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BRAZILIAN JOURNAL OF ULTRASONOGRAPHY

ISSN - 2675-4037 *ISSN - 2675-4800*

VOL. 28 Nº 29 (SEPTEMBER 2020)


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CIP - Brasil - Catalogação na Fonte
Dartony Diocen T. Santos CRB-1 (1° Região)3294

R454 RBUS - RBUS - Brasilian Journal Of Ultrasonography .V.28, n. 29. september 2020 -
Goiânia:. D&D Comunicação Ltda.

60p. : il. (Semiannual publication)

ISSN - 2675-4037

1. Magazine. 2. Ultrasonography. 3. Cytology. 4. Gynecology.
I.Título.

CDU: 616.62(52) =111

Impresso no Brasil
Printed in Brazil – 2020

Índice para catalogo sistemático:

CDU: 616.62(52) =111

RBUS BOARD | 2018-2021

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ACKNOWLEDGMENTS

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INDEX

UNCERTAINTIES AND COMMON SENSE

We live, unquestionably, a moment of uncertainty, insecurity and anxiety with the Covid-19 pandemic, declared by the World Health Organization (WHO) on March 11th, 2020. Once again, science takes a center stage in the global debates and attention in the pursuit of the longed-for cure of this disease that does not choose race, nationality, sex or social condition. The moment is one of alertness, common sense and observance of all preventive rules recommended by WHO. Encouraging research and scientific production is one of the main pillars of the SBUS, a respected entity that plays an important role in the national medical universe. In this scenario, Revista de Brasileira de Ultrasonografia – RBUS (Brazilian Journal of Ultrasonography), traditionally known as Revista Azul (Blue Journal), plays a fundamental role, becoming an extraordinary tool for the dissemination of scientific research in USG, sharing experiences and knowledge through relevant and unpublished articles. To expand the scope of our scientific publication, starting from this edition we will also make available digital versions in English and Spanish. More good news: each article now has a QR Code, making downloads even more agile and uncomplicated. Participate in this project that helps to value Brazilian ultrasonography even more.

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MAIN FINDINGS OF BREAST ULTRASONOGRAPHY EXAMINATIONS AND BI-RADS CLASSIFICATION

CORINA GOMES DAVID[1], ARIELA MAULLER VIEIRA PARENTE[1], PATRÍCIA GONÇALVES EVANGELISTA[2], WALDEMAR NAVES DO AMARAL[2]

ABSTRACT

INTRODUCTION: Ultrasound is an additional diagnostic tool that increases the detection rate of benign and malignant breast lesions. It is the method of choice to differentiate solid and cystic lesions, to further characterize mammographic findings and to better appreciate palpable breast lesions.

OBJECTIVE: To survey the main findings of ultrasound exams and histopathological findings and the Bi-Rads categorization.

METHODS: Cross-sectional, analytical, descriptive study carried out from ultrasound exams performed at Clínica Fértile from January to December 2019.

RESULTS: 2,259 breast ultrasound exams from January 1, 2019 to December 31, 2019 were analyzed. Fertile clinic. Of the exams analyzed, 2,005 were categorized as 0, 1, 2 within the normal range with 89%. In categories 3,4,5 there were 251 exams representing 19% that were referred for histopathology. Of these, 230 exams had benign and 21 malignant findings. Category 4 represented 48% of malignant exams and category 3 was 94% benign. Regarding the age group in categories 1,2,3, the prevalence was of women under 40 years old with 57%, 52% and 61% respectively. 36% of women under 40 and between 41-50 were classified in category 4. In category 5 there was a higher prevalence of women aged 51-60 years with 68%. Of the malignant findings, the main finding was invasive ductal carcinoma with 33% of the cases analyzed.

CONCLUSION: 2259 breast ultrasound exams were evaluated with 89% within the normal range in categories 0, 1, 2. In categories 3,4,5 there were 19%. The findings of categories 3.4 and 5 were referred for histopathological analysis with 91% benign and 9% malignant. Category 4 represented 48% of malignant exams and category 3 was 94% benign. Regarding the age group in categories 1,2,3, the prevalence was of women under 40 years old with 57%, 52% and 61% respectively. 36% of women under 40 and between 41-50 were classified in category 4. In category 5 there was a higher prevalence of women aged 51-60 years with 68% of the findings. Of the malignant findings, the main finding was invasive ductal carcinoma with 33% of the cases analyzed.

KEYWORDS: BREAST CANCER, DIAGNOSIS, ULTRASOUND.

INTRODUCTION

Breast cancer accounted for 24.2% of all cancers in the world in 2018 with 2.1 million new cases, being the fifth leading cause of cancer death in general (626,679 deaths). In Brazil, with the exception of non-melanoma skin tumors, breast cancer is also the most estimated incident in 2020, with 66,280 new cases with an incidence rate of 43.74 cases per 100,000 women. The South and Southeast regions have the highest rates, with 14.14 and 14.10 deaths / 100,000 women in 2017, respectively[1-3].

The World Health Organization emphasized that the early detection of cancer is based on the observation that the treatment is more effective when the disease is diagnosed in early stages, before the onset of clinical symptoms[4].

It is known that women who have 75% or more of fibroglandular tissue have a four to six times greater risk of developing breast cancer than women of the same age with less than 10% of fibroglandular tissue[5].

Since its inception, the Breast Imaging Data and Reporting System (BI-RADS) has classified mammographic density into four categories, with the percentage of each tissue density in the general screening population estimated as follows: 10% of women have almost entirely fatty breasts, 40% have spread areas of fibroglandular density, 40% have heterogeneously dense breasts and 10%

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have dense breasts. Other studies suggest that 50% of the population undergoing mammographic screening has heterogeneously dense or extremely dense breasts. For this group, mammography has limited sensitivity, which hinders early detection[6].

Ultrasound represents an additional diagnostic tool that increases the rate of detection of benign and malignant breast lesions. It is the method of choice to differentiate solid and cystic lesions, to further characterize mammographic findings and to better appreciate palpable breast lesions. Mode B ultrasound is used in daily practice. Harmonic and composite images can be used to improve image contrast and resolution[7].

In this context, the objective of this study is to raise the main findings of ultrasound exams and histopathological findings.

METHODS

This is a cross-sectional, analytical, descriptive study carried out based on ultrasound exams performed at Clínica Fértile from January to December 2019.

The ultrasound examination was performed with high-resolution devices with 7.5 MHz and 10 MHz transducers.

Histological findings were compared with ultrasonographic characteristics. This research project was based on Resolution N0. 466/2012, being the rights of those involved ensured and approved by the Ethics Committee appointed by Plataforma Brasil.

RESULTS

2,259 breast ultrasound exams were analyzed from January 1st 2019 to December 31st 2019 performed at the Fértile clinic. The results are shown in tables 1-4.

BI-RADS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Category 0	8	0,3%
Category 1	1370	61%
Category 2	627	27,7%
Category 3	223	9,8%
Category 4	22	0,9%
Category 5	6	0,2%
Category 6	3	0,1%
TOTAL	2259	100%

Table 1 - Distribution of breast ultrasound characteristics according to the BI-RADS categories performed on women treated at the Fértile clinic, Goiânia - GO, 2019.

USG Aspect	< 40	41-50	51-60	61 a 70	71 >
Category 0	6(75%)	1(12%)	1(12%)	0	0
Category 1	777(57%)	298(22%)	166(12%)	95(7%)	34(2%)
Category 2	325(52%)	181(29%)	82(12%)	29(5%)	10(1%)
Category 3	136(61%)	50(22%)	25(11%)	10(5%)	2(1%)
Category 4	8(36%)	8(36%)	1(5%)	4(18%)	1(5%)
Category 5	0	1(16%)	4(68%)	1(16%)	0
Category 6	0	1(25%)	0	1(25%)	2(50%)

Table 2 - Distribution of breast ultrasound characteristics according to age and BI-RADS categories performed on women treated at the Fértile clinic, Goiânia - GO, 2019.

Biopsies of categories 3,4,5 were analyzed, totaling 251 patients.

HISTOPATHOLOGY	BENIGN		MALIGNANT	
N = 251	N = 230		N = 21	
Category 3	215	94%	8	38%
Category 4	12	5%	10	48%
Category 5	3	1%	3	14%

Table 3 - Distribution of the histopathological characteristics of breast exams performed in women treated at the Fértile clinic, Goiânia - GO, 2019.

HISTOPATHOLOGY	HISTOLOGICAL TYPE	N	%
Malignant	Invasive ductal carcinoma	7	33%
	Invasive lobular carcinoma	5	24%
	Ductal carcinoma *in situ*	4	19%
	Mucinous Carcinoma	3	14%
	Lobular carcinoma *in situ*	1	5%
	Invasive papillary Carcinoma	1	5%

Table 4 - Distribution of the main histopathological findings of breast exams performed in women attended at the clinic Fértile, Goiânia - GO, 2019.

DISCUSSION

Breast cancer has a high incidence and mortality worldwide, representing a serious public health problem. The incidence of this neoplasm has been increasing in recent decades[8]. 2259 breast ultrasound exams were analyzed during 2019 at the Fértile clinic, of which 2005 were categorized as 0, 1, 2 within the normal range, which corresponded to 89%.

The BI-RADS system was created by the American College of Radiology in the 90s, initially only for mammography, with the aim of standardizing the medical report, standardizing the terms used, establishing final evaluation categories and suggesting appropriate conducts for each one[9].

When analyzing 218 ultrasound exams in the city of Itajaí - SC in relation to BI-RADS, it was shown that 38.53% were classified as benign[10].

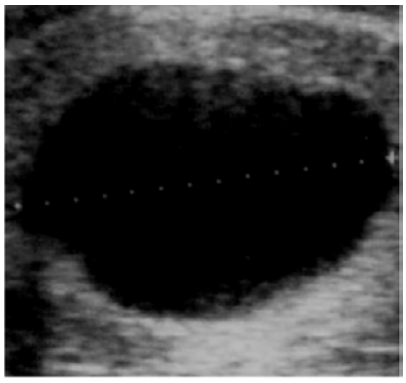
251 exams were classified in the categories 3, 4, 5 representing 19%; after the histopathology 230 exams were benign and 21 malignant. Category 4 represented 48% of malignant exams and category 3 was 94% benign.

When evaluating the BI-RADS system as a predictor of suspicion for malignancy in breast lesions, correlating the radiological findings and histological results by calculating the positive predictive value of categories 3, 4 and 5 in a reference service in the diagnosis and treatment of breast cancer in the city of São Paulo, with 725 patients, lesions classified in category 5 showed high suspicion of malignancy whereas category 3 showed very low risk. As for category 4, the need of systematic biopsies became clear[11].

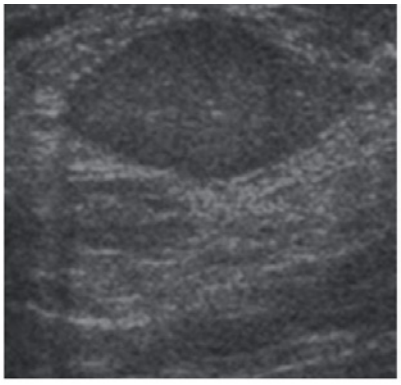
For BI-RADS classification, the following ultrasound descriptions were used to characterize the nodule: contours, margins, orientation of the nodule in relation to the skin, edges of the lesion, internal echo pattern, posterior acoustic characterization and changes in the surrounding tissues. After describing the lesions according to the BI-RADS criteria, all lesions were classified in the categories of Table 1.

Incomplete evaluation
Category 0 (zero): requires additional evaluation by image
Complete evaluation
Category 1: negative
Category 2: negative findings
Category 3: probably benign findings - suggests follow-up in a short period of time
Category 4: suggestive of abnormality - biopsy should be considered (undetermined)
Category 5: highly suggestive of malignancy - appropriate conduct should be taken
Category 6: biopsy-proven disease

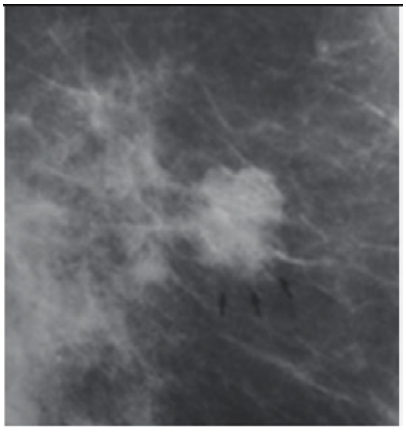
Table 1 - Bi-Rads classification [12,13]



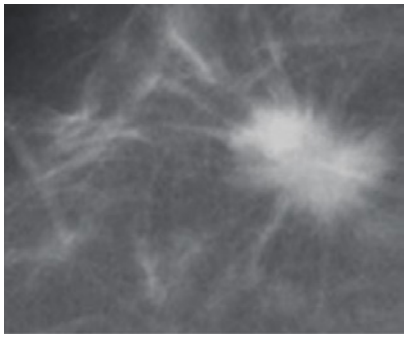
Category 2



Category 3



Category 4



Category 5

Regarding the age group in categories 1,2,3, the prevalence was of women under 40 years old with 57%, 52% and 61% respectively. In category 4, 36% of women were under 40 and between 41 and 50. In category 5 there was a higher prevalence of women aged 51-60 years with 68%. The incidence of breast cancer in young women in Goiânia has been increasing significantly. However, this increase is similar to that observed in other age groups[14].

Among the malignant findings, invasive ductal carcinoma was the one with the highest incidence with 33% of the cases analyzed. Breast cancer is the most common cancer and the second most frequent cause of death due to neoplasms in women, representing high mortality also in Brazil[15].

Breast ultrasound is widely used in clinical practice in patients with detectable changes on physical examination or mammography. In the presence of mammographic lesions, ultrasonography not only helps characterize and perform biopsies, but it is also able to identify additional lesions in 14% of women with dense breasts[5]. The Brazilian College of Radiology and Diagnostic Imaging, the Brazilian Society of Mastology and the Brazilian Federation of Gynecology and Obstetrics Associations for breast cancer imaging screening in Brazil recommend complementary screening with breast ultrasound, especially for women with dense breasts[16].

Failure to observe these assumptions can negatively condition echographic information or even cause error, in view of the great inter and intra-observer variability in the characterization of images[15].

The global impact of breast cancer on women is considerable and growing in many countries. Adequate characterization of the affected populations helps health professionals, improving their degree of suspicion and contributing to early diagnosis[17].

CONCLUSION

2259 breast ultrasound exams were evaluated with 89% within the normal range in categories 0, 1, 2. In categories 3,4,5, 19% remained.

The findings of categories 3.4 and 5 were referred for histopathological analysis, with 91% benign and 9% malignant. Category 4 represented 48% of malignant exams and category 3 was 94% benign.

Regarding the age group in categories 1,2,3, the prevalence was of women under 40 years old with 57%, 52% and 61% respectively. In category 4, 36% of women were under 40 and between 41-50. In category 5 there was a higher prevalence of women aged 51-60 years with 68%.

Of the malignant findings, the main finding was invasive ductal carcinoma with 33% of the cases analyzed.

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CONGENITAL PULMONARY AIRWAY MALFORMATIONS: CHARACTERISTICS, NEONATAL OUTCOME AND PROPOSED FOLLOW-UP PROTOCOL ON THE FETAL MEDICINE SERVICE AT HOSPITAL MATERNO INFANTIL PRESIDENTE VARGAS.

MARINA DOMINGUES[1], JORGE ALBERTO BIANCHI TELLES[2].

ABSTRACT

OBJECTIVE: To evaluate the characteristics and outcomes of pregnancies affected by congenital pulmonary airway malformation (CPAM) on a Fetal Medicine Service in Porto Alegre-RS.

METHODS: Documentary, descriptive, retrospective cohort study. All pregnancies diagnosed with CPAM were evaluated from 2013 up to 2019. Analysis of medical records was performed. The final sample consisted of nine patients.

RESULTS: All babies were delivered at term, with adequate weight, and Apgar above 8 in the 1st and 5th minute. There was a higher incidence of lesions affecting the left lower lobe. Was also noted a higher prevalence on males. Some cases evolved with mediastinal shift, but none evolved to non-imune fetal hydrops. Corticosteroid therapy was performed in all pregnant women since 2015. In cases where it was possible to access the CVR (5/9) a tendency to decrease in the third trimester was observed. There was no patient with CVR > 1,6. There was one case of spontaneous regression of CPAM. All postnatal confirmed cases went to surgery (lobectomy) between 3-6 months of life.

CONCLUSIONS: CPAM is a rare malformation with a variable outcome and prognosis. Fetal therapy is indicated in severe cases complicated by hydrops or at high risk of developing this condition. Given this broad spectrum of possibilities, it is necessary to develop a care protocol for the service to standardize follow-up and the conduct to be adopted for each case.

KEYWORDS: CONGENITAL PULMONARY AIRWAY MALFORMATION, CVR, NON-IMUNE FETAL HYDROPS, CORTICOSTEROIDS, LOBECTOMY.

INTRODUCTION

Congenital pulmonary airway malformation (CPAM), classically referred to in the literature as cystic adenomatoid malformation, consists of a rare anomaly in the development of the lower respiratory tract, which probably results from an interruption of lung development between the 7th and 15th weeks of gestation , during the pseudo-glandular stage[1,2]. It is characterized by the excessive growth of terminal bronchioles without the corresponding alveoli1. The lesion has a vascular supply from the pulmonary circulation. It is estimated that the incidence is approximately 1 in every 10,000 - 35,000 live births[3,4].

Currently, the wide use of ultrasound has led to an increase in the prenatal diagnosis of these lesions[5]. In association, fetal magnetic resonance imaging improves the assessment of lung anatomy, which can help to confirm or exclude the suspected diagnosis, and provides additional useful information for counseling and obstetric treatment[5]. Thus, the main pulmonary malformations are, in theory, likely to be detected before birth[6].

The main differential diagnosis of CPAM is bronchopulmonary sequestration (BPS), which consists of a mass of anomalous lung tissue that does not communicate with the tracheobronchial tree and receives blood supply from the systemic circulation (usually the abdominal or thoracic aorta) [7]. There is also the possibility of "hybrid" lesions that

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have histopathological features of CPAM, but with vascular supply from the systemic circulation. This indicates a probable single embryological origin of CPAM and BPS[7,8]. Other differential diagnoses include bronchogenic or neuroenteric cysts, diaphragmatic hernia, congenital lobar emphysema and peripheral bronchial atresia[9].

There are currently two classifications for CPAM. One of them, proposed by Stocker in 1977, classifies the lesions in three types according to their histological characteristics[10]. This classification system, although useful in prognostic terms in the postnatal period, is less appropriate in the prenatal period, since the tissue is not available for analysis. In prenatal care, the most simplified Adzik classification is used, which divides CPAM into macrocystic, when there are one or multiple cysts with at least 5mm in diameter, and microcystic, when the lesion appears as an echogenic mass with smaller cysts than 5mm[11].

The prognosis of affected fetuses depends on the volume of the lung mass and on the secondary pathophysiological effects: a bulky mass causes deviation of the mediastinum, pulmonary hypoplasia, polyhydramnios and cardiovascular involvement, leading to hydrops and death[12]. Regarding the assessment of the evolution and prediction of the risk of developing hydrops, the measurement of the mass volume (cm^3) / cephalic circumference (cm) - acronym in English: CVR - congenital cystic malformation volume ratio is used. Lesions of CPAM can be measured ultrasonically using the volume formula of an ellipse (length x height x width x 0.52). They are considered high risk for the development of hydrops when the CVR is greater than or equal to 1.613.

The follow-up of these lesions can vary from only ultrasound follow-up with full-term delivery and resection of the lesion in the postnatal period to intrauterine surgery, which may include thoracotomy and lobectomy, thoracoamniotic shunt and EXIT procedure with thoracotomy and lobectomy at the time of delivery[2].

In most cases, it is not necessary to perform any type of intrauterine intervention. Babies have a good postpartum evolution and remain asymptomatic for a long period. However, complications can occur beyond childhood, including adolescence and adulthood[14]. In addition to recurrent respiratory infections, the lesions have the potential for malignancy[15]. Therefore, when prenatal diagnosis is not performed, there may be more difficult implications for treatment and future surgical planning.

This study aimed to evaluate the characteristics and outcome of pregnancies affected by CPAM in the Fetal Medicine service of Hospital Materno Infantil Presidente Vargas and to propose a model of care protocol for the service.

METHODS

This is a documentary, descriptive study of a retrospective cohort. All pregnancies diagnosed with congenital pulmonary airway malformations that were attended at the Fetal Medicine service of HMIPV in the period from 2013 to 2019 were included. The final sample was nine patients.

The data were obtained through research in medical records and care records and the information was compiled in tables containing demographic and care variables of the maternal-fetal binomial. The maternal variables analyzed are shown in table 1.

Variables	Options
Maternal age	-
Type of pregnancy	1. Single 2. Multiple
Gestational age at diagnosis	-
Associated malformations	-
Type of delivery	1. Normal 2. Caesarean
Gestational age at delivery	-
Fetal weight at birth	-
Apgar at 1st and 5th minute	-
Sex of the NB	1. Male 2. Female
Side of the lesion	1. Left 2. Right 3. Bilateral
Type of lesion	1. Macrocystic 2. Macrocystic
Mediastinal shift	1. Yes 2. No
Hydrops	1. Yes 2. No
Use of corticosteroids	1. Yes 2. No
25-week CVR	-
CVR after 30 weeks	-
Postnatal diagnosis by computed tomography	1. CPAM 2. BPS 3. Hybrid lesion 4. Other lesions 5. Absence of lesion
Types of post-natal procedures	1. Surgery 2. Expectant treatment

Table 1 - Maternal variables

Data processing and analysis methods were performed using the Microsoft Excel program. The project was approved by the Research Ethics Committee (Comitê de Ética em Pesquisa - CEP) of Hospital Materno Infantil Presidente Vargas. Protocol number: 3.791.926.

Due to the retrospective nature of the study, we found some limitations related mainly to the absence of some data in the medical records studied and to the small number of cases that did not allow statistical analyzes between the variables.

RESULTS

Between 2013 and 2019, nine pregnancies affected by CPAM were monitored at the Fetal Medicine Service of Hospital Materno Infantil Presidente Vargas, in Porto Alegre. The median maternal age in the affected pregnancies was 24 years (18-34). The median gestational age at diagnosis was 23 weeks (20-32). There was a case of involvement of multiple pregnancy (dichorionic and diamniotic twins), where one of the fetuses was diagnosed with the pathology.

In one case, there was an association between CPAM and frontal encephalocele, the karyotype was normal (46, XY). No associated malformations were observed in other fetuses.

Regarding the type of delivery, it was observed that 37.5% of babies were born by normal delivery versus 62.5% by caesarean section. All babies were born at term with a median gestational age at delivery of 39 weeks and 1 day. No pregnancy needed to be terminated due to CPAM. The median fetal weight at birth was 3143g (2860g - 4100g). The median of the Apgar in the 1st minute was 8 (8-9) and in the 5th minute 9 ([8-9]). In the analysis of sex, 78% of the fetuses were male and 22% female.

Regarding the location of the lesions: 62.5% (five cases) affected the left pulmonary lobe, 25% (two cases) the right pulmonary lobe and one case (12.5%) had bilateral involvement. Among the types of CPAM 55.6% were macrocystic and 44.4% microcystic. In 55.6% of the cases, the lesion caused deviation of the mediastinum, but in no case did hydrops occur. Corticosteroids (betamethasone, at a dose of 12mg, IM, 2x) were used in 77.8% of cases.

In five cases, it was possible to obtain CVR measurements at 25 weeks and after 30 weeks. In one case the CVR was ≥1.6 at 25 weeks and in one case the CVR was ≥1.6 after 30 weeks.

The result of the diagnostic imaging using computed tomography (CT) performed in the postnatal period was obtained in five cases: three of them (60%) confirmed the prenatal diagnosis of CPAM. In one case, the diagnosis of a hybrid lesion was made and in one case, no change in CT was seen. In the case in question, the last ultrasound performed at the service also did not show the lesion anymore. In the four cases with confirmed lesion, surgical treatment (lobectomy) was performed between 3-6 months of age.

DISCUSSION

Prenatal ultrasound diagnosis of fetal abnormalities not only improves the management of the fetus and the newborn, but also helps to define the natural history and pathophysiology of some congenital malformations[16]. In the case of CPAM, with the increased experience and knowledge of professionals and the improvement of ultrasound devices, it is possible to define more precisely the lesions and classify them as solid or cystic, assess vascularization, predict risks and indicate procedures that can be fundamental for maintaining the pregnancy.

CPAM lesions affect both lungs equally, preferably the lower lobes, and a slight predominance in males is observed[14]. In our study, it was observed a greater involvement in the left lower pulmonary lobe and a higher prevalence in males. Other sociodemographic variables do not appear to be associated with this pathology.

Typically, these lesions grow up to 25 weeks, when they usually reach their greatest volume, and after 30 weeks they tend to shrink or even disappear spontaneously[13]. A Canadian study published by Laberge et al[3] in 2001, showed a spontaneous intrauterine regression rate of 56%, with only 5% of fetuses evolving with hydrops and a 10% rate of postnatal death (including a fetus with trisomy 18). In contrast, Nicolaides et al5 published a series of 132 cases in which the incidence of spontaneous regression occurred in only 9% of cases, with a rate of 43% of the fetuses progressing to hydrops and 24% to death. Therefore, it is observed that the evolution of cases varies widely. In our service, the lesion disappeared in one case (12.5%) of microcystic CPAM, and there were no cases of hydrops or fetal/neonatal deaths.

Ultrasound control with CVR measurement is an important predictor of outcome in fetuses with CPAM17. In 86% of cases, fetuses with CVR <1.6 will not progress to hydrops[13]. Among the cases in the study, 89% had CVR <1.6 and none of them evolved with hydrops, thus corroborating the effectiveness of this parameter as a predictor of severity. In cases where it was possible to obtain the CVR at 25 weeks and after 30 weeks, a propensity towards a reduction in CVR after 30 weeks was observed, in agreement with the literature[13].

In the three cases that serial CVR measurements were performed, a disparity in the volume of lung mass was noted over the weeks, with measurements alternating between major and minor, and not a constant growth (or decrease) of the lesion, as shown in figure 1.

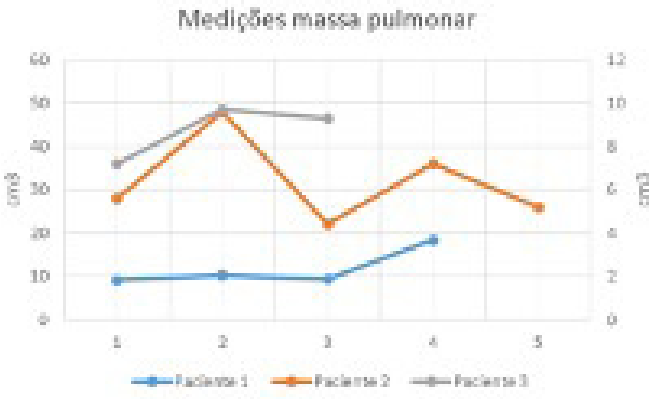
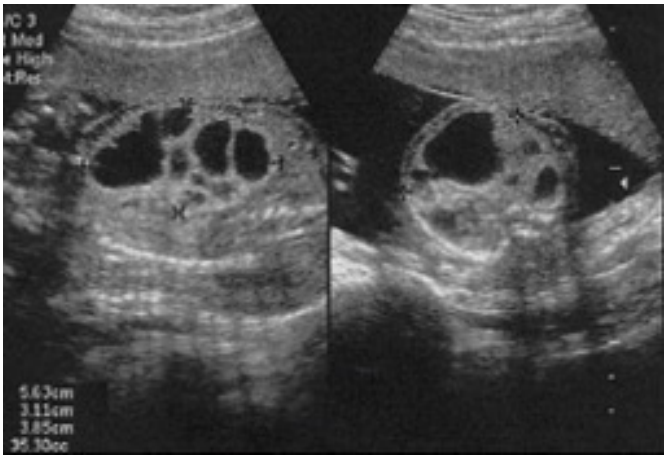


Figure 1. Variation in lung mass volume according to the evolution of pregnancy.

Therefore, the need for improvement in the standardization of the measurement of the lesion volume is highlighted. According to Crombleholme et al [11], the proper measurement method involves sagittal and transverse sections. The maximum length in the sagittal cut must be obtained and, after that, the maximum height and width in the axial cut. The approximate volume will be calculated using the formula of an ellipse: length x height x width x 0.52 (Figure 2).



After obtaining the volume of the lung lesion, the CVR can be calculated using the formula:

$$CVR = \frac{\text{Mass volume } (cm^3)}{\text{Head circumference (cm)}}$$

Intrauterine fetal therapy is always indicated in cases of high risk of developing hydrops (CVR ≥ 1.6) or when this condition is already installed[3,9], since this condition becomes lethal if it is not treated in 100% of cases[12] . Treatment for macrocystic lesions consists of aspiration of the cysts or placement of a thoracoamniotic shunt. However, treatment for microcystic lesions remains a challenge[2]. Recently the use of betamethasone based on small case series has started to be discussed. It is not known what the exact mechanism of action of the medication for these lesions is, some authors hypothesize that the pulmonary cells in the CPAM are immature and that the corticoid could stimulate maturation, thus reducing the volume of the mass and contributing to the improvement of hydrops[18,19] .

The literature indicates fetal therapy only in high-risk cases[3,9]. However, in HMIPV, as well as in some other reference centers in fetal medicine in Brazil, we opted for corticotherapy in seven of the nine cases (78%), regardless the severity and gestational age. No case progressed to hydrops, including the two who had not taken corticosteroids. A larger number of patients would be needed in order to perform a better analysis and draw better conclusions, but the use of corticosteroids did not appear to affect the outcome in this group of patients.

Although some authors defend the expectant treatment for some cases of CPAM that evolve asymptomatic in the postnatal period1,[20,21], in our service all cases that had a confirmed postnatal diagnosis went to surgery. This finding is in agreement with Laberge et al[3] in 2001, who affirms that CPAM are not variants of normality and that all babies with a confirmed diagnosis must go to surgery, even asymptomatic ones. The lack of treatment can lead to both an increased risk of recurrent respiratory infections and the subsequent malignancy of those lesions[22].

In view of the above, it was decided to create a proposal for a follow-up protocol from the HMIPV Fetal Medicine service for this pathology, based on the updated literature[8,18,20] and with the resources available in the service (Figure 3).

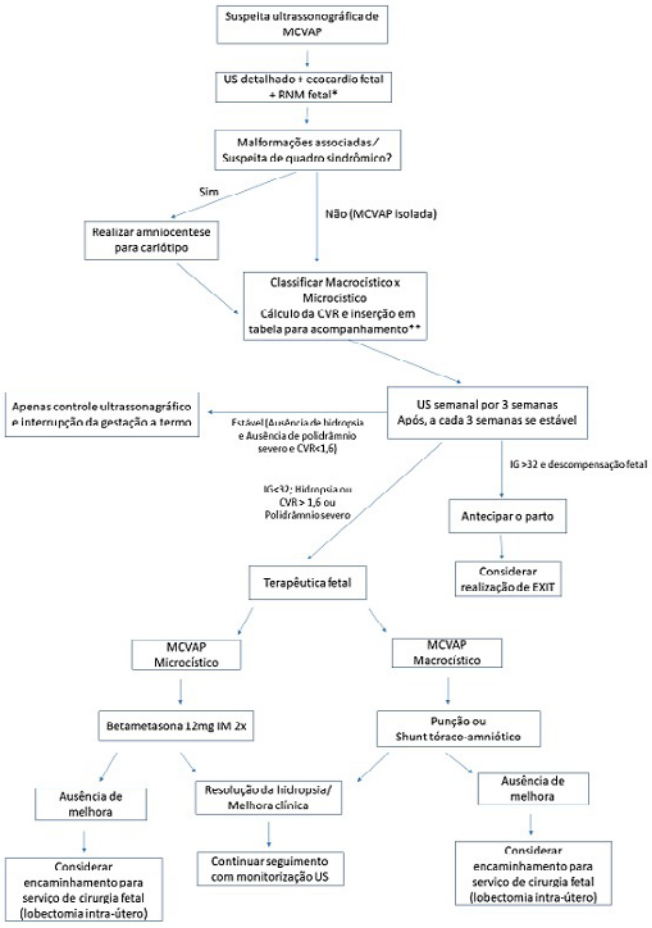
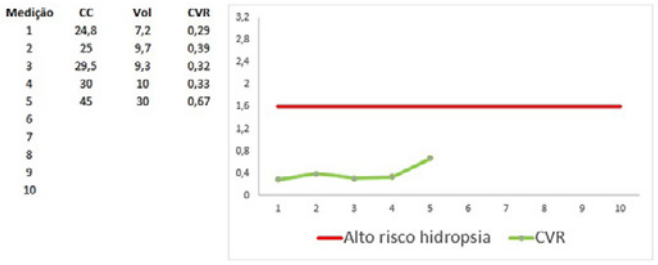


Figure 3. Flowchart for monitoring and treating cases of CPAM in the Fetal Medicine service of HMIPV. * Adequate gestational age to perform fetal echocardiography after 24 weeks and to perform fetal MRI from 26 weeks onwards. ** Worksheet for inserting the volume of the CPAM and fetal head circumference, with CVR calculation and graph plotting, developed by the author (figure 3).

To make the prenatal follow-up more uniform and illustrative, a spreadsheet was created in Excel software to insert the volume of the CPAM and the head circumference, which automatically calculates the CVR and inserts this data in a chart for monitoring (Figure 4).



Medição	CC	Vol	CVR
1	24,8	7,2	0,29
2	25	9,7	0,39
3	29,5	9,3	0,32
4	30	10	0,33
5	45	30	0,67
6			
7			
8			
9			
10			

Figure 4. Demonstrative model of the table created in Excel for insertion of lung mass volume, calculation of CVR and plotting on the graph.

Thus, it is concluded that CPAM is a rare malformation, with variable evolution and prognosis. Fetal therapy is indicated in severe cases complicated by hydrops or at high risk of developing this condition. The elaboration of an assistance protocol for the service aims to improve monitoring and the most appropriate therapy for each case.

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TECHNIQUE OF PUDENDAL NERVE BLOCK IN THE CANAL OF ALCOCK GUIDED BY ULTRASOUND

GILLIATT SAEKI DE SOUZA [1] , MONRES JOSÉ GOMES [2]

ABSTRACT

OBJECTIVE: To describe the technique of pudendal nerve block in the Alcock canal developed in cadavers and to show results of its application in clinical cases of symptomatic patients, for diagnosis and treatment.

MATERIALS AND METHODS: Punctures and infiltrations were performed with dye (methylene blue) guided by ultrasound in three cadavers (bilateral) and thorough dissection of the deep gluteal region to identify the pudendal nerve. Using the same technique, anesthetic blocks were performed in seven patients with severe perineal pain, unilateral and evaluated by the visual analogue scale (VAS) before and after the procedures. In all cases, high-resolution multifrequency transducers and spinal needles BD 23 were used. The ultrasonographic parameters were, in systematic order, the identification of the ischial tuberosity, the sacrotuberous ligament, the anatomical space below the sacrotuberous ligament and which was subdivided into three other spaces (proximal, middle and distal third) and direct echogenic identification of the pudendal nerve.

RESULTS: In the anatomical study, we observed the presence of dye in the pudendal nerve and proximal adjacency in all dissected cadavers. In clinical cases, pain relief in all patients after procedures, obtaining effective nerve block. Complications: Absence of clinical signs of anesthetic block of the sacral plexus, vascular lesions with puncture and cases of superficial and or deep infection.

CONCLUSION: The technique of pudendal nerve block guided by ultrasound in the Alcock canal, delimiting anatomical space below the sacrotuberous ligament, proved to be effective and safe in anatomical studies in cadavers and in clinical procedures performed.

KEYWORDS: PUDENDAL NERVE, SACRAL PLEXUS, PUDENDAL NEURALGIA, CHRONIC PELVIC PAIN SYNDROME.

INTRODUCTION

In 1836, Benjamin Alcock (Kilkenny, Ireland, 1801)[1], an anatomist physician at Trinity College Dublin (founded in 1592), described, in the chapter on iliac vessels of the work "The Cyclopaedia of Anatomy and Physiology", the presence of an anatomical structure originated from the fascia of the internal obturator muscle that projected over the pudendal artery, vein and nerve, which he called the pudendal canal (Figure 1).

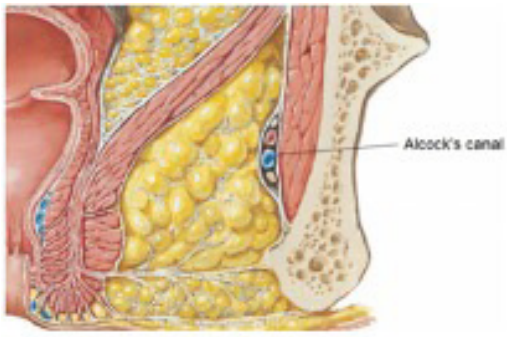

Figure 1. Illustration of the Alcock canal (pudendal canal)

The pudendal nerve originates from the anterior sacral branches (sacral plexus) from S2 to S4, with rare variants receiving branches from S1 or S5. The three roots form two trunks (an upper one for S2 and a lower one for S3 and S4) that join to form the nerve, which in turn bypasses the ischial spine and penetrates into an anatomical space delimited later by the sacrotuberous ligament and, anteriorly (floor), through the fascia of the internal obturator muscle (Alcock canal). After entering the canal, the nerve will be subdivided into three terminal branches which will innervate the region of the external genitalia (dorsal of the penis and or the clitoris), the anal sphincter (lower rectal) and the perineum (perineal nerve). More recent anatomical studies[2] made it possible to define an average canal wall length of 1.6 mm in adult cadavers and 0.8 mm in stillbirths and, in a histological analysis, observed the intense presence of collagen and elastic fibers, concluded by the authors to be important for increase the resistance to trauma and subluxations of the neurovascular bundle and contribute to the venous return of the pudendal vein.

The pudendal neuralgia is part of the group of chronic pelvic pain. It is a neuropathic clinical condition of variable intensity in the perineal and myofascial region in the buttocks, usually unilateral and with a predominance during the

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day and when seated. Dysuria, polaciuria, dyspareunia and erectile dysfunction may be present. The etiologies are the stretches of the pudendal canal wall itself, compressions by impact of the posterior ligaments (sacrotuberal) and physical activities such as leg press and cycling, and secondary nerve fibrosis in irradiations, postpartum and surgical scars. In 1987, Alcock's Canal Syndrome[3] was described, for the first time, in male cyclists who evolved with genital and sphincter dysfunction associated or not with perineal and transient genital paresthesias and hypoesthesias.

For the diagnosis and treatment of this clinical condition, a precise physical examination and a local approach of the pudendal nerve4 with minimally invasive and safe anesthetic tests are necessary. Neural anesthetic procedures and blocks in the upper and lower limbs[5] are already perfectly executed with the help of high resolution ultrasound, favored by the echogenicity of the nerve fascicles and their adjacent connective tissue, in addition to being more superficial structures. For deeper anatomical regions, such as the abdominal, pelvic and gluteal cavities, it is reported by the literature[6] that the use of convex transducers (low frequency / 2 to 5 MHz) is fundamental, especially to visualize nerves with a smaller cross-sectional area.

The aim of this study is to define a new technique for blocking the pudendal nerve and its branches at the entrance to the Alcock canal using local anatomical parameters and high resolution multifrequency ultrasound equipment in fresh cadavers.

MATERIAL AND METHODS

The study was carried out by two orthopedic doctors, hip surgeons, both with experience in musculoskeletal ultrasound. It started at Instituto Médico Legal of Goiânia, Goiás, between March 10, 2016 and June 18, 2016, with punctures and infiltrations with methylene blue dye (5ml) in the region of the lower-medial buttock quadrant, guided by ultrasound, in three cadavers, bilaterally. In all cases, high-resolution linear transducers with low frequency (3.5 to 7.5 MHz), high-frequency convex (6.6 MHz) and Becton Dickison (BD) 23 spinal needles were used for the procedures. The position adopted was the prone position and the transducer initially positioned on the ischial tuberosity with a spatial orientation of 11 hours for the right gluteus and 1 hour for the left (Figure 2). In order, the parameters were to identify the sacrotuberous ligament as a hyperechogenic linear band in a longitudinal plane and then an anatomical (anterior) space below this ligament and filled, predominantly, by the fibers of the internal obturator muscle. In this space, using the ultrasound caliper, a line was drawn parallel to the sacrotuberous ligament, starting from the sacral bone border (cranial proximal) to the ischial tuberosity (distal caudal), which was subdivided into three segments and or spaces: proximal, middle and distal third (Figure 3). Thus, maintaining the longitudinal transducer over the sacrotuberous ligament, at its outer edge, the neural echogenic signs of the pudendum in the proximal third (Figures 4 and 5) and or transition from the proximal to the middle third were observed.

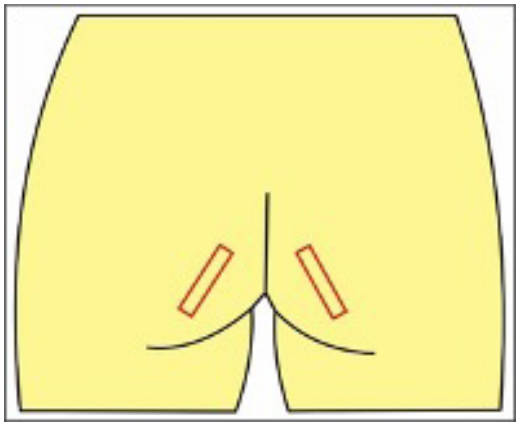

Figure 2. Position of the transducer. For ultrasonographic visualization of the sacrotuberous ligament in a longitudinal position.

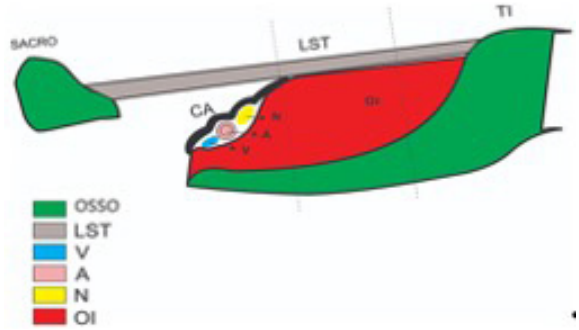

Figure 3. Schematic drawing: CA - Alcock canal, LST - sacrotuberous ligament, TI - ischial tuberosity, V - pudendal vein, A - pudendal artery, N - pudendal nerve, OI - internal obturator muscle.

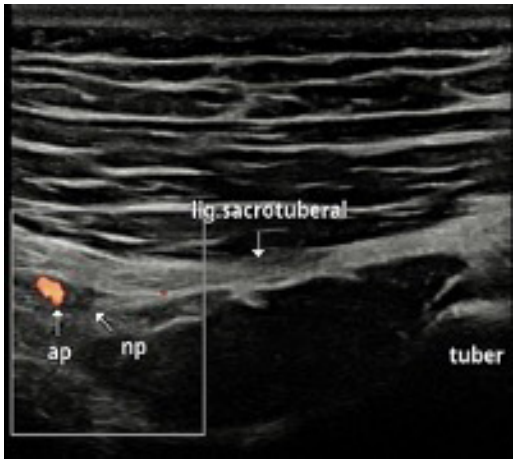

Figure 4. Linear transducer. Ultrasonographic image of a clinical case, ap - pudendal artery (power Doppler), np - pudendal nerve.

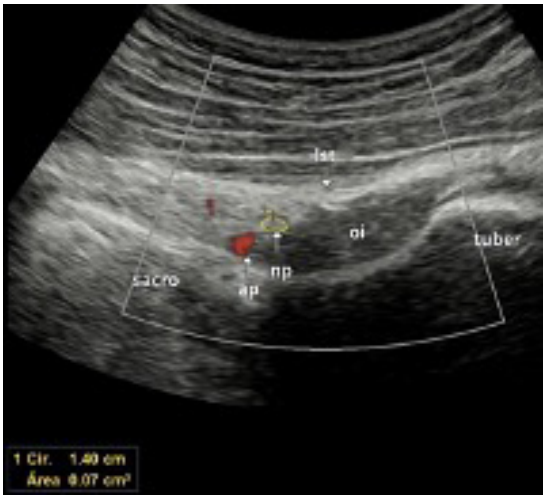

Figure 5. Convex transducer. Ultrasonographic image of a clinical case - ap - pudendal artery (power Doppler), np - pudendal nerve (yellow), lst - sacrotuberous ligament, oi - internal obturator muscle.

After echogenic identification of the pudendal nerve, the needle was introduced at an angle between 45 and 60 degrees, from cranial to caudal, transfixing the sacrotuberous ligament to perform the infiltration with the dye (Figure 6). Then, in all cases, a thorough deep gluteal dissection was performed with a posterolateral incision, identification of the sciatic nerve (initial anatomical reference), sacrotuberous ligament, pudendal nerve and artery and verification of the substance administered in the anatomical structures (Figures 7 and 8).

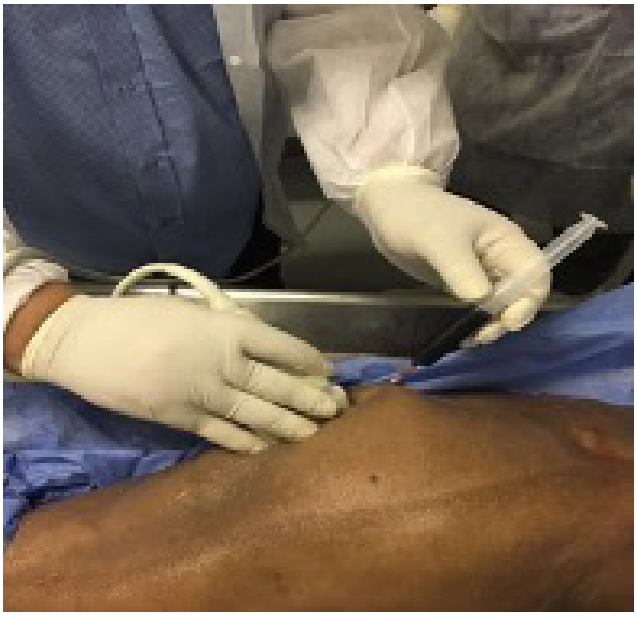

Figure 6. Right buttock. Transducer positioned 11 hours over the sacrotuberous ligament.

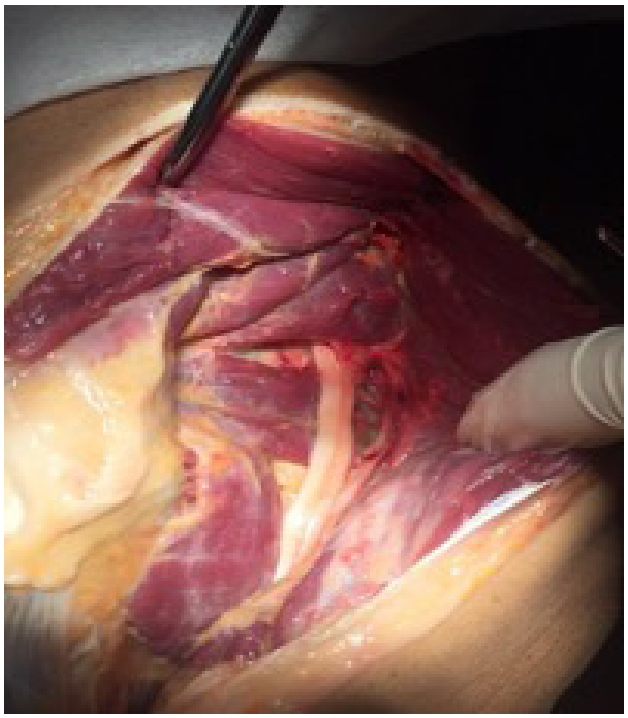

Figure 7. Deep gluteal dissection on the left. Sciatic nerve. Initial anatomical reference.

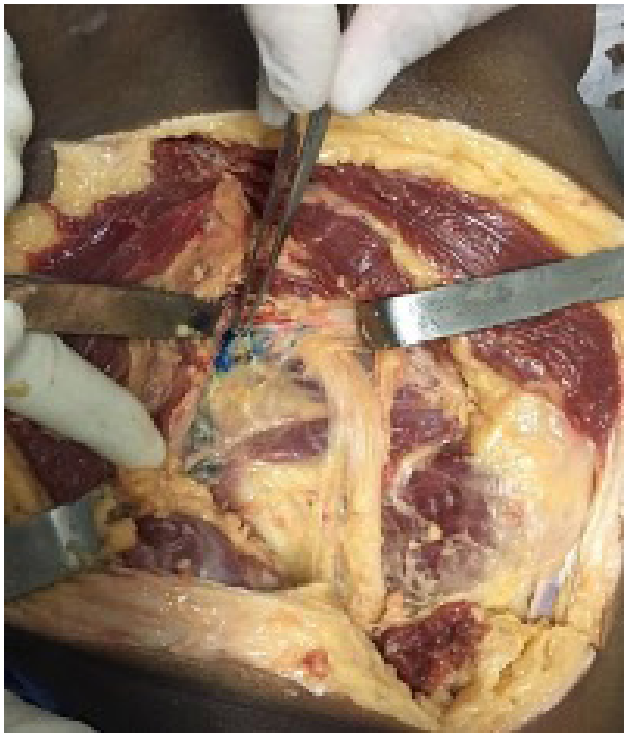

Figure 8. Deep gluteal dissection on the right. Pudendal nerve and artery colored by the dye after infiltration.

Using the same technique, from September 2016 to October 2018, in a medical specialty, teaching and research clinic in Goiânia, Goiás, anesthetic blocks were performed in seven patients (Table 1), six of whom were female, all with perineal pain. The age of the patients ranged from 20 to 56 years and all of them presented terms of consent to perform the procedures. Pain symptoms, in all seven patients, did not respond to oral and nor parenteral analgesic therapy. Before puncture and infiltration with 2% lidocaine (5ml) without vasoconstrictor had started, skin asepsis was performed with alcoholic chlorhexidine 0.5%, direct echographic identification of the pudendal nerve and, then, the use of the power Doppler resource which, as a counter-proof, helped us by visualizing the pudendal artery adjacent to the nerve. The results were assessed using the visual analog scale[7] (VAS) for pain before and 30 minutes after the procedures.

Sex	Age /years	Etiology	VAS
Male	20	Urological.	5
Female	27	Trauma	8 a 9
Female	32	Gynecological	8 a 9
Female	37	Gynecological	8 a 9
Female	42	Gynecological	8 a 9
Female	47	Gynecological	8 a 9
Female	56	Proctological	8 a 9

Table 1. Illustrates patients submitted to blocks according to sex, age, etiology and VAS classification.

RESULTS

Anatomical study: Presence of dye in the pudendal nerve within the Alcock canal, in the sacrotuberous ligament (transfixed by the needle) and in a minimal area in the internal obturator muscle fascia, adjacent to the nerve, in all three cadavers / bilateral.

Clinical cases: Pain improvement in all patients after 30 minutes of the procedures, with levels ranging from 8 to 9 (severe) on the VAS scale to 0 (no pain) in six patients. In one case, male, the pain in the assessment before the procedure was considered moderate (VAS [5]) and progressed to mild residual pain (VAS [2]) after anesthetic block. This patient had a clinical picture of bladder atony still under diagnostic investigation, with frequent dependence on the administration of tubes for urinary elimination. He had been referred by neuropelveology for anesthetic block of the pudendal nerve and, as a result, after the procedure, he had temporary restoration (16 hours) of spontaneous bladder elimination, even allowing the removal of the catheter.

DISCUSSION

The search for techniques for pelvic and perineal neural block with anesthetics and other procedures such as infiltration with corticosteroids and botulinum toxins, guided by imaging resources, arouse the interest of several medical specialties such as urology, gynecology, neuropelveology, anesthesiology, proctology, orthopedics among others.

In 2008, French urologists in Nantes[8], observing groups of patients with Alcock canal syndrome, concluded that there is no single pathognomonic criteria, but a meeting of five main criteria (Nantes criteria) that, if added together, can define a safe diagnosis , emphasizing the importance of the fifth criteria as the most important, which is the anesthetic block of the pudendal nerve as positive.

Peng et al[9], in a review study of pelvic syndromes associated with neuropathy (ilioinguinal, iliohypogastric, piriformis / ischial and pudendal), likewise, valued the importance of neural block for the diagnosis and treatment of these pathologies. For these authors, the use of ultrasound has a greater advantage in guiding these procedures in comparison with computed tomography because it provides images with real-time adjustment, it is easier to access an interventionist doctor and it is irradiation-free. For each syndrome, they developed their own neural block technique, and for the pudendal nerve it was described by placing convex transducers (2-5 Mhz) on the sciatic spine in a transverse position, identifying a space between the echogenic images of the sacro-spinal and sacrotuberous, reference used as a parameter for needle introduction and infiltration.

For Kovacs et al[10], safety for pudendal nerve block guided by ultrasonography occurs only with the use of convex transducers (2-5 Mhz) and low frequency. They defend this routine because these nerves are deep and thin, with a cross-sectional area around 0.6 to 6.8mm^2. For the authors, the nerve fascicles, being parallel structures and surrounded by connective tissue, depending on the angle of impact of the sound waves, may form both hypoechoic (dark) and hyperechoic (bright) images. As for the technique, they described the placement of the convex transducer in a transverse position on the sciatic

spine and sacrospinal ligament, which are anatomical references used for the introduction of the needle. The rate of nerve visualization was 47.2% of the cases and, thus, ratified the importance of the concomitant use of power Doppler in the identification of the pudendal artery, which, in 90% of the cases, is in the medial and anterior position (distal to the transducer) of the nerve, there is a distance ranging from 0.1 to 15.3 mm. The eight patients, six with severe pain (VAS $^{7-10}$) and two with moderate pain (VAS $^{4-6}$) improved, with one patient with severe pain having moderate to mild pain and another with moderate pain having mild pain (VAS ^{2}). In our clinical cases, we consider the direct ultrasound identification of the pudendal nerve in the area of the proximal third below the sacrotuberous ligament to be an important step, placing the longitudinal transducer in relation to this ligament. We agree that it is feasible to indicate convex transducers to be used in procedures, especially in female and obese patients. However, a good calibration technique of the ultrasound device11 and the availability of probes with greater resolving power, were essential to obtain a satisfactory visualization of the nerve, with the use of high-frequency linear transducers in all cases. The verification of the pudendal artery by power Doppler provided us with greater security for the entry of the spinal needle, the precision for neural block and also to prevent strokes.

Fichtner et al[12] reported in their studies the importance of pudendal nerve block and its three branches in the Alcock canal. For these authors, using the sciatic spine as an anatomical reference is a risk of accidental blockage of the sacral plexus. The technique used, guided by ultrasound, was the contralateral lateral decubitus position and slight flexion of the ipsilateral knee and placement of the transducer between the posterior superior iliac spine and the greater trochanter in a transverse position. Then, the movement was from cranial to caudal, keeping the transducer in a transverse position, bordering the bone border of the major sciatic notch, sciatic spine and, finally, the minor sciatic notch, an anatomical parameter where they identified the Alcock canal. At this point, using the power Doppler (artery in position medial to the nerve), the medial to lateral needle was inserted in order to avoid perforation of the rectum and, in all cases, transfixed the sacrotuberous ligament, which they described as having a firm "rubber resistance". They performed this technique in two cadavers (bilateral) infiltrating latex (1ml) and, anesthetic blocks, in three patients (bilateral) with severe perineum pain (VAS ^{9}). In the cadavers, after the infiltration and with the needle still in place, minimally invasive dissections were performed with the sole purpose of observing if they had reached the nerve, which they reported to occur in all cases. In the three clinical cases, all with proctological pathologies, two had total pain improvement (VAS ^{0}) and, in one male patient, the only one with tumor disease, it evolved to mild pain (VAS ^{3}). Similarly, in our study, we share the principle of pudendal nerve block in the Alcock canal. We did not have a direct concern with intestinal perforations because we inserted the needle in a longitudinal position to the sacrotuberous ligament. Despite the significant ligament resistance to the introduction of the needle, we noticed that, after being transfixed, it was an aid factor for better stability at the time of infiltration (dye and anesthetic).

Pradal et al[13], carrying out studies on eight cadavers, evaluated the transgluteal infiltration of the pudendal nerve, guided by magnetic resonance imaging (MRI), and the resulting distribution of the injected agents. As a technique, they adopted the contralateral lateral decubitus position and ipsilateral hip in 90 degree flexion. After identifying a space between the second sacral foramen and the greater trochanter, in a middle third, they palpated the lower border of the piriformis muscle and, with a medial inclination of 45 degrees towards the sacrotuberous ligament, spinal needles and catheters were inserted. Of the eight corpses, in three, 10 ml of gadolinium infiltrated and evaluated the results by MRI. In four, 5 ml of latex and 5 ml of methylene blue were infiltrated and the evaluation was macroscopic by anatomical cross-sectional pelvic sections from 4 to 8 mm. And in a corpse, 5 ml of gadolinium and 5 ml of latex were infiltrated and the evaluation was carried out by both MRI and cross sections. The results obtained were, in all cases, the presence of the substances used in the pudendal nerve in its trunk. When gadolinium was used, they also observed the presence of this substance in the internal obturator and anus elevator muscle and, when latex was used, they found presence in the internal obturator muscle and sacrotuberous ligament. In our anatomical studies, we opted for a broad approach to dissection after infiltration, considering providing better identification of which adjacent anatomical structures the dye could reach, as it has an aqueous composition close to an anesthetic. Thus, we observed its presence in the sacrotuberous ligament, since we transfix it with the needle and, also, in the fascia of the internal obturator muscle adjacent to the nerve.

CONCLUSION

The echo-guided block technique with direct visualization of the pudendal nerve in the Alcock canal, under the sacrotuberous ligament, in an anatomical space in its proximal third and or in the transition with the middle, proved effective in a cadaveric study, as well as for pain relief in patients, without any complications.

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MOST FREQUENT FINDINGS OF BENIGN PATHOLOGIES IN PROSTATE BY ABDOMINAL AND TRANSRECTAL ULTRASONOGRAPHY

RAMIELY SOKOLOSKI DE OLIVEIRA [1], PATRÍCIA GONÇALVES EVANGELISTA [2], WALDEMAR NAVES DO AMARAL [1,2]

ABSTRACT

INTRODUCTION: The prostate is the retroperitoneal gland located in the pelvic cavity responsible for the production and storage of citrate, it constitutes the sperm, liquid expelled during ejaculation. It can be assessed echographically by both the transabdominal and transrectal techniques, with a volumetric variation very close to the real one. According to the literature, the most frequent prostatic changes found on ultrasound are presence of nodules and enlarged prostate with and without central calcification.

OBJECTIVE: to identify the most frequent pathological ultrasound findings of the prostate and separate them according to the examination technique (abdominal or transrectal route), of the patients seen at Fértile Diagnósticos in Goiânia-GO, in 2019.

METHODS: It is a cross-sectional, observational, retrospective study.

RESULTS: 149 prostate exams performed from January to December 2019 were analyzed. Of these, 113 were performed through the abdomen and 36 through the rectum. Among the alterations found, hyperplasia was 85% in the rectal route and 81% in the abdominal route. The age of the patients analyzed through the abdominal route had a greater incidence of 51-70 years with 55% and rectally was over 71 years. Of the alterations found, the findings of the abdominal route were 66% of normal US and in the abdominal route the altered with 64%. Regarding the ages of patients with changes, there was no difference between the age group and the group from 51 to 70 and older than 71 years, adding up to 100% in the rectal route and 93% in the abdominal route. CONCLUSION: Among the alterations found, hyperplasia was 85% in the rectal route and 81% in the abdominal route. The prevalence of changes was 63% rectally 41% abdominal. This research is expected to evolve in therapeutic application in order to avoid future complications in the health of the male population, in addition to being able to carry out educational projects for the prevention of results found.

KEYWORDS: PROSTATE, ABDOMINAL ULTRASOUND, TRANSRECTAL ULTRASOUND.

INTRODUCTION

The prostate is a retroperitoneal organ and is in the pelvic cavity. Its limits are: bladder (in contact with the base), pubic symphysis (Retzius space), rectum, urogenital diaphragm (in contact with the apex), levator ani muscle and seminal vesicles. It measures approximately 4.0-4.5 cm (transversal), 2.5-3.0 cm (anteroposterior), 3.0-4.0 cm (longitudinal) and weighs in a young adult around 12 to 20 g[1] .

The prostate is the gland responsible for the production and storage of citrate that enters the composition of the spermatic fluid, a secretion that together with the product of the seminal vesicles and peri-ureteral glands, constitutes the sperm, fluid expelled during ejaculation. The prostatic fluid participates in the nutrition and preservation of the sperm produced in the testicles and in the liquefaction of the sperm, so the prostate is considered an endocrine-dependent organ[1].

The prostate can be assessed in two ways. According to the lobar anatomy, it is divided into anterior, posterior, median and lateral lobes, the latter important in the diagnosis of benign prostatic hyperplasia. According to zonal anatomy it is divided into peripheral, central, transition and peri-urethral zones, which are fundamental for the diagnosis and location of prostate cancer. In zonal ultrasound, these four zones are divided into just two: the peripheral and the internal [2].

The prostate can be evaluated by ultrasound using both the transabdominal and transrectal techniques, with a volumetric variation very close to the real one. The transabdominal approach allows the global view of the gland that has a triangular aspect and presents itself as a hypoechoic, homogeneous structure with a visible capsule. However, the technique of choice when one wants to observe smaller structures, rich in details, such as nodules and changes in the parenchyma

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texture is the transrectal approach, which has the best indication [2] (see figures 1 and 2).

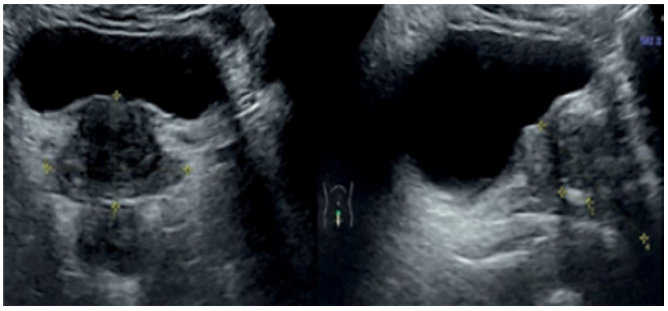


Figure 1. Transabdominal ultrasound with full bladder in coronal and longitudinal section of the prostate. [10]

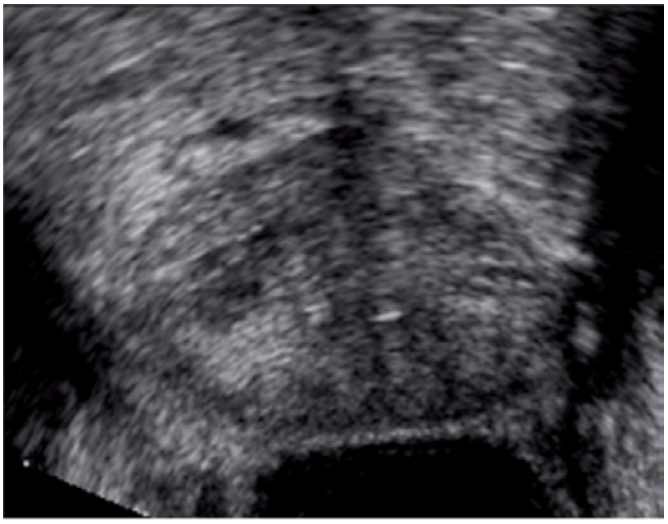


Figure 2. Transrectal ultrasound of the prostate of a 57-year-old patient who had a PSA of 4.8ng/ml which showed no suspicious areas[7].

Older ultrasound equipment did not improve diagnostic accuracy, as they lacked the sensitivity to detect tiny vessels and slow blood flow from the prostate. This situation changed completely with the advent of the latest and most sophisticated Power Doppler equipment [3] (figure 3).

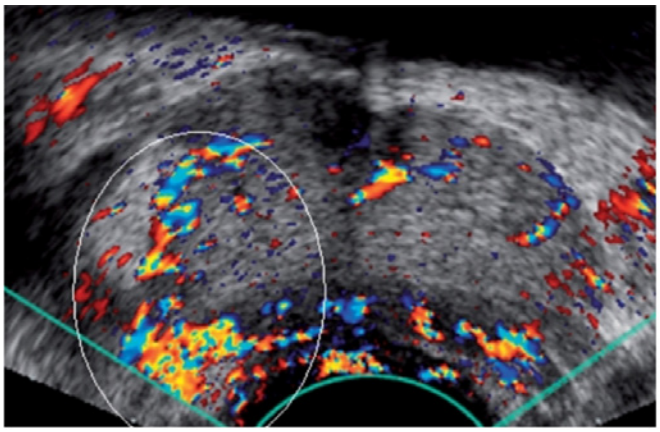


Figure 3. Transrectal ultrasound of the prostate with color Doppler mapping showing an increased signal (ellipse) in a high suspicion area[7].

The prostate is the heart of silent lesions, many are only demonstrated in routine necropsy, therefore, the importance of carrying out this study. Prostate cancer is currently a worldwide health problem. In Brazil, it has become a public health problem, since it represents the second most common cancer in men (behind only of non-melanoma skin cancer) and has shown an increasing rate in recent years, due to the aging of the population. The estimate of new cases is 68,220 (2018/2019 - INCA) with a number of deaths of 15,391 in 2017[4].

The objective of this study is to identify the most frequent benign ultrasound findings of the prostate and separate them according to the examination technique (abdominal or transrectal route), of the patients seen at Fértile Diagnósticos in Goiânia-GO, in 2019 so that we can evolve even more in the therapeutic application in order to avoid future complications in the health of the male population, in addition to being able to carry out educational projects for the prevention of the results found.

METHODS

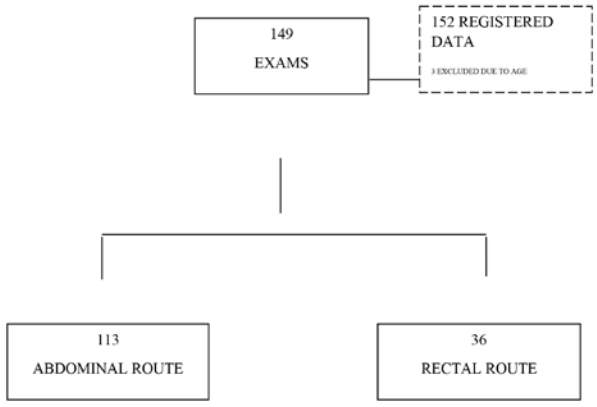
Retrospective observational cross-sectional study. The study was developed at Fértile Diagnósticos with male patients and with data from January to December 2019.

The sample number was due to temporal convenience and the data will be analyzed in the Excel program to make the calculations and tables.

The research was submitted to the Ethics Committee through plataforma Brasil respecting the ethical principles that regulate research in human beings (RESOLUTION 466/12).

RESULTS

149 prostate exams performed from January to December 2019 were analyzed. The findings are shown in tables 1-5.



US ROUTE	N	%
Abdominal	113	76
Rectal	36	24

Table 1 - Distribution of the results of prostate ultrasound performed at clínica Fértile, Goiânia (GO), Brazil, 2020.

	Abdominal Route	Transrectal Route
18-30	2(2%)	0(0%)
31-50	29(26%)	2(5%)
51-70	63(55%)	20(39%)
>71	19(17%)	14(56%)

Table 2 - Age distribution of patients with changes in prostate US at clínica Fértile, Goiânia (GO), Brazil, 2020.

	Rectal Route	Abdominal Route
Normal	13(36%)	66(58%)
Altered	23(64%)	47(42%)

Table 3 - Distribution of the results of exams for patients who underwent prostate US at clínica Fértile, Goiânia (GO), Brazil, 2020.

	Rectal Route	Abdominal Route
18-30	0(0%)	0(0%)
31-50	0(0%)	3(7%)
51-70	12(52%)	26(55%)
>71	11(48%)	18(38%)

Table 4 - Age distribution of patients with alterations who underwent prostate US at clínica Fértile, Goiânia (GO), Brazil, 2020.

	Rectal Route	Abdominal Route
Hyperplasia	19(85%)	37(81%)
Hypertrophy	0(0%)	7(15%)
Calcifications	1(5%)	0(0%)
Fibrosis	1(5%)	1(2%)
Cyst	1(5%)	1(2%)

Table 5 - Distribution of the main changes found with the route performed in patients who underwent prostate US at clínica Fértile, Goiânia (GO), Brazil, 2020.

DISCUSSION

Tourinho-Barbosa et al [5] revealed that the recommendations for prostate screening are very different. Tyloch and Wieczorek[6] (2016), on the other hand, reported that transabdominal ultrasound should be part of the examination of abdominal organs and ought to be performed in patients with complaints of dysuric symptoms. An addition to the test, especially when the prostate is enlarged, should be the measurement of the capacity of the urinary bladder and the assessment of the amount of residual urine after urination. The indications for the ultrasound examination of the prostate are pathological changes found in the rectal examination, high concentration of prostate specific antigen PSA, cancer and inflammation of the prostate if an abscess is suspected, qualification for surgery in the course of benign prostatic hyperplasia (BPH) and the diagnosis of ejaculation disorders, thus establishing which group should indicate the route of the exam.

In the present study, 149 prostate exams were analyzed, 113 of which were abdominal and 36 rectal. In the study's findings, the age of the patients analyzed through the abdominal route had a greater incidence of 51-70 years with 55% and by the rectal route it was over 71 years. Of the alterations found, the findings of the abdominal route were 66% of normal US and altered with 64%. Regarding the ages of patients with abnormalities, there was no difference between the age

group in the groups from 51 to 70 and over 71 years, adding up to 100% in the rectal route and 93% in the abdominal route.

Mitterberger et al [7] revealed that more than 32 million men worldwide have symptoms related to BPH affecting more than 50% of men over 60 and up to 90% of men over 70. Benign prostatic hyperplasia is a pathology that contributes to, but is not the only cause of, low urinary symptoms in elderly men [8,9]. Histological features of benign prostatic hyperplasia occur in 90% of men aged 85. Benign prostatic hyperplasia does not directly threaten life, but it significantly reduces quality of life. In the last decade, there has been a significant reduction in the frequency of surgical treatment with a simultaneous increase in the frequency of application of pharmacological treatment[10]. According to the indications of the European Association of Urology (EAU), the tests recommended in the course of benign prostatic hyperplasia include measuring the volume of residual urine present in the bladder after urination performed during transabdominal ultrasound; and in the group of complementary exams - ultrasound of the upper urinary tract and transrectal ultrasound of the prostate. In our study, when we evaluated the ultrasound scan, changes such as BPH were 85% and 81%, respectively for rectal and abdominal.

The benign enlargement of the prostate usually starts in men over 40 years old. Pimenta et al [11] highlights that changes in the prostate may give rise to intraparenchymal prostatic cysts in association with hyperplasia. They can also be related to other diseases such as: bacterial prostatitis, squamous metaplasia, prostatic abscess and prostate neoplasia.

Reis PR [12] (2012) highlights that the main risk factors are: age, the genetic component, inflammation and steroid hormones are established risk factors for benign changes in the prostate and modifiable risk factors seem to substantially influence its natural history.

Steffen et al [13] emphasized that it is time to rethink the role of screening in prostate cancer and discuss its potential benefits in view of the risks associated with anticipation, overdiagnosis and overtreatment bias.

CONCLUSION

Among the alterations found, hyperplasia was of 85% in the rectal route and 81% in the abdominal route. The prevalence of changes was 63% in the rectal route and 41% in the abdominal route. Therefore, the transrectal route has a higher percentage of detection in BPH.

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UTERINE ARTERIOVENOUS MALFORMATION (UAVM) - A CASE REPORT

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ABSTRACT

INTRODUCTION: Uterine arteriovenous malformations (AVMs) are rare uterine changes that occur in reproductive age and can cause abundant hemorrhages, which can be lethal if poorly conducted by invasive procedures.

CASE REPORT: It is a case of a patient with AVM and a history of gestational trophoblastic neoplasm.

KEYWORDS: VASCULAR MALFORMATION, ULTRASONOGRAPHY, DOPPLER, EMBOLIZATIO

INTRODUCTION

Uterine arteriovenous malformation (UAVM) or uterine arteriovenous fistula is a rare vascular disorder, with less than 100 cases reported in the world literature. It is suspected that it is more common than what the literature suggests. It represents about 1 to 2% of all cases of genital hemorrhage.

They are characterized by allowing flows from the uterine arterial system to the venous system, without the participation of capillary vessels 1-3.

They can be classified into two types 3:

1. Congenital, which is even rare and happens when there is an abnormal unevenness in the communication of arteries and veins. Histologically they are classified into cirsoids or cavernous, according to the diameter of the fistulas. It is common to appear in other areas of the body, such as the brain, when it is not associated with bleeding.

2. Acquired, which are the majority of cases, having varied etiopathogenesis, such as: endometrial and cervical carcinoma, pelvic trauma, cesarean section, curettage, but the most common is gestational trophoblastic neoplasia (GTN). The diagnosis must be considered in all patients of reproductive age and with negative β-hCG.

The diagnosis was previously made with angiography or after laparotomy to contain the bleeding. Currently, Doppler ultrasonography (USG) is the method of choice 4-6.

In B-Mode US, the images are nonspecific, of varying sizes in the myometrium, and may also have endometrial thickening 3.

The diagnosis cannot be confirmed without Doppler. Doppler shows a tangle of vessels, with various types of flow velocity, with a low resistance index (RI). The RI ranges from 0.27 to 0.75, with an average of 0.41 3.

Symptoms are varied, from hemorrhages to mild and abnormal bleeding. In the differential diagnosis, we included GTN and incomplete abortions7.

Treatment can be conservative in patients without hemorrhage. Intervention with embolization is the treatment of choice, as curettage is not indicated because it can exacerbate the bleeding4. Hysterectomy can be indicated in cases where the bleeding does not stop and in patients who do not want to become pregnant6.

CASE REPORT

A 26-year-old patient was seen at the clinic on 01/02/2020, with a history of minor bleeding for more than thirty days. She presented a report with a diagnosis of incomplete abortion. The irregular anechoic image suggested a gestational sac from an unviable pregnancy (Figure 1)

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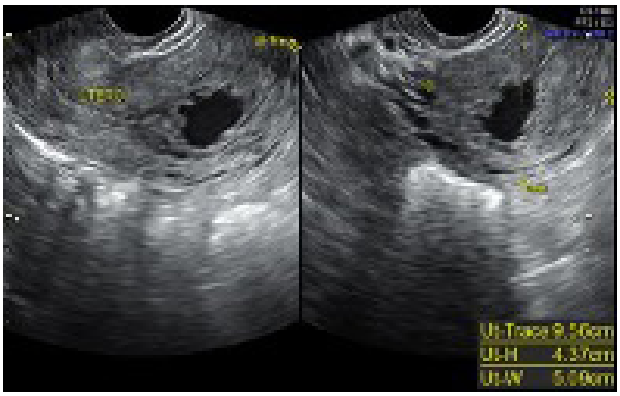

Figure 1. Ultrasound image illustrates irregular anechoic area.

The color Doppler signal shows an exuberant flow (Figure 2).

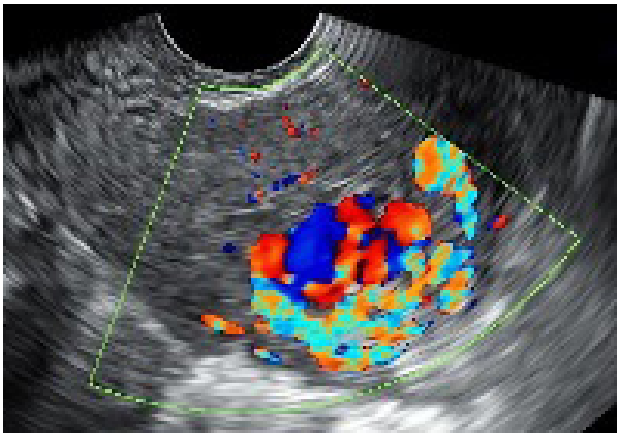

Figure 2. Color Doppler ultrasound image shows exuberant flow.

This image with the amplitude Doppler (Figure 3) confirms the diagnosis.

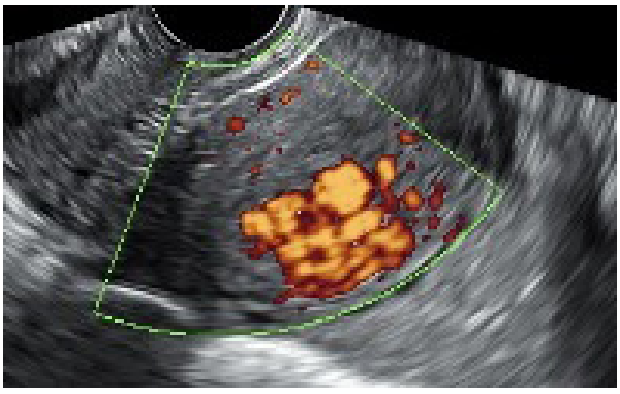

Figure 3. Amplitude Doppler ultrasound image

DISCUSSION

The ultrasound report with a transvaginal Doppler probe was of an anteverted flexed uterus, of irregular contour and diffuse alteration of the myometrial texture, being observed in the posterior wall and uterine cavity an anechoic irregular image, with exuberant vascularization, with low impedance flow, and an IR of 0.39, compatible with a uterine arteriovenous malformation (UAVM). The uterus measures: 9.56cm x 4.37cm x 5.09cm, in its longitudinal, anteroposterior and transversal diameters with volume = 111.34cm³ (Normal = 25 to 90cm³). Heterogeneous acoustic content. Attachments: Parauterine ovaries, with normal volume and texture for the age group. The right ovary measures: 3.95 cm x 2.28 cm x 2.35 cm, with a volume of 11.08 cm³. The left ovary measures: 3.30 cm x 1.93 cm x 2.19 cm, with a volume of 7.30 cm³ (Normal = 3 to 12 cm³).

Contact made with an attending physician advising about the risks of an invasive procedure and orienting about embolization. The patient underwent an embolization procedure (Figure 4).

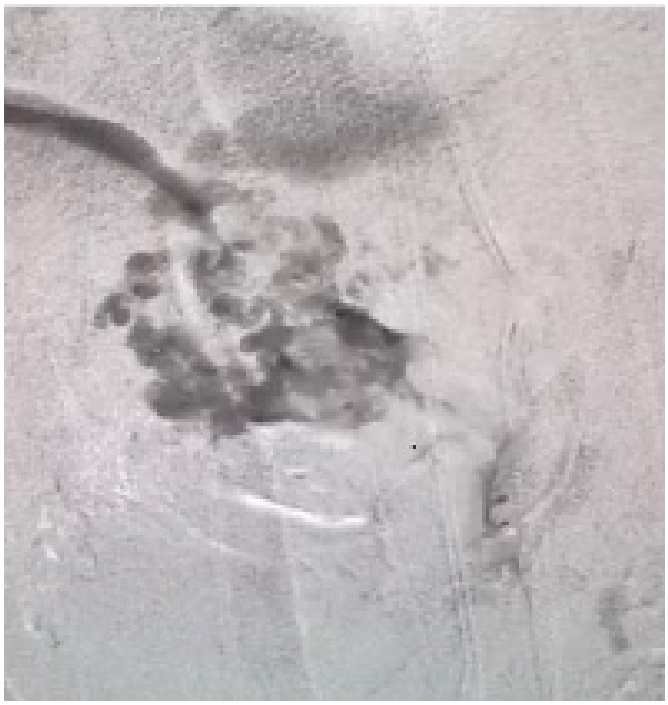

Figure 4. Illustrates the moment of embolization of the intrauterine vascular mass.

The patient returned for a new ultrasound exam two weeks after the embolization procedure (Figure 5).

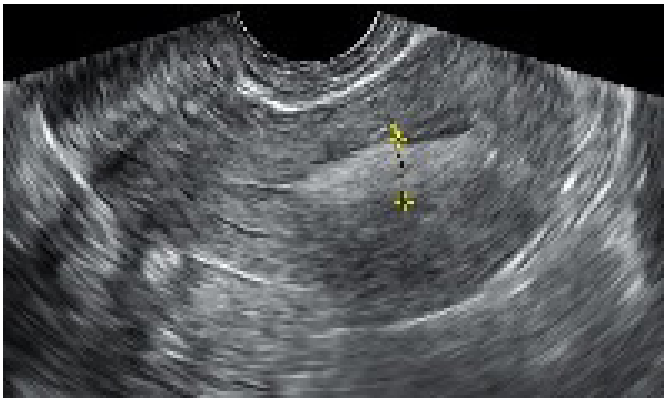

Figure 5. Ultrasound image two weeks after the embolization procedure.

The patient is currently well, without symptoms, using contraceptives.

This case report shows the importance of ultrasound diagnosis avoiding an intrauterine procedure, such as curettage, which could cause major uterine bleeding. Embolization of the arteriovenous malformation was effective with prompt recovery of the patient.

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CONGENITAL OCCIPITAL MENINGOENCEPHALOCELE AND MTHFR - C677T MUTATION IN HETEROZIGOSIS - CASE REPORT

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ABSTRACT

INTRODUCTION: Congenital meningoencephalocele is the result of a serious failure in the primary neurulation process of the neural tube. It has an incidence of 0.1 to 10: 1. 000 live births in different demographic regions. Neural tube defects are multifactorial, but the main cause is related to folate metabolism.

CASE REPORT: The objective is to report a case of meningoencephalocele with intrauterine ultrasound diagnosis, which took place in Vitória-ES. Computerized medical record data were used as a methodology

In conclusion, early diagnosis enables specialized care, substantially improving maternal-fetal care.

KEYWORDS: NEURAL TUBE, CONGENITAL, MENINGOENCEPHALOCELE, DIAGNOSIS, ULTRASOUND.

INTRODUCTION

The most common fetal malformations are abnormalities of the central nervous system, and these include cranial defects and spinal dysraphism. In Brazil, congenital malformations are in second place among the causes of infant mortality. [1]

Congenital meningoencephalocele is the most frequent formation of spinal and cranial dysraphism, representing a serious failure in the process of primary neural tube neurulation, which occurs in the first four weeks of pregnancy. It has an incidence of 0.1 to 10:1,000 live births, in the different demographic regions. The most prevalent form is the occipital, which extends from the occipital bone to the foramen magnum, with cranial herniation.[2]

Neural tube defects are multifactorial, involving genetic and environmental factors, which lead to changes in folate metabolism (a biological pathway regulator essential for the proper growth, differentiation and proliferation of cells) .[1]

The prognosis varies according to the contents of the hernia sac and the site involved, which can cause various neurological deficits and complications. It can lead to devastating morbidity and multiple deficiencies; therefore, the prognosis is generally worse if diagnosed late or left untreated.[3]

Prenatal follow-up is essential for carrying out preventive measures and detecting structural anomalies. Routine fetal morphological ultrasonography in low-risk pregnant women is relevant for early discovery and consequent family preparation, in an attempt to improve the prognosis.[4]

The report involves a case of congenital occipital meningoencephalocele in a pregnancy of a 28-year-old woman in Vitória, Espírito Santo, Brazil.

CASE REPORT

P.S.C, 28 years old, GI P0 A0, without replenishment of periconceptional folic acid. The first trimester ultrasound showed no alterations. The second trimester imaging exam (obstetric ultrasonography at 17 weeks and 2 days) showed a solution of continuity in the left occipital skullcap with herniation of the brain tissue, configuring important encephalocele and interventricular communication (IVC), as seen in figure 1. the gestation completed 38 weeks, the patient was submitted to elective cesarean section, for neonatal preparation, with birth of a female live newborn, weight 2,960grs, length 44cm, apgar 9/9, showing signs of microcephaly and encephalocele.

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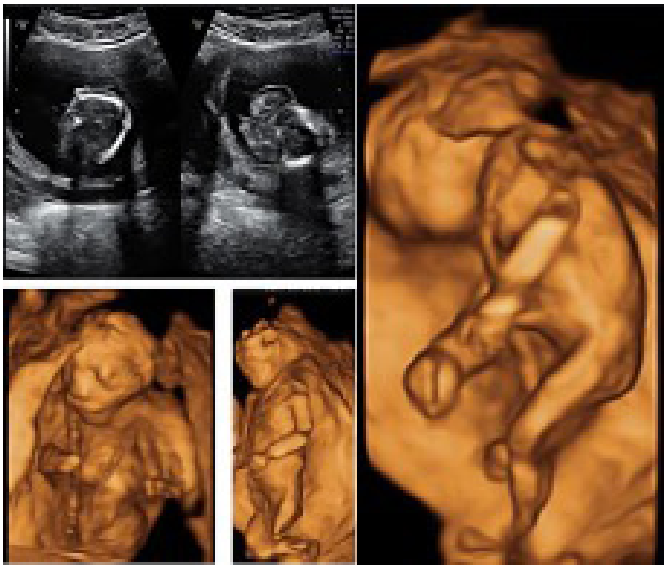

Figure 1 - Solution of continuity of the left occipital skullcap, with herniation of a great amount of the brain tissue: meningoencephalocele. Skullcap of reduced dimensions.

A cranial tomography was performed, which showed a significant reduction of the cerebral parenchyma with occipital meningoencephalocele. The Doppler echocardiogram confirmed the VSD apical muscular defect. The newborn died after 10 days of birth.

Histopathological examination compatible with occipital meningoencephalocele. Mother presented mutation of the enzyme methylenetetrahydrofolate reductase (MTHFR) - C677T in heterozygosis with normal homocysteine.

DISCUSSION

Meningoencephalocele occurs in about 1 in 10 other neural tube defects. The development of the spinal cord occurs between the second and sixth weeks of gestation. During primary neurulation, the neural folds appear with a central depression called the neural groove. The neural folds will be gradually fused to form the neural tube. The closure of the cranial and caudal ends of the neural tube marks the end of the process. Any defects during this process would be associated with meningoencephalocele or myelomeningocele. [4]

Folate deficiency is the main cause related to neural tube defect. It is a fundamental cofactor involved in the methylation of nucleic acids, proteins and lipids - involved in maintaining genomic stability and gene expression, in addition to the role in the synthesis of purines and pyrimidines, which are necessary for DNA synthesis and repair. The terms folate or folic acid can be used interchangeably, and are part of the B-complex vitamins. Insufficiency of this cofactor causes elevated levels of homocysteine.[5]

Moderately high concentrations of serum homocysteine may also be associated with an increased risk of thromboembolism, atherosclerosis and complications in late pregnancy, such as preeclampsia, placental abruption, delayed intrauterine growth, premature birth and even intrauterine fetal death.[5, 6]

Genes involved in the absorption of folate and its metabolism can present numerous changes, such as polymorphisms of the MTHFR gene. The MTHFR enzyme is encoded by the methylenetetrahydrofolate reductase (MTHFR) gene. Mutations can alter the beneficial effect of folates and other B vitamins, changing the flow between folate cofactors, DNA synthesis and methylation reactions. [5]

The mutation in the MTHFR gene at nucleotide position 677 (exon [4]), was one of the first described, in which there is a mutation of substitution of Cytosine for Thymine, which results in a change from Alanine to Valine. In the presence of heterozygosis, genotype 677CT, the specific activity of the MTHFR enzyme is reduced by 35%. Several studies demonstrating the link between the MTHFR gene polymorphisms with the closing of the neural tube, in addition to being a fact of genetic risk for vascular diseases.[7]

In the reported case, the use of folic acid was only started in the first trimester, thus compromising the benefits of its use before conception. In addition, a genetic study carried out showed a maternal mutation of MTHFR - C677T in heterozygosis which, as evidenced, also contributes as a risk factor for neural tube defects. [7]

Other risk factors associated with neural tube defects are hyperthermia, obesity, diabetes mellitus, use of valproic acid, insulin and salicylates, excess or deficiency of vitamin and zinc deficiency.[8]

The prognosis of changes in the formation of the neural tube varies between severe chronic disabilities, such as limb paralysis, hydrocephalus, deformation of limbs and spine, bladder, intestinal and sexual dysfunction and learning dissabilities, with a risk of psychosocial maladjustment. Mortality increases depending on the severity of the lesion. [2]

Early detection of neural tube defects offers hope for early intervention, in addition to an improved long-term prognosis. Studies show that changes are usually identified in the second or third trimester, mainly in two-dimensional ultrasound examinations. Three-dimensional ultrasound allows greater resolution of the anatomy of the fetal surface, with better differentiation between fetal structures in the first trimester (up to the ninth week of gestation) with the potential to bring about a revision of the guidelines for screening for birth defects.[9]

The sensitivity of high-resolution fetal ultrasound is close to 100% in experienced hands. The first gestational ultrasound, ideally performed between the 11th and 13th weeks of gestational age, aims to correctly date the pregnancy, and can identify some fetal anatomical abnormalities. The second trimester morphological ultrasound scan, performed between 20 and 22 weeks, can detect two cranial changes that occur in association with myelomeningocele. The first is a frontal bone overlap secondary to spinal CSF leak, known as

the "lemon sign". The second alteration is the "banana sign", a deformity of the brain stem with an biconcave elongated cerebellum surrounding the brain stem and obliterating the cistern magna. [10]

Other diagnostic exams can also be used, such as the measurement of maternal serum-alpha-fetoprotein, which is ideally performed between 16 and 18 weeks of gestation and has considerably increased levels in neural tube defects. However, it is in disuse due to low specificity. Magnetic resonance imaging is an excellent non-invasive imaging test, and is an alternative that can be used. [10]

Family counseling should be performed after confirmation of the abnormality, regarding the unfavorable prognosis in the postnatal period, in relation to intellectual disorders and high mortality. The need for ultrasound monitoring, and interruption via term discharge, with multidisciplinary assistance, should be discussed with family members.[5]

Despite the high morbidity and mortality, prenatal screening becomes important for the early diagnosis of the malformation and better programming of the neonatal period.

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SPONTANEOUS OVARIAN HYPERESTIMULATION WITH TOPICAL PREGNANCY: CASE REPORT

RUI GILBERTO FERREIRA, LUÍSA HASIMYAN FERREIRA, VALDIVINA ETERNA FALONE, PATRÍCIA MENDONÇA LEITE, LUCCA LOPES MARTINS, LORENA TARASSARA QUIRINO VIEIRA, WALDEMAR NAVES DO AMARAL

INTRODUCTION: Ovarian hyperstimulation syndrome (OHSS) is a serious and potentially fatal complication that is easily found in patients undergoing controlled ovarian hyperstimulation. Its incidence varies between 3% and 6%, while its severe form varies from 0.1% 3% of all cycles. Its occurrence in patients who have not been administered human chorionic gonadotropin (hCG) is extremely rare and it is typically associated with multiple pregnancy, hypothyroidism, mycropolicistic ovary syndrome, hydatiform mole and pituitary adenomas.
CASE REPORT: In the case reported, a 26-year-old patient with a history of polycystic ovary syndrome and no history of ovulatory induction, presents with pain in the right iliac fossa and later, an ultrasound indicates ovarian hyperstimulation syndrome. After 2 months, she is diagnosed with a single, spontaneous pregnancy compatible with 5 weeks and 3 days. The chronology of the occurrence of OHSS in the reported case draws attention, since the condition, when spontaneous, usually occurs between the 8th and 14th weeks of amenorrhea, due to the action of hCG.
DISCUSSION: It is necessary to emphasize the importance of early diagnosis through ultrasound in spontaneous cases, after all, these cannot be predicted. The treatment of the syndrome, in turn, is generally conservative and consists of rest, hydration and pain management, as proposed for the patient in this case. Recognition by the health professional is essential as an attempt to reduce mortality.

KEYWORDS: HYPERSTIMULATION OVARIAN SYNDROME; SPONTANEOUS PREGNANCY; ULTRASOUND; DIAGNOSIS; CASE REPORT.

INTRODUCTION

Ovarian hyperstimulation syndrome (OHSS) is a serious and potentially fatal complication, being more easily found in patients undergoing controlled ovarian hyperstimulation cycles. OHSS is typically associated with the use of exogenous gonadotropins, but it is also seen in the administration of clomiphene citrate for ovulation induction in reproductive therapies [1].

The incidence of the syndrome varies between 3-6%, while its severe form varies from 0.1-3% of all cycles. Its occurrence in patients who have not been administered human chorionic gonadotropin (hCG) is extremely rare [2].

The main risk factors for OHSS are: young age, low body weight, practice of controlled ovarian stimulation (COS), high levels of estradiol, rapid increase in estradiol levels, size and number of follicles stimulated and evidence of polycystic ovary syndrome . Evidence shows mainly the use of COS in subsequent cycles [3,4].

In this syndrome, the ovaries increase in size, due to the presence of multiple cysts, capillary permeability increases and there is leakage of fluid rich in protein, causing edema of the third space, hemoconcentration and even accumulation of fluids in the peritoneum, pleural and pericardial spaces[1].

Clinically, the presentation in cases of spontaneous and iatrogenic OHSS is similar. The patient may have abdominal pain, nausea and vomiting, with loss of appetite and ascites, pleural effusion and pericardial effusion, with dyspnea, hypotension, hypercoagulability, electrolyte imbalances and acute renal failure [2,5].

There is possibly a genetic predisposition to spontaneous OHSS and it is believed that the syndrome may be caused by a hypersecretion of glycoprotein hormone or by a mutation in the FSH receptor (FSHR) [6].

Mutations in FSHR can be activated by both FSH and glycoprotein hormones that have the same beta subunit (TSH, LH and hCG). Thus, the hCG produced during pregnancy could lead to spontaneous OHS during pregnancy[5].

During pregnancy, the FSH receptor expression falls sharply in the corpus luteum, while in the granular layer the expression remains continuous. The hCG stimulates those mutated receptors expressed in developing follicles that grow, develop and acquire LH receptors. These can also be stimulated by hCG, inducing follicular luteinization concom-

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itant with the secretion of vasoactive molecules [6].

As a result of multiple formations of the corpus luteum, angiogenesis and increased capillary permeability occur, leading to spontaneous OHSS [6].

The syndrome's staging system divides it into three levels and five degrees of severity of OHSS and takes into account clinical signs, symptoms, ultrasound and laboratory findings [7].

In addition, OHSS can be subdivided into four subtypes. Subtype [1] encompasses cases where there is mutation of the FSHR with normal hCG, TSH and FSH and can lead to recurrent spontaneous OHSS. Subtype [2] are the secondary cases to high levels of hCG, such as hydatidiform mole and multiple pregnancy. Subtype [3] is related to hypothyroidism, with high TSH levels. In such cases, administration of levothyroxine may relieve symptoms. Finally, subtype [4] is related to FSH or LH-secreting adenomas [5].

In the reported case, we will see a patient who was not undergoing assisted reproduction treatment and had pain in the right iliac fossa, being diagnosed with ovarian hyperstimulation and topical pregnancy, simultaneously.

CASE REPORT

JESF, 26 years old, seeks medical attention with severe pain in the right iliac fossa, without improvement. The first hypothesis, of appendicitis, was discarded even in the emergency room. Consultation with a gynecologist as well as an abdominal computed tomography were performed, revealing the presence of free fluid in the cavity. The measurement of b-hCG was also performed, obtaining results lower than 25mUI/mL. The diagnostic hypothesis at the time was ectopic pregnancy and the conduct was expectant. After one week, the patient returns to the service, reporting continuity of pain, of an intermittent character, but with a decrease in intensity. After 45 days, patient reports low libido, hair loss, hot flashes and regular menstrual cycle. The performance of transvaginal ultrasonography (USG) in the same month corroborated the hypothesis of ovarian hyperstimulation syndrome (OHSS) - figure 1. The conduct consisted of rest, hydration and use of analgesics to combat pain. After two months, a new USG demonstrated a single topical pregnancy compatible with 5 weeks and 3 days. USG performed after two weeks showed a right ovary measuring 44.47 cm^3 and a left ovary measuring 58.85cm^3 and was compatible with a diagnosis of OHSS associated with spontaneous topical pregnancy. The patient still reports some episodes of pain, but of lesser intensity and pregnancy continues uneventfully (figure 2).

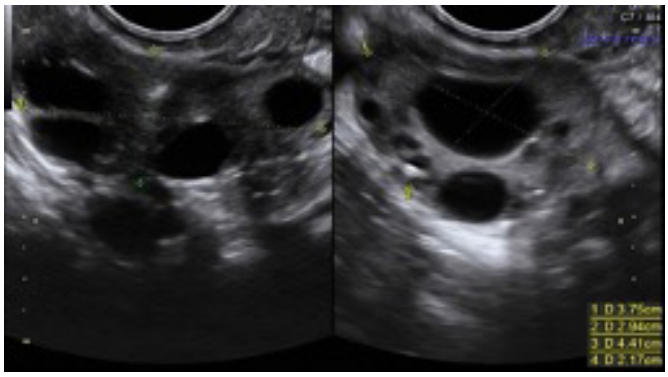

Figure 1. Transvaginal USG - overstimulated ovaries with several follicles.

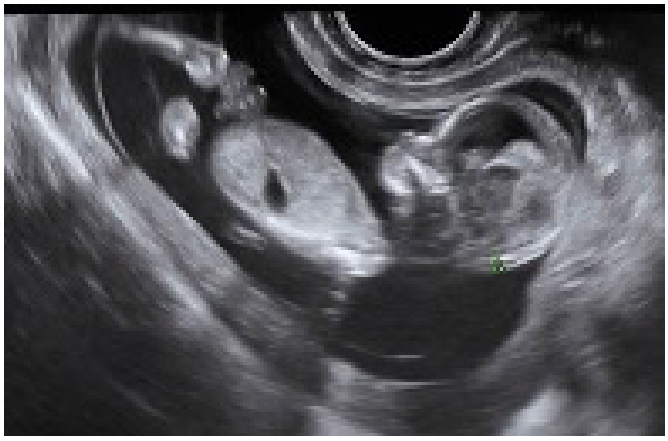

Figure 2. Transvaginal USG - topical pregnancy with live fetus

DISCUSSION

The main factor involved in OHSS is a treatment for infertility, using controlled hyperstimulation and exogenous gonadotropins, being one of the most significant complications with the use of assisted reproduction, leading to high morbidity, but low mortality. It is a very uncommon condition in spontaneous ovulations, even more in single pregnancies [8].

In the absence of treatment for infertility, OHSS usually occurs in polycystic ovary syndrome, hypothyroidism, twin pregnancy, molar disease and gonadotropin-secreting pituitary adenoma. Ovarian tumors are part of the differential diagnosis in cases with rapid ovarian growth, being ruled out

by bilateral involvement and ultrasound images that suggest benign dysfunction [9]. The patient in question reports having been diagnosed with polycystic ovary syndrome in adolescence, which could corroborate the hypothesis diagnosis because it is a risk factor.

In addition, another fact that draws attention is the chronology of the occurrence of OHSS. The iatrogenic form of the syndrome occurs during 3-5 months of pregnancy, while spontaneous usually occurs between the 8th and 14th week of amenorrhea. In the case presented, the patient begins to report the symptoms even before the pregnancy, which goes against the expectations [5].

What usually occurs is that during spontaneous OHSS, the pregnancy-related corpus luteum is responsible for the subsequent formation of multiple corpus luteum or a mass of luteinized granulosa cells that can induce the massive release of vasoactive mediators, leading to the appearance of the syndrome [6].

OHSS in cases of ovulation induction can be predicted by the existence of risk factors. However, in the case of its spontaneous form, there is no form of prediction. Thus, the great importance of medical care is in the early diagnosis, made mainly by performing ultrasound. In addition, as previously mentioned, the elimination of malignancies is essential. USG at OHSS shows a spoke wheel appearance characteristic of theca-lutein cysts without solid components [5,6].

Treatment is generally conservative and surgical intervention is only done in cases of ovarian rupture, ovarian torsion, abdominal hemorrhage and ectopic pregnancy [5].

The clinical improvement of the patient occurs in parallel with the reduction in serological hCG, with a complete improvement approximately between 10 and 14 days [1].

That being said, the highlighted clinical case becomes relevant due to the rarity of this event, in which the patient did not perform assisted reproduction techniques and presented OHSS, with symptoms prior to topical pregnancy.

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HEROIC CERCLAGE OF THE CERVIX

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ABSTRACT:

INTRODUCTION: Cervical insufficiency (CI), whose incidence is estimated around 0,5% of all pregnancies, is the incapacity of the uterine cervix of keeping a second trimester pregnancy, even in the absence of signs and symptoms of labor, being associated with abortion or extreme prematurity. CASE REPORT: A 28 year old patient is diagnosed in her 21st week of pregnancy with prolapsed fetal membranes. Recommendation at the time was an amniocentesis, followed by emergency cerclage, pessary insertion and antibiotic prophylaxis. She presented with possible amniotic fluid embolism in postoperative, which was treated during six days of permanence in an intensive care unit. At 36w and 6d of pregnancy, the patient went into labor and after a few complications and a recommendation of cesarean section, mother and baby were fine.

DISCUSSION: The risk of a premature labor in cases of CI combined with prolapsed fetal membranes is high and perinatal mortality in the absence of surgical intervention is 38% when diagnosis is made between 22 and 25 weeks of pregnancy. Evaluation of uterine cervix through ultrasound allows the measurement of cervix length, a marker of cervical competency, detection of uterine cervix tapering and prolapsed membranes. The cerclage is the recommended procedure, being performed in a prophylactic way, therapeutic or even in emergencies when there are prolapsed membranes, for example. However, the emergency intervention may confer important risk for the fetus and therefore the importance of preventing protrusion through early diagnosis of CI is essential.

KEYWORDS: CERCLAGE, UTERINE CERVICAL INSUFFICIENCY, CERVIX UTERI, PROLAPSE, ULTRASONOGRAPHY.

INTRODUCTION

Cervical insufficiency (CI) is defined as an inability of the cervix to maintain a pregnancy in the second trimester, even in the absence of signs and symptoms of labor, which manifests itself as a painless cervical dilation and is associated with occurrences of pregnancy loss or extreme prematurity, being a major cause of recurrent abortions[1].

The actual incidence of the CI is not very well defined, due to the lack of defined and universally accepted diagnostic criteria, but it is estimated in about 0.5% of pregnancies[2]. Risk pregnancies for premature birth by CI are those in which the mother has a history of previous preterm birth, has uterine malformations, with a history of cervical surgery or with a history of exposure to diethylstilbestrol, used in post-menopausal metastatic breast carcinomas[3].

Emergency or elective cerclage is performed in the presence of cervical dilation or prolapse of the sac, performed with the aim of prolonging pregnancy, a rare procedure in obstetric practice[1]. There is limited data on the outcome of emergency cerclage in the literature, as well as on the superiority of this procedure in relation to the expectant conduct, existing a suggestion of benefit over the surgical treatment, as it improves the latency for delivery, with a higher gestational age at birth and less prematurity [4].

In the reported case, a woman who was diagnosed with protruding amniotic sac in the vagina, is presented, being submitted to emergency cerclage as a therapeutic measure, allowing the extension of the pregnancy, avoiding bacterial contamination and allowing a follow-up of the pregnancy without further complications, with healthy delivery for the newborn.

CASE REPORT

B.A.T, 28 years old, G2P0A1, without comorbidities, performed obstetric ultrasound on the 13th week of pregnancy, presenting a 35mm cervix. During the 21st week of pregnancy she was diagnosed with protruding sac in the vagina. During that period, an amniocentesis was performed with removal of 400ml of liquid, followed by cerclage, insertion of a cervical pessary and indication of antibiotic therapy with ampicillin 2g (6/6h) and clindamycin 600mg (8/8h) for 7 days - figures 1-5.

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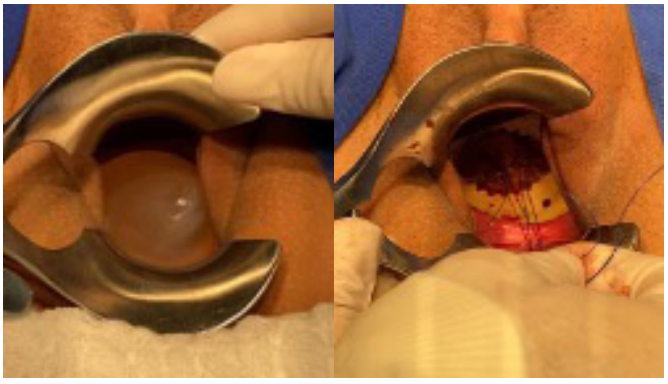
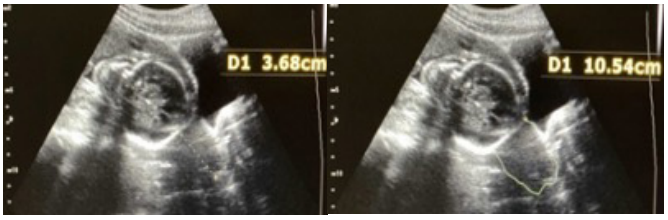
Figure 1. Amniocentesis with an epidural needle to remove amniotic fluid before performing uterine cerclage.



Figures 2 and 3. Visualization amniotic sac protrusion through the cervical canal. Illustrates the final result after uterine cerclage surgery.



Figures 4 and 5. Ultrasound images on the first postoperative day showing the closed cervix without protrusion of the amniotic sac.

The patient evolved with dyspnea and decreased saturation in the postoperative period due to probable amniotic fluid embolism, requiring support in an intensive care unit for six days with non-invasive ventilation. The Amnisure test was performed on the 11th postoperative day of cerclage as well as a culture for group B streptococcus, both negative. The pregnant patient did not have any more complications during the rest of the pregnancy. Corticotherapy was performed during the 26th and 30th weeks. The patient went into spontaneous labor at 36w and 6d. The pessary and cerclage stitches were removed at the time. During labor, the patient presented with bradycardia, being treated with O^2 in a nasal catheter, glucose and left lateral decubitus. Subsequent tachycardia indicated cesarean delivery. Fetus was born with 2335g and 46cm, with no other complications, being taken to rooming-in with mother (figure 6).

Figure 6. Healthy newborn without complications.

DISCUSSION

Pregnant women with CI who enter with early cervical dilation and protrusion of membranes are a challenge for obstetric practice, due to the high risk of prematurity and great limitations in therapeutic options, limited to emergency cerclage and bed rest. Perinatal mortality, in the absence of surgical interventions, is 38% when the diagnosis is made between 22 and 25 weeks. Morbidity and mortality when there is extreme prematurity is high, with survival estimated at 23% in the 23rd week of pregnancy[5].

The competent cervix is responsible for maintaining the fetus in the uterine cavity during pregnancy, which can dilate and allow the fetus to pass through during labor, being a barrier against both infections and the exit of the fetus with the expansion of the uterus. The cervical ripening process occurs with labor and contractions which allow the cervix to soften and dilate[6].

The etiology of CI is not well defined, however several factors have been pointed out, such as: genetic (presence of family history in patients with CI), surgical procedures with mechanical dilation of the uterine cervix, Müllerian anomalies, deficiency of collagen and elastin in the uterine cervix, in addition to intrauterine exposure to diethylstilbestrol[3,7].

The evaluation of the cervix with transvaginal ultrasound (TVU) allows the measurement of the length of the uterine cervix, detection of the tapering and protrusion

of membranes in the cervical canal, as shown in the case. Thus, it is concluded that the cervix is a dynamic structure that responds to several factors, being the cervical length a marker of cervical competence with the CI being the most serious degree of such incompetence[8].

The surgical approach with the use of cervical cerclage is recommended for the treatment of CI. Cerclage can be done in three ways, with prophylactics being performed between 12 and 16 weeks in pregnant women with CI due to clinical history; therapeutic when performed in asymptomatic high-risk pregnant women, with TVU findings suggestive of CI between 16 and 24 weeks; or emergency in pregnant women with cervical dilation or visualization of protruding membranes in the cervical canal1. The use of pessaries is a non-invasive alternative for treatment but its benefits have not been fully determined[1].

In the reported case, the patient underwent emergency cerclage, since it was performed after protrusion of the amniotic membrane through the uterine cervix, being responsible for a great increase in the risk of bacterial infections and premature birth compared to prophylactic or therapeutic cerclage [9].

Thus, it is noted the great risk of morbidity and mortality that the fetus in the case suffered, with great chances of bacterial infection in addition to a high risk of extreme prematurity. Therefore, the importance of cerclage therapy in this case is emphasized, which enabled the survival and health of the fetus in question, and the importance of screening through TVU and search for family and personal history, in addition to possible risk factors for CI.

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NEONATAL DEATH RELATED TO GIANT PLACENTAL CHORIOANGIOMA: CASE REPORT

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ABSTRACT

INTRODUCTION: Chorioangioma, also known as placental hemangioma, is a common benign vascular tumor of primitive chorionic mesenchyme. The size of the tumor is important for perinatal prognosis. Smaller tumors are clinically insignificant. Giant chorioangioma more than 4cm are associated with fetal complications. Imaging techniques help in early diagnosis. Placental lesions detected on sonography need close surveillance of these pregnancies because of the poor outcome of the pregnancy.

RELATO DE CASO: The authors present a case of a giant chorioangioma that developed threatening preterm labor. The newborn died in less than an hour after birth. The histopathological examination of placenta helped in the diagnosis of giant placental chorioangioma.

KEYWORDS: GIANT CHORIOANGIOMA, PLACENTA, ULTRASONOGRAPHY, DIAGNOSIS.

INTRODUCTION

The evidence on the evolutionary mechanisms of placental formation and adaptation contributed to the placenta being considered an extremely important organ in the metabolic process of fetal growth. Certain tumor abnormalities of the placental stroma itself can interfere with the supply of nutrients and uteroplacental blood flow, impairing conceptual development.

Chorioangioma, also known as placental hemangioma, is the most common benign vascular tumor of the placenta, being characterized by the abnormal proliferation of vessels that ascend from the chorionic tissue, occurring between 0.5-1.0% of pregnancies.[1-3] Usually small and underdiagnosed, they are found incidentally in histopathological exams, depending on the cuts performed, and tend to be asymptomatic and rarely complicate pregnancy.[3-5]

However, giant chorioangiomas (> 4 cm in diameter) are rare neoplasms, with prevalence ranging from 1: 9,000 to 1: 50,000 pregnancies. These can be associated with various complications such as preterm birth, placental abruption, polydramnia, growth restriction, hepatosplenomegaly, cardiomegaly, congestive heart failure, hydrops and even fetal death.[1,5]

Ultrasonography, with the use of color Doppler, enables the early diagnosis of these placental tumors, so that these methods have been widely used in the detection of chorioangioma and in the planning of some intrauterine interventions that can improve the perinatal prognosis.[3, 4, 6, 7]

CASE REPORT

Patient RMP, 21 years old, G3P1(c)A1, with spontaneous pregnancies and no complications reported in the current pregnancy, was admitted to the State Maternal and Child Hospital with a gestational age (GA) of 24 weeks and 6 days confirmed by the first ultrasound (USG) , complaining of frequent contractions. Blood pressure levels, pulse, fundal height, abdominal circumference and fetal cardiac auscultation at admission were normal. She was pale (+/4 +) on physical examination. Examinations performed on admission showed anemia (Hb: 9.6g/dL) and, on USG, polyhydramnios and a large heterogeneous placental image that the on-duty physician suspected of possible hematoma. The conduct proposed at the time was pulmonary maturation, tocolysis due to the threat of premature labor, and hematimetric and ultrasound follow-up.

On the third day of hospitalization, a new image exam was performed with a specialist in fetal medicine, which showed a fetus biometrically compatible with gestational age and an estimated weight of 968 g, increased amniotic fluid, anterior body placenta, and circular image, vascularized in the periphery and especially in its interior, heterogeneous (hypoechogenic areas with some foci of hyperechogenicity),

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located in the placental chorial plate that was directed towards the amniotic cavity, measuring in its largest diameter 10.2 cm; suggestive of chorioangioma (Figures 1-3).

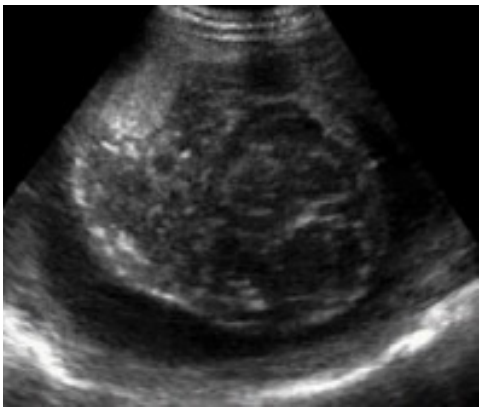

Figure 1. Circumscribed, well-defined, intraplacental tumor, with a solid and heterogeneous appearance on the inside where blood vessels can be seen

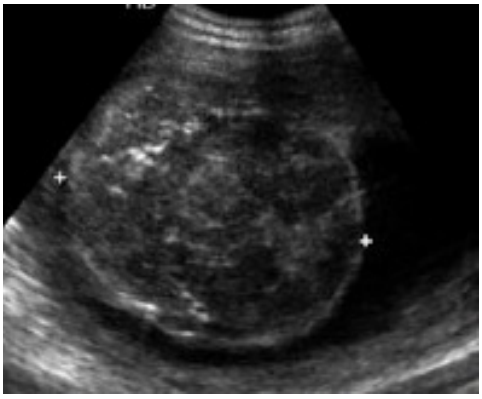

Figure 2. Giant chorioangioma with textural alteration that projects in the region of the chorial plate towards the amniotic cavity.

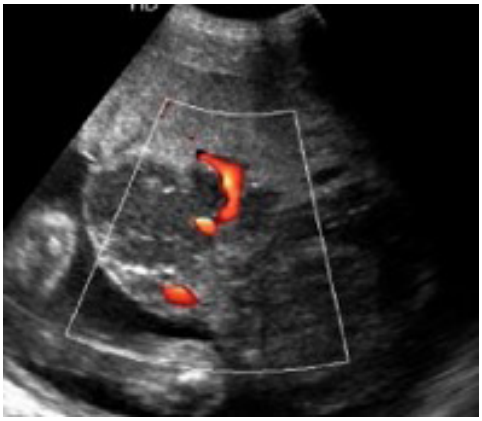

Figure 3. Color Doppler showing vascularization in the mass with a large nutrient vessel inside the tumor.

There was also fetal subcutaneous edema, and the flow Doppler study showed an increase in umbilical artery resistance and an increased systolic peak velocity in the middle cerebral artery for GA. The pregnant woman evolved with worsening of anemia and with signs of uterine hypertonia. Three red blood cell concentrates were then transfused and a cesarean was indicated for suspected placental detachment and impaired fetal vitality. Newborn with 870 g, Apgar 1/2/2 and diffuse subcutaneous edema evolving to death after 37 minutes. The macroscopic evaluation showed a circumscribed mass on the placental, hardened fetal face, approximately 10 cm in diameter, close to the uterine fundus (Figures 4 and 5). Neomort and placenta were sent to the Death Verification Service of the City of Goiânia for anatomopathological analysis. Patient needed a new blood transfusion after cesarean section. During all hospitalization, maternal blood pressure levels remained around 140 x 90 mmHg, with no need for antihypertensive medication, evolving without complications in the puerperal period.

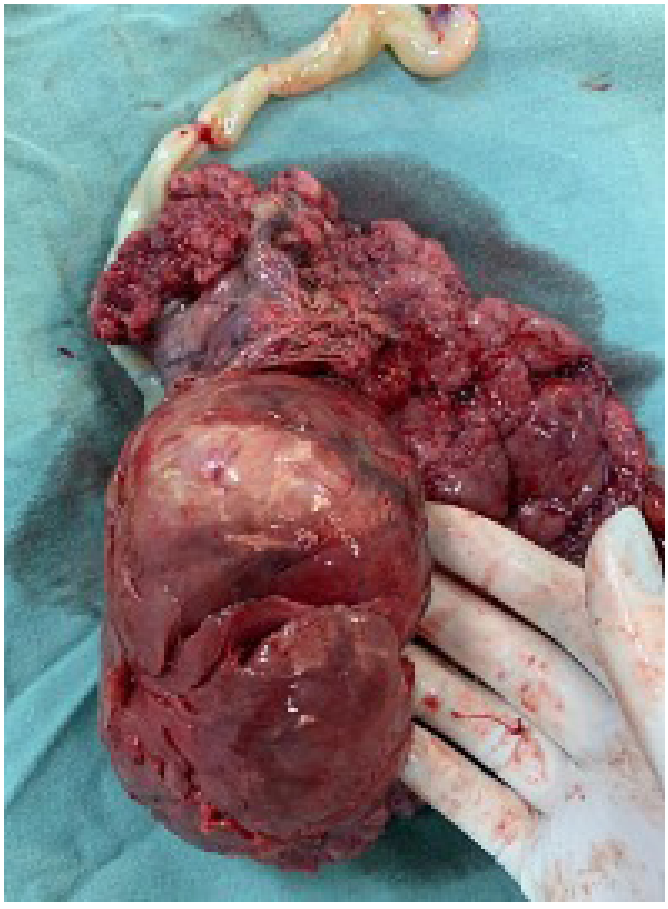

Figure 4. Macroscopic appearance of the placenta with the giant chorioangioma.

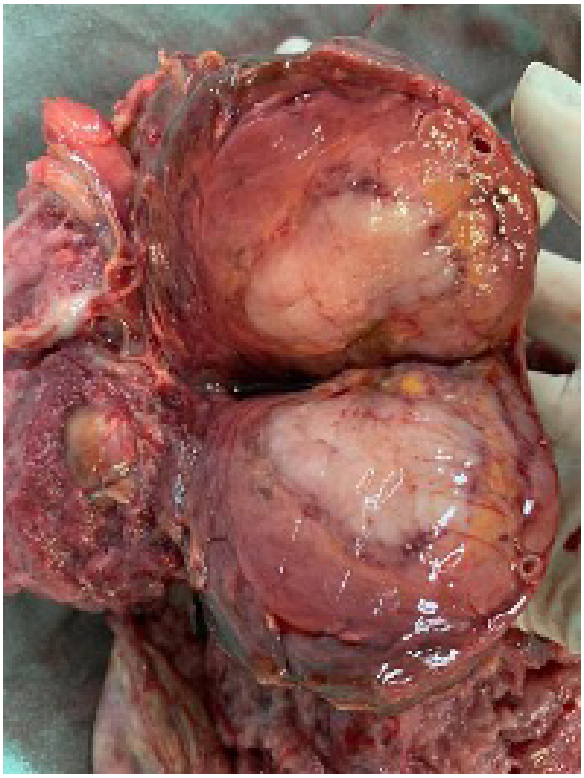

Figure 5. Giant chorioangioma with an area of intratumoral necrosis.

The conclusions of the necroscopic report were: Giant placental chorioangioma associated with thrombotic vasculopathy in fetal territory (Figures 6 and 7). Signs of hydrops and fetal anemia. Acute fetal distress. Premature labor. Extreme prematurity.

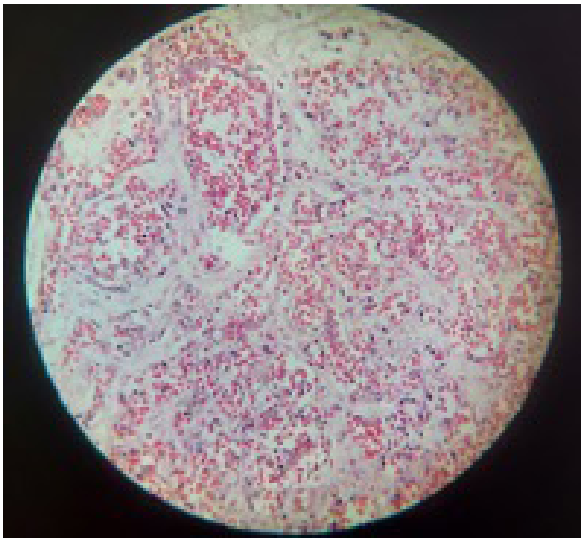

Figure 7. Thrombotic vasculopathy in giant placental chorioangioma.

DISCUSSION

Giant chorioangiomas are rare placental tumors associated with a high prevalence of complications during pregnancy and an unfavorable perinatal prognosis. Prenatal diagnosis is performed by color Doppler ultrasound. The typical echographic aspect found is that of a circumscribed, hypo or hyperechogenic mass, located in the chorionic plate that goes to the amniotic cavity, usually close to the insertion of the umbilical cord. Color Doppler shows large vascular channels on the periphery and inside the tumor.[1,2,4]

The approach and management in cases of antepartum diagnosis are guided by fetal maturity and the presence of maternal and fetal complications. These tumors act as large arteriovenous shunts within the placenta, diverting blood from the conceptual product. Polydramnia, like the one in this case, has been associated with increased urinary output and hyperdynamic circulation related to blood shunt or fetal anemia. Transudation of fluid from the tumor surface can also contribute to the accumulation of amniotic fluid.[3,5]

The investigative propedeutics consists of detailed and serial ultrasound examinations every 2-3 weeks, including echocardiography for access to cardiac function and evaluation of the systolic peak velocity of the middle cerebral artery for the diagnosis of fetal anemia.[4,6]

The high perinatal mortality (30-40%) in cases of giant tumors stimulated the attempt of prenatal therapeutic interventions with the intention of improving the conceptual prognosis.[8,10]

The treatment of chorioangioma and related complications is controversial. Amniodrenage to relieve polyhydramnios, intrauterine blood transfusion to correct fetal anemia are alternatives to complications related to tumors. The therapy for the tumor itself has been carried out by means of endoscopic vascular coagulation with laser guided by ultrasound, and more recently by endovascular embolization under selected conditions. All of these options are not innocuous and have highly variable success rates.[8-10] In the case presented, due to the signs of fetal circulatory dysfunction established at the time of diagnosis and unstable maternal clinical picture, none of these interventions was performed.

Finally, it is important to note that the early diagnosis of giant placental chorioangiomas, careful prenatal surveillance and appropriate and timely intervention can prevent serious fetal complications and high perinatal mortality related to these rare tumors.

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CRITERIA FOR PERFORMING ULTRASONOGRAPHY IN THE FIRST TRIMESTER OF PREGNANCY BASED ON ISUOG GUIDELINES

ANTONIO GADELHA DA COSTA, PATRICIA SPARA GADELHA, MARINA MENDES CAVALCANTI

ABSTRACT

Obstetric ultrasound should be offered to low-risk patients after 11 weeks of gestation. In this phase, it is important to establish fetal viability, gestational age, chorionicity in multiple pregnancies, as well as to evaluate fetal morphology and risk of fetal structural abnormalities, genetic syndromes and aneuploidy. The recommendations of the guideline of the International Society for Ultrasonography in Gynecology and Obstetrics (ISUOG) represent an international reference for the performance of fetal ultrasound and intend to reflect on the methodology considered most appropriate.

Thus, the aim was to analyze the criteria and indications for performing ultrasound in the first trimester of pregnancy. The work was developed in the form of a bibliographic review carried out based on ISUOG's practical guidelines for the routine performance of fetal ultrasound in the first trimester, through the study of updated literature. Knowledge of embryonic development throughout pregnancy and the use of an appropriate ultrasound methodology in the first trimester are, therefore, essential to obtain accurate results.

KEYWORDS:ULTRASONOGRAPHY; GESTATION; FIRST QUARTER; PRENATAL; DIAGNOSTIC IMAGING.

INTRODUCTION

Ultrasonography (USG) is an imaging method widely used in prenatal assessment of fetal growth and anatomy[1, 2], as well as in monitoring multiple pregnancies[2].

The first trimester is defined as from the moment when embryonic viability can be confirmed, that is, identification of the gestational sac in the uterine cavity with an embryo showing cardiac activity, up to 13 weeks and six days of gestation3. The term "embryo" should be used from the beginning of gestation until the period between 9 and 10 weeks, when the fetal period begins and the organogenesis is essentially complete [4]. At this stage, there is the definitive formation of the placenta that assumes, together with the fetus, the hormonal production of the corpus luteum4. From then on, the fetus develops more than 90% of its body structures, with subsequent growth and maturation[4].

In the early stages of pregnancy, in addition to viability, it is important to establish gestational age and assess chorionicity and amnionicity, in cases of multiple pregnancies. In addition, the first trimester USG has been of great importance for the identification of fetal structural anomalies, as well as genetic syndromes and risk of aneuploidy early in pregnancy[5]. Thus, it should be offered, in low-risk patients, from 11 weeks onwards, an optimal age to reach the goals with more reliable characterization, with the possibility of performing the initial diagnosis of pregnancy by measuring the βhCG6-11.

The adequate performance of fetal USG in the first trimester of pregnancy is of great importance to obtain accurate results that optimize prenatal care[3]. In this sense, the recommendations of guidelines represent an international reference for their realization, and are intended to reflect on the practices, considered more appropriate by the International Society of Ultrasonography in Gynecology and Obstetrics (ISUOG), when they were developed[3]. However, local medical circumstances and practices should be considered, and it is advisable to document cases where it is impossible to perform the examination in accordance with these recommendations[3].

Therefore, this study aims to analyze the criteria and indications for performing USG in the first trimester of pregnancy.

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ULTRASONOGRAPHIC METHODOLOGY IN THE FIRST QUARTER OF PREGNANCY

The work was developed in the form of a bibliographic review carried out based on ISUOG's practical guidelines for the routine performance of fetal ultrasound in the first trimester.

In the ISUOG guidelines, recommendations are described, ranging from the equipment that must be used to the way of evaluating the embryo from a morphological and structural point of view:

The ultrasound equipment to be used for the adequate realization of USG in the first trimester of pregnancy must acquire two-dimensional (2D) images in real time and gray scale[3]. In addition, they must contain transabdominal and transvaginal ultrasound transducers; adjustable acoustic power output controls and standard biological effect display (TI and MI); frame freeze and image magnification capabilities, "freeze" and "zoom" modes, respectively; electronic cursors and the ability to store images[3]. There should be regular maintenance and repair of equipment[3].

After the examination, a documented report must be made, to be printed and stored, and, according to local practices, made available to the pregnant woman and the health service provider who referred the patient[3]. This document should contain information about the patient's general data; date of the exam and performing professional; relevant clinical indication and information; if there was adequacy or technical limitation; chorionicity in cases of twin pregnancies; as well as the appearance of the attachments, regarding their normality or abnormality, with description of the anomaly[3].

The use of USG in its B and M modes is safe for all stages of pregnancy, since the output acoustic energy is not high enough to produce harmful effects[12, 13].

Doppler ultrasonography, on the other hand, is associated with greater energy production and consequently a greater potential for biological effect[14, 15]. Thus, Doppler exams require clinical indication to be used in the first trimester[12], by establishing the minimum necessary time for the effective performance of the method, based on the thermal index used and the exposure time[15].

In addition, biometric measurements and their respective percentiles must be documented, as well as an ultrasound estimate of gestational age (GA) [3]. In this sense, it is important to point out that the embryonic/fetal size corresponds to the post-conception age, and that the GA represents the age after conception + 14 days[3].

The ideal period for measuring the crown rump length (CRL) is 8 weeks to 13 weeks and 6 days[1, 3]. In this case, the CRL should be used to evaluate the embryonic size and estimate the GA until it reaches 84 mm in length, when the head circumference (HC) should be the parameter for this estimate[1, 16]. From 14 weeks on, the usual measures include biparietal diameter (BPD), abdominal circumference (AC) and length of the femur (FL) [1, 3].

Measurements can be performed via transabdominal or transvaginal ultrasound. For all of them, sharp images with sufficient magnification for the correct representation of the reference points are necessary in order to allow the precise placement of the cursors[17].

For the evaluation of the CRL, a median sagittal section of the entire embryo/fetus[17] must be obtained, so that the measurement line between the head and the rump is as close to 90 degrees with the ultrasound beam[3]. The fetus needs to be in a neutral position, not hyperflexed or hyperextended[3]. Magnification should be performed so that the embryo fills at least 30% of the monitor. The profile, head, spine and rump must be visible as well as the fluid between the chest and chin18 (Figure 1). The intersection of the cursor must be positioned on the outer edges of the skin over the head and rump for proper measurement[18] (Figure 2).

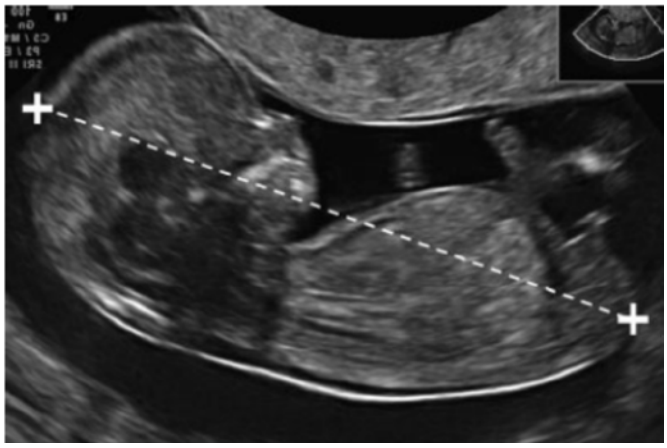


Figure 1: Crown rump length (CRL) 3. Note the indifferent fetal position and the fluid between the chin and the chest.

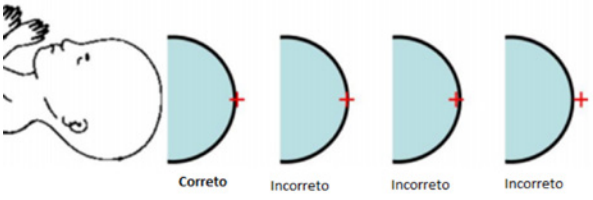


Figure 2: Cursor positioned on the outer edge of the fetal head, showing adequate technique for measuring the CRL[18].

For the measurement of BPD and HC, the symmetrical axial plane of the fetus head should be considered, in which the third ventricle should be visible, in a central position; interhemispheric fissure; choroid plexus and midline struc-

tures, such as the thalamus[2, 5, 16] (Figure 3). There should be no distortion of the fetal head by adjacent structures or by the pressure exerted by the transducer[3]. The HC can be obtained directly by the measuring tool in ellipse, as well as it can be calculated through the measurements of the BPD and the occipital frontal diameter (OFD) [1, 16]. For this, the position of the cursors must follow the technique used to produce the selected nomogram, so for the BPD they must be positioned external-internal, and for the OFD, external-external[3, 6, 16, 19].

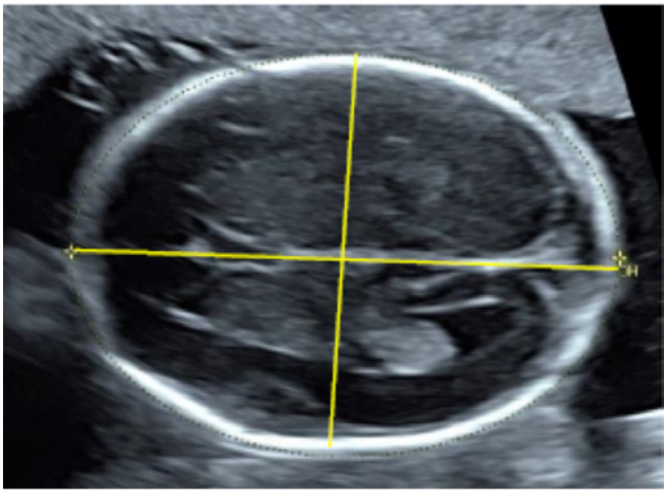


Figure 3: View of the symmetrical axial plane of the fetal head[20]. Cursors positioned to measure BPD (external-internal) and OFD (external-external).

Nomograms for AC, FL and other fetal organs are also available, but there is no indication to measure these structures as part of the routine in the first trimester[3].

CHARACTERIZATION OF THE ECOGRAPHIC EXAMINATION IN THE FIRST QUARTER OF PREGNANCY

Embryo detection and confirmation of embryo viability

The first visible sign of intrauterine pregnancy is the appearance of the gestational sac (GS), an anechoic round structure with an echogenic halo, located on the deciduous between 28 and 31 days at USG TV10 (Figure 4). In normal pregnancies, the diameter of the GS, in the first trimester, grows on average 1.13 mm/day21, and a smaller size than expected between 36 and 42 days, is predictive of spontaneous abortion[22].

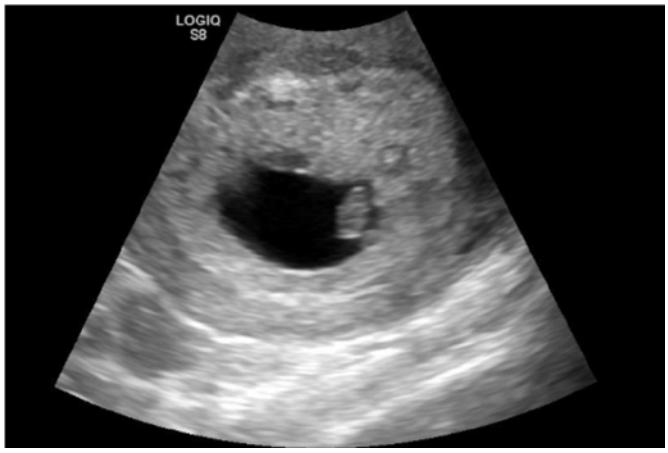


Figure 4: Gestational sac; making the embryo visible.

From the 35th day onwards, the first embryonic pole can be seen, initially as a small linear echogenic structure on the periphery of the yolk sac[10], about 1 to 2mm in length[3] (Figure 4). Until the 53rd day, the cephalic and caudal extremities were indistinguishable, at which point the rhombencephalic cavity, the future fourth ventricle, becomes visible[10] (Figure 5).

Fetal viability, from the point of view of USG, is the term used to confirm the presence of an embryo with an active heart, meaning the presence of life[3, 23]. Embryonic cardiac activity is documented after 37 days of gestation[2], and gradually increases between its first detection and the 8th week[23]. Normally, the embryonic heart rate (EHR) can be seen as soon as the embryonic pole is visualized[10]. However, it may not be seen in viable embryos measuring from 2 to 4 mm, in 5% to 10% of cases[3, 24]. Therefore, the absence of EHR should only involve the diagnosis of embryonic death for embryos with CRL measuring 7mm or more[25].

At this gestational age, it is preferable to measure the EHR using the M mode (Figure 6).

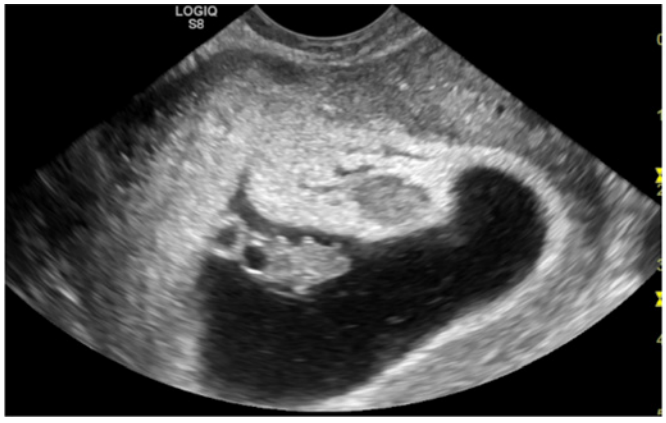


Figure 5: Embryo at 7-8 weeks of gestation. Note the cystic structure in the embryonic head that corresponds to the rhombencephalon.

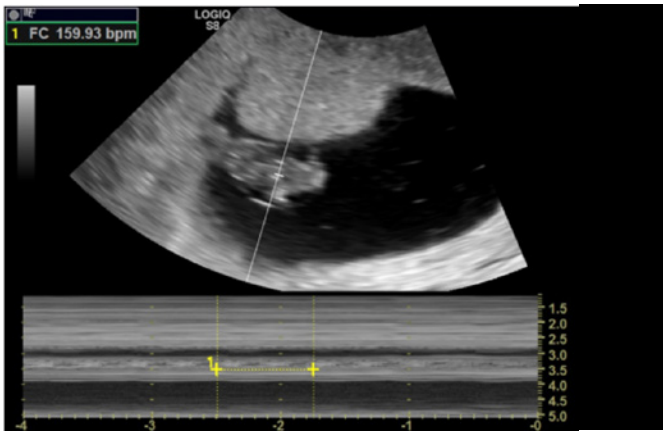
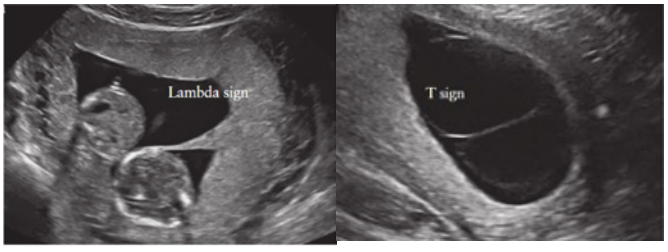


Figure 6: Embryonic heart rate assessed by the M mode.

CHORIONICITY

The precise determination of chorionicity is mandatory in the routine care of twin pregnancies in the first trimester to distinguish and detect early gestational risk[11]. This is because, in addition to twin pregnancies, they already have an increased risk of perinatal morbidity and mortality, such as premature delivery and fetal growth restriction (FGR)[26], the rate of mono-chorionic pregnancy losses is five times higher compared to dichorionic pregnancies, mainly due to the Twin-to-twin transfusion syndrome or selective intrauterine growth restriction[11].

USG is effective in determining the chorionicity of twin pregnancies, preferably between 10 and 14 weeks[27, 28], by determining the number of placental masses and findings such as the "T" or lambda (λ)[11, 27, 28] signs. The sign "λ" refers to a triangular projection of placental tissue that extends between the amniotic membranes[11, 27], and is practically 100% predictive of dichorionic pregnancies[27] (Figure 7). In monochorionic diamniotic pregnancies, the intra-amniotic membrane is thinner, forming a "T" junction[27] (Figure 8). If there is uncertainty in determining chorionicity, one should choose to conduct the pregnancy as monochorionic[11].



Figures 7 and 8. (7): Lambda signal evidenced in transabdominal ultrasonography of dichorionic diamniotic pregnancy[28]. (8): Thin intra-amniotic junction forming the "T" sign at transabdominal ultrasound of monochorionic diamniotic pregnancy[28].

Determination of gestational age

Accurate knowledge of gestational age (GA) is essential for the proper monitoring of pregnancies[3, 7], as well as for obstetric decision making[8], and has been the main indication for routine ultrasound in the first trimester[3]. Correct dating is important for determining the exact risk of chromosomal abnormalities during the first and second trimesters, interpreting biometric data in the second half of pregnancy[8, 29] and containing the misidentification of pregnancies as post-term, which ultimately require induction of labor[9]. Furthermore, the proper determination of the CRL is important in the diagnosis of fetal macrosomia, preterm fetuses and FGR[29].

The estimate of the GA or the estimated due date (EDD) based exclusively on the date of the last menstrual period (LMP), even in pregnancies where the menstrual history is certain, proved to be unreliable[6, 7, 29, 30]. In this sense, to establish a precise GA, routine ultrasound dating from 8 weeks to 13 weeks and 6 days is recommended for all women, since it is considered a highly accurate method and the most suitable for this purpose[3, 6, 7, 29]. This dating must be performed by measuring the CRL, the gold standard for calculating the GA[6, 7, 23, 31]. From 14 weeks onwards, BPD7 should be used.

Twin pregnancies can be accurately dated by the same nomograms used for single pregnancies, since the CRL variation, from 11 to 14 weeks, did not show clinical significance between twin or non-twin fetuses[11, 26].

FETAL ANATOMY

Anthropometric differences and growth abnormalities can be expressed as early as the first trimester[4, 7]. However, fetal biometry is rarely used to diagnose or characterize abnormal fetal development in the first trimester[4]. In this sense, some chromosomal abnormalities are associated with low embryonic and fetal growth even in this period[7]. Embryo size lower than expected is associated with an increased risk of miscarriage, and in chromosomally normal fetuses, the small size between 11 and 14 weeks suggests an increased risk of FGR and premature birth[7]. However, the current diagnosis of growth restriction must be performed using both fetal biometry and Doppler velocimetry of the uterine, fetal middle cerebral and umbilical arteries[32].

Detailed anatomical ultrasound assessment, at an early gestational age, can be performed in conjunction with the measurement of nuchal translucency (NT), but it does not seem to be more specific than this[33]. The increase in the thickness of NT is strongly related to chromosomal syndromes such as trisomy of chromosomes 21, 18 and 13, as well as Turner syndrome[34]. In addition, in the presence of a normal karyotype, increased NT is also associated with an increased frequency of structural abnormalities, such as major heart defects, skeletal dysplasias, diaphragmatic hernia, as well as genetic syndromes in the first trimester[27]. Through USG between 11 and 14 weeks, it is also possible to detect some abnormalities such as anencephaly, alobar holoprosencephaly and gastroschisis[35].

Although a wide variety of abnormalities are detected by ultrasound in the first trimester of pregnancy, the fetal morphological study in the second trimester cannot be replaced, and remains the standard exam for fetal anatomical evaluation in pregnancies[33].

The ultrasonographer must have full knowledge of embryonic structures and their visibility through ultrasound throughout pregnancy. Below, we describe the structures that can be seen in the various embryonic segments, based on gestational age.

HEAD

The cephalic pole is identified at 7 weeks of gestation[27]. Around the 10th-11th week, the echogenic choroid plexuses are the most important intracranial structures and fill the large lateral ventricles in their two posterior thirds[27, 35] (Figure 9). The cerebral parenchyma at this age is thin[27] and must appear symmetrical, separated by the interhemispheric fissure[35]. The thalamus and midbrain are visible more caudally[27].

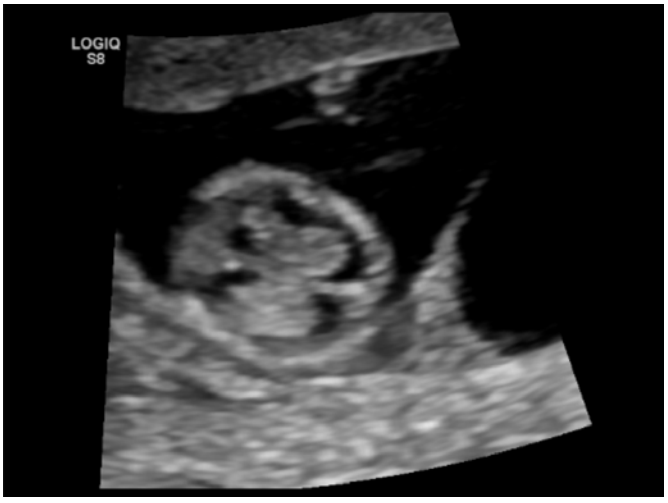


Figure 9: Choroid plexuses in the first trimester. They fill the lateral ventricles.

Ossified frontal and parietal bones are visible at the 11th week[27, 35]. Anencephaly is the most common anomaly that affects the central nervous system and results from failure to close the rostral portion of the neural tube[27].

VERTEBRAE

Ossification of the vertebral body begins on the 7th week, in the central thoracic region, extending to the head and sacrum[27]. Accurate vertebral examination, between 12 and 13 weeks, consists of longitudinal and axial vision to show alignment and integrity of the vertebrae, as well as the evaluation of the intact overlying skin[3, 27].

THORAX

In the evaluation of the chest, lungs of homogeneous echogenicity and continuous diaphragm should be observed, with intra-abdominal positioning of the stomach and liver[3].

The best time in the first trimester to assess the heart is in the 13th week of pregnancy[27]. The fetal heart is generally completely formed, with a four-chamber structure established, approximately on the 56th post-conceptional day[36], with a normal position on the left side of the chest (levocardia)[3] (Figure 10).

Cardiac and major artery abnormalities are the most common birth defects, and include interventricular communication, ectopia cordis and left atrial isomerism[27].

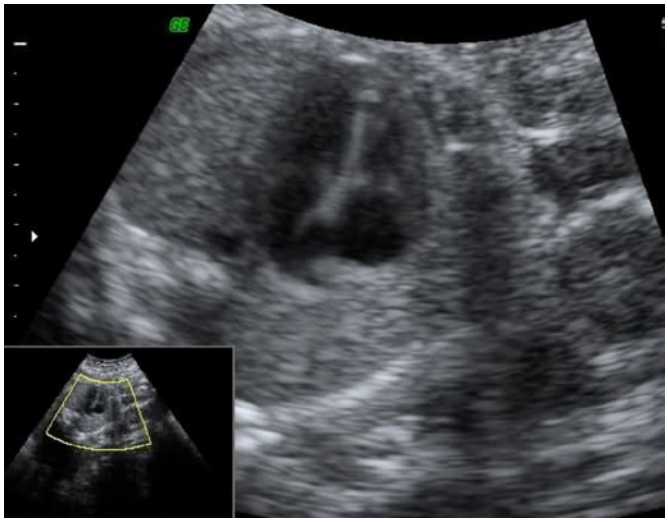


Figure 10: Ultrasonographic view of the four fetal cardiac chambers.

ABDOMEN

From 8 to 10 weeks, there is a physiological midgut herniation, visible as an echogenic mass at the base of the umbilical cord, which regresses to the normal position in the abdominal cavity on the 12th week[27, 35]. In this sense, the diagnosis of omphalocele and gastroschisis should not be done before this period[27, 35] or with a CRL ≤ 45mm, unless the anterior abdominal mass is greater than 7mm or contains the liver or the stomach[27].

The characterization of the umbilical cord must be done regarding its insertion, number of vessels and presence of cysts[3].

URINARY TRACT

Between 12 and 13 weeks of gestation, the bladder and kidneys can be seen in almost 100% of cases[27, 35]. Failure to view the bladder may be due to renal abnormalities or bladder exstrophy[27].

LIMBS

In transvaginal US, limb buds can already be identified between the 8th and 9th week of pregnancy[27]. The ossification centers of the long bones can be seen in the 10th week and the terminal phalanges of the hands in the 11th, a period in which the humerus, ulna, radius, femur, tibia and fibula can be measured with satisfactory precision and the movements of the limbs are easily viewed[27].

In a practical way, the ultrasound examination of the first trimester should value the evaluation of the fetal anatomical appearance in terms of its normality, abnormality or non-visualization of the structure (Chart 1).

Anatomical Structure	Anatomical Structure
Head	**Heart**
Head	Cardiac activity
Cranial Bones	Size
Falx cerebri	Axis
Lateral ventricles with plexus Choroid	Viewing of and chambers
Neck	**Abdomen**
General appearance	Stomach
Nuchal translucency thickness	Intestine
Face	Kidneys
Orbits	Bladder
Nasal bone	**Abdominal Wall**
Profile	Umbilical cord insertion
Lips	Umbilical cord vessels
Spine	**Limbs**
Vertebrae	Right arm
Skin	Left arm
Chest	Right leg
Pulmonary fields	Left leg
Diaphragm	Hands and feet

Chart 1: Basic evaluation of fetal morphology in the first trimester of pregnancy.

SCREENING FOR CHROMOSOMAL DISORDERS

Screening for chromosomal abnormalities by the first trimester USG can be offered depending on public health policies, the availability of health resources and trained professionals[3]. In this sense, in countries where the termination of pregnancy is restricted, the rates of detection of anomalies must be balanced with the necessary time for genetic counseling and further investigation[2].

Measurement of NT thickness between 11th and 14th weeks of gestation, corresponding to a CRL between 45 and 84 mm3, combined with age and maternal serum biochemistry - free human chorionic gonadotropin (βhCG) and pregnancy-associated plasma protein (PAPP-A) -, is an effective screening method for trisomy 21 (Down syndrome) 27, 37. Thus, calculating the risk for chromosomal disorders, using the measurement of the CRL, βhCG and PAPP-A is the best approach for the screening of fetal anomalies in the first trimester of pregnancy[34]. Other chromosomal abnormalities such as trisomies on chromosome 13 and 18 and Turner syndrome can also be screened by this method[27].

NT can be measured transabdominally or transvaginally[3], although the transabdominal ultrasound is satisfactorily used in 95% of cases[34]. It is obtained through a sagittal section of the fetus in a neutral position[3], in which only the head and upper region of the chest of the fetus should be included in the image[34]. Normally, a thin layer of fluid is seen in the posterior nuchal region in the fetus of the first trimester[27] (Figure 11).

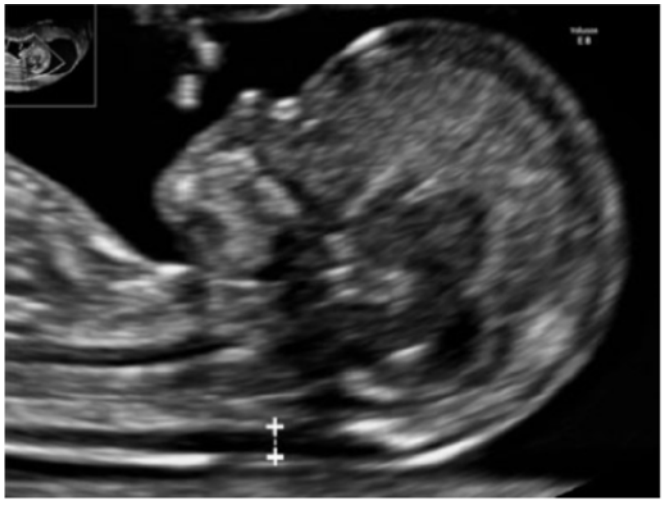
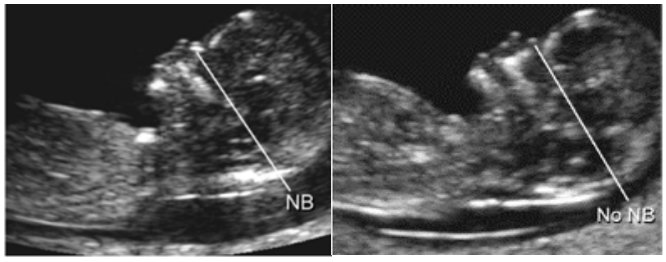


Figure 11: Ultrasound measurement of NT[3] thickness



Figures 12 and 13. Ultrasound image of the profile of the fetal face shows normal ossification of the nasal bone (NB) [27]. Ossification of the missing nasal bone (No NB)[27].

Current propaedeutics for calculating the risk of chromosomal disorders include the patient's age, maternal and gestational data, CRL measurements, βhCG and PAPP-A[34].

TN values > 3mm are useful markers for fetal chromosomal abnormalities[38]. However, preference should be given to calculating the risk of the patient developing chromosomal disorders, using existing programs on the World Wide Web.

In this regard, the Fetal Medicine Foundation (FMF) program can be used, in which the patient's age, maternal and gestational data, NT measurement and β hCG and PAPP-A values are applied[34, 39, 40].

ASSESSMENT OF THE UTERUS AND PLACENTA

Placenta previa is one of the main causes of vaginal bleeding in the third trimester of pregnancy and is associated with an increased risk of maternal, fetal and perinatal morbidity and mortality[41]. However, its diagnosis should not be defined in the first trimester of pregnancy[3]. This is because the position of the placenta in relation to the cervix changes throughout most pregnancies, due to the difference in growth between the uterus and the placenta, and, therefore, its report is less important in the first trimester of pregnancy [41].

Patients with uterine curettage[40] and previous cesarean section should receive special attention, as they may be significantly predisposed to uterine scars or placenta accreta[3]. However, evidence for the inclusion of routine assessment for women with previous cesarean section is scarce[3].

Also in the first trimester exam, the placental structure and the uterine conformational abnormalities, such as uterine septum and bicornuate uterus, should be described if detected[3].

Ultrasound examination is of great importance for the reduction of perinatal morbidity and mortality. The study of the inverted pyramid proposed by the FMF emphasizes the importance of valuing this exam in the early diagnosis of embryonic abnormalities, using ultrasonography[42, 43]. However, the good results are related to knowledge of anatomy and embryonic development, as well as the ultrasound methodology used during the first trimester of pregnancy.

CONCLUSION

We conclude, therefore, that the knowledge of embryonic development throughout pregnancy and the use of an appropriate ultrasound methodology in the first trimester are essential to obtain accurate results.

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THE MEDICAL USE OF WHATSAPP™ AND SIMILAR PLATFORMS

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ABSTRACT

INTRODUCTION: The use of digital media is a reality in all spheres and professions in society. Systematization and ethics in its use are a need to be discussed due to the importance of the benefits they offer us as well as the problems they trigger. Medical secrecy and bioethics are at the heart of the relationships between doctors and between them and their patients; and they are the pillar that governs these relationships, which necessarily require mutual trust and respect. Thus, social media fit into this context.

OBJECTIVE: To present and discuss the boundaries and ethical aspects of the use of WhatsApp™ and similar platforms among medical professionals and between physicians and their patients, in accordance with legislation and advice from professional organizations.

METHODS: Narrative review of the literature of free online scientific articles and publications of the Federal Council of Medicine.

RESULTS AND DISCUSSION: WhatsApp™ and similar platforms can be used for communication and discussion of cases and conduct between doctors and doctors and between doctors and their patients. The information shared is absolutely confidential and should follow the medical ethics recommendations in force in Brazil. There is no restriction on use in relation to medical specialties; therefore, the use in ultrasonography stands out.

CONCLUSIONS: The use of digital communication platforms, such as WhatsApp™, is a reality in the practice of contemporary medicine and has guidelines well established by the Federal Council of Medicine.

KEYWORDS: DIGITAL COMMUNICATION PLATFORMS, SOCIAL MEDIA, MOBILE APPLICATIONS, BIOETHICS, MEDICAL LAW.

INTRODUCTION

Advances in telecommunications are continually improving telemedicine modalities. This type of audiovisual health communication supported by Smartphone apps is a new concept that is rapidly gaining ground in all areas of medicine. WhatsApp™ Messenger - is a free real-time messaging application that allows Smartphone users to send text messages or other types of media, such as images, videos or voice messages, to their contacts.[1]

The SEJUR Ruling no. 373/2016, from the Federal Council of Medicine[2], brings the following information: "Thus, the use of "WhatsApp™" application, or similar apps, to allow the simultaneous and agile exchange of information between doctors is a measure that can effectively prove useful to medical work, because obviously the diversity of knowledge demands the interaction between different medical professionals in various specialties. Such diligence through discussion groups and exchange of information allows medical professionals to reach clear, accurate, rapid and effective diagnoses in fighting the ills of human health, thus making the greater primacy of the medical profession, which is the well-being of human health[2]. "

The Federal Council of Medicine published Opinion no. 14/2017 in which concludes that "WhatsApp and similar platforms can be used for communication between doctors and their patients, as well as between doctors and doctors on a private basis to send data or clarify doubts with their colleagues, as well as in closed groups of specialists or the clinical staff of an institution or chair, with the proviso that all past information is absolutely confidential and cannot go beyond the limits of the group itself, nor can they circulate in recreational groups, even if only composed of doctors, emphasizing the explicit prohibition to replace face-to-face consultations and those for diagnostic or evolutionary complementation at the physician's discretion by any of the existing or existing platforms ".[3]

The creation of groups on the WhatsApp™ Messenger application platform in ultrasound teams becomes an important pillar in the strategy for training and continuing education of doctors in carrying out this method. [4]

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OBJECTIVE

Present and discuss the limits and ethical aspects of using WhatsApp™ and similar platforms between medical professionals and between doctors and their patients, in accordance with the legislation and opinions of the professional councils.

METHODS

Narrative review of the literature of scientific articles with free online access and publications of the Federal Council of Medicine.

DISCUSSION

Telemedicine is defined as the use of electronic information and communication technologies to provide healthcare support when distance separates the patient. In this case, the contact between the patients, the doctor or even between professionals is considered, where the information transmitted between the two parties can take various forms, including audio, still images, videos and texts.[5]

The use of digital media is a reality in all spheres and professions in society. Systematization and ethics in its use are a need to be discussed due to the importance of the benefits they offer us as well as the problems they trigger.[6]

Global adoption of telemedicine has been slow, especially in developing countries, where there is a greater need. Barriers to its use in the developing world are high costs, infrastructure, and little economic evidence of its benefits. [6]

WhatsAppTM Messenger emerges as a tool for instant messaging and multimedia texts with medical content, since 2016, regulated by the Federal Council of Medicine.[2, 3]

The exchange of information between patients and doctors, when dealing with people already receiving assistance, is allowed to elucidate doubts, deal with evolutionary aspects and provide guidelines or emergency interventions [2, 3, 7].

Gulacti et al. published a paper that evaluated the use of WhatsApp™ in communication between patients and emergency doctors. This was a retrospective observational study carried out in the emergency department of a university hospital serving tertiary care over a period of six months. WhatsApp™ messages transferred to medical consultants consisted of 510 (98.3%) photographic images, 517 (99.6%) text messages, 59 (11.3%) videos and 10 (1.9%) voice messages. The most frequently requested consultation was at the orthopedics clinic (n = 160, 30.8%). Most of the requested consultations were closed only by evaluation via WhatsApp™ messages (n = 311, 59.9%). The authors concluded that WhatsApp™ can be a useful communication tool between doctors, especially for emergency room consultants who are out of the hospital, due to the ability to transfer large amounts of clinical and radiological data over a short period of time.[7]

Mars & Scott performed a literature review on the use of WhatsApp™ in clinical practice, to determine how it is used and user satisfaction. 32 articles were found on the subject, of these, 17 articles reported the use of WhatsApp™ groups of medical specialties, 14 of which were related to surgery. The articles report that instant messaging groups have improved communication and guidelines for conduct and treatment for patients. Confidentiality was mentioned in 19 articles and consent in five. Data security was addressed in part in 11 articles; still, with little understanding of how data is transmitted and stored, which points to the need for further studies that aim to discuss and evaluate legal and ethical issues in the discussion of patient cases by this means of communication.[6]

Ellanti et al. performed work to evaluate and compare the use of the WhatsApp™ instant messaging application and the pager in an orthopedic surgery team. The medical team was evaluated for six months and observed the exchange of messages and case/patient information through the application and the pager. The authors noted that the average time spent on communication between users was 5.78 minutes using Whatsapp™ and 7.45 minutes using the pager, saving up to 7,644 minutes during the study period. 5,492 messages were exchanged during the study period, mostly related to patient care, and 195 multimedia messages containing imaging tests. All survey participants found using the Whatsapp™ application easy to handle and more efficient than the traditional pager system.[8]

Giordano et al. carried out a systematic review of the current literature on the use of the Whatsapp™ Messenger application as an auxiliary health care tool for doctors. The authors concluded that the data grouped in the systematic review presents convincing evidence that the Whatsapp™ Messenger application is a promising system, used as a communication tool between health professionals, as a means of communication between health professionals and the general public, or as a learning tool for health service delivery. However, they emphasize the need for new research with better and appropriate methodological descriptions and study processes to allow WhatsApp™ to be implemented as an effective telemedicine tool in many different fields of healthcare.[1]

Piber et al. presented partial results of a study by a group of Whatsapp™ Messenger, formed by 106 doctors. Such group was limited to discussing medical issues about breast ultrasound and all patient data were hidden, respecting the guidelines proposed by the Federal Council of Medicine at the SEJUR Ruling no. 373/2016.2 85 cases were discussed, from February to December 2017. Of these, 49 cases (57.6%) were presented with photos. The discussion time with resolution of cases and/or doubts ranged from 1 to 136 minutes, with a median of 11 minutes and an average of six minutes. The most prevalent keywords were suspicious nodules (22.3%) and probably benign nodules (15.3%). The ACR-BIRADS classifications, two (37%) and four (34%), were the most frequent. The use of this multimedia tool facilitated communication between doctors and had a positive impact on the continuing education process, reflected by the

decreasing number of doubts over this period.[4]

The creation of groups on the Whatsapp™ Messenger application platform in general ultrasound and radiology teams has become an important pillar in the strategy for training and continuing education of doctors.[4]

From a legal point of view, it is necessary to promote a systematic interpretation of the constitutional, legal and administrative rules that govern the practice of medicine in Brazil, as well as the unavoidable secrecy of the doctor-patient relationship. In addition, it is also necessary to relate medical confidentiality with the new methods and technological resources of communication that are inherent to the current scenario of the evolution of human relations.[2,3]

CONCLUSIONS

Therefore, since telemedicine is a contemporary global reality, and the use of Whatsapp™ Messenger is widespread in all specialties; it is necessary to understand the dynamics of this telecommunication in Medicine, either between professionals or between doctors and their patients. We emphasize the importance of following the ethical precepts of Medicine, guided by the Federal Council of Medicine in our country.

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UTERINE ARTERIES DOPPLERFLUXOMETRY AS A PREECLAMPSIA SCREENING METHOD

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ABSTRACT

Objectives: Because of the maternal-fetal risks due to preeclampsia, this study aims to evaluate the importance of uterine artery Doppler as a method of prediction and control of preeclampsia.

Methods: For this literature review were used articles from the PubMed, UpToDate, LILACS and SciELO databases, as well as articles from the Revista Brasileira de Ultrassonografia and the New England Journal of Medicine. After the reading and analysis of the abstracts, 9 articles were filtered from 2010 to 2018 in the English and Portuguese languages.

Results: In preeclampsia there is a decrease in uteroplacental blood flow and an increase in endothelial resistance, evidences found in uterine artery Doppler due to the presence of bilateral protodiastolic notch and high pulsatility of these arteries.

Conclusions: Thus, the uterine artery Doppler in the first trimester, even before the change in blood pressure values, and again in the third trimester, is fundamental for the prevention and control of maternal-fetal morbidity and mortality associated with preeclampsia.

KEYWORDS: PREGNANCY, HIGH-RISK. ULTRASONOGRAPHY. HYPERTENSION, PREGNANCY-INDUCED. PREVENTION AND CONTROL. PREGNANCY TRIMESTER, FIRST.

INTRODUCTION

Presented as a gestational condition that usually occurs after the 20th week, pre-eclampsia (PE) is initially characterized by arterial hypertension associated with proteinuria, resulting from endothelial dysfunction and poor placental perfusion. [1] It represents 10% to 15% of maternal deaths due to complications related to placental abruption, acute renal failure, liver failure, cerebral hemorrhage, pulmonary edema and disseminated intravascular coagulation, in addition to the possibility of progressing to eclampsia and HELLP syndrome. There are also fetal consequences and complications for the newborn, as it increases the risk of restricted intrauterine growth, as well as preterm delivery, respectively.[2,3]

The pathophysiology of PE is due to an alteration in the trophoblastic invasion, which is the insertion of the decidua and myometrium by extravillous cytotrophoblasts during human placentation. This process occurs in the direction of the spiral arteries of the uterus, which leads to the invasion of the arterial wall, leading to the disappearance of the smooth muscle tunic of the artery and the cells of the endothelium of the mother. Both are replaced by extravillous cytotrophoblasts. As a result, the tunic of the artery becomes atonic, enabling easy perfusion of the intervillous chamber.[4]

However, in PE, while the uterine invasion is preserved, there is a decrease in intra and perivascular invasion of the uterine arteries. In addition, there is a defect in remodeling by the cytotrophoblasts. Endothelial cells are not replaced by trophoblasts and the smooth muscle layer does not undergo repair, resulting in a smaller diameter of the uterine arteries, which causes placental hypoxia by vasoconstriction.[4] In short, there is a decrease in uteroplacental blood flow with increased endothelial resistance.

Therefore, in view of the maternal-fetal risks resulting from pre-eclampsia, this study aims to assess the importance of uterine artery doppler flowmetry as a method of prediction and control of pre-eclampsia.

METHODS

To perform this literature review, articles from the PubMed (NCBI), UpToDate, LILACS and SciELO databases were used, as well as articles from Revista Brasileira de Ultrasonografia (RBUS) and The New England Journal of Medicine. The articles were filtered by reading and analyzing the abstracts, with 9 articles selected between 2010 and 2018, in English and Portuguese.

The keywords used during the search were: "Uterine ar-

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tery Doppler / uterine artery Doppler"; "Pre-eclampsia / Pre-eclampsia" and "Rastreio / Screening".

RESULTS

The evaluation of the blood flow of the uterine arteries is done by dopplerfluxometry, with arterial insonation in the proximal third from a wave analogous to at least other three symmetrical waves. For this, a convex transducer with a frequency of 3.5 MHz and an angle of a maximum of 60 degrees is used [2].

However, references to uterine artery Doppler indices vary depending on the measurement technique and gestational age, so appropriate references should be used. Insonation techniques during the examination must correctly follow the procedures used to determine the reference values.[5]

During the evaluation of the uterine arteries in the first trimester, using the transabdominal technique, a median section of the uterus must be obtained to identify the cervical canal, then the transducer must be moved laterally until the visualization of the paracervical vascular plexus, then the color Doppler must be connected and the uterine artery can be identified. Measurements should be performed at this time, before the uterine artery branches into arched arteries - see figure 1. This same process will be performed on the contralateral side, later.[5]

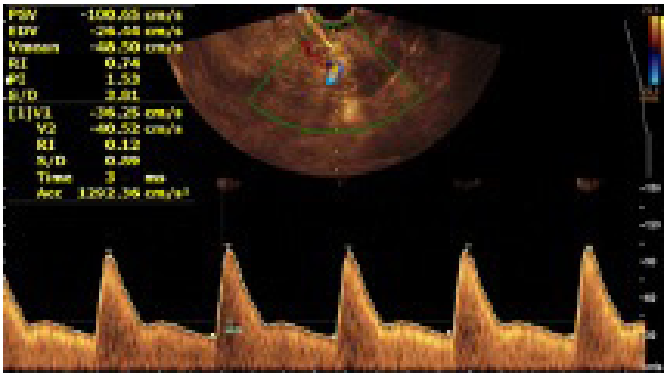

Figure 1. Ultrasonographic image illustrates uterine artery insonation, high-strength dopplerfluxometric indices and flowchart during the first trimester.

When observing changes in the normality pattern during the first trimester, that is, when changes are found in the dopplervelocimetric parameters, such as a higher rate of pulsatility and uterine arterial resistance, the administration of a prophylactic measure, an aspirin, is indicated. The recommended dose for use is 150mg/day from the 11th to the 14th week, extending it to the 36th week6. Such measure guarantees a lower incidence of the onset of preterm pre-eclampsia.[6]

From the second trimester, the technique of studying the uterine arteries at Doppler differs from that used in the first trimester. In the transabdominal technique, the medially angled transducer is positioned longitudinally in the lower lateral quadrant of the abdomen; color Doppler mapping is useful to differentiate the uterine artery when it crosses with the external iliac artery. If the uterine artery branches before the insertion of the external iliac artery, the transducer must be placed before the bifurcation of the uterine artery, this process will be repeated in the contralateral uterine artery, see figure [2]. It should be remembered that usually with advancing gestational age, the uterus rotates to the right side, thus the right uterine artery is more lateralized than the left uterine artery.[5] In this period of pregnancy, only if there is bilateral protodiastolic notch and/or increased resistance and pulsatility above the 95% percentile of curves according to gestational age, the test is considered altered.

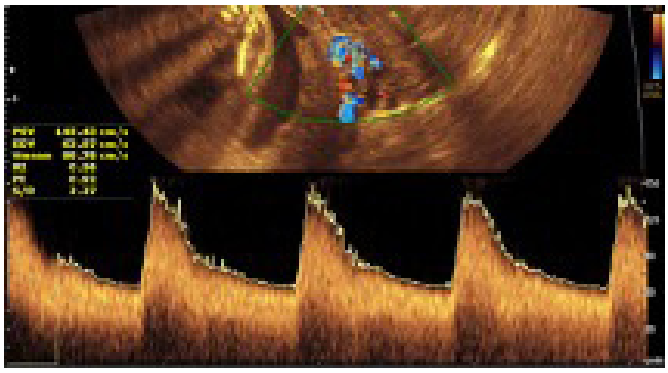

Figure 1. Ultrasonographic image illustrates insonation of the uterine artery, low resistance dopplerfluxometric indices and flowchart during the second trimester.

Thus, one of the methods of choice for prevention, diagnosis and control of this gestational alteration is the ultrasound with Doppler of uterine arteries with isolated sensitivity of 63.1% .[2]

DISCUSSION

In the context of PE, there is an emphasis on the interference of clinical risk factors, modifiable and non-modifiable, for the development of these comorbidities. The most commonly associated are: nulliparity, maternal age greater than 35 years, multifetal pregnancy, pre-gestational body mass index greater than 25, chronic hypertension, pre-gestational diabetes, previous PE, family history of PE, chronic kidney disease, systemic lupus erythematosus (SLE), antiphospholipid antibody syndrome (APS) and intolerance to paternal antigens (poor maternal adaptation to the fetal paternal antigen). These should be analyzed based on the control of confounding/modifiable factors such as lifestyle, nutritional factors and prenatal care[7,8]

The clinical picture resulting from arterial hypertension with proteinuria is accompanied by headache, seizures, visual symptoms, epigastric pain and fetal growth restriction, signs and symptoms resulting from dysfunctions of target organs (brain, kidneys, liver and placenta), which are justified by the

dysfunction systemic endothelial disease initiated from the inadequate placentation process.[2] Thus, such parameters (risk factors + symptomatology) warn about obstetric counseling and monitoring by a vigilant prenatal care, in addition to the need for holistic multidisciplinary support directed to particularities of the patient or pregnant woman with a high risk factor or who already has PE.

Therefore, the method of complementary examination to quantify high or low risk of PE development is dopplerfluxometry of the uterine arteries to assess the pulsatility index in the first trimester of pregnancy, which may generate the possibility, based on the framed percentile, of the use of aspirin therapy by the pregnant woman, since there are studies that prove that the prophylactic use of this mediation, in women at high risk of pre-eclampsia, resulted in a lower incidence of this diagnosis.[6] Therefore, the investigation by Doppler is aimed to measure the velocities of the uteroplacental blood flow, the umbilical artery to observe the fetoplacental circulation, the cerebral arteries and the venous Doppler (inferior vena cava, venous duct and umbilical vein).

This set, when analyzed, serves as a basis for the establishment of four Doppler models: obstructive, hyperdynamic, metabolic and malformative, in which the first is related to PE. Thus, the Doppler of the uterine arteries when evaluating the resistance index of the vessels, which reflects in the remodeling of the spiral arteries, has great applicability in pregnancies complicated by hypertensive disease, in which the bilateral protodiastolic uterine notches persist. However, the low predictive value of uterine artery Doppler in later or mild cases is attributed to atherosclerotic changes in the uteroplacental circulation that develop late and are associated with a less significant impairment in trophoblastic invasion.[9]

CONCLUSION

Therefore, the performance of obstetric US Doppler ultrasound of the uterine arteries in the first trimester, even before there is a change in blood pressure values and, again, in the third trimester, is fundamental for the prevention and control of maternal-fetal morbidity and mortality associated with PE and improvement of the outcome of the pregnancy, as it allows for more specialized and rigorous prenatal care as well as earlier interventions, if necessary. In this context, holistic follow-up offered by a multidisciplinary support team is essential.

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FETAL NEUROSONOGRAPHY: A PARALLEL WITH ECOCARDIOGRAPHY

JORGE ALBERTO BIANCHI TELLES

There is no doubt that they are distinct organs and systems with unique peculiarities, corresponding to the most frequent birth defects in the fetus and newborn in and the main causes of perinatal morbidity and mortality due to structural defects.1 Interestingly, when we focus attention on similarities among these groups of fetal pathologies, we can make interesting observations.

The classic indications for neurosonography and echocardiography are well established and explicit in tables 1 and 2, as well as the main markers of pathologies of the central nervous system (CNS) in table 3.

It is also well known that the evaluation of the fetal heart requires special attention from every professional who is dedicated to prenatal diagnosis. Firstly due to the frequency of congenital cardiopathies and then due to the characteristics of the dynamic functioning of the organ, which makes it difficult, for example, to assess static images, in addition to the special attention and training that the ultrasonographer needs to have to recognize subtle asymmetries and expressive changes that include the pathophysiology of some diseases of this organ.

The reader should notice that, with few word adjustments, the paragraph above could describe the pathologies of the CNS, with the exception of the constant movement characteristic that is inherent to the cardiac muscle.

Malformations of the central nervous system are the second most common congenital malformations, only surpassed by cardiac malformations, affecting 0.1-0.2% of newborns. Of course, these defects also have their own characteristics. Whenever we suspect or detect a structural defect in the CNS, we must take into account some particularities:

- Normal patterns of CNS morphology change with gestational age.

- Some injuries are progressive. Sometimes it may take some time from the risky situation until the abnormality is evident in the image.

- A normal ultrasound examination at week 20-22 does not exclude the pathology that may occur later.

When we are studying and learning to use morphological ultrasound as a tool to detect fetal structural defects in the second trimester, we are soon obliged to pay special attention to these two systems. In general, if we are going to divide our study of the fetal morphology of the second trimester into 3-4 moments, certainly two of these stages will be the heart and the CNS of the fetus. This is clearly explicit when we analyze the ISUOG (International Society of Ultrasound in Obstetrics and Gynecology) guidelines. A few years ago, our leading international board brought together some of its world experts, with the mission of determining which major plans may suspect and diagnose the most prevalent and epidemiologically relevant defects in the heart and central nervous system, and should be included in all of these screening tests. Thus, it was established the minimum assessment that must be carried out on all fetuses, both those at normal risk and those at high risk, to track fetal structural defects in the second trimester. This was expressed by ISUOG in two publications. Regarding the heart, ISUOG published a guideline in 2006[2] and also prepared the 2008 consensus[3]. The guideline for the CNS was published in 2007, encompassing the basic evaluation and characterization of neurosonography.4 Some important practical aspects in neurosonography are described in a very didactic way in the protocol of the Barcelona Fetal Medicine Foundation.5

In a previous publication6 we demonstrated some pathophysiological similarities in what we call fetal circulatory systems. The blood and cerebrospinal circulatory system are included in that comparison.

When comparing these systems, we observe that each one presents a homeostasis, a balance between production, circulation and absorption. Any obstructive process along the systems will increase the pressure upstream, with specific consequences. Likewise, whenever we increase or decrease the production of the specific liquid, we will observe pathological changes in the systems.

Another interesting analysis is shown in table 4, which draws a parallel between cardiopathies and congenital encephalopathies. Of course, this proposal needs some abstraction, but didactically it is a very curious comparison.

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INDICATIONS FOR NEUROSONOGRAPHY[5]
1. History of abnormality in the development of the CNS (family or previous pregnancy)
2. Abnormality or suspicion of CNS abnormality detected on screening ultrasound (Appendix 1)
3. Suspicion of fetal infection with cytomegalovirus, toxoplasmosis, rubella or chickenpox due to seroconversion or presence of ultrasound signs
4. Severe restricted intrauterine growth (percentile <3)
5. Extracranial malformations
a. Facial anomalies
b. Arterial duct-dependent heart disease
c. Cardiac rhabdomyomas
d. Ultrasound signals associated with specific genetic syndromes
6. Fetal hematological pathology: moderate and severe anemia, thrombocytopenia
7. Situation of fetal hypoxic-ischemic risk
8. Complications of the monochorionic pregnancy: Twin-to-twin transfusion syndrome, type II-III selective intrauterine growth restriction or intrauterine fetal death
9. Maternal phenylketonuria or thrombocytopenia
10. Consumption of toxins (alcohol and drugs) and medications: anticoagulants, antiepileptics, antimetabolites and retinoids

Tabela 1 – Indicações para neurossonografia

CLASSIC INDICATIONS FOR ECHOCARDIOGRAPHY (ISUOG)[3]
Maternal
First degree relative (mother or father) with congenital heart disease
Previous child with congenital heart disease born to mother and/or father
Pre-existing metabolic disease
Infections
Autoimmune antibodies
Exposure to teratogens
Fetal
Increased nuchal translucency
Altered venous duct
Abnormality in routine cardiac screening (morphological)
Extracardiac malformation
Altered karyotype
Hydropsy
Effusions
Arrhythmia
Persistent bradycardia or tachycardia

Tabela 2: Indicações para ecocardiografia.

CENTRAL NERVOUS SYSTEM PATHOLOGY ULTRASOUND MARKERS [5]
1. Posterior atrium > 10 mm
2. Cisterna magna >10mm
3. Cisterna magna < 2mm
4. Morphological or echogenicity changes in the cavum septum pellucidum
5. Absence of cavum septum pellucidum
6. Changes in cranial morphology
7. Biometric cephalic change (below or above 2 standard deviations)
8. Intracranial cystic structures
9. Morphological alteration of the anterior horn of the lateral ventricles
10. Morphological or biometric alteration of the cerebellum
11. Alteration of echogenicity of the cerebral parenchyma
12. Alteration of cerebral circumvolutions

Tabela 3 – Marcadores ultrassonográficos de patologias no sistema nervoso central.

	HEART	CNS
Circulatory system5	Sanguineous	Cerebrospinal fluid
Overall Increase Volume	Cardiomegaly	Macrocrania
General and evident dilation	Cardiomyopathy	Hydrocephalus
Surface irregularity	Aneurysms	Cephaloceles
Pathology in extensions	Malformations in the outflow tract (aorta and pulmonary)	spine/spinal cord malformations
Partial circulation obstruction	Valve and outlet stenosis	Foraminal stenosis
Total obstruction of circulation	Aortic and pulmonary coarctation	Obstruction of the foramen magnum
Total loss of structure	Acardiac fetus	Anencephaly, acrania
Midline structure loss	AVSD, IVC, IAC	Holoprosencephaly
Alterations with multiple consequences	Tetralogy of Fallot	Agenesis of corpus callosum
Malformations with critical perinatal care	Duct-dependent pathologies	Pathologies with brainstem involvement
Clear and localized defect	Total AVSD	Dandy-Walker syndrome
Tuberous sclerosis	Echogenic tumors in the cardiac chambers	Echogenic tumors dispersed in the brain

AVSD - atrioventricular septal defect, IAC - interatrial communication.

Tabela 4: Comparativo patologias graves ecocardiografia e neurossonografia

Circulatory system	Production	Absorption / drainage	Obstruction	Increase of pressure	Loss of pressure/ pump
Sanguineous	Hematopoiesis	Tissues, kidneys	Disruption, edema	Preload: DHF Afterload: LCHF/CHF	ICC, hydropsy
Lymphatic	Thymus, spleen	Venous system	Lymphedema/ hydropsy	Lymphedema / hydropsy	
Liquoric	Choroid plexuses	Granulations arachnoid (Dura mater)	Hydrocephalus located (non communicating)	Hydrocephalus	Secondary hydrocephalus, Arnold Chiari sequence
Amniotic	Fetus (urine, Fetal respiratory and digestive, membranes skin), amnion	Intestine system,	Polyhydramnios	Polyhydramnios	Oligodramnios, rupture membranes

Tabela 6: Sistemas circulatórios fetais[6]

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ISSN 1679-8953

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