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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tool for the dissemination of scientific research in USG, sharing experiences and knowledge through relevant and unpublished articles.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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ULTRASONOGRAPHIC AND CYTOLOGICAL EVALUATION OF 499 THYROID NODULES

LEONARDO PIBER[1,2], CARLA FREITAS[2] , THIAGO TEIXEIRA[2] , ARTHUR BEZERRA[2] , MAYRA FERNANDES[2] , REGINA YOSHIASSU[2]

ABSTRACT

OBJECTIVE: The goal of the study is to verify ultrasound and cytological findings in thyroid fine needle aspiration (FNA) punctures.
METHODS: Retrospective cross-sectional study in which 499 thyroid nodules were evaluated by ultrasound and cytological examination in a period from October 2018 to August 2019. FNA was performed in patients of both sexes, in a private diagnostic center in São Paulo.
RESULTS: Out of the 499 nodules punctured in 334 patients, 44 (8.8%) were male and 455 (91.2%) female. In considering the total amount of patients, 31 (9.3%) were men and 303 (90.7%) women, aged between 13 and 88. Three (0.6%) hemorrhagic samples were obtained; therefore punctures were performed again in such patients. The malignancy prevalence was 4.8% and the frequency of benign nodules in this was 92.4%.
CONCLUSION: The analyses show that the ultrasound and cytological profile of the thyroid nodules are in accordance with the current literature, which can assist in the audit of the results in the diagnostic imaging centers.

KEYWORDS: THYROID DISEASES, THYROID GLAND, NEOPLASMS, NODULE, IMAGE-GUIDED BIOPSY, ULTRASONOGRAPHY, ULTRASONOGRAPHY INTERVENTIONAL.

INTRODUCTION

The thyroid is a small gland that is found in the infrahyoid cervical region.[1]

The thyroid gland is controlled by the thyroid stimulating hormone (TSH), which promotes a sign and through it regulators of great importance for the growth and development of metabolism are produced.[2]

Among the diseases that affect the thyroid, thyroid nodules are frequent, with a prevalence of 4 to 7% in the adult population, if the diagnosis is made through physical examination; and from 17 to 67% in cases of investigation using ultrasound (US). [3, 4] The high sensitivity of the US makes it an excellent form of screening.

Ultrasonographic characteristics predict a greater or lesser probability of benign or malignant nodules.[3] The Thyroid Imaging Reporting and Data System published by the American College of Radiology (ACR TI-RADS) is a system for categorizing ultrasound findings of thyroid nodules [5], which correlates these findings with the possible cytological classification, characterizing the potential of malignancy of the nodule according to the characteristics that are found. The US must be performed in mode B, to reduce variations between observers. The nodules are then classified into five categories, the last being the one with the highest risk of malignancy, therefore it has an increasing pattern of severity[6] - (see figures 1-10).

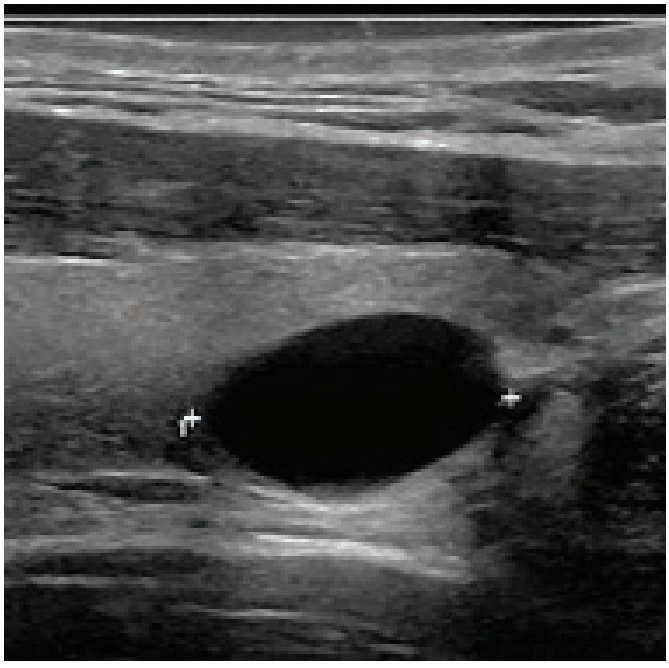

Figure 1 - Description: anechoic, cystic nodule, well-defined, without microcalcifications, measuring 1.5 cm. ACR TI-RADS [1].
Cytology: Colloid cyst. Bethesda I.

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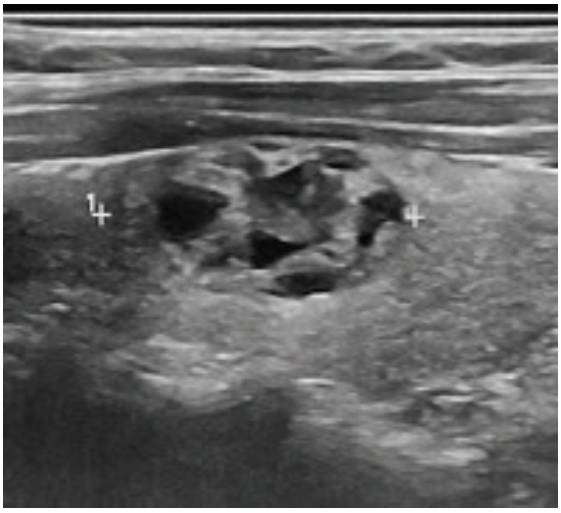

Figure 2 - Description: isoechogenic nodule, mixed, well defined, parallel to the skin, without microcalcifications, measuring 2.2 cm. ACR TI-RADS 2. Cytology: Colloid nodule, Bethesda II.

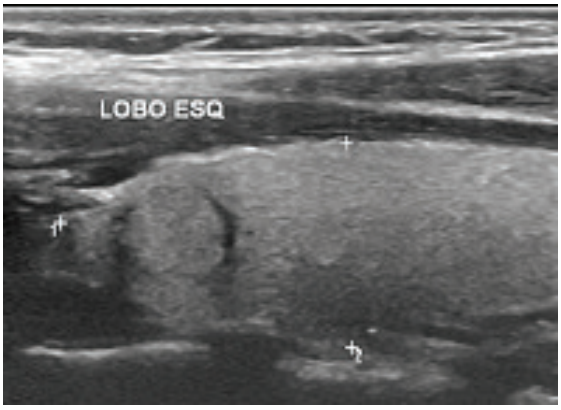

Figure 3 - Description: solid, well-defined isoechogenic nodule, parallel to the skin, without microcalcifications, measuring 0.8 cm. ACR TI-RADS 3. Cytology: Follicular lesion of undetermined significance, Bethesda III.

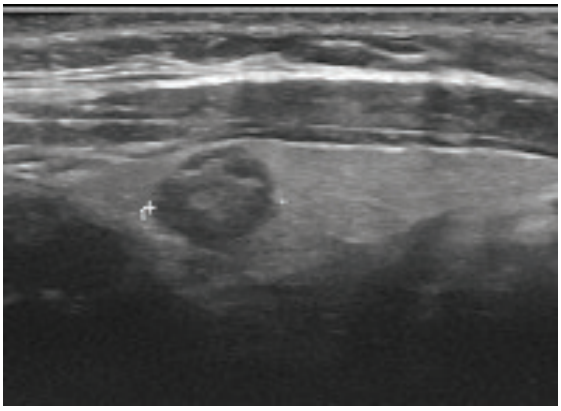

Figure 4 - Description: hypoechogenic nodule, predominantly solid, well defined, regular, parallel to the skin, without microcalcifications, measuring 0.8 cm. ACR TI-RADS 3. Cytology: Colloid nodule, Bethesda II.

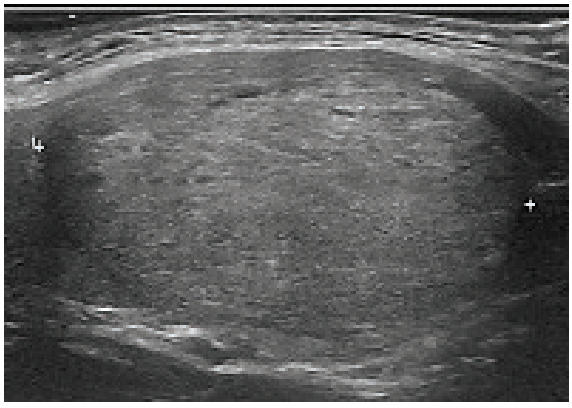

Figure 5 - Description: hypoechogenic nodule, almost totally solid, well defined, regular, parallel to the skin, without microcalcifications, measuring 4.1 cm. ACR TI-RADS 4. Cytology: Colloid nodule, Bethesda II.

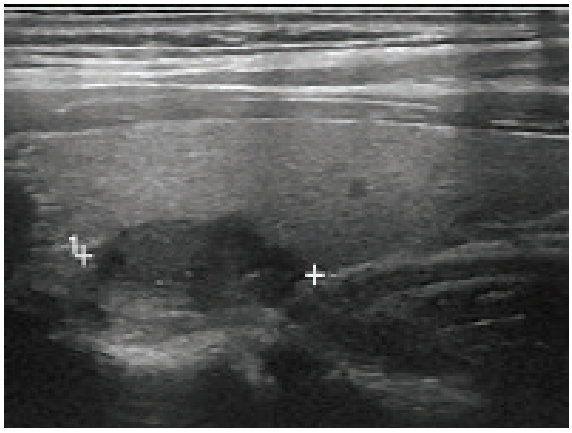

Figure 6 - Description: hypoechogenic nodule, solid, well defined, irregular, parallel to the skin, without microcalcifications, measuring 1.6 cm. ACR TI-RADS 4. Cytology: Colloid nodule, Bethesda II.

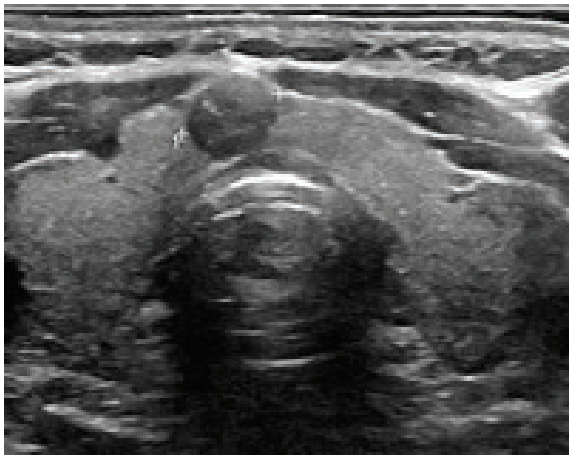

Figure 7 - Description: hypoechogenic nodule, solid, well defined, irregular, parallel to the skin, without microcalcifications, measuring 0.7 cm, in the region of the isthmus. ACR TI-RADS 4. Cytology: Papillary carcinoma, Bethesda V.

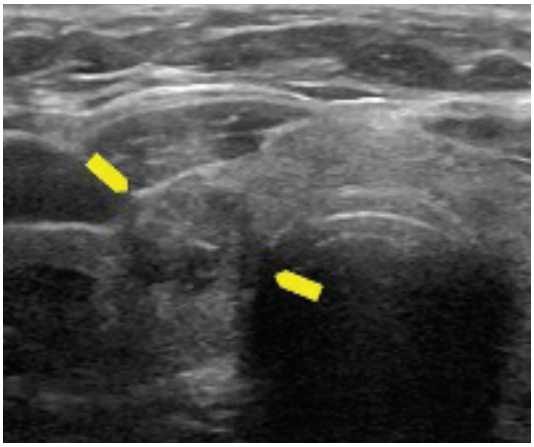

Figure 8 - Description: hypoechogenic nodule, solid, well defined, irregular, parallel to the skin, without microcalcifications, measuring 1.2 cm (yellow arrows). ACR TI-RADS 4. Cytology: Papillary carcinoma, Bethesda V.

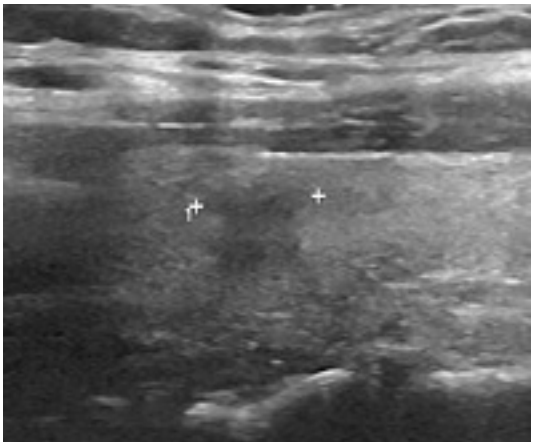

Figure 9 - Description: solid, hypoechogenic nodule, with imprecise limits, irregular, parallel to the skin, without microcalcifications, measuring 0.7 cm. ACR TI-RADS 4. Cytology: Lymphocytic thyroiditis, Bethesda II.

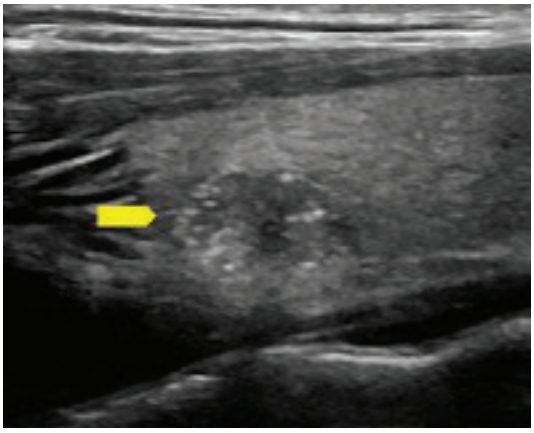

Figure 10 - Description: hypoechogenic nodule, solid, well-defined, with microcalcifications, measuring 1.2 cm (yellow arrow). ACR TI-RADS 5. Cytology: Papillary carcinoma, Bethesda V.

The classification of ACR TI-RADS ranges from 1 (benign) to 5 (high suspicion of malignancy), from TI-RADS 3, depending on the size presented by the nodule, fine needle aspiration (FNA) or clinical follow-up are indicated. For example, FNA is indicated for nodules greater than or equal to one centimeter and TI-RADS 5, if the nodule is TI-RADS 3 (low risk of malignancy) the biopsy is indicated if the nodule is 2.5 cm or more. This was proposed to prevent indiscriminately invasive procedures, such as biopsies.[7]

The suggestive characteristics of malignancy seen on ultrasonography, mode B, are solid nodular composition greater than 50%, irregular shape, higher than wider, microcalcifications, solid eccentric portion, alteration in echogenicity as marked hypoechogenicity, solid nodules. [6,8,9]

The puncture is performed with a transdermal needle inserted in a specific region and if associated with US, it is possible to visualize in real time the positioning of the needle and therefore collect material from nodules characterized as potentially malignant. [10]

The collected material undergoes cytopathological analysis, and thus classified according to the Bethesda system, which is divided into six categories: non-diagnostic sample (I), benign (II), atypia / follicular lesion of undetermined significance (III), suspected of follicular neoplasia or follicular neoplasia (IV), suspected for malignancy (V) and malignant (VI) [3]. This helps the communication between cytopathologists, reducing unnecessary procedures and facilitates data exchange between laboratories and institutions. [11]

The main interest of the aspiration biopsy is centered on its potential to distinguish nodules of benign nature from those that require surgical intervention. FNA's accuracy in identifying benign nodules leads to a reduction in the number of unnecessary surgical interventions.

METHODS

This is a cross-sectional study, of complete selection, with sampling by convenience. The target population was all patients who scheduled ultrasound-guided thyroid fine needle aspiration (FNA) for investigation of thyroid pathology in a private imaging center in the city of São Paulo, of both genders, as requested by their attending physician between October 2018 to August 2019.

Were excluded from the study those who did not accept to participate or be examined and those who did not sign the informed consent form. Data was extracted from the service's standard cytopathological analysis request form. The variables analyzed were: age, gender, nodule characteristics, such as composition, echogenicity, shape, margins, presence of calcification, size, location, ACR TI-RADS classification, result of cytopathology and Bethesda classification.

Ultrasound exams were performed in horizontal dorsal decubitus position, with cervical hyperextension to facilitate access to the gland, with longitudinal and transversal scans.

The procedure involved three stages: collection, preparation of the collected material and microscopic analysis and interpretation of the smear, by the cytology department.

This research was approved by the Ethics and Research Committee of Santo Amaro University, whose approval number is CAAE 97937018.1.0000.0081.

RESULTS

Of the 499 punctured nodules in 334 patients (ratio of 1.5 nodules per patient), 44 (8.8%) were nodules in men and 455 (91.2%) in women. Of the total number of patients, 31 (9.3%) were men and 303 (90.7%) were women, aged between 13 and 88 years. Three hemorrhagic samples (0.6%) were obtained, whose nodules were re-punctured. Table 1 shows the number of nodules punctured per patient. Most patients (67.0%) had one punctured nodule.

number of nodules	amount of nodules punctures per patient	Total amount of nodules
1	224	224
2	76	152
3	24	72
4	4	16
5	3	15
6	2	12
7	0	0
8	1	8
Total	334	499

Table 1 – Distribution of the amount of thyroid nodules, per patient, punctured between October 2018 and August 2019. São Paulo, 2020.

Table 2 shows the various results of the cytopathological analysis of the thyroid nodules. Of these, 4.8% were papillary carcinoma.

Cytopathology of thyroid nodules	N	%
Colloid nodule	395	79,2
Lymphocytic thyroiditis	59	11,8
Paillary carcinoma	24	4,8
Atypias of undetermined meaning	12	2,4
Colloid cyst	6	1,2
Hurthle cell follicular neoplasia	2	0,4
Adenomatous nodule	1	0,2
Total	499	100,0

Table 2 - Distribution, according to the cytopathological diagnosis, of the punctured thyroid nodules between October 2018 and August 2019. São Paulo, 2020.

To compare the variables, we chose to continue with two groups, nodules whose diagnosis was papillary carcinoma and colloid nodule. The other diagnoses did not present a sufficient absolute number for this descriptive biostatistical description.

Table 3 presents the studied variables, highlighting the characteristics of the nodules based on ACR TI-RADS. The Bethesda classification is directly related to cytopathological diagnosis.

Variables analyzed	carcinoma (N=24)		papillary nodule (N=395)	colloid
	N	%	N	%
gender				
female	20	83,3	358	90,6
male	4	16,7	37	9,4
age				
median	42,5		48	
interval	18 a 59		17 a 88	

composition				
Solid or almorst completely solid	18	75,0	163	41,3
mixed	6	25,0	205	51,9
cystic or almost completely cystic	0	0,0	27	6,8
echogenicity				
hypoechoic	23	95,8	252	63,8
isoechoic	1	4,2	134	33,9
hyperechoic	0	0,0	6	1,5
anechoic	0	0,0	3	0,8
form				
taller than wide	2	8,3	5	1,3
wider than tall	22	91,7	390	98,7
margin				
regular	17	70,8	368	93,2
lobulated	2	8,4	20	5,1
irregular	5	20,8	7	1,7
calcification				
absence	8	33,3	351	88,9
macrocalcification	9	37,5	29	7,3
peripheral	0	0,0	4	1,0
microcalcification	7	29,2	11	2,8
position				
isthmus	2	8,3	28	7,1
right lobe	10	41,7	217	54,9
left lobe	12	50,0	150	38,0
size				
< 5mm	1	4,2	5	1,3
> or = 5 mm	8	33,3	120	30,4
> or = 10 mm	7	29,2	126	31,9
> or = 15 mm	5	20,8	61	15,4
> or = 20 mm	3	12,5	83	21,0
ACR-TIRADS				
T1	0	0,0	2	0,5
T2	0	0,0	79	20,0
T3	1	4,2	167	42,3
T4	11	45,8	135	34,2
T5	12	50,0	12	3,0
Bethesda Classification				
I	0	0,0	0	0,0
II	0	0,0	395	100,0
III	0	0,0	0	0,0
IV	1	4,2	0	0,0
V	13	54,2	0	0,0
VI	10	41,6	0	0,0
Total	24	100,0	395	100,0

Table 3 - Comparison of the characteristics of punctured thyroid nodules, diagnosed with papillary carcinoma and colloid nodule, between October 2018 and August 2019. São Paulo, 2020

DISCUSSION

The incidence of thyroid cancer has increased in the past decades, considering the advance of diagnostic methods to detect aspects suggesting malignancy in non-palpable thyroid nodules. [4, 9] The characterization of the nodule according to the ultrasound aspect is classified according to the ACR TI-RADS, which allows better understanding and communica-

tion between health professionals. [5]

Thyroid nodules are found in 19% to 67% of adult people, this by means of ultrasound, of which about 10% are malignant. [4, 9] In this study the rate of malignancy was 4.8%, which is in accordance with existing literature. Still, the frequency of benign nodules in this study was 92.4%, a higher prevalence if compared to that described by other authors, whose value is between 69 and 81%. [12]

There are certain situations such as insufficient cellularity for analysis and hemorrhagic samples, in which it is not possible to make a diagnosis. In the present study, the total of hemorrhagic samples was 0.6%; the expected percentage of hemorrhagic samples being 1 to 15%. [12]

Of all endocrine neoplasias, 96% are represented by thyroid cancer, which is more common in females. 4 What was also seen in this study was that 20 of the 24 nodules (83.3%) characterized as papillary carcinoma belonged to female patients, while only four were male (16.7%).

This study, as well as the ones mentioned above, has a larger number of female individuals with thyroid nodules, with the ratio between men and women being approximately 1:10. In a similar study, the proportion of men and women was 1: 11[13]. When the cytological profile in papillary carcinoma of this study is characterized, the proportion becomes 1: 5 between men and women.

In the present study, only 31 (9.3%) of the patients were male and 303 (90.7%) were female. The values found are similar to other studies carried out in São Paulo, as well as in other states. For example, the work of Ceratti[12], carried out in São Paulo, brought a percentage of 9.6% of men and 90.4% of women, similarly the study carried out in Aracajú-SE revealed that only 5.2% of patients were men while 94.8% corresponded to female patients. [14]

Among the most prevalent echographic characteristics for the diagnosis of papillary carcinoma, hypoechogenicity, solid consistency, irregular margins, and presence of micro and macrocalcifications can be highlighted, as foreseen by the ACR TI-RADS Classification.

The analyzes show that the ultrasound and cytological profile of thyroid nodules is in accordance with the current literature, which can help diagnostic imaging centers in the assessment of results.

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ULTRASONOGRAPHY FOR MEASURING NUCHAL TRANSLUCENCY AND PRENATAL GENETIC SCREENING

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ABSTRACT

INTRODUCTION: Routine ultrasonography at the beginning of pregnancy enables a better assessment of gestational age, early detection of multiple pregnancies and early detection of clinically unsuspected fetal malformation. After this first screening it is recommended in case of changes, more accurate examinations to diagnose chromosomal abnormalities.

OBJECTIVE: To analyze the effectiveness of the ultrasound method for measuring nuchal translucency (NT) in screening for chromosomal abnormalities confirmed by chorionic villus biopsy or amniocentesis and to define the efficiency of NT as a diagnostic test for fetal abnormalities, to establish the most frequent chromosomal abnormalities and to verify whether NT can be incorporated as aneuploid trace elements.

METHODS: This is an observational, descriptive, retrospective analytical study of pregnant women attended from 2007 to 2017 at the Fértile Clinic to perform nuchal translucency ultrasound screening performed at gestational age between 11th and 13th weeks and six days of age of pregnancy. NT measurement was considered increased when it was < 2.5 mm. Fetal karyotype was established by cytogenetic analysis of material obtained by chorionic villus sample or amniocentesis.

RESULTS: A total of 219 pregnant women were studied, among them 216 with NT alterations (> = 2.5 mm), submitted to confirmation by chorionic villus biopsy and 113 normal ones. Sensitivity: 100%, Specificity: 97,3%, Positive Predictive Value (PPV): 49%, Negative Predictive Value (NPV): 100% and accuracy: 49.8%. The most prevalent maternal age was 18 to 35 years, with normal karyotype exams and confirmation by chorionic villus biopsy was chosen and the main karyotype change was 47 XX + 21.

CONCLUSION: NT as a diagnostic test for fetal aneuploidies presented 100% sensitivity, 100% NPV, 97,3% specificity, PPV 49% and accuracy 49.7%. The most frequent fetal chromosomal abnormality was 21 (Down syndrome) trisomy 47 XX + 21. Considering that the criterion of the important diagnostic test for disease screening is sensitivity, NT should be incorporated as such, since sensitivity was full in this study.

KEYWORDS: ULTRASONOGRAPHY. NUCHAL TRANSLUCENCY, TRACKING. CHROMOSOMAL ABNORMALITIES

INTRODUCTION

Prenatal diagnosis is a set of techniques designed to investigate fetal health while still in the intrauterine life span, with the aim of tracking genetic or congenital anomalies[1].

Routine ultrasound at the beginning of pregnancy allows a better assessment of gestational age, early detection of multiple pregnancies and early detection of clinically unsuspected fetal malformation being undoubtedly the one that most diagnoses, both in frequency and in number, both genetic and non-genetic diseases. -genetic and, for this reason, combined with its low cost and non-invasive characteristics, should be encouraged and prioritized in prenatal diagnosis [2].

The nuchal translucency is configured as a hypoechogenic ultrasound image, where we can find the accumulation of fluid in the posterior region of the neck, which occurs more intensively between the 10th and 14th weeks of pregnancy, being the main screening test performed in Brazil. In the face of a positive result of a screening test, the possibility of a diagnostic test will be offered, which inevitably still constitutes an invasive yet high precision procedure [3,4].

After this first screening, in case of abnormalities, more accurate tests to diagnose chromosomal disorders are recommended, these are tests that raised the possibility of making the diagnosis through invasive methods in prenatal care, which was a great advance, as it enabled the direct collection of fetal material for laboratory analysis, allowing the performance of several tests, such as the karyotype for chromosomal diseases, enzymatic assays for innate metabolism errors and molecular analysis in intrauterine life[5].

These are done by collecting a sample of the liquid around the baby (amniocentesis) or a small piece of the placenta (chorionic villus sample , CVS) to search for chromo-

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somal abnormalities. The test is performed by inserting a needle into the pregnant woman's belly, leading to a higher risk of miscarriage. Therefore, these tests are not offered to all pregnant women [6].

Currently, the gold standard for prenatal diagnosis for chromosomal anomalies is provided by the karyotype technique, which has a high level of accuracy, but is dependent of invasive procedures to collect samples of fetal material directly from the maternal uterus, through sample of chorionic villus (CVS) during the first trimester of the pregnancy or through the collection of amniotic fluid in the second trimester [7].

The aim of this study is to analyze the effectiveness of the ultrasound method for measuring nuchal translucency (NT) in the screening of chromosomal anomalies confirmed by chorionic villus sample or amniocentesis.

METHODS

This is an observational, descriptive, retrospective analytical study with pregnant women attended from 2007 to 2017 at Clínica Fértile for ultrasonographic screening of nuchal translucency (NT) performed with gestational age between the 11th and 13th weeks and six days of pregnancy.

The NT measurement was considered increased when> 2.5 mm (see figures 1 and 2). The fetal karyotype was established through cytogenetic analysis of material obtained through chorionic villus sample or amniocentesis.

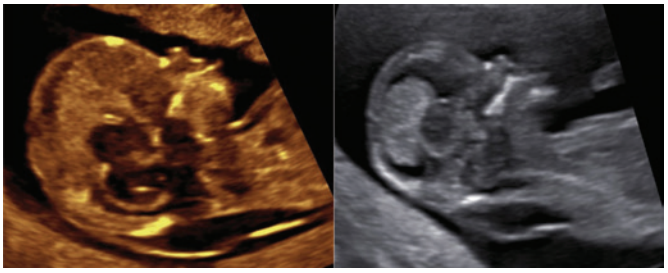

Figure 1 e 2. Two cases of abnormal nuchal translucency (Courtesy Faria & Pettersen)[9]

The data was entered and manipulated in Excel and were later processed using the Windows Statistical Package for Social Science (SPSS) program (version 21.0).

Categorical variables were presented in table form, with absolute values (f) and percentage values (%).

Efficiency was assessed by the contingency table, through sensitivity, specificity, positive predictive value, negative predictive value and accuracy.

As for ethical aspects, it is highlighted that the research was based on Resolution n. 466/2012, with the rights of those involved ensured, with the approval of the Ethics Committee.

RESULTS

219 pregnant women were studied, among them 216 with NT alterations (> = 2.5 mm) and three with normal NT. All were submitted to confirmation by chorionic villus biopsy or amniocentesis.

TN	Karyotype		Total
	Changed	Normal	
> 2,5	106	110	216
≤ 2,5	-	3	3
Total	106	113	219

Table 1 - Distribution of genetic study cases according to positive and negative tests of karyotype with altered NT and normal NT, performed at the clinic Fértile, Goiânia, Goiás, 2019.

Sensitivity: 100%, specificity: 97.3%, positive predictive value: 49%, negative predictive value: 100% and accuracy: 49.8%. The most prevalent maternal age was 18 to 35 years, with normal karyotype exams, confirmation by chorionic villus biopsy was the choice and the main karyotype abnormality was 47 XX + 21 (see figure 3).

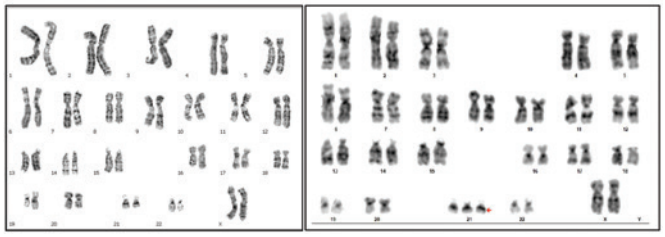

Figure 3. A. Illustrates a normal cytogenetic study (46, XX). B. Illustrates karyotype abnormalities in Down syndrome (47, XX, +21) - (Courtesy Faria & Pettersen) [9]

Variables	TN > 2,5	TN ≤ 2,5	TOTAL (%)
Maternal Age			
< 18 years	3	-	3 (1,3%)
18 a 35 years	144	2	146 (66,7%)
> 35 years	69	1	70 (32,0%)
Karyotype			
Normal	110	3	113 (51,6%)
Changed	106	-	106 (48,4%)
Examination			
Amniotic Fluid	78	-	78 (35,6%)
Chorionic Villus biopsy	138	3	138 (64,4%)
Karyotype Changes			
47 XX + 13	4	-	4 (3,8%)
47 XX + 18	13	-	13 (12,4%)
47 XX + 21	26	-	26 (24,8%)
45 X0	9	-	9 (8,6%)
Other Changes	54	-	54 (50,5%)

Table 2 - Distribution of genetic study cases according to the profile of the patients analyzed at the Fértile clinic, Goiânia, Goiás, 2019.

DISCUSSION

According to Vieira AA[8] the use of prenatal exams is essential to make a detailed assessment in pregnancy of both the health of the fetus and the mother´s. Early prenatal diagnosis can reduce neonatal mortality and ultrasonography is the first test performed to screen for possible abnormalities.

219 pregnant women were studied, among them 216 with NT alterations (> = 2.5 mm), submitted to confirmation by chorionic villus biopsy or amniocentesis and 3 with normal NT.

Calculating taking into account whether the value was altered or not (NT>= 2.5 or NT <2.5), we found: Sensitivity: 100%, specificity: 97.3%, positive predictive value: 49%, negative predictive value: 100% and accuracy: 49.8%.

The first study in Brazil was carried out by Faria et al [9] in 1997 in which they studied 231 fetuses and found a sensitivity of 100%.

In the studies by Murta and França[4] 1,152 fetuses were analyzed and among these 124 cases were submitted to a cytogenetic study on the material obtained by means of chorionic villus biopsy or amniocentesis and in 1028 the result was based on the newborn's phenotype. 23 cases of chromosomal abnormalities were diagnosed in the population studied. Among these, the NT measurement was greater than the 95th percentile in 16 (sensitivity of 69.5%). In the group of normal fetuses (1129 cases), the NT measurement was greater than the 95th percentile in 41 evaluations (specificity of 96.3%, positive and negative predictive value of 28.0% and 99.3%, respectively, rate of false positive of 3.7% and probability ratio of 19.1).

In the studies by Saldanha et al. [10], 14.2% of cases, the karyotype was altered and in 85.8% the karyotype or phenotype was normal, in fetuses with increased NT and normal karyotype, the greater the NT measurement, the greater the frequency of structural malformations, especially heart defects, adverse pregnancy outcomes and abnormalities in postnatal assessment were found.

Vieira LA[11] analyzed 116 cases of nuchal translucency above the 95th percentile, and in 79 (68%) a fetal karyotype was performed, within these alterations the fetuses with normal karyotype, there was an abortion in the 15th gestational week with Pentalogy of Cantrell, one death in the 24th week with several structural anomalies, one neonatal death without a defined cause and two cases of intraventricular communication detected on the fetal echocardiography.

For Almeida et al[3], the offer of invasive diagnostic tests must be maintained for pregnancies with positive results in the screening and counseling should reinforce the notion that a negative result is not a guarantee of an unaffected pregnancy, as false negatives can occur.

The most prevalent maternal age was 18 to 35 years, with normal karyotype exams and confirmation by chorionic villus biopsy was the choice and the main karyotype abnormality was 47 XX + 21.

Emer et al.[12] evaluated 840 amniocentesis exams and 60 cases were diagnosed, nine of which were trisomy of chromosome 13, 26 of chromosome 18 and 25 of chromosome 21.

Pereira et al.[13] found 142 cases of abnormal karyotype, with aneuploidy (45.1%) being the most frequent, followed by structural alterations (38.7%) and mosaicism (16.2%). Almeida et al., found trisomies 21, 18 and 13 to be prevalent, accounting for 70% of all aneuploidies detected in the prenatal period.

When prenatal screening tests are performed, it is concluded that the aneuploidies that are among the most common genetic abnormalities according to Sbragia et al.[14] are the trisomies involving chromosomes 13, 18 and 21. Among the most frequent trisomies observed at birth, we find Down syndrome (trisomy 21), preceded by Edwards syndrome (trisomy 18).

Regarding prenatal screening, Henriques[15] warns that prenatal screening for chromosomal anomalies raises several ethical issues among pregnant women, couples, and health professionals since it does not offer a therapeutic option for chromosomal anomalies. The only possible preventive measure is the termination of the pregnancy in rare cases. This puts couples facing difficult decisions, early in the pregnancy, decisions that have to be made quickly. Therefore, good information for these couples is necessary and this should include: 1) a brief explanation of the pathologies to be tracked; 2) the characteristics of the available tests and 3) the implications of taking the tests: options available after positive screening (increased risk), the risk of iatrogenic abortion with amniocentesis, options available after the diagnosis of a fetal anomaly (termination of pregnancy , continuation of pregnancy and preparation for the birth of a child with special needs).

Pereira et al[13] highlights the importance of clarifying that, even if the karyotype has a normal result, there is a possibility that some alterations are not identified, requiring more specific exams. Cytogenetic reports should, in addition to presenting the karyotype, clarify health professionals on the fact that, in cases of individuals with normal chromosomal constitution who present malformations, referral to genetic counseling is recommended, in order to guide them on the diagnosis, the therapeutic conduct and the risk of recurrence of genetic problems.

NT as a diagnostic test for fetal aneuploidies showed sensitivity of 100%, NPV 100%, specificity 97.3%, PPV 49% and accuracy 49.7%. \

The most frequent fetal chromosomal anomaly was trisomy 21 (Down syndrome) 47 XX + 21.

Considering that the criteria of the diagnostic test important for the screening of diseases is sensitivity, NT should be incorporated as such, since the sensitivity was full in this study.

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PREVALENCE OF NEUROLOGICAL INJURIES DIAGNOSED BY TRANSFONTANELLE ULTRASONOGRAPHY IN TERM NEWBORN

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ABSTRACT

INTRODUCTION: Ultrasonography (USG) is the most widely used neuroimaging procedure, as it provides information on perinatal brain injury to predict long-term results. Transfontanellar USG (TFUS) is a routine examination for those with lower gestational age than 34 weeks and there are many studies that talk about the prevalence of injuries for this group and few studies related to findings in term newborns (NB). Studying the findings of the TFUS are essential in the health care of premature babies, aiming at better prognosis.

OBJECTIVE: To measure the main findings in TFUS in term newborns.

METHODS: Descriptive quantitative and retrospective cross-sectional study, developed in a public maternity of reference in Goiânia-GO.

RESULTS: All NBs admitted to the intensive care unit (ICU) from January to December 2019 were analyzed in a total of 265, 50 of which were considered terms in relation to gestational age and who were indicated to perform the USFT (excluding six cases due to incomplete forms) totaling a final total 44 patients. Maternal profile was women between 18 and 30 years old (62%), primiparous (50%), less than seven prenatal consultations (62%), cesarean section (62%) with risk factors associated with preeclampsia and urinary tract infections (43%). Profile of the newborns is female (75%), 38 weeks (38%), apgar score 1º minute an seven (65%), apgar score 5º more than eight (75%), appropriate to gestational age (62%) and more than 2,501 grams (62 %). 25% of deaths were registered in the group of patients with abnormalities, 100% of whom were diagnosed with leukomalacia.

CONCLUSION: 44 tests were performed, 82% of which were normal and 18% abnormal. The main alteration found in this group was leukomalacia with 50%. Maternal profile was women between 18 and 30 years old, primiparous who had less than seven prenatal consultations and who had deliveries by cesarean section with risk factors associated with preeclampsia and urinary tract infections. The profile of the newborns is female, born at 38 weeks, with an Apgar score less than seven, an Apgar score greater than eight, with a weight appropriate to gestational age with babies over 2,501 grams.

KEYWORDS: LESIONS, TRANSFONTANELLE, ULTRASONOGRAPHY, DIAGNOSIS.

INTRODUCTION

Since the late 1970s, ultrasonography (USG) has been the most widely used neuroimaging procedure, as it provides information on perinatal brain injury to predict long-term results[1]. Favorable qualities of the ultrasonography that make it almost indispensable for routine newborn care include easy access, low cost, portability, lack of ionizing radiation and no need of sedation nor anesthesia[2].

It is very useful in many clinical situations, making it possible to select which patients will benefit from other techniques that are more invasive or more expensive, or that require sedation, such as the magnetic resonance imaging (MRI). The disadvantages of the technique are that it depends on the operator and that an appropriate acoustic window is required. It also has limitations in the study of obstetric trauma, in the assessment of complex malformations and in the assessment of damage to white matter[3].

Cranial ultrasound screening is suggested in the first 4-7 days of life with a repetition of the cranial ultrasound within 10-14 days. When used this way, cranial ultrasound presents 100% sensitivity for the detection of severe intraventricular hemorrhage injuries and severe white matter injury. If the ultrasound examination is normal, a follow-up examination at the corrected gestational age of 36 to 40 weeks (equivalent term) is suggested to track evidence of more serious lesions in white matter[4].

It is known that pregnancy is measured from the first day of the last normal menstrual period and can be counted

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by complete gestational weeks, where pregnancies with less than 37 complete weeks are considered preterm and less than 42 complete weeks are considered term[5].

Transfontanellar US (TFUS) is a routine exam for those with gestational age less than 34 weeks and there are many studies that talk about the prevalence of injuries for this group and few studies related to findings in term newborns. To study the findings of TFUS is essential for the health care of premature babies, thus aiming for better prognosis.

METHODS

Cross-sectional quantitative and retrospective study, carried out in a public maternity of reference in Goiânia-GO. The hospital is part of the Municipal Public Health System of Goiânia with ICU and neonatal intensive unit care (NIUC) exclusively for users of the Unified Health System (SUS).

The research was carried out from January to December 2019, including all newborns who passed through the NICU in the established period (excluding newborns in which the medical records were incomplete and did not have enough data for analysis).

For data collection it was developed an instrument for secondary data including maternal variables: maternal age, number of children, number of prenatal consultations, maternal risk factors and type of child-birth. The neonatal variables were the Apgar score in the first and fifth minutes of life, gestational age, sex and weight and the TFUS: type of lesion presented. The collected items were inserted in an electronic spreadsheet (Excel, Microsoft Corporation, USA) and the EpiInfo 2002 system (Centers for Disease Control and Prevention, USA) was used for the analysis of tables and graphs.

This research project was based on Resolution N0. 466/2012 ensuring the rights of those involved and approved by the Ethics Committee appointed by Plataforma Brasil.

RESULTS

All NBs admitted to the ICU from January to December 2019 were analyzed representing a total of 265, 50 of which were considered terms in relation to gestational age and who were indicated to undergo TFUS (excluding six patients who were incomplete), totaling 44 medical records.

USTF	N	%
Normal	36	82
Changed	8	18

Source: Research data, 2019.

Table 1 - Distribution of the results of the TFUS performed in term newborns at HMDI, Goiânia (GO), Brazil, 2020.

	Number of patients (N=8)	
	N	%
MATERNAL AGE		
≤ 17	2	25
18 – 30	5	62
≥31	1	13
NUMBER OF PREGNANCES		
1	4	50
2-3	3	37
≥ 4	1	13
PRENATAL CONSULTATIONS		
< 7	5	62
≥ 8	3	38
TYPE OF CHILDBIRTH		
Cesarean	5	62
Normal	3	38
MAIN RISK FACTORS		
DHEG	3	43
Urinary Tract Infection	3	43
Diabetes	1	14

Source: Research data, 2019.

Table 2 - Distribution of maternal characteristics of NBs in the NICU who underwent TFUS at the HMDI, Goiânia (GO), Brazil, 2020.

	Number of patients (N=8)	
	N	%
GENDER		
Female	6	75
Male	2	25
GESTATIONAL AGE		
37 weeks	1	12
38 weeks	3	38
39 weeks	2	25
40 weeks	2	25
APGAR 1º		
< 7	5	62
≥ 8	3	38
APGAR 5º		
< 7	2	25
≥ 8	6	75
WEIGHT FOR GESTATIONAL AGE		
AIG	5	62
GIG	-	0
PIG	3	38
WEIGHT RANGE (IN GRAMS)		
<2.500	3	38
≥2.501	5	62

Fonte: Dados da pesquisa, 2019.

Table 3 - Distribution of the characteristics of NBs in the NICU who underwent TFUS at the HMDI, Goiânia (GO), Brazil, 2020.

Alterações encontradas	N	%
Leucomalácia	4	50
Calcificações Talâmicas	3	38
Hemorragias	1	12

Source: Research data, 2019.

Table 4 - Distribution of the results of the altered TFUS performed in Term NB at HMDI, Goiânia (GO), Brazil, 2020.

25% of deaths were registered in the group of patients with alterations, 100% of whom were diagnosed with leukomalacia.

DISCUSSION

Ultrasonography is a non-invasive diagnostic technique and has been used to detect intracranial lesions in neonates for a long time. This study evaluated 44 TFUS exams performed on term NBs, 82% of whom were within normal limits and 18% abnormal.

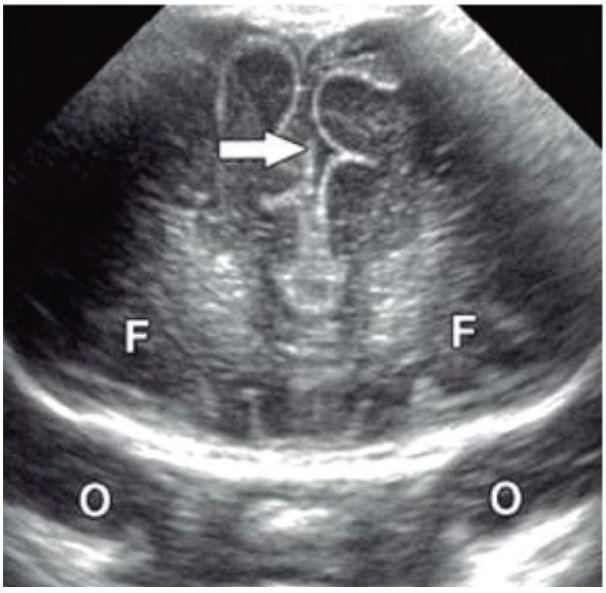

Figure 1 - TFUS image in coronal section of the frontal lobe [5].

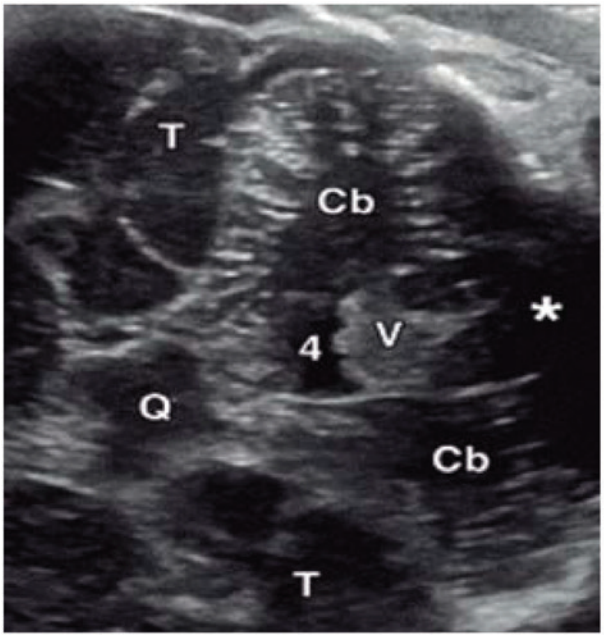

Figure 2 - TFUS image showing cerebellar hemispheres (Cb), fourth ventricle (4), cisterna magna (asterisk), quadrigeminal plaque (Q), vermis (V) and temporal lobes (T) [5].

The main alteration found in this group was leukomalacia with 50%. Hsu et al., [6] evaluated 3186 term neonates between September 2004 and August 2009 and found 93.6% within the normal range, 6.3% with minor alterations and 0.1% with major alterations.

Santos e Prado[7] researched 52 medical records of NBs. As for the ultrasound diagnosis, 63% of the NBs presented a normal result. Abnormal TFUS (37%) were classified into five types of injuries: intracranial hemorrhage (ICH) and peri-intraventricular hemorrhage (PIVH) making up for 9% of those affected, hypoxic-ischemic encephalopathy (HIE, including periventricular leukomalacia) 17%, dilation ventricular (DV) 9% and cerebral malformations affecting 2% of the population.

The maternal profile was of women between 18 and 30 years old, primiparous who had less than seven prenatal consultations and who had deliveries by cesarean section with risk factors associated with preeclanpsia and urinary tract infections. The profile of the NBs is female, born at 38 weeks, with Apgar 1st minute less than seven, Apgar 5th minute greater than eight, with appropriate weight for the gestational age and above 2,500 grams. Baumert et al., [8] analyzed 2675 term newborns between the years 2003-2005. Periventricular / intraventricular hemorrhage were diagnosed in 392 neonates (14.65%). The average gestational age of the group was 39.11 ± 1.26 weeks and ranged from 37 to 43 weeks and a higher prevalence of males and low birth weight was found, disagreeing with our findings.

Haataja et al., [9] analyzed 103 babies and revealed that accidental abnormalities on the ultrasound in term newborns, in particular intraventricular hemorrhage, though common, seem to have a good prognosis and the doctor should take a closer look at those with white matter injuries. White matter damage is a major risk factor for cerebral palsy, and the main presentation is periventricular leukomalacia. Although the etiology of white matter damage in preterm infants is largely related to circulatory changes, the etiology in term babies is less well understood[10].

Hsu et al.,[6] the cranial ultrasound screening test can play a role in the early diagnosis of intracranial anomalies in term newborns. Hayward[11] suggests that ultrasound should be the initial neuroradiological investigation in this age group and that all term babies in a special care unit should be routinely examined.

Few studies have been found that analyze transfontanelle ultrasonography in term NBs. Jensen and Holmer[12] the fact that apparently healthy term newborns are not screened by head images is considered the missing link between the insult that escapes diagnosis and the neuropsychomotor development delay.

CONCLUSION

44 exams were performed among which 82% were normal and 18% abnormal; the main alteration found in this group was leukomalacia with 50%. The maternal profile was

of women between 18 and 30 years old, primiparous who had less than 7 prenatal consultations and who had deliveries by cesarean section with risk factors associated with preeclanpsia and urinary tract infections. The profile of the newborns is female, born at 38 weeks, with Apgar 1st minute less than seven, Apgar 5th minute greater than eight, with appropriate weight for the gestational age and above 2,500 grams.

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ULTRASONOGRAPHY IN THE DIAGNOSIS OF FETAL INTESTINAL OBSTRUCTION - A CASE REPORT

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ABSTRACT

Bowel obstruction is the main cause of neonatal surgical emergencies and atresia is the most prevalent representant of it. Colonic atresia on the other hand, is very rare among the others intestinal atresias and its ultrasonographic diagnosis is not frequent, specially due to its unspecific and sometimes non-pathogenic findings. This paper aims to describe a case of colonic atresia diagnosed with ultrasonography during prenatal care.

KEYWORDS: COLONIC ATRESIA; ULTRASSONOGRAPHY; PRENATAL

INTRODUCTION

Intestinal obstruction is the most common cause of neonatal emergencies, occurring in 1 in every 1,500 live births. A few decades ago, however, children who were born with such condition almost always died. Advances in surgical techniques have since contributed enormously to reduce mortality. In addition, an important role in reducing this number is due to the development of diagnostic methods in prenatal care, such as ultrasonography (USG) [1].

Among the various causes for obstruction, intestinal atresia, meconium ileus, Hirschprung´s disease and intestinal malrotation, with or without volvulus, stand out, the most common being atresia, followed by malrotation and then meconium ileus[1].

Atresia has a prevalence of 1 case for every 2,500 live births and can be duodenal, jejunal, ileal, jejunoileal or colonic, with the duodenal being the most commonly found. In prenatal ultrasounds, the presence of polyhydramnios can be observed, which becomes greater the more proximal the obstruction is, in addition to the dilation of intestinal loops [2].

In duodenal atresia, the diagnosis should be suspected when there is a finding of polyhydramnios in almost all cases in conjunction with a 'double bubble'. In this condition, the association with defects in other systems is common, as well as with trisomy of chromosome 21. Ileal jejunal atresia is not as associated with other malformations as duodenal and its multiplicity is common. In the ultrasonography it is characterized by the dilation of thin loops in the aspect of a triple or quadruple bubble. Finally, colonic atresia, the rarest of them, generally does not occur in multiplicity and its evidence in prenatal care is due to dilation of loops. Many cases, however, cannot be detected in the ultrasound[3].

Meconium ileus is the result of intestinal occlusion of a thicker meconium, suggested by hyperechogenicity, with or without dilation. It is present in at least 15% of patients with cystic fibrosis[4].

Hirschprung's disease, on the other hand, is caused by a defective migration of ganglion cells, approximately in the 12th week of pregnancy, which culminates in an intestinal aganglionosis, recognized by loop dilation. Polyhydramnios, in this case, is not commonly visualized [4].

Finally, poor intestinal rotation is the result of incorrect embryonic fixation, which causes rotation of mesenteric vessels and can culminate in ischemia. Ultrasonographic visualization is possible when intestinal volvulus occurs, resulting in dilation of the loops [4].

A CASE REPORT

AFCA, female, G4P3A1, 30 years old. The patient underwent morphological ultrasound over 33 weeks of pregnancy. Upon examination, dilation of large intestinal loops was observed indicating suspicion of obstruction due to atresia (figures 1-3). The patient went into labor three weeks later, after completing 36 weeks and 5 days of pregnancy. Soon after birth, the newborn was submitted to the first approach for surgical correction. After 20 days, the second corrective surgery was performed. Neonate remained in the intensive care unit (ICU) for 56 days and is currently healthy.

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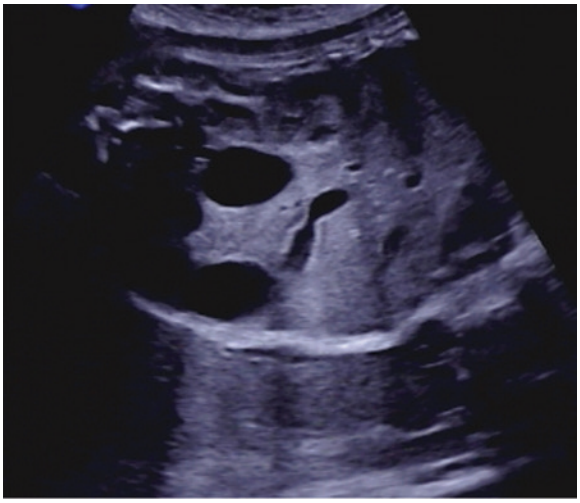

Figure 1: Obstetric ultrasound: distention of the large intestine (anechoic content).

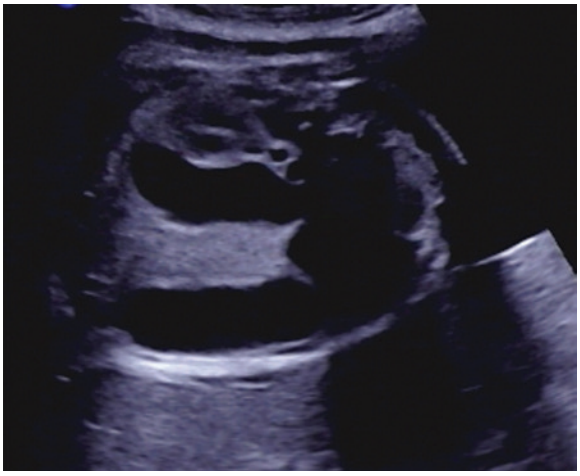

Figure 2: Obstetric ultrasound: distention of the large intestine (anechoic content)

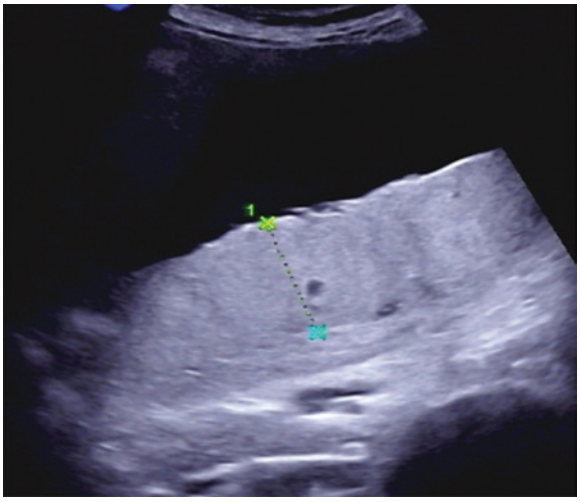

Figure 3: Obstetric ultrasound: polyhydramnios.

DISCUSSION

Colonic atresia arises in neonatal life with vomiting, loop distension and difficulty in eliminating meconium. It is a rare condition that constitutes only 1.8 to 15% of intestinal atresias and can be confused with other conditions such as Hirschsprung's disease, meconium plug syndrome and meconium ileus [3].

Prenatal diagnosis in general intestinal obstructions by USG usually occurs in the 3rd trimester of pregnancy; however, the accuracy is variable. This method can become limiting because it depends on the operator and his technique and because it has a restricted field of vision. In addition, many findings are not very specific and others are non-pathological variants [5].

As mentioned, for example, polyhydramnios and even dilation of loops may be present in other conditions of obstruction. However, the location of the dilation and even the absence of typical signs of other atresias, such as the double, triple or quadruple bubble sign, speak in favor of a diagnosis of colonic atresia.

Although ultrasonography is not always able to provide the correct diagnosis and exclude differentials, through early diagnosis, the child's parents can be offered advice regarding the condition, especially in cases where the obstruction is part of some other diagnosis , as is the case of meconium ileus in cystic fibrosis [6].

In addition, when an intestinal obstruction is diagnosed early, it is possible to develop a therapeutic plan for the child, involving a multidisciplinary team and assistance center capable of attending complications during child birth or after the child is born. Early planning intervention is able to reduce mortality and complications in the neonatal period [6].

A retrospective study was conducted at the Texas Children's Fetal Center in Houston, in Texas, from January 2006 to February 2016, to show the result of prenatal diagnosis of fetal gastrointestinal obstruction. The survival rates found were 88%, and in cases of obstruction of the large intestine, it was 100% [5]. Such information differs greatly from the extremely high mortality of decades ago. Data suggest that until 1950, only 125 children had survived congenital bowel obstructions [1].

It is known in medicine that early diagnosis in several areas is responsible for improving the patient's prognosis and even reducing costs for the Health System. Therefore, advances in the ultrasonographic method, as well as the adequate training of health professionals and studies in the field are aspects of great value in obstetrics and fetal medicine.

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ULTRASONOGRAPHIC ASPECT OF THE PERMANENT FEMALE ANTICONCEPTIONAL DEVICE ESSURE® - CASE REPORT

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ABSTRACT

Essure® is a contraceptive method that acts through hysteroscopic tubal occlusion. The purpose of this case report is to show the ultrasound images of the Essure® device well positioned, as it is an unusual case in the daily practice in diagnostic imaging.

KEYWORDS: CONTRACEPTION, FEMALE CONTRACEPTIVE DEVICES, ULTRASONOGRAPHY, GYNECOLOGY, WOMEN'S HEALTH.

INTRODUCTION

Female sterilization, by ligation or tubal occlusion, is the most effective and used method for family planning in the world[1]. Methods for female sterilization include salpingectomy, tubal ligation, laparoscopic tubal occlusion and hysteroscopic tubal occlusion[2]. The latter, commercialized as Essure® by Bayer AG (Leverkusen, Germany), involves the insertion of nickel / titanium alloy coils containing polyethylene fibers in the fallopian tubes, which cause a fibrotic reaction to obstruct the tubes and prevent fertilization[3]. The presented advantages of the procedure include the the fact that there is no need for incisions and/or general anesthesia[4]. Figure 1 shows the device; figure 2 shows the intratubary position of the device and figure 3, the hysteroscopic aspect after implantation.

Figure 1 – The Essure® intratubary device.[5]

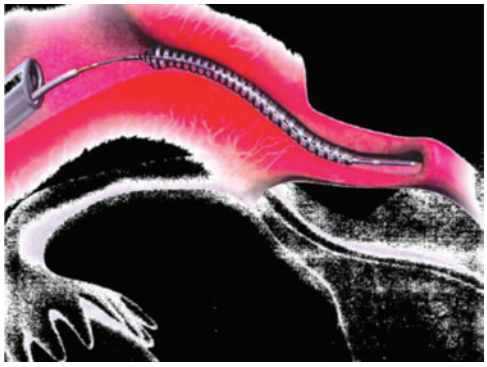

Figure 2 - Drawing showing placement of Essure®.

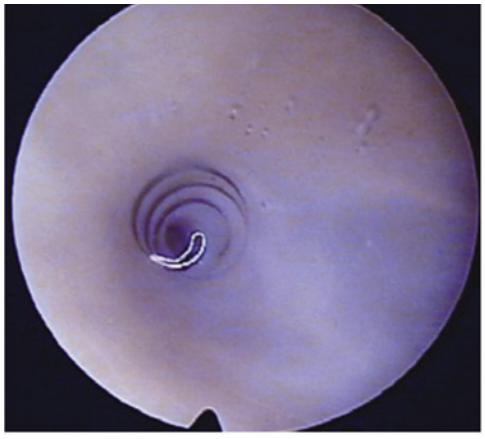

Figure 3 - Hysteroscopic appearance of Essure® after insertion.

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Essure®, by Bayer AG (Leverkusen, Germany) was the first mechanical device approved by the Food and Drug Administration (FDA), in 2002, for transcervical sterilization, and in 2009, the National Health Surveillance Agency (Agencia de Vigilancia Sanitária - ANVISA) approved it in Brazil[6].

The system consists of an intratubary device, a delivery system and a catheter to access each tube through transcervical route. The microdevice is a dynamic expansion spring composed of an inner ring of stainless steel surrounded by an outer ring of nickel and titanium that, being expandable, keeps the device at the uterus-tubal junction for the necessary time for fibrosis to occur.

Polyester fibers are around the central structure and cause a reaction of the surrounding tissue, followed by fibrosis, causing irreversible occlusion of the tubes. This process takes approximately three months and, during this period, the woman must maintain the contraceptive method she was previously using[7].

The review after implantation of the device is considered the final part of the procedure, being mandatory at three months, to verify if the implant is in the pelvis and in the appropriate position. In the United States, hysterosalpingography (HSG) is requested and, in other countries, a simple pelvic radiography or ultrasound is performed. If the devices are satisfactorily placed in the uterus-tubal junction, the patient can abandon the alternative method used for contraception. If the position is unsatisfactory, an HSG[8] is requested. However, transvaginal ultrasound performed three months after the insertion of Essure® showed the same accuracy as hysterosalpingography for detecting the correct positioning of the device[9].

The purpose of this case report is to show the ultrasound images of the Essure® device well positioned, as it is an unusual case in the daily practice of the ultrasonographer.

CASE REPORT

Asymptomatic female patient, 38 years old, undergoing routine exams. The ultrasound aspect of the Essure device, which is characteristically echogenic, is illustrated in the topography of the fallopian tubes, making it possible to assess its relationship with the adjacent soft tissue structures. As the serosa is well demarcated and easily identifiable, ultrasound allows the identification of the uterotubal junction, the point where the fallopian tube crosses the uterine serosa, which is an important anatomical landmark to assess the location of the Essure insertion. Figures 4, 5 and 6 show the position of the devices bilaterally.

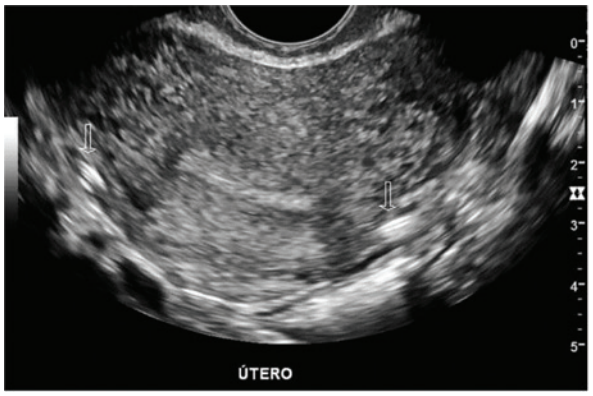

Figure 4 - Tubuliform echogenic image in the topography of the fallopian tubes, symmetrically and bilaterally identified at the uterotubal junction.

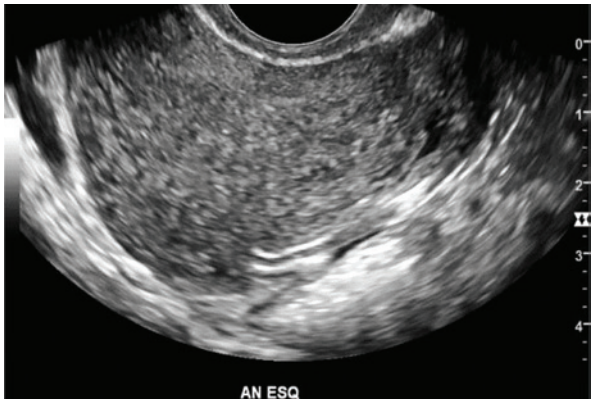

Figure 5 - Tubuliform echogenic image in the topography of the left uterine tube, evidenced as two parallel hyperechogenic lines.

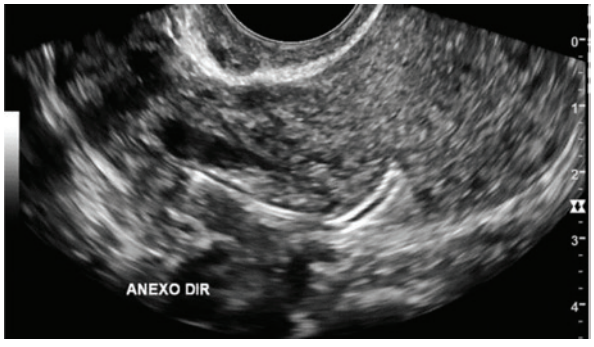

Figure 6 - Tubuliform echogenic image in the topography of the right uterine tube, shown as two parallel hyperechogenic lines.

DISCUSSION

Essure® revolutionized female sterilization by allowing definitive contraception through a rapid, minimally invasive and outpatient procedure, without the need for anesthesia, allowing a quick return to work and equally effective[10].

Several studies have confirmed the safety, effectiveness and low rate of adverse events of the technique; however, since 2013, the product has been the subject of controversy, with many women reporting complications requiring intervention[11]. In 2015, a review was published that confirms the similar effectiveness of Essure® in preventing pregnancy, but with a 10 times higher risk of reintervention, when compared to laparoscopic sterilization[12].

Since August 2017, the Essure® CE certificate of conformity has been suspended in the European Union by the National Standards Authority of Ireland, with Infarmed issuing a written statement in the same month recommending "as a precautionary measure, that the Essure® medical device should not be purchased or used during the suspension of the certificate"[13].

After several worldwide publications reporting possible adverse occurrences[14-16], in July 2018, Bayer decided to voluntarily discontinue the sale and distribution of the device until the end of December, in order to finalize its commercialization[17].

Ultrasonography is suitable for early post-insertion location, as the scan can ensure the correct positioning of the device and relieve the patient's anxiety, or even diagnose early malposition.

With this case, the importance of continuing education through diagnostic photographic documentation and the integration between ultrasonographers and gynecologists is emphasized.

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LYMPHOMA DURING PREGNANCY WITH LIVE FETUS: CASE REPORT

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ABSTRACT

Lymphomas are neoplasms of the immune system originating from B, T or Natural Killer cells that lead tumor masses. They can be classified as Hodgkin and Non-Hodgkin. Cancer is the second most prevalent cause of death in women during reproductive age, and lymphomas are the fourth most diagnosed cancer in pregnant women, given the peak incidence of the disease during the female reproductive phase. The aim of this report is to present a case of lymphoma during pregnancy with a live fetus.

KEYWORDS: LYMPHOMA, PREGNANCY, LYMPHOMA IN PREGNANCY

INTRODUCTION

Lymphomas are neoplasms of the immune system originating in B, T or Natural Killer cells that lead to the appearance of tumor masses. They can be classified as Hodgkin and Non-Hodgkin. The Brazilian estimate for 2018 was 2,530 new cases of Hodgkin's Lymphoma and 10,180 Non-Hodgkin's, affecting 1,050 and 4,810 women, respectively [1]. Cancer is the second leading cause of death in women in reproductive age, with lymphomas being the fourth most diagnosed neoplasm in pregnant women, since the incidence peak of the disease occurs during the female reproductive phase[2].

The diagnosis for Hodgkin's and Non-Hodgkin's lymphoma is made with a histopathological biopsy of the lymph node. Hodgkin's lymphoma is classified as Classic, with four subtypes (nodular sclerosing, mixed cellularity, lymphocyte depleted and lymphocyte rich) and nodular lymphocyte predominant. Non-Hodgkin lymphoma is classified as indolent (40%) or aggressive (60%) [1] .

Excision of the lymph node can only be done safely for the fetus in the first trimester. In addition, the staging is done with anamnesis, physical examination, laboratory tests and bone marrow biopsy. The use of imaging tests with a high radiation load must be avoided. Nuclear magnetic resonance must be considered whenever possible. Treatment with radiation and chemotherapy during pregnancy should take into account the risk-benefit for the health of the mother and the fetus. The risks of chemotherapy in the first trimester range from spontaneous abortion to malformations [3].

CASE REPORT

33-year-old patient, G5P2A2, with a personal history of Hashimoto's thyroiditis and gestational diabetes in previous pregnancies. In the 30th week of pregnancy the patient noticed the appearance of nodules in both armpits. She sought medical attendance where a lymph node biopsy was performed, which revealed the presence of lymphoma on 03/02/19. Affected nodules in the breasts were also identified. Despite maternal illness, 34.5-week-old fetus with normal vital signs (see figures 1 and 2). Full-term fetus, healthy newborn and placenta. Chemotherapy shortly after delivery, followed by radiation therapy with maternal death after 6 months.

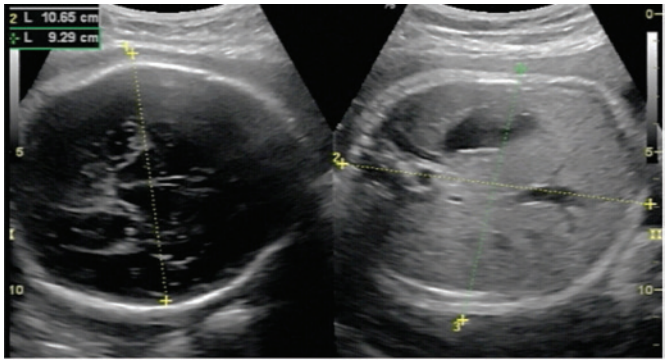

Figure 1: Obstetric ultrasound showing a normal fetus. Source: Clínica Fértile

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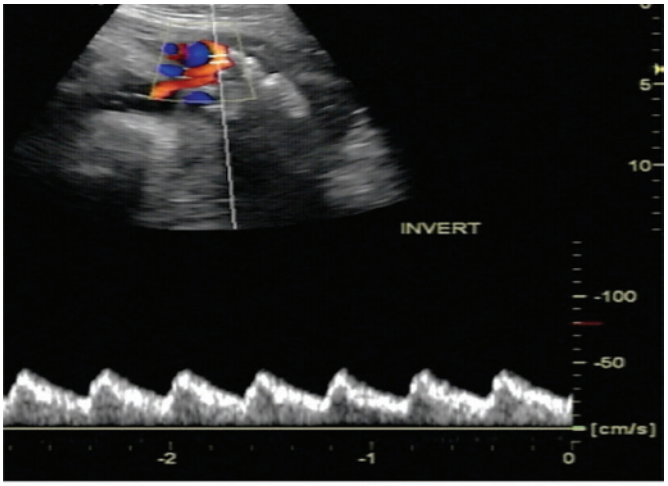

Figure 2: Obstetric Doppler showing a normal umbilical artery. Source: Clínica Fértile

Figure 3: Healthy 7 month old baby.

DISCUSSION

Among the tests for HL staging we find imaging tests such as radiography and computed tomography of the chest, abdomen and pelvis, with high emission of ionizing radiation. Therefore, alternative exams are nuclear magnetic resonance and ultrasonography (USG), which are more suitable for the stage of pregnancy, although ultrasonography is an operator dependent exam [2].

Although it is questioned for an increased risk of premature birth, low birth weight and a higher number of abortions of fetuses, studies show that the possibility of congenital abnormalities in children of Hodgkin mothers cannot be ruled out. In this case, morphological USG is an ally to detect malformations and fetal aneuploidies. The ultrasound follow-up ensures greater accuracy of gestational age and evaluation of fetal anatomy and development, allowing safety in decision making regarding the treatment of the patient and the welfare of the fetus [4].

In an English study comparing 129 children of mothers who had cancer during pregnancy and underwent some type of treatment after the second trimester of pregnancy with children of healthy mothers, it can be observed that there were no significant differences between initial development and cardiac evaluation between the children[5]. A Danish study showed a high degree of prematurity among newborns of mothers with HL compared to babies of healthy mothers [2].

FINAL CONSIDERATIONS

Treatment in pregnant women with cancer is possible, as long as delays in diagnosis are avoided. Despite the associated complications, the advantage of the treatment is already evident and should be discussed and duly clarified with the patient so that she can exercise her autonomy in making the decisions regarding her treatment [3].

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NODULAR FASCIITIS: A CASE SIMULATING SUSPICIOUS PATHOLOGY AT ULTRASONOGRAPHY

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ABSTRACT

Nodular fasciitis is a benign tumor of the subcutaneous tissue, and its etiology has not yet been truly elucidated. It predominantly affects the upper extremities of patients between the second and fourth decades of life. The clinical and imaging features of this entity can resemble those of malignant tumors, especially due to the rapid growth, thus, becoming a diagnostic challenge. Treatment usually consists of surgical removal of the lesion. The objective of this study is to report a case of a patient with nodular fasciitis of unusual location and simulated suspect tumor at ultrasonography and to briefly review current literature about this pathology and its sonographic characteristics.

KEYWORDS: NODULAR FASCIITIS, ULTRASONOGRAPHY, ELASTOGRAPHY, MAGNETIC RESONANCE IMAGING, NODULE.

INTRODUCTION

Nodular fasciitis (NF) is a benign condition in which there is a self-limited proliferation of fibroblasts and myofibroblasts, that was first described in 1955 by Konwaler et. al[1]. Characteristically, it presents rapid growth, high cellularity and high mitotic activity [1-3], which can then be confused with malignant tumors such as sarcomas[1-5].

It preferably affects young adults, between 20 and 45 years old, without gender predilection [2,6]. The anatomical regions that are most affected, according to the literature on the subject, are the upper limbs, especially the forearms [1,2,7]. It is often located in the subcutaneous region, but there are reports of being identified in deeper planes such as intramuscular and intra-articular [4,6].

CASE REPORT

30-year-old female patient, black, was referred to the ultrasound service due to the appearance of a palpable nodule, located below the sternal furcula, with a report of rapid and progressive growth. On physical examination, a hardened nodular lesion was found, measuring approximately 5mm. The Doppler ultrasound examination of soft tissues revealed a nodule with precise limits, irregular contours, spiculated, markedly hypoechoic, with a slight increase in the echogenicity of the surrounding tissues, located in the subcutaneous plane, shown in figure 1. The nodule measured approximately 6 x 3 x 5mm (figure 2), with its center 4 mm from the skin plane and 26 mm inferior to the sternal furcula (figure 3). During the study with color Doppler, the nodule showed internal vascularization of easy capture and the study with spectral Doppler revealed pulsatile flow, with low resistance arterial pattern (IR: 0.61), shown in figure 4. In a complementary study with dynamic elastography by compression (strain elastography), the nodule appeared hard, with a stiffness about 5.3 times greater than that of the surrounding tissues (figure 5).

After carrying out the ultrasonographic exam, the patient was referred to the plastic surgery service, which proceeded to excise the lesion. Such procedure was performed without any complications and the surgical specimen was sent to the pathological anatomy laboratory. The anatomopathological analysis revealed a relatively monomorphic fusocellular proliferation, without significant atypia and with red cell extravasation, shown on the slides in figure 6 .

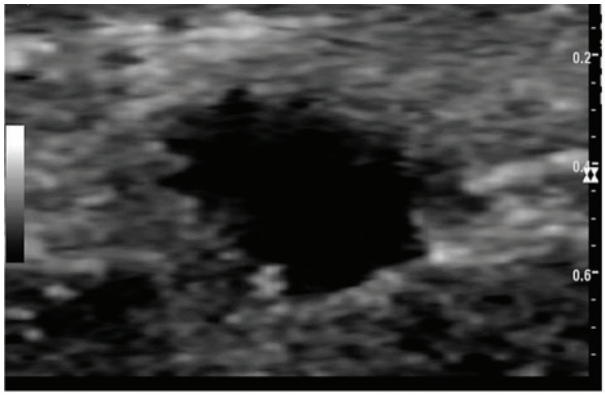

Figure 1: Solid nodule, markedly hypoechoic, with irregular contours and unclear limits.

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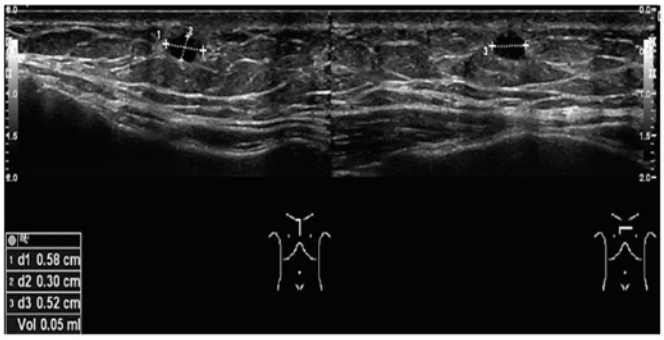

Figure 2: Measurements of the nodule in the longitudinal (left) and transverse (right) planes, with estimated volume of 0.05cm³.

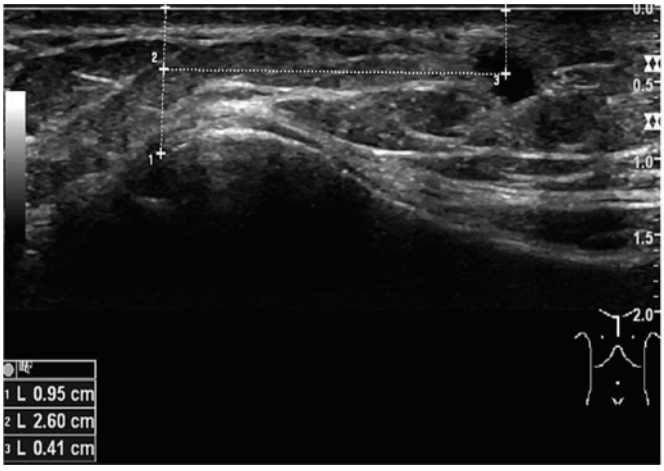

Figure 3 - The center of the lesion is approximately 4mm from the skin and 26mm caudal to the sternal furcula.

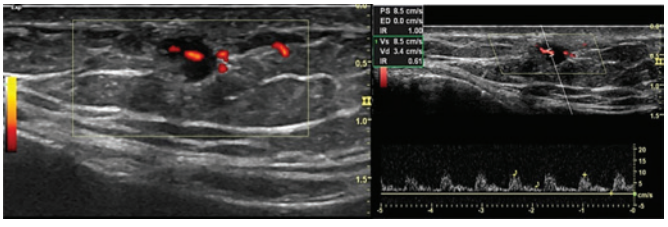

Figure 4 - The nodule shows easy central flow uptake on the Power Doppler study (left), with a low resistance arterial flow pattern to the Spectral Doppler study (right).

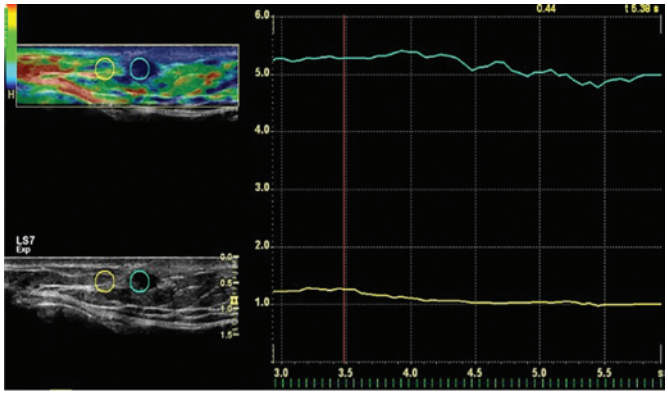

Figure 5 - Compression elastography showed nodule stiffness (blue circle)

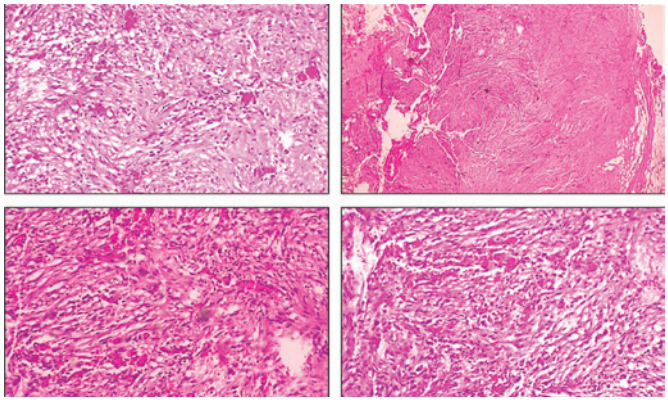

Figure 6 - Relatively monomorphic fusocellular proliferation, with no significant atypia and with red blood cell extravasation.

DISCUSSION

Nodular fasciitis is a benign lesion, characterized by the proliferation of fibroblasts that is constantly confused histologically with sarcomas [1-5].

Its etiology has not been completely clarified, but Velagaleti et al., reviewed publications pointing out the involvement of clonal abnormalities in the tissue repair mechanisms related to the FGR7 (fibroblast growth factor) gene located on chromosome 15 [8]. Oliveira, AM and Chou, MM., on the other hand, observed a high expression of mRNA of the USP6 gene (ubiquitin-specific protease) in these lesions and raised the hypothesis of an oncogenic mechanism involving genomic rearrangements in the locus of this gene [6] .

NF commonly presents as a single, rapidly growing nodule (2 to 4 weeks), with a diameter that rarely exceeds 5cm[6,7,9] and may or may not be accompanied by pain [4,7]. There are reports of association with local trauma in 10 to 15% of cases[1,2,6]. The anatomical regions most affected are the upper extremities and the trunk, followed by the head and neck and lower

extremities[1,2,4,7,9] but they can affect any part of the body[1,9]. In the pediatric population, the head and neck are the most affected regions[1,2]. Symptoms such as numbness, paresthesia and pain irradiation are uncommon and denote compression of peripheral nerves[4] .

It can take three main forms, that are based on their anatomical location: the subcutaneous form (which is the most common); the intramuscular form (which mimics malignant lesions) and the fascial form[2,4].

Microscopically, NF basically consists of fibroblasts arranged in short bundles and fascicles scattered within a myxoid or fibrous stroma[6]. Based on the predominant histological composition, the lesion can be: fibrous, myxoid or cellular[6]. Giant osteoclastlike cells may be present, as well as an infiltration of lymphocytes and extravasation of erythrocytes, without deposit of hemosiderin[2]. It presents a wide variation of morphological pattern and can often be mixed, consisting of spindle cells, thin, similar to fibroblasts[7]. In the case described, the macroscopy of the lesion proved to be predominantly fibrous.

Ultrasonography usually shows quite nonspecific findings, such as a solid, well-defined, ovoid or lobular, isoechogenic or hypoechogenic mass[1]. In some cases, it may also present a posterior acoustic shade[2]. As in the ultrasonographic findings, NF usually presents itself on magnetic resonance imaging (MRI) as a well-defined, rounded or oval lesion, still without a specific pattern of signal intensity in the different sequences[4,9]. In the T1-weighted sequence, the NF usually presents with an increased signal in relation to the adjacent and slightly heterogeneous muscle tissue. In the T2 weighted image, the lesions are relatively homogeneous and hyperintense in relation to the subcutaneous adipose tissue[4] . However, depending on the histological components of the lesions, they may be slightly hypointense in all sequences[9]. Due to this fact, some authors[9] advocate that the myxoid and cellular subtypes show a more intense signal than the muscle in T1 and are also hyperintense in relation to fat in the T2-weighted sequences, whereas in the fibrous subtype, the lesion is hypointense in relation to the muscle tissue in all weights. Such properties of the different histological subtypes and the location of the lesion will influence the gadolinium contrast pattern enhancement[9] .

High celularity and dense vascularization are related to an early enhancement after intravenous gadolinium injection, which was mainly homogeneous when the lesion was located in the subcutaneous topography[9]. In view of image aspects only, differential diagnoses are diverse and include aggressive fibromatosis, adenomegaly, dermatofibroma, fibrosarcoma and malignant fibrous histiocytoma[2,4]. Thus, the diagnosis of NF cannot be made using only the results of imaging tests[2] .

Compression elastography (strain elastography) is an ultrasound technique based on the static deformation of a linear, isotropic and elastic material[10,11]. In a simpler way, it can describe the displacement (compression) or stiffness of a given tissue in response to the application of a local force that makes rigid tissues deform less and have less tension than compliant tissues when the same force is applied[12].

Recent studies show that elastography has high sensitivity and specificity for differentiating benign from malignant lesions when the technique is properly applied[13].

The treatment of choice is surgical excision of the lesion [2,4,7], but some authors suggest alternatives such as observation and injection of corticoids into the lesion[4]. Recurrence is quite rare, being reported in 1-2% to 10%[2,4,7], probably due to incomplete resection[2]. In this patient, the treatment offered was complete surgical excision of the lesion, without the need for additional treatment.

Nodular fasciitis is a relatively infrequent benign tumor, with unusual clinical and imaging features, with several differential diagnoses, including pathologies of malignant nature.

Ultrasonography can be considered as an initial method for evaluating these lesions due to its wide accessibility, availability and the non-use of ionizing radiation, and can offer valuable information for the elaboration of a diagnostic hypothesis. Tools such as color Doppler, pulsed Doppler and elastography are useful to increase the sensitivity of B-mode ultrasound.

The final diagnosis is made after biopsy or surgical excision of the injury. The removed specimen is sent for anatomopathological analysis and in some situations the immunohistochemical study must be performed for diagnostic confirmation.

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PRENATAL SCHIZENCEPHALY DIAGNOSIS WITH PROGRESSIVE UNILATERAL TO BILATERAL EVOLUTION - CASE REPORT

RENATO MURTA, MARCOS FARIA, LUCCA PENNA FARIA, BRUNO PENNA FARIA, HEVERTON PETTERSEN

ABSTRACT

Schizencephaly is a rare congenital malformation of the central nervous system (CNS). Belonging to the group of CNS cell migration defects, it appears between the 2nd and 5th month of gestation, characterized by a gray dysmorphic substance outlining the slits in the cerebral cortex that extend medially from the subarachnoid space communicating with the ipsilateral cerebral ventricle.

This report is from a fetus that was referred with the diagnosis of ventriculomegaly and a morphological examination identified a rare pathology of the CNS, unilateral type II schizencephaly.

During monitoring it evolved to a bilateral form with progressive increase in the cleft, subarachnoid space, cerebral ventricle and identification of associated brain abnormalities. This evolution from unilateral to bilateral form is not described in the medical literature. You can assume that the diagnosis was very early and although the event had been bilateral, its manifestation took some time to become identified on ultrasound examination.

An etiology, associated anomalies, differential diagnosis and prognostics factors in schizencephaly will be addressed.

KEYWORDS: SCHIZENCEPHALY, DIAGNOSIS, PRENATAL CARE, ULTRASOUND, EVOLUTION, ETIOLOGY, PROGNOSTIC FACTORS

INTRODUCTION

Schizencephaly is a rare congenital malformation of the central nervous system (CNS), with a prevalence of 1.5: 100,000 live births [1,2]. It was first described in 1946 by Yakovlev and Wadworth when they defined schizencephaly as a congenital cleft in the brain mantle in a post-mortem study [3].

Belonging to the group of the cell migration defects of the CNS, it appears between the 2nd and 5th month of gestation, being characterized by a gray dysmorphic substance outlining the cracks in the cerebral cortex. These clefts extend medially from the subarachnoid space, communicating with the ipsilateral cerebral ventricle. The identification of the gray matter bordering the cleft is a pathognomonic characteristic of the lesion, differentiating it from severe porencephaly.

Unilateral schizencephaly is more frequent (60%) than the bilateral cleft and in 75-95% of cases the predominant anatomical location is in the frontal and parietal lobes [3-5] .

ETIOLOGY:

Most cases of schizencephaly are sporadic and unfamiliar, not having a recognized etiologic cause. Theories such as anomalous neuronal migration and obstruction of the middle cerebral artery as a result of an intrauterine inflammatory process have been suggested, as in the cytomegalovirus infection[3,4] .

The theory of abnormal early neuronal migration involves the pleating and fusion of the layers of the pia mater with the ependyma. Figure 1 illustrates coronal histological section at [10], 17 and 28 gestational weeks showing the pleating and fusion of the layers of the pia mater with the ependyma, and subsequent development of the cerebral cortex[5] .

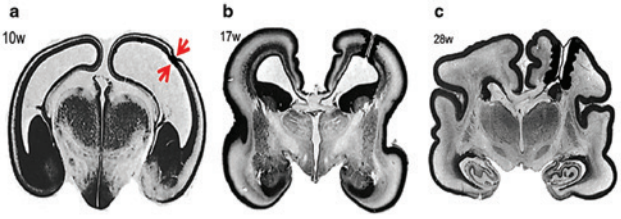

Figure 1. Illustrates the pleating and fusion of the pial and ependymal layers in the cerebral cortex at 10, 17 and 28 weeks of gestation [5].

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Figure 2 illustrates the changes in the cerebral cortex and their evolution during pregnancy. In the figure, the red square represents the focal damage of the entire thickness of the early cerebral cortex and subsequent destruction of the brain tissue. During the period of neuronal migration, around 28 weeks, regions of polymicrogyria are formed, seen at the edges of the schizencephaly cleft[5]

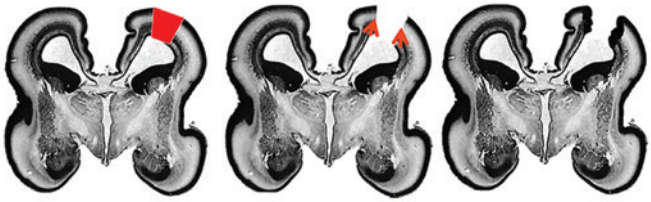

Figure 2. Illustrates the changes in the cerebral cortex and their evolution in the course of pregnancy [5].

On the other hand, if the event occurs after the sixth month of pregnancy, there is not neuronal migration that is sufficient enough to circumvent the existing lesion and therefore there is not enough organization to develop polymicrogyria.

Therefore, brain damage is produced by reabsorption of the injured tissue and, due to inadequate neuronal migration; there is an absence of gray matter at the edges of the lesions, resulting in the formation of porencephalic cysts, different from schizencephaly. On the other hand, the theory of vascular obstruction of the middle cerebral artery corroborates the fact that the majority of schizencephaly is seen in the region of the lateral sulcus of the brain, territory that is irrigated by the middle cerebral artery, including in the bilateral forms [3,4] .

Some authors point to certain genetic factors as etiology, such as mutations in the EMX2 gene that regulates the structural development of the forebrain. The mutation causes a lesion in the periventricular germinal matrix, impairing cell migration between the 6-7th week of pregnancy[4,6] .

Other genes such as EPG5 and COL4A1 causing vulnerability in the vascular wall are considered responsible for schizencephaly [7,8] .

Other related factors were age below 20 years, alcohol abuse, narcotic drugs, exposure to organic solvents, death of a twin, alloimmune thrombocytopenia, thrombophilia, congenital infections, maternal trauma and warfarin[8].

CLINICAL PRESENTATION:

Schizencephaly is divided into two clinical types: type I or closed lip, the cerebral cleft does not communicate with the ventricle turning prenatal diagnosis difficult. Griffiths PD performed a review with 11 fetuses and found type I (closed) schizencephaly in 45% of cases when using an magnetic resonance imaging (MRI) study [5] .

Type II or open lip schizencephaly, the cleft communicates with the ventricle being filled with fluid and with characteristics that can be described in prenatal care, occurring in 55-60% of cases[5]. The cleft margins are surrounded by dysplastic and heterotopic gray matter [1,8] .

Both types of schizencephaly can be unilateral or bilateral. The unilateral form is characterized by a markedly smoother course; may be asymptomatic or have epileptic seizures, mild motor defects and abnormal vision. The bilateral type is a severe and irreversible malformation of the CNS that manifests with seizures that are difficult to control, severe mental retardation, blindness and varying degrees of motor defects[8] .

There are no reports of schizencephaly diagnosed by ultrasound before 20 weeks of gestation. Howe et al evaluated 18 cases of prenatal schizencephaly and they all had a gestational age greater than 21 weeks of gestation[8] .

ASSOCIATED ANOMALIES:

The literature describes the association of schizencephaly with chromosomal abnormalities, genetic syndromes, congenital infections and death of monochorionic twinning. Other concomitant brain pathologies have been described as hydrocephalus (30% of cases and almost exclusively with type II), ventriculomegaly (85%), agenesis of the corpus callosum and septum pellucidum (40-70%), atrophy of the optic nerve (30%), arachnoid cyst and cerebellar malformations, cortical dysplasia, heterotopia, pachygyria, polymicrogyria, periventricular leukomalacia[1,8] .

Griffiths PD reported absent or interrupted septum pellucidum in 64% of fetuses with a tendency to be absent in fetuses with type II (open) schizencephaly[5].

DIFFERENTIAL DIAGNOSIS:

The differential diagnosis must be made with agenesis of the corpus callosum, hydrocephalus, holoprosencephaly, encephalocele, arachnoid cyst and porencephaly. The porencephalic lesion is a separate challenge, especially in type I, being differentiated from schizencephaly, on magnetic resonance, due to the absence of gray matter in the lesion outline.

CASE REPORT:

ARSC patient, 19 years old, white, regular cycle, natural conception, primiparous, date of the last menstruation unknown; no history of previous pathologies. She was referred to our service with a diagnosis of severe unilateral ventriculomegaly.

On December 31, 2019, the first ultrasound examination was performed on the pregnant woman, identifying a left unilateral cleft communicating the ventricular system to the subarachnoid space in the region of the parietal lobe - (figures 3). The diagnosis was unilateral type II schizencephaly. No other associated major structural anomaly was seen.

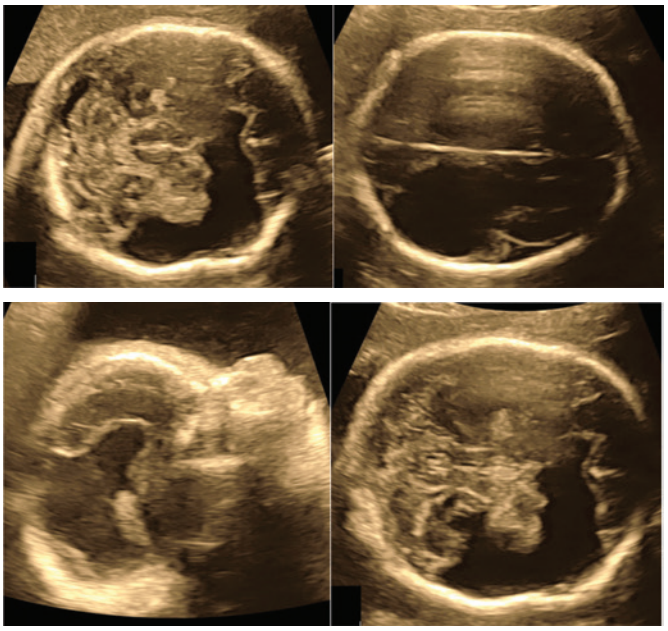

Figure 3. Ultrasound images show an anechoic area in the left parietal lobe region (unilateral type II schizencephaly).

On January 28, 2020, the second exam was performed, when an evolution from unilateral to bilateral was observed, communicating the ventricular systems to the subarachnoid spaces bilaterally - (figures 4). No other major associated structural anomaly was identified.

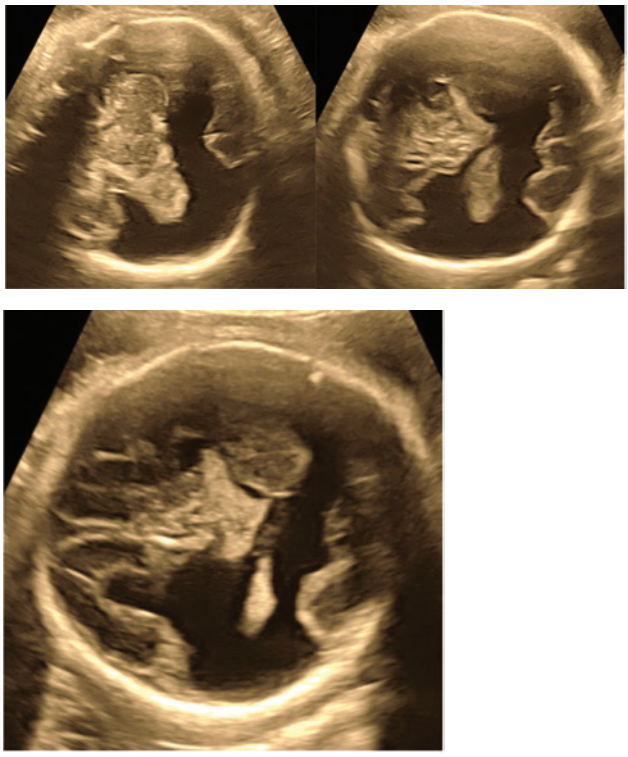

Figura 4. Ultrasound images show an anechoic area in the bilateral parietal lobe region (bilateral type II schizencephaly).

On February 14, 2020, a third ultrasound examination was carried out, in which an anechoic image was observed, communicating the right subarachnoid space to the right ventricle, an anechoic image of the same characteristics communicating the left subarachnoid space to the left ventricle and absence of cavum septum pellucidum, noting increased communications from the subarachnoid spaces to the ventricles. No other major structural anomalies associated.

On March 10, 2020, a fourth ultrasound examination was performed, which revealed a progressive increase in the subarachnoid space, in the cleft and in the cerebral ventricles and the absence of cavum septum pellucidum. Choroid plexus is seen floating in the ventricular cavity - (figures 5).

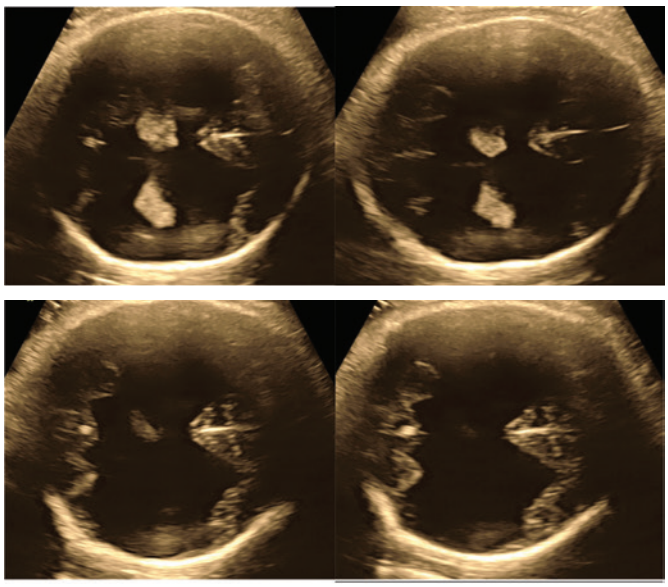

Figura 5. Ultrasound images show an anechoic area in the bilateral parietal lobe region (bilateral type II schizencephaly).

DISCUSSION:

Schizencephaly is usually associated with other CNS malformations, such as ventriculomegaly, polymicrogyria, pachygyria, heterotopia, lissencephaly, absence of cavum septum pellucidum, agenesis of the corpus callosum, hypoplasia of the optic nerve. Although the gold standard for the diagnosis of schizencephaly is the magnetic resonance imaging exam, there are rare cases described in the literature. The largest series was described by Nabavizadeh et al who studied 10 fetuses with intrauterine magnetic resonance and confirmed with a postnatal study, including eight bilateral cases. An interesting finding was the disagreement in the classification between prenatal and postnatal with 47% of schizencephaly type II (open) detected intrauterine that became type I (closed) in the postnatal period. They reported that about 26% of fetal polymicrogyries were not detected[10].

Another circumstantial evidence in this research by Nabavizadeh et al, is the finding of hemosiderin deposi-

tion and/or hemorrhage in the cleft and in the ventricles of the fetuses affected by schizencephaly in the magnetic resonance imaging exam. In addition, more than half of the fetuses presented microcephaly due to the destruction of the brain tissue. These findings corroborate with the theory that the main etiology for the cases of schizencephaly is due to bleeding and/or destruction of the brain matrix [10].

The clinical manifestations of schizencephaly include different levels of developmental delay, neuropsychomotor seizures and different degrees of abnormalities in vision and speech. Hunt et al studied 21 patients with schizencephaly (16 unilateral and 5 bilateral). Most patients with neurological deficits were detected before one year of age, especially in bilateral clefts. The main clinical presentation was hemiparesis in unilateral schizencephaly and seizures in the bilateral form.

About 81% of patients manifested generalized tonic-clonic epileptic seizure, with 38% of cases developing refractory epilepsy. Most patients developed motor, intellectual and language deficits, especially in bilateral schizencephaly [11].

This report is from a fetus who was referred with the diagnosis of ventriculomegaly and a morphological examination identified a rare pathology of the CNS, the unilateral type II schizencephaly. During monitoring, it evolved to a bilateral form with a progressive increase of the cleft, subarachnoid space, cerebral ventricle and identification of associated anomalies such as the absence of the cavum septum pellucidum and corpus callosum. This evolution from unilateral to bilateral form is not described in the medical literature.

It can be presumed that the diagnosis was very early and although the event had been bilateral, its manifestation took some time to become identified on ultrasound examination. The differential diagnosis is made to distinguish this disorder from holoprosencephaly, hydranencephaly and bilateral arachnoid cysts. Cases of schizencephaly type I and porencephaly most of the time can only be distinguished on the MRI exam in which the dysplastic and heterotopic gray matter bypasses the cystic lesion in type I schizencephaly.

In most cases an etiology will not be identified. The long-term prognosis will depend on the size and location of the lesion, whether unilateral or bilateral and if there are associated brain malformations. The newborn should be evaluated by a pediatric neurologist and follow-up with MRI is recommended. Therefore, an accurate prenatal diagnosis is important for adequate parental genetic reproductive counseling.

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PIGMENTED VILLONODULAR SYNOVITIS: CASE REPORT

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ABSTRACT

Pigmented villonodular synovitis is a benign, proliferative synovial disease characterized by a nodule, sessile, pedunculated disease of unknown etiology. Its annual incidence is 1.8 / 100,000 affects the 3rd and 4th decade. In most cases the symptoms are non-specific, it is monoarticular and the knee is the most affected segment. It was concluded that ultrasonography showed to be an effective imaging technique in the detection of villous lesion.

KEYWORDS: SYNOVIA, INTRA-ARTICULAR, BONE, VILLONODULAR, HOFFA.

INTRODUCTION

Pigmented villonodular synovitis (PVNS) is a benign and unusual clinical disease of unknown etiology, characterized by an excessive proliferation of the synovial membranes, including joints, bursae and tendon sheaths[1-4].

In 1852, Chassaignac reported the first case of nodular lesion in the flexor tendon sheath of the middle and index fingers1. Recently, the World Health Organization defined that PVNS and giant cell tumor are equivalent terms [2, 4].

CASE REPORT

Female patient, 26 years old, presented with swelling in the anterolateral region of the right knee for three months (Figure1), without complaints of pain or joint block. Orthopedic physical examination with good alignment of the lower limbs, meniscal and ligament tests negative and absence of signs of joint instability.

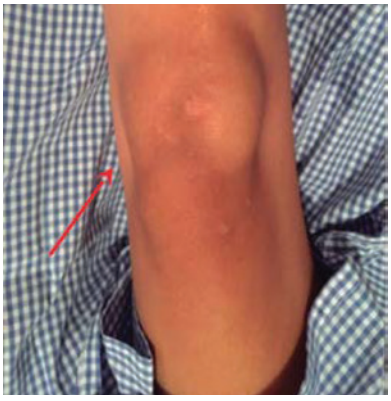

Figure. 1. Swelling in the anterolateral right knee.

Ultrasonography was performed, which showed a solid intra-articular, hypoechogenic formation with dimensions of 3.5 x 1.6 x 3.8 cm, expanding to Hoffa's fat (Figs. 2 and 3) and vascularised in the Spectral Doppler ultrasound. (Figure 4 and 5).

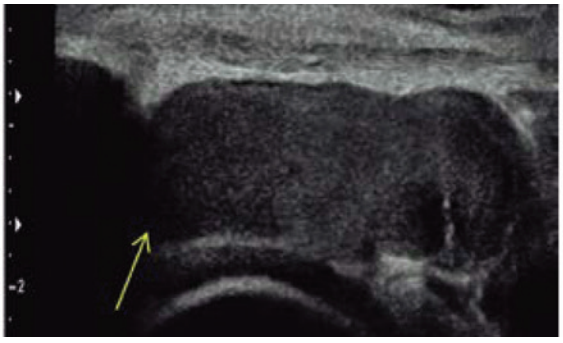

Figure2. Hypoechogenic transverse nodule.

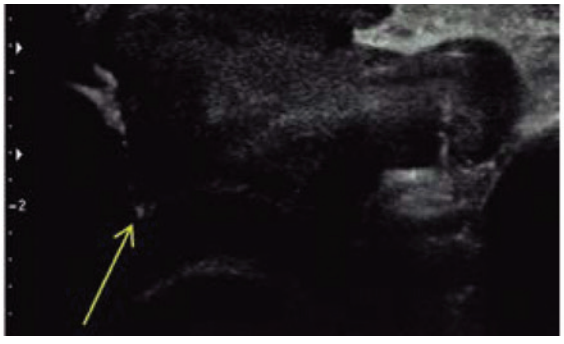

Figure3. Hypoechogenic longitudinal nodule.

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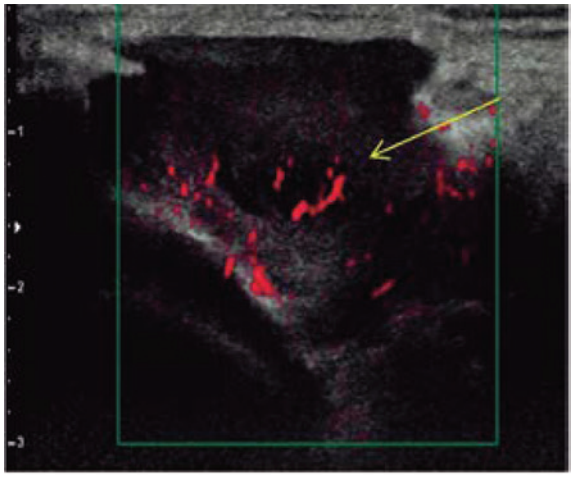

Figure4. Vascularised nodule seen with amplitude Doppler.

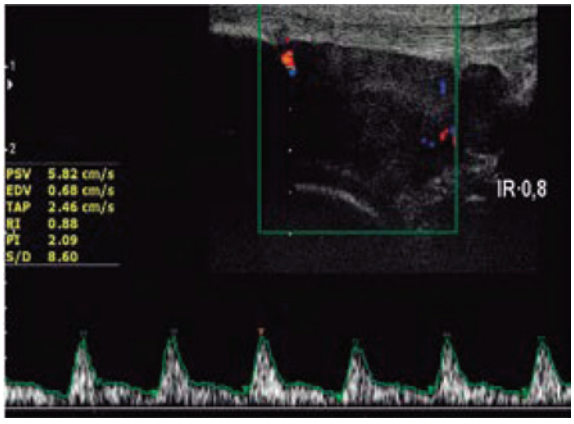

Figure5. Nodule with marked peak systolic velocity.

Magnetic resonance imaging showed a heterogeneous mass with low uptake in T1 and T2. The anatomopathological result was compatible with PVNS. Treatment with arthroscopic resection was successful.

DISCUSSION

PVNS is a rare disease, usually monoarticular, with the knee being the most affected joint in 80% of cases, followed by the hip and ankle. Incidence of 1.8 /100,000 people, in the 3rd and 4th decade[1,3,6].

The most frequent clinical signs are the slow insidious appearance of pain, edema and joint stiffness[6]. It has two presentations:

a) diffuse: fully involving the synovial lining of large joints, such as the knee and hip; b) local: sessile villonodular affecting small joints of hands and feet[5, 7].

Differential diagnosis is made with synovial sarcoma, synovial chondromatosis, hemangioma and lipoma arborescens[4].

The most appropriate imaging method for its diagnosis is magnetic resonance imaging, since intra-articular extension and bone involvement cannot be accurately assessed by ultrasound. Ultrasonography can assist in the diagnosis, but it is not specific [4,7].

CONCLUSION

Pigmented villonodular synovitis, though uncommon, is benign and its diagnosis is histopathological. However, ultrasonography has proved to be a sensitive method for detecting the intra-articular expansive process.

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DOPPLER ULTRASONOGRAPHY IN THE EVALUATION OF GASTROESOPHAGEAL REFLUX

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ABSTRACT

Gastroesophageal reflux (GERD) is the involuntary passage of gastric contents into the lumen of the esophagus. It is a common condition in infants and young children, and is often considered physiological; however, it can determine clinical manifestations and lead to gastroesophageal reflux disease. The general objective of this study was to analyze the role of ultrasonography in the diagnosis and follow-up of gastroesophageal reflux. The methodology used in this work was a literature review. The methodology used was a bibliographic review of articles published in Spanish, English and Portuguese in the last 20 years, the database was PubMed, SciElo, Bireme, Lilacs. What can be concluded is that the ultrasonography in the evaluation of gastroesophageal reflux is a non-invasive, fast, affordable and cheap exam.

KEYWORDS: GASTROESOPHAGEAL REFLUX, ULTRASONOGRAPHY, DIAGNOSTIC IMAGING

INTRODUCTION

Gastroesophageal reflux (GER) is the condition that most attacks the esophagus and one of the most common complaints in medical facilities[1].

The expression symptomatic gastroesophageal reflux disease refers to those patients who present with peptic signs (heartburn and regurgitation), with or without endoscopic evidence of esophagitis. The most complex patients to understand are those who exhibit extensive symptoms with no evidence of tissue damage to the esophagus (nonerosive gastroesophageal reflux disease) [2].

The number of hospitalizations associated with gastroesophageal reflux disease (GERD) in the United States increased from 710,000 to 3,100,000 from 2002 to 2004. An episode of GER occurs when the lower esophageal sphincter (LES)

opens spontaneously and gastric content affects the esophagus [3].

GERD is one of the most common disorders in medical practice. North American data indicate that heartburn, the most prevalent symptom of the disorder, occurs at least once a week in 20% of the studied population. Similar data has been reported in England and Scotland. In Brazil, a population-based study showed a prevalence of at least 12% in the general population [4].

It is one of the most common conditions affecting the gastrointestinal tract and is generally considered to be the cause of a variety of esophageal symptoms. In an individual suffering from GERD, symptoms such as heartburn or a burning sensation in the chest can be present. Untreated GERD can lead to other consequences such as Barrett's esophagus, which has been considered a precursor to esophageal cancer [5].

GERD has a multifactorial etiology where both the tissue damage and symptoms result from the contact of the mucosa with the refluxed content. Such contact is due to the failure of the esophageal defenses. The anti-reflux barrier, considered to be the main protection against gastroesophageal reflux, is formed by the internal sphincter (or lower esophageal sphincter) and external sphincter (formed by the crural portion of the diaphragm). The main mechanism of this failure is the transitional relaxation of the lower esophageal sphincter, unrelated to swallowing, being responsible for about 70% of GERD episodes [6].

The diagnosis of GER should start by identifying the complete clinical history of the patient. The diagnostic approach should vary depending on the clinical presentation. The clinical manifestations of GER are variable and refer not only to the digestive tract. Therefore, the differential diagnosis is wide, covering clinical and surgical causes of vomiting and regurgitation, causes of bronchospasm and atypical

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symptoms, such as asthma, otitis, laryngitis and sinusitis. Another significant factor is the patient's age, as the diseases vary according to age [7] .

Gastroesophageal reflux disease can be diagnosed by its subjective clinical manifestations. Heartburn (or pyrosis), regurgitation and dysphagia represent the common symptoms of GERD. Endoscopy is indicated in patients in whom the common clinical treatment is not efficient and presents symptoms of GERD, dysphagia, odynophagia, microscopic or macroscopic gastrointestinal bleeding or in patients with detected iron deficiency anemia [6].

Considering the non-invasive and non-oncogenic characteristic of the transabdominal ultrasonography (US), this method can eliminate the main disadvantages of upper digestive endoscopy. Several studies have suggested the utility of transabdominal US in detecting GERD in pediatric patients. However, there seems to be few studies that investigate the utility of US in detecting esophagitis induced by GERD in the adult population [6] .

Recently, Savino et al. [8] published an article on US for the diagnosis of pediatric GERD. The authors analyzed other causes of symptoms, such as vomiting, other than GERD; and measured the length of the abdominal esophagus, the diameter of the esophagus, the thickness of the esophageal wall and the angle of Hiss to obtain anatomical and functional data. The authors also highlighted the need to define diagnostic criteria, to standardize the exams and the referred measures. The traditional analysis for the study of GERD is the seriography of esophagus, stomach and duodenum (SESD) with barium and, more recently, the intraabdominal esophagus ultrasonography (IEUS) - figure 1.

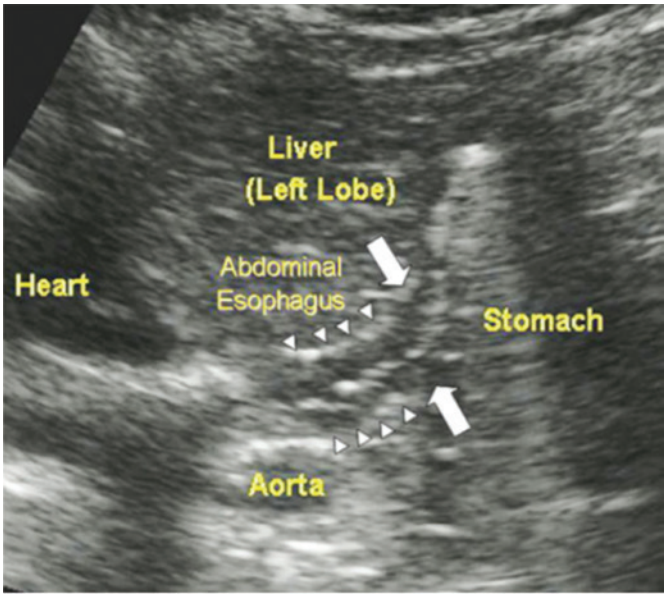

Figure 1. Transverse oblique ultrasound of the gastroesophageal junction (arrows). The esophagus seen as a tubular structure (arrowheads) with a hypoechogenic wall (muscular layer) and a hyperechogenic center (mucosa and lumen) [8].

Nowadays, there are several methods that allow the analysis of esophageal disorders, such as X-rays contrasted with fluoroscopy, scintigraphy, manometry, upper digestive endoscopy and prolonged esophageal pH monitoring (24 hours). However, simple, quick, inexpensive and non-invasive tests that do not use ionizing radiation are essential. The transabdominal US used to analyze the intra-abdominal esophagus, within this context, represents a good resource and incorporates immediate advantages, such as distinguishing itself as an initial study, better directing complementary tests, and permitting appreciation of the effect of treatment in individuals with dysphagia [9] .

IEUS provides, in a similar way to SESD, the possibility to classify structural anatomical details, and can verify several pathological methods, even GER, in real time. It is a non-invasive safe method and does not use ionizing radiation [10] .

With this in mind, this article aimed to describe the role of the ultrasound in the diagnosis and monitoring of gastroesophageal reflux.

METHODOLOGY

This is a literature review study. After defining the theme, a search for scientific articles was carried out in the following scientific databases: Pubmed, Scielo, Lilacs and Bireme.

The search was carried out using the following keywords: gastroesophageal reflux / gastroesophagealreflux, ultrasonography / ultrasonography, gastroesophageal reflux / diagnostic imaging / gastroesophagealreflux / diagnosticimaging.

This research included: articles published in Spanish, English and Portuguese in the last 20 years. Review articles, systematic or not, and those that used animal models were excluded from this research.

RESULTS

Gastroesophageal reflux concept - GER The term symptomatic gastroesophageal reflux disease refers to those patients who present peptic symptoms (pyrosis and regurgitation), with or without endoscopic evidence of esophagitis. The most difficult patients to understand are those with great symptomatology, but with no evidence of esophageal tissue damage (non-erosive gastroesophageal reflux disease) and also those with symptoms considered extradigestive manifestations with minimal changes in esophageal motility[11]. Gastroesophageal reflux (GER) refers to the involuntary passage of gastric contents into the esophagus.

In children, it often represents a physiological phenomenon, especially in children with innocent regurgitation. On the other hand, GER disease (GERD) occurs when reflux of gastric contents causes uncomfortable symptoms and/or complications. It is one of the most common causes of bowel symptoms in all pediatric patients age groups[12].

Although the pathophysiology and symptoms of pediatric GERD, especially in older children, are similar to those in adults, children may present with a difference between gastroesophageal and extra esophageal symptoms and pos-

sible complications[13] .

Gastroesophageal reflux disease (GERD) is the most common esophageal disorder in infants and children, causing intermittent regurgitation or vomiting. Although it is a physiological event in most adults and children, it becomes pathological when the intensity and/or frequency increases[14].

The retrograde movement of gastric contents into the esophagus is called gastroesophageal reflux (GER). This clinical condition, resulting from the immaturity of the natural anti-reflux defense mechanisms, is common in infants, being self-limited and free of complications. When accompanied by clinical repercussions such as anemia, gastrointestinal bleeding, difficulty in gaining weight or weight loss, respiratory and otorhinolaryngological manifestations, developmental delay, among others, it is characterized as gastroesophageal reflux disease (GERD)[15] .

Reflux of gastric content can occur to a greater or lesser degree and with variable frequency. In most cases it is transitory, in small volume and with no particular consequences. However, if it is persistent, pathological reflux is configured[16].

EPIDEMIOLOGY

GER is certainly one of the main gastroenterological conditions among children. Despite being common in males, the difference between the sexes has no statistical significance. A recent study involving a sample of 1,447 mothers in the United States, using the criteria defined by the Roma III Consensus, showed a prevalence of regurgitation among infants of 26%. It is also estimated that regurgitations occur more than once a day in 41 to 67% of healthy infants aged four months. Fortunately, only the minority of these regurgitating children will need some clinical investigation and/or therapeutic intervention [17].

Another alarming association was proposed by a recent epidemiological study that suggests that the occurrence of GERD, in preterm newborns or small for gestational age, may be the responsible factor for the higher frequency of esophageal adenocarcinoma in adults that were born prematurely [18].

The prevalence rates of GERD, characterized by the presence of symptoms of pyrosis and acid regurgitation, are quite variable, but, especially in western countries, they are almost always high. In Spain, a cross-sectional study published in 2004, identified a prevalence of 31.6% of GERD per year. In Belgium, it is also high, having been 28% in 2002. In a study conducted in Australia in 1996, 56% of individuals reported having had GERD symptoms at least once in their lifetimes, with 37% having them at least once every four months. In Denmark, in 1994, the prevalence was 38% among men and 30% among women. In Brazil, in 2001 it was 48.2%. In a review study published in 1997, the variation in prevalence ranges from 10% to 48% for pyrosis, 9% to 45% for acid regurgitation and 21% to 59% for both symptoms[19].

The prevalence of gastroesophageal reflux disease (GERD) is increasing in Japan, as well as in Western countries, which may be related to westernization and diet, increased age, decreased prevalence of Helicobacter pylori infection, and so on. GERD affects the activities of daily living and reduces the patient's quality of life, so that the diagnosis and management of this condition are clinically crucial [20] .

Diagnostic tests: Doppler ultrasonography. The diagnosis of GER needs to start with the elaboration of the complete clinical history. The diagnostic focus of GERD should change according to the clinical presentation. Diagnostic tests are useful to document pathological reflux or its difficulties, to constitute a causal relationship between reflux and symptoms, to analyze therapy and to exclude other pathological species. As no test ponders all these questions, they must be carefully chosen according to the history obtained and their limitations must be recognized [7].

Gastroesophageal reflux (GER) is a common condition in early childhood, characterized by the retrograde flow of gastric content into the esophagus. Due to potentially serious sequelae, early diagnosis and treatment in these patients is extremely important. Although continuous pH monitoring, scintigraphy and contrast tests of the upper gastrointestinal tract have been the primary methods for assessing GER, ultrasound has also been used to diagnose this condition, especially in children and term babies. The sensitivity and specificity of ultrasound in the diagnosis of reflux in children are around 95 and 60%, respectively, and it has recently been shown that sensitivity can be increased by the use of color Doppler imaging. Several studies have compared pH monitoring with ultrasound exams in the diagnosis of GERD in children, giving different results [21].

A study by Manabe et al. [22] speculated that impaired salivary flow contributes to abnormal acid clearance in patients with erosive esophagitis (EE). For an easy and objective assessment of salivary function, we have developed a technique for measuring blood flow in the salivary glands using continuous wave Doppler sonography. In the present study, we assessed salivary secretory function in patients with EE and those with non-erosive reflux disease (NERD) using this method. An analysis of the Doppler waveform was performed in the facial artery to assess blood flow to the submandibular gland of 30 healthy subjects (HS). Blood flow was compared before and after secretory stimulation with 1 ml of lemon juice. Saliva was simultaneously collected and weighed before and after stimulation. Continuous wave Doppler sonography was also performed in patients with EE and NERD. The size of the submandibular gland was compared in 26 patients with EE, 41 patients with NERD and 86 in the control group. The blood flow of the submandibular gland increased after stimulation in all HS. Both the reproducibility in the day as in the day to day was good. There was a significant correlation between the percentage increase in maximum speed and the percentage increase in salivary secretion. Although the size of the sub-

mandibular gland was not significantly different between the three groups, the percentage increase in maximum speed in patients with EE was significantly less than in HS. What this study revealed is that a decrease in salivary secretory function is involved in the pathology of EE. Manabe et al.[22] , developed a new method to measure the blood flow of the submandibular gland by cephalometric Doppler sonography to assess salivary secretion. Using this method, we demonstrated that patients with EE had significantly less reactivity to salivary secretion after stimulation than HS.

Sakuno [23], in a dissertation presented to the Federal University of Santa Catarina, 76 compared US with SESD. They examined 102 children with clinical suspicion of GERD using SESD, US and US with Doppler. US proved to be more sensitive than SESD in detecting GERD (83.3% of US against 62.7% of SESD), with a high negative predictive value, close to 100% and the addition of Doppler to US did not having increased its sensitivity. Riccabona et al. [24] comparing US with pH metry found 100% sensitivity of 87.5% specificity, however its population was exclusively newborns and infants. Jang et al.[25] using US with Doppler also found a sensitivity of 95.5%, but a low specificity of 11.0% when compared to pH metry (figure 2).

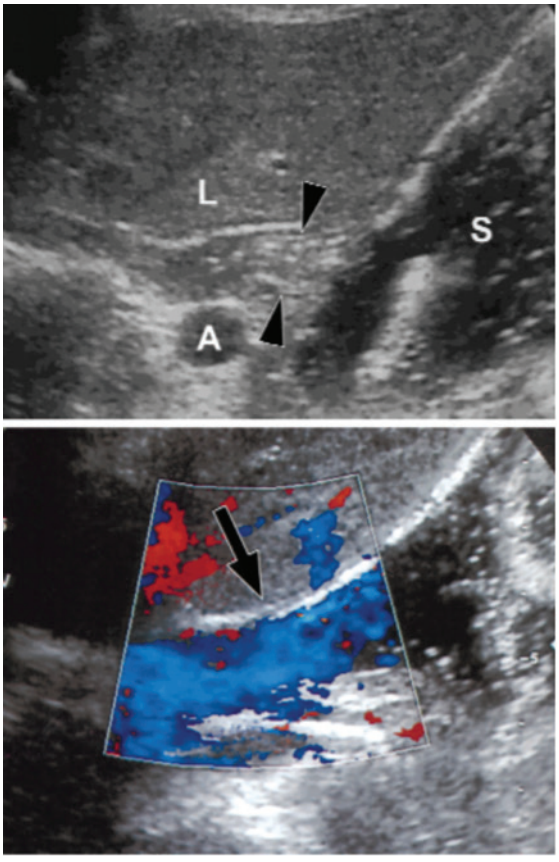

Figure 2. A - Longitudinal oblique ultrasound of the epigastrium shows the gastroesophageal joint (arrowheads). B - The blue color in the Doppler study illustrates a reflux episode (arrow) in the gastroesophageal junction. A = aorta, S = stomach, L = liver [25].

A comparison analysis of some articles that talk about sensitivity and specificity was carried out, as shown in the table below:

Autor	Sensibilidade	Especificidade
Pezzati et al., 2005	38%	100%
Sakuno T, 2002	87,5%	97,4%
Riccabona et al., 1992	100%	87,5% p <0,001.

A study by Pezzati et al. [21] (2005), showed that ultrasonography has low sensitivity in the detection of GER in premature infants and should not replace the 24-hour esophageal pH test as a definitive diagnostic tool. However, ultrasonography has a very high specificity and a 100% positive predictive value. In a study by Sakuno[23] ultrasonography was able to diagnose gastroesophageal reflux, its number and duration, adequately assessing the anatomy of the esophagogastric junction and accurately determining the length of the intra-abdominal esophagus and the angle of His. When compared to duodenal esophagogastric seriography, it has greater sensitivity and a high negative predictive value. Another study by Riccabona et al. [24] (1992), compared the ultrasound to pH metry and/or esophageal manometry to assess ultrasound accuracy in the early diagnosis of gastroesophageal reflux. Thirty children with an average age of 72 days (21-252 days) were studied. The results showed that the specificity of the ultrasound diagnosis was 87.5% and the sensitivity was 100% (with P <0.001). Ultrasonography has proven to be useful in providing both functional and morphological data, in addition to metric pH results.

CONSIDERATIONS

Doppler ultrasonography can be used as the procedure of choice in the investigation and control of GERD.

It is able to diagnose gastroesophageal reflux, its number and duration, adequately assess the anatomy of the esophagogastric junction and accurately determine the length of the intra-abdominal esophagus and the angle of Hiss.

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INFORMED CONSENT FORM: CONCEPTS THAT THE ULTRASONOGRAPHIST SHOULD KNOW

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ABSTRACT

OBJECTIVE: The goal is to present concepts about the informed consent form that are important to the medical daily practice.
METHOD: This is a narrative literature review about the informed consent form. The concepts discussed were selected from articles available freely online, legal doctrine books, Brazilian law, as well as guidelines and resolutions of the Federal Council of Medicine.
RESULTS: The practice or obtention of informed consent in the practice of medicine is typical of the last decades and characterizes the improvement of biomedical ethics. Brazilian legislation, guidelines and resolutions governing the doctor-patient relationship and informed consent form should be followed. However, there are no established rules that define the form of this term.
CONCLUSION: The validity of the informed consent form will depend on the professional to inform and clarify it, in addition to the willingness of the patient.

KEYWORDS: INFORMED CONSENT FORM; BRAZILIAN LEGISLATION; MEDICAL ETHICS; BIOETHICS; MEDICAL LAW

INTRODUCTION

Since ancient times, few and sparse reports and references of situations have been observed in which the patient was informed and enlightened about medical procedures that were indicated to him. There is also little mention of the doctor's consideration and importance given to the patient's willingness to comply with the recommended procedure or to refuse it.

In the 1950s, some major legal events took place in the United States, resulting in behavioral changes in the doctor-patient relationship. The expression informed consent came from the judicial decision in the Salgo v. Leland Stanford Jr. University Board of Trustees, in 1957.[1]

It is also observed that the most expressive ethical and legal documents were realized from the 1970s, coinciding with the fall of dictatorial regimes in Europe. Among these documents the following stand out: the Nuremberg Code (1947), the Belmont Report (1978), the Helsinki Declaration (1964) and the Universal Declaration of Human Rights (1948).

In the current reality, health professionals rely on both the Medical Code of Ethics and national legislation to better ensure patient autonomy.

The Code of Medical Ethics refers to the patient's informed consent on several occasions: it qualifies the patient's autonomy, in the choices related to medical care, as a fundamental deontological principle of medical ethics, and prevents the doctor from not obtaining consent of the patient, or his legal representative, after informing him about the procedure to be performed, except in case of imminent risk of death. [2]

Therefore, it is important to mention that the main cause of the litigation labeled as medical error comes from the unsatisfactory doctor-patient relationship, resulting from the professional's inability to provide adequate interpersonal communication and excel in good quality care. Today, this relationship tends to be impersonal, distrTFUSul, mutual and reciprocal. [3]

The elaboration of the informed consent form is an obligation of the health professional who will provide the service, being a medical act and not from the hospital, clinic or laboratory, where the patient will be informed about the benefits, risks of the procedures and medical treatments to which he will be submitted, which strengthens his confidence. [3]

What is certain is that, failing to do so, the professional can be characterized as an agent of bad faith, by guilt or intention, because only from the exact knowledge of what is offered to him, as well as the risks and benefits to which he will be submitted - it is that the patient agrees or not with the performance of the procedure, thus contemplating the bioethical principle of autonomy. [4]

It is worth mentioning that, the failure of the duty to in-

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form or to obtain consent, today, become the main point of the lawsuits against doctors in many countries. [5]

When dealing with an invasive procedure, especially those performed through interventional imaging, which can cause the patient, in addition to anxiety also discomfort, it is extremely necessary that the side effects listed in the medical literature are very well clarified[5], thus motivating doctors of the importance of learning and retraining through this article.

OBJECTIVE

To present concepts about the informed consent form which are important to the daily practice of sonographer doctors.

METHOD

This is a narrative literature review about the informed consent form. Articles available for free online access, books of legal doctrine, Brazilian legislation, as well as guidelines and resolutions of the Federal Council of Medicine were selected.

RESULTS AND DISCUSSION

The Federal Council of Medicine provided Recommendation 1/2016 to the medical class, which deals about obtaining consent in medical care, justifying the initiative to develop guidelines for doctors on the subject, by the following facts:

a) The evolution, development and expansion of the human rights catalog, remade based on the knowledge of the atrocities perpetrated during the Second World War, including experiments on human beings;[6]

b) Documents that support and stipulate guarantees, rights, duties and ethical references in relation to human beings;[6]

c) The four basic references of bioethics: the principles of (i) autonomy, (ii) non-maleficence, (iii) beneficence and (iv) justice;[6]

d) The guarantee of the dignity of the human person;[6]

f) The need to establish, for all health professionals and institutions, the fact that patients have rights, including to right to decide, freely and autonomously, after being sufficiently informed and clarified, about his submission to any therapy , clinical or surgical procedure that is recommended.[7]

Thus, informed consent has become a mandatory medical practice, equaling to the legal status of freedom, equality and human dignity, since it is a fundamental right of the patient. [8]

In the doctor-patient dialogue, the doctor will elucidate all information about the treatment to which the patient will be submitted, informing all the risks, side effects and consequences of the treatment. In addition, it is necessary for the doctor to not only report one treatment, but to provide information about other possible procedures or even for the patient to receive a second opinion.[10]

For the informed consent term to be complete, it is necessary that the patient obtains the right to choose the form of intervention based on the information received during the dialogue.[10]

The 1947 Nuremberg Court ruling specifically summarizes what the informed and voluntary consent term is, demonstrating that this is essential, since it is the means by which the patient exercises his right of choice after receiving all the information of the procedure he will undergo. [10]

Therefore, the informed consent form constitutes the patient's right to participate in the relevant decisions to his treatment and the physician must alert him about the benefits and risks of the procedure. [11]

Given the subjectivity of this relationship, the form becomes secondary to the real objective of the institute. However, in view of the need for documentary defense in a judicial process, the usual practice of requiring written forms in health institutions must be taken into account. [12]

Thus, taking into consideration the need for documentary evidence, the main characteristics are[13]:

a) Written - containing all written risks and benefits, not just containing the information "the patient was aware of all the risks and benefits ";

b) Understandable - understandable to the patient (to be clear, by the principle of information - without purely technical terms);

c) Informative - with risks and benefits of reaching the different cultures and social classes of patients;

d) Absence of addictions - free from any kind of deception, coercion, intimidation, threat, injury, simulation, error, etc. The term informed consent aims to protect: (i) human dignity, (ii) private autonomy, (iii) beneficence, (iv) non-maleficence and (v) justice; these principles should be used as molds in the physician's performance. [14]

The principle of autonomy is the essence of the informed consent form, since it prescribes respect for the legitimate autonomy of people, for their choices and decisions; these must be truly autonomous or free. Thus, in order to have autonomy, the person's free will is necessary, without defects or vices that may tarnish his will. [14]

The principle of beneficence, on the other hand, describes that the doctor must seek the best treatment without considering the personal manifestations of patients and the principle of non-maleficence implies doing only what is good for the patient. [15]

The term informed consent, from the perspective of the principles of human dignity and justice, aims to exercise the fundamental right to the physical and moral integrity of the person /patient. [15]

It is discussable, when the patient cannot speak for himself or is unable to understand the act to be performed, being the doctor obliged to obtain the consent of his legal guardians, whose name is the substitute consent.

The civil capacity defined as aptitude to perform acts of civil life is defined in articles 3 and 4 of the Brazilian Civil Code, which absolutely excludes minors under 16 years old and those with mental illnesses and in a relative way over minors that are16 and under 18 years old. In the absence of civilian capacity, it is necessary to obtain substitute consent

for the performance of medical procedures. The holder of this right varies according to the factual situation presented and not every kind of relationship gives such a prerogative. [16]

If the minor has been emancipated by his parents, by means of a public instrument or sentence of the judge, he will no longer depend on those responsible to consent. The minor's participation in obtaining consent must be encouraged. It is even suggested that the consent should be obtained in a playful way, with figures and comics, to exercise the better understanding of the patient. [17]

In other cases of disability, the participation of those involved should also be encouraged, based on the assessment of the degree of impairment of the patients' ability to understand.

Patients who, for any reason, have greater difficulty in understanding the information should receive more detailed explanations and adequate to their degree of understanding. The criteria for determining the ability to consent, or even to refuse, includes the assessment of the individual's ability to, upon receiving information, process them in order to understand the questions posed and rationally evaluate the possibilities presented, that is, evaluate values, understand risks, consequences and benefits of the surgical or therapeutic treatment to which he will be submitted. [18]

There may be situations in which the patient denies his consent to perform a certain medical procedure, with serious consequences for his health. In these cases, if there are doubts about his decision-making ability, the doctor should request a specialized evaluation. If the patient is capable to decide and denies consent, the doctor

must register his decision in paper; propose alternatives, if any; give the patient time for reflection; explain the prognosis and consequences; and finally, fill out a refusal form.

Regarding legislation, the following articles stand out:

a) Article 1 of the Federal Constitution: The Federative Republic of Brazil, formed by the indissoluble union of States and Municipalities and the Federal District, constitutes a Democratic State of Law and is based on: (...) III - the dignity of the human person. [19]

b) Article 5, item X, of the Federal Constitution: All are equal before the law, without distinction of any kind, guaranteeing to Brazilians and foreigners residing in the country the inviolability of the right to life, freedom, equality, security and property, in the following terms: (...)

X - intimacy, private life, honor and image of people are inviolable, ensuring the right to compensation for material or moral damage resulting from their violation. [19]

c) Article 15 of the Civil Code: No one can be constrained to undergo, at risk of death, medical treatment or surgical intervention. [20]

d) Article 6 of the Consumer Protection Code: Basic consumer rights are: (...) III - adequate and clear information about the different products and services, with correct specification of quantity, characteristics, composition, quality, incident taxes and price, as well as on the risks they present. [21]

e) Article. 22 of CFM Resolution no. 2.217/2018: The doctor is prohibited from: Failing to obtain consent from the patient or his legal representative after informing him about the procedure to be performed, except in case of imminent risk of death. [22]

f) Article. 24 of CFM Resolution no. 2.217/2018: The doctor is prohibited from: Failing to guarantee the patient the exercise of the right to freely decide on his person or his well-being, as well as exercising his authority to limit him. [22]

g) Article. 31 of CFM Resolution no. 2.217/2018: It is forbidden for the doctor to: Disrespect the right of the patient or his legal representative to freely decide on the execution of diagnostic or therapeutic practices, except in case of imminent risk of death. [22]

CONCLUSIONS

Therefore, consent to the medical act is the acceptance given by the patient to the professional who observes the above requirements. Thus, its validity will depend on the fulfillment of the professional's duty to inform and the clarification and will of the patient.

There is no specific form, in a specific law or in the Code of Medical Ethics, for informed consent in a general manner. This is based on the idea of providing contact between the professional and the patient, thus strengthening their relationship.

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