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UPDATE AND SCIENTIFIC IMPROVEMENT

Keeping its commitment to the promotion of scientific updating and improvement, SBUS holds, on October 22, 23, 26 to 30, the 25th Brazilian Congress of SBUS Ultrasonography and 17th International Congress of Ultrasonography of FISUSAL, both in the virtual format. The initiative will ensure the sharing and debate of current issues, in addition to contributing to the acquisition of knowledge and exchange of experiences among the participants of these renowned scientific events.

SBUS has also invested in conducting webinars, supporting and participating in conferences in the federates, thus ensuring the continued distance education of ultrasound physicians.

The Revista de Brasileira de Ultrasonografia – RBUS, traditionally known as Revista Azul, is an important result of these efforts, as it is the main tool for disseminating scientific research in USG in Brazil. You can also participate in these pages that share knowledge and help to enhance the value of Brazilian Ultrasonography.

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ORIGINAL ARTICLE

ULTRASONOGRAPHIC THYROID FINDINGS

VINICYUS HAMILTON RODRIGUES BARROS, ARIELA MULLER VIEIRA PARENTE

ABSTRACT

INTRODUCTION: Thyroid nodules are by far the most common disorder of the endocrine system. Epidemiological studies have indicated that approximately 5% of women and 1% of men residing in areas with sufficient iodine have palpable thyroid nodules.
OBJECTIVE: to evaluate the prevalence of thyroid nodules analyzed by ultrasound.
METHODS: This is a cross-sectional study carried out using thyroid ultrasounds performed from August to December 2019 at an SMS / GO unit.
RESULTS: 182 thyroid tests, 162 tests performed on women and 20 on men were analyzed. In the male age group, there is a tendency for normal examinations in the age group from under 30 to 50. In the range of 51 to 60 nodules, two (50%) and normal (50%) were found. From 61 to the largest, there is a tendency to nodules. In the age group of women under 30 years old, the prevalence is of normal exams, in the range of 31 to 40 years old, non-nodular changes, of over 51 the nodules smaller than 1 cm. For larger nodules, the range with the highest incidence is 61 to 70 years. Of the 162 women examined, the average age was 50 years old (10 to 95). Of these patients, 30 (18%) had normal thyroid and 6 (4%) underwent thyroidectomy. Some type of alteration had been found in 126 patients and the nodular alterations totaled 73, being 58 (36%) smaller than 1cm and 15 (9%) larger than 1cm. In 20 male patients, the mean age was 56 years (25 to 79). Of these nine (45%) were within normal limits. Some type of change in 11 (55%) patients and non-nodular changes totaled 6 (30%) and nodular changes in six, with four (20%) smaller than 1cm and two (10%) larger than 1cm.
CONCLUSION: The prevalence of thyroid nodules analyzed by ultrasonography in this population was 48%. Female patients have a greater tendency to develop nodules, mainly in the 61 to 70 years age group. It is also noticed that there is a relationship between increasing age and thyroid disorders.

KEYWORDS: THYROID, DIAGNOSIS, ULTRASOUND.

INTRODUCTION

Thyroid nodules are by far the most common disorder of the endocrine system. Epidemiological studies have indicated that approximately 5% of women and 1% of men living in areas with sufficient iodine have palpable thyroid nodules. However, at age 60, it is estimated that around 50% of the general population has at least one thyroid nodule[1].

Most thyroid nodules have benign features; therefore, ultrasound is an integral part of tracking[2].

Thyroid nodules and thyroid abnormalities are common findings in the general population. Ultrasonography is the most important imaging tool for diagnosing thyroid disease. In most cases, a correct diagnosis can now be made only on ultrasound, together with clinical findings and baseline thyroid hormone parameters[3].

Ultrasonography allows real-time identification of structures up to 2 mm in diameter, allowing the visualization of very small tumors of the thyroid and parathyroid glands. In the case of the thyroid, certain internal sonographic features of a nodule are clinically useful because they can correlate highly, but not perfectly, with histology, thus improving a management decision. These methods also allow estimates of global and regional blood flow to the thyroid[4].

Although many studies have analyzed the association between the characteristics of ultrasound imaging of nodules and the risk of thyroid cancer, most studies have limited their analysis to patients undergoing biopsy, but the adoption of uniform standards for the interpretation of thyroid ultrasound would be a first step to standardize the diagnosis, thus avoiding unnecessary treatments and tests[5].

Ultrasound classification serves to select nodules with a higher risk of malignancy for fine needle aspiration puncture. Nodules with benign sonographic characteristics have a positive correlation with cytology and pathological examination, therefore, they can be observed clinically[6].

The present study aims to assess the prevalence of thyroid alterations analyzed by ultrasonography.

METHODS

This is a cross-sectional study carried out from exams from August to December 2019.

All patients were included and separated into groups, female and male, stratified by age who underwent ultrasound examination in a unit of the municipal health department of Goiânia. All examinations were performed using a 7.5 MHz transducer, with the patient in the supine position and neck extended.

For ultrasonography, the classification proposed by Furla-

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netto et al.[7] was used. (1) normal; (2) non-nodular changes; (3) nodules smaller than 1cm; (4) nodules of 1cm or more and (5) patients that underwent thyroidectomy.

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

RESULTS

182 thyroid exams were analyzed, 162 exams were performed in women and 20 in men.

Aspect of USG	Absolute frequency	Relative frequency
Normal	30	18%
Non-nodular alterations	53	33%
Nodules < 1cm	58	36%
Nodules > = 1cm	15	9%
Thyroidectomy	6	4%
TOTAL	162	100%

Tabela 1 – Distribuição das Características ultrassonografias das tireoides de mulheres atendidas na SMS/GO, Goiânia, 2019.

Aspect of USG	Absolute frequency	Relative frequency
Normal	9	45%
Non-nodular alterations	5	25%
Nodules < 1cm	4	20%
Nodules > =1 cm	2	10%
Thyroidectomy	-	-
TOTAL	20	100

Tabela 2 – Distribuição das Características ultrassonografias das tireoides de homens atendidos na SMS/GO, Goiânia, 2019.

Aspect of USG	< 30	31 to 40	41 to 50	51 to 60	61 to 70	71 >
Normal	11(5)	2(9)	5(17)	8(17)	3(10)	1(8)
Non-nodular alterations	3(15)	11(50)	14(46)	14(31)	6(19)	5(38)
Nodules < 1cm	6(35)	8(36)	8(27)	19(41)	12(39)	5(38)
Nodules > =1 cm	-	0	2(7)	3(7)	9(29)	1(8)
Thyroidectomy	-	1(5)	1(3)	2(4)	1(3)	1(8)

Tabela 3 – Distribuição das Características ultrassonografias das tireoides em relação a faixa etária de mulheres atendidas na SMS/GO, Goiânia, 2019.

Aspect of USG	< 30	31 to 40	41 to 50	51 to 60	61 to 70	71 >
Normal	1(50)	1(100)	2(50)	2(50)	1(20)	2(50)
Non-nodular alterations	1(50)	-	2(50)	-	1(20)	1(25)
Nodules < 1cm	-	-	-	1(25)	2(40)	1(25)
Nodules > = 1cm	-	-	-	1(25)	1(20)	-
Thyroidectomy	-	-	-	-	-	-

Tabela 4 – Distribuição das Características ultrassonografias das tireoides em relação a faixa etária de homens atendidas na SMS/GO, Goiânia, 2019.

DISCUSSION

The ultrasound (US) is the main imaging modality for detecting, characterizing and monitoring thyroid nodules, in addition to evaluating the neck after thyroidectomy. A comprehensive examination of the thyroid US requires assessment of the size and morphological features of the thyroid gland; documentation of any nodules, including size, shape, echogenicity, and presence of suspicious features; evaluation of lymphadenopathy in stations I-VI; and providing recommendations for fine-needle aspiration biopsy (FNAB)[8].

The thyroid ultrasound is an excellent method for detecting nodules, with a sensitivity of approximately 95%, superior to other more sophisticated methods, such as computed tomography (CT) and nuclear magnetic resonance (NMR)[9].

In the age group of men, there is a tendency for normal exams in the age group under 30 to 50 years of age. In the range of 51 to 60, nodules were found in two (50%) and two were normal (50%). From 61 to older, there is a tendency to nodules.

In the age group of women younger than 30 years of age, the prevalence is normal exams, in the range from 31 to 40 years of age, non-nodular alterations, with nodules smaller than 1cm over 51 years old. For larger nodules, the range with the highest incidence is between 61 and 70 years of age.

According to the Brazilian Society of Endocrinology and Metabology, about 4-7% of women and 1% of men have palpable thyroid nodules, with nodules larger than 1cm, corroborating our findings. Kimura et al.[10] ultrasound studies show that this prevalence is even higher, ranging from 19% to 67%, with a higher incidence in women and elderly people. This is extremely important since the management of thyroid nodules is based on the fact that, although the vast majority represent benign lesions, it is necessary to exclude thyroid cancer, which occurs in 5% to 10% of cases. Rio et al.11 reveal that there is a higher risk of malignancy in men, with hypoechogenic nodules, with microcalcifications and inversely related to age, and that the TSH level is not an independent predictor of malignancy.

Of the 162 women examined, the mean age was 50 years (10 to 95). Of these patients, 30 (18%) had normal thyroid and six (4%) underwent thyroidectomy. Some type

of alteration was found in 126 patients and nodular alterations totaled 73, 58 (36%) smaller than 1cm and 15(9%) larger than 1cm.

In 20 male patients the mean age was 56 years (25 to 79). Of these, nine (45%) were within the normal range. Some type of alteration was found in [11] (55%) patients and non-nodular changes totaled six (30%) and nodular changes four (20%) smaller than 1cm and two (10%) larger than 1cm.

Cavallo et al, when evaluating 1003 nodules from 659 patients, found that 26% were malignant. Nodules <2cm had the highest malignancy rate (30%). The risk was similar (± 20%) for nodules ≥2cm. Decreasing rates of malignancy were observed with increasing size (57% for nodules <1cm to 20% for nodules >6cm). In slices with ultrasound size of 2-5cm, smaller nodules had higher rates of malignancy than larger nodules, so the size of thyroid nodules is inversely related to the risk of malignancy, as larger nodules have lower rates of malignancy[2]. Therefore, follow-up should be done in patients with smaller nodules. In 992 patients, followed up for five years, they observed that 15.4% of the nodules had grown (increase of two diameters ≥20%); 18.5% decreased in size; and only 0.3% (5) of the nodules were malignant. This indicates that the treatment of asymptomatic patients is unnecessary[3] thus revealing the importance of clinical monitoring of these patients. Nodules larger than 1cm should always be evaluated and nodules smaller than 1cm should be evaluated if they present ultrasound characteristics suggestive of malignancy[9].

It is also perceived that there is a relationship between increasing age and thyroid alterations, therefore, thyroid ultrasonography requires experience and understanding of thyroid anatomy and pathology. It cannot be ideally performed by a technician who simply takes pictures and then sends the photographs off for later interpretation. The thyroid ultrasonographer must master thyroid palpation, anatomy and pathophysiology and must have special training in ultrasound procedures, meticulous attention to detail and adequate time to perform a complete examination[4].

Rahal Junior et al.[12] recommends to the ultrasonographer that the TI-RADS classification be performed to avoid unnecessary fine needle aspiration puncture and to help in decisions about when it should be done. This classification is known to improve communication and reduce confusion between physicians and patients.

CONCLUSION

The prevalence of thyroid abnormalities analyzed by ultrasound in this population was 48%.

Female patients have a greater tendency to develop nodules, especially in the 61 to 70 year age group.

It is also perceived that there is a relationship between increasing age and thyroid alterations.

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CASE REPORT

INTRAMUSCULAR HEMANGIOMA – AN UNUSUAL INJURY OF THE GLUTEUS MUSCULATURE – CASE REPORT

MÁRCIO LUÍS DUARTE[1]; FERNANDO DA SILVA XAVIER[3,4]; JOSÉ LUIZ MASSON DE ALMEIDA PRADO[1,3]; LUIZ CARLOS DONOSO SCOPPETTA[4]

ABSTRACT

Hemangiomas are benign vascular neoplasms characterized by an abnormal proliferation of blood vessels that most often occur in the skin or subcutaneous tissue, followed by the deep tissues and, occasionally are intramuscular and rarely within a bone. Hemangiomas are the most common benign soft-tissue tumor of infancy and childhood comprising 07% of all soft tissue tumors. Intramuscular hemangiomas account for 0.8% of all hemangiomas, growing in size slowly, but never metastasize. Although they affect all age groups, they are more common in young adults and may occur in any muscle. We report the case of a 23-year-old patient with thigh pain for three months.

KEYWORDS: HEMANGIOMA; THIGH; MUSCLE, SKELETAL; MAGNETIC RESONANCE IMAGING; ULTRASONOGRAPHY

INTRODUCTION

The word hemangioma comes from the Latin words "hemangio" which means blood vessel and "oma" which means tumor with cell division activity.[1] Hemangiomas are benign vascular neoplasms characterized by an abnormal proliferation of blood vessels that occur most frequently in the skin or in the subcutaneous tissue, followed by deep tissue, and occasionally intramuscularly and rarely within the bones.[2-6]

Hemangiomas are the most common benign soft tissue tumors in childhood, comprising 7% of all soft tissue tumors.[2-6] Intramuscular hemangiomas account for 0.8% of all hemangiomas, growing slowly in size but never metastasizing and despite affecting all age groups, they are more common in young adults and can occur in any muscle.[1,2-4,6-8] Their growth can be accelerated with trauma - 17% of cases, but they can regress spontaneously. [3,4] A sudden increase in size when taking oral contraceptive pills has also been reported.[4] Its malignant transformation is rare and may be accompanied by bone atrophy as well as reactive bone changes.[3,6]

Histologically, soft tissue hemangioma can be classified into five types: capillary, cavernous, arteriovenous, venous, and mixed hemangioma.[5,6] Capillary hemangiomas are more common in muscle than in cavernous and compound types.[2] The etiology is unclear , but possibly of congenital origin.[2,6,8]

CASE REPORT

23-year-old woman with pain in her right thigh for three months, without other complaints or other pathologies. On physical examination, the patient has no movement limitations or lameness during gait. Ultrasonography demonstrates a heterogeneous and partially defined nodular formation in the gluteus medius muscle (Figure 1).

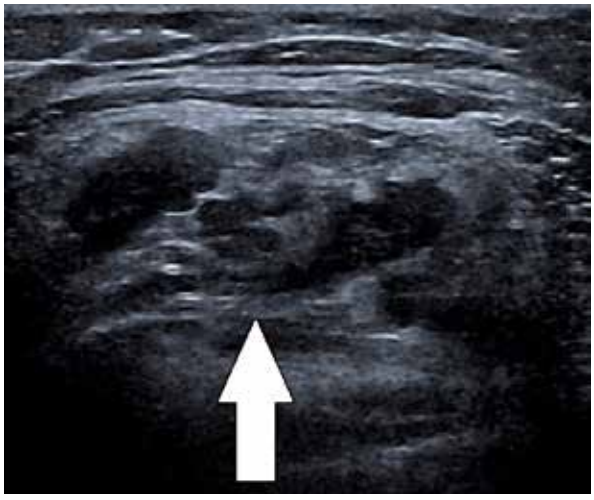

Figure 1: Ultrasonography showing a heterogeneous and partially defined nodular formation in the right gluteus medius muscle (white arrow).

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Magnetic resonance imaging (MRI) demonstrates irregular intramuscular expansive formation in the right gluteus medius, with mildly high signal on T1, high heterogeneous signal on T2 with intense contrast enhancement, compatible with intramuscular hemangioma (Figures 2 and 3).

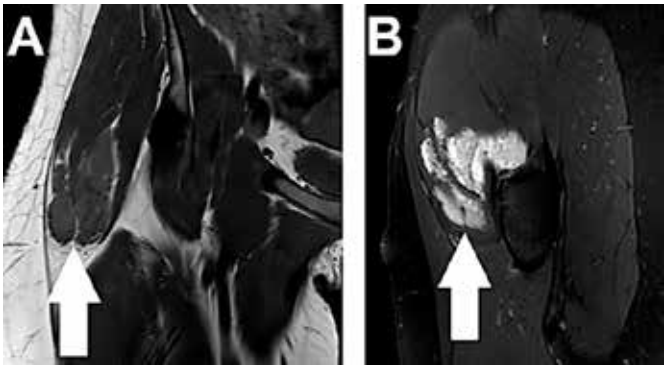

Figure 2: In A, MRI in the coronal section on the T1 sequence and in B, the MRI in the sagittal section in the T2 SPIR sequence demonstrate irregular intramuscular expansive formation in the right gluteus medius (white arrow).

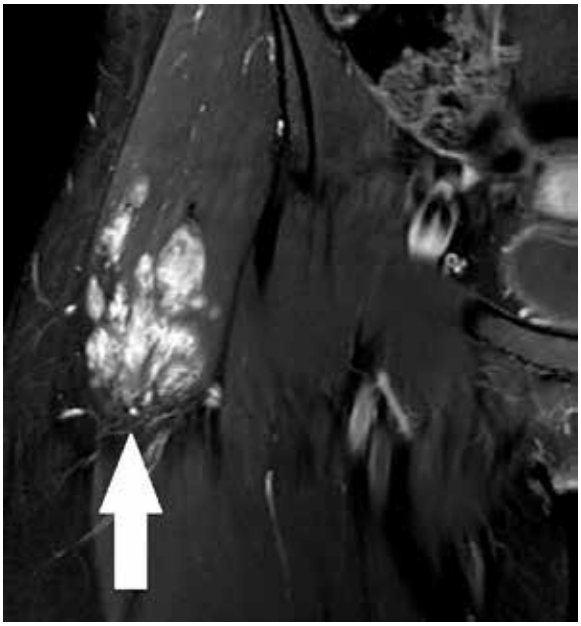

Figure 3: Contrast-enhanced coronal MRI scan on T1 FAT SAT sequence demonstrates irregular intramuscular expansive formation in the right gluteus medius with intense contrast enhancement, compatible with intramuscular hemangioma (white arrow).

DISCUSSION

It is estimated that 90% of intramuscular hemangiomas occur before the third decade of life and there is a general consensus that women are more commonly affected than men, and may increase in size during pregnancy.[1,2,5-8] Tumors they range in size from less than 4cm to more than 20cm, but most are less than 9cm in diameter.[7]

Because they are located in the muscle, hemangiomas usually do not present visible signs, although some may cause edema in the tumor area, which increases with activity and may be pulsatile and present a murmur - arteriography is indicated in these cases[2-4,8] Pain it is a cardinal symptom in 60% of cases, with the lower limb being the most common site of involvement (42-45%), with the quadriceps being the most frequently affected muscle.[1-3,8]

Patients usually present with an elevated tumor with 50 to 60% pain, along with symptoms of pressure.[1,2] Complications of hemangioma include functional impairment, necrosis of overlying skin, bone erosion, entrapment of vessels and nerves, heart failure, thrombocytopenia and consumptive coagulopathy (Kasabach-Merritt syndrome).8 Hemangiomas are diagnosed by physical examination, plain radiographs, Doppler ultrasound and MRI.[1,2]

Plain radiography may show foci of calcification - 25% of cases, which are highly suggestive of hemangioma.[2,3,8] The Swiss cheese pattern of ossification is seen as ill-defined ossification with coarse trabecular pattern on plain radiographs, whereas phlebolite presents hyperdensity round or well-defined oval, characteristically with central lucent.[7] Angiography is useful to delineate if there is a nourishing vessel that can be embolized.[3]

In intramuscular hemangiomas, color Doppler ultrasonography is useful exclusively to demonstrate vascular structures around the muscle and to assess pathological changes such as fibrosis and to detect calcifications.4 Color Doppler ultrasonography demonstrates a well-defined hypoechoic mass with heterogeneous echotexture. [4]

An MRI is important for the characterization and extension of soft tissue hemangioma and is the method of choice.[3,6,8] On T1-weighted images, the hemangioma has a low to intermediate signal intensity mass, with high signal intensity peripheral due to fat.[2,4,8] On T2-weighted images, it presents areas of high signal due to vascular tissue and intermediate signal intensity due to fat.2,4,8 Contrast-enhanced MRI shows serpentine enhancement of lesions.[5,7] The presence of lobulation, septation, and nodular hypointense foci on T2-weighted images facilitates diagnosis.6 As imaging is often diagnostic for soft tissue hemangiomas, biopsy is not necessary.[5]

The treatment of choice is complete excision of the lesion.4 There is a recurrence rate of 9-28% after surgical excision.2,4 Sclerotherapy has a role in the management of intramuscular hemangioma when excision is not possible.4

CONCLUSION

Patients with palpable masses on physical examination require further investigation for diagnosis. In these cases, the hemangioma must be remembered and investigated, because the biopsy can cause extensive bleeding and the diagnosis can be made only with imaging exams.

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CASE REPORT

VOLAR GLOMUS TUMOR – DIAGNOSTIC ULTRASOUND OF A RARE ENTITY – CASE REPORT

SIDEVAL TEIXEIRA PONTES

ABSTRACT

Glomus tumors are rare benign perivascular lesions and symptoms are disproportionate due to his size. They are characterized as hamartomatous proliferation with origin in the glomic bodies that are neuromyoarterial structures and are responsible for regulating the capillary flow in response to temperature changes. They match with less than 2% of all primary soft tissue tumors and 1% to 5 % of all tumors of the hand.
The clinical criteria are based on paroxysmal pain, local hyperalgesia and cold hypersensitivity. Thus, these criteria delay among 4-7 years to be determined, the imaging examinations are utilized as complementary diagnostic techniques.

KEYWORD: GLOMUS TUMOR, DIAGNOSTIC, ULTRASOUND, VOLAR, RARE.

INTRODUCTION

Glomus tumors are rare benign perivascular lesions that are difficult to diagnose due to their size.[1,4] Characterized by hamartomatous proliferation originating from the glomus bodies, which are neuro arterial structures responsible for regulating the flow in the skin microvasculature in response to changes in temperature.[2,3]

Correspondem a menos de 2% dos tumores primários de partes moles e de 1% a 5% de todos os tumores da mão. Acomete adultos jovens entre a quarta e a quinta década de vida tendo predileção pelo sexo feminino sendo sete vezes mais frequente que no sexo masculino.[5]

They account for less than 2% of primary soft tissue tumors and 1% to 5% of all hand tumors. It affects young adults between the fourth and fifth decade of life, with a predilection for females, being seven times more frequent than for males.[5]

Clinically, the cardinal sign is local hyperalgesia. The clinical picture presents the triad of paroxysmal pain, local hyperalgesia and hypersensitivity to cold, however the clinical triad has a sensitivity of 50-90% and takes between 4-7 years to be determined. As the clinical criteria have low sensitivity, we resorted to imaging methods for diagnostic complementation.

Its treatment is complete surgical excision 2,5 and subsequent confirmation by histopathological study of the specimen.[7] Differential diagnoses include hemangioma, mucous cyst, osteochondroma, neurilemoma and neuroma, among others.[5,7]

CASE REPORT

A 56-year-old female patient complaining of pain in the digital pulp of the left fifth finger, the ultrasound examination was performed with a portable ultrasound device, SAEVO, model EVUS [5], with a high-resolution L7 linear transducer (4-16Mhz), which demonstrated a hypoechoic oval image with well-defined regular contours and irregularity of the volar bone surface of the distal phalanx (figures 1-4).[2,3]

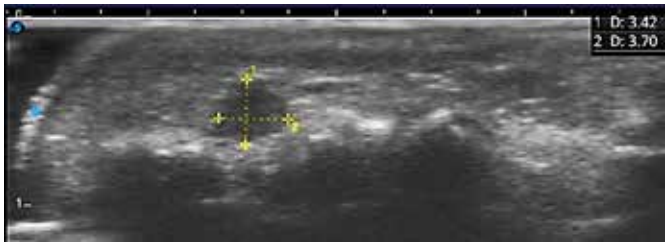

Figure 1: USG in the longitudinal section where we visualize an oval, hypoechoic image and irregularity of the bone surface.

Figure 2: USG in cross section.

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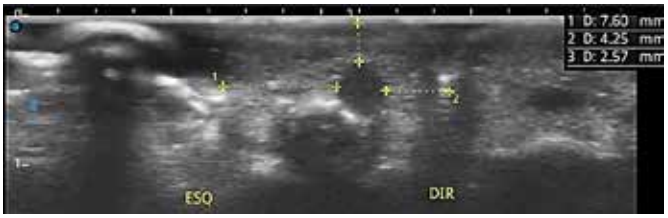

Figure 3: Cross-sectional USG marking distances relevant to anatomical structures.

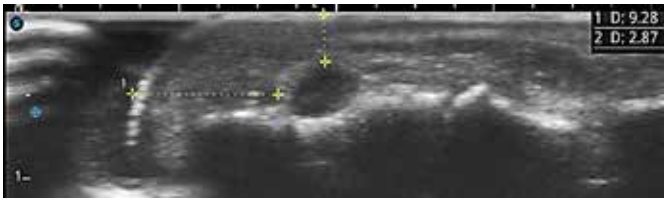

Figure 4: Longitudinal USG marking distances relevant to anatomical structures.

Referred to surgery where complete excision of the tumor was performed (figures 5 and 6), later referred to histopathology in which the diagnostic impression was confirmed.[7] After the surgical procedure, the patient reports complete resolution of symptoms.

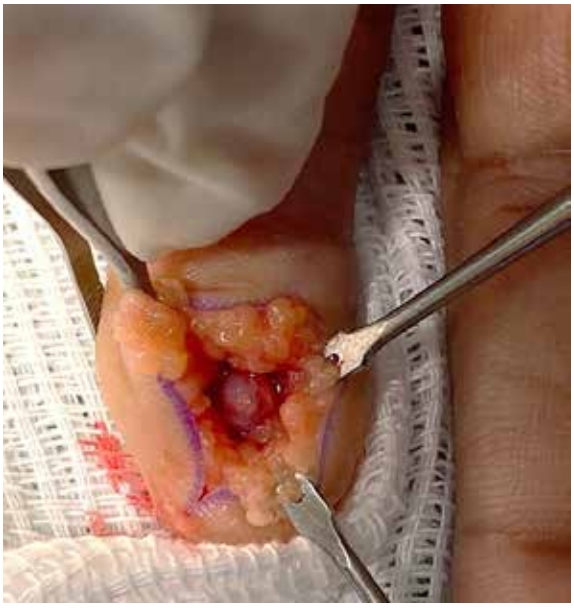

Figure 5: Macroscopic aspect of the tumor during surgery.

Figure 6: Macroscopic aspect of the tumor after excision prior to referral to histopathology.

DISCUSSION

Glomus tumor is an uncommon entity with subungual predominance and its presentation in the region of the digital pulp is even more rare.[4,8] Complementary diagnostic exams such as plain radiography do not provide significant findings, in turn, magnetic resonance (MRI) has good specificity and sensitivity at high cost and morbidity from the use of contrast.

Ultrasonography has great advantages and diagnostic reliability and a non-ionizing method. It allows three-dimensional localization, performing a dynamic study in both axes and verifying the characteristics of the contours, echogenicity, bone surface irregularities, mobility, positivity at the Doppler of the lesion, dimensions and pertinent distances from the lesion to anatomical structures (figures 3 and 4).[1, 2,3]

CONCLUSION

The use of high-resolution ultrasound as a diagnostic tool demonstrates an important role in providing high sensitivity and specificity with greater safety and less cost than MRI, being effective in detecting lesions smaller than 2mm in its shortest axis, aiding in surgical planning; providing accurate three-dimensional location of the tumor lesion.

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ORIGINAL ARTICLE

ECHOGRAPHIC FINDINGS IN FETUS WITH TURNER SYNDROME - A CASE REPORT

TÁBATA DE O. SILVA, CARLOS EDUARDO L. DE S. CRUZ, JOÃO PEDRO C. CORREIA, PAULA DE O. SILVA, JOBE PETTER

ABSTRACT

Turner Syndrome (TS) is the congenital hypoplastic ovarian syndrome that occurs in the absence or partiality of the X chromosome and by instability of the Y chromosome, which causes loss during meiosis. Diagnosis by ultrasound examination in the 1st and 2nd trimester is essential to identify phenotypic changes and associated complications with the pathology, such as those seen in the current case.

KEYWORDS: TURNER SYNDROME, FETAL MEDICINE, CHROMOSOMAL DISEASE, NUCHAL TRANSLUCENCY, ULTRASONOGRAPHY

INTRODUCTION

Turner syndrome is an anomaly with partial or complete loss of the X chromosome, which is more common in fetuses of women younger than 35 years (about 3% of all). The phenotypic severity occurs according to the dimension of the X chromosome loss, and it can affect several systems such as the skeletal, cardiovascular, lymphatic, endocrine, gastrointestinal, renal, auditory, visual and central nervous systems. This is the only monomeric syndrome in which humans can survive. The mortality rate is higher than that of people without this change due to its correlation with cardiovascular changes and autoimmune diseases. [1, 2]

Cardiovascular complications (mosaicism 45, X) occur in about 41% of patients, the most common being cardiac valve disease and bicuspid aortic deformity, but patients with TS may present with partial anomalous pulmonary connection and persistent left superior vena cava. Furthermore, abnormalities in electrical physiology such as QT prolongation, T wave alteration and increased atrioventricular conduction are observed. It is important that these are monitored by a cardiologist through echocardiography and electrocardiography, respectively. [3] It is also related to other diseases that can lead to thyroiditis (in approximately 3.2% of cases), colitis, celiac disease, type 1 diabetes and psoriasis. [1, 4]

The incidence ranges from 1:2500 to 1:3000 live-born girls due to the high frequency of miscarriages. About 70% of cases of Turner syndrome diagnosed in the 2nd trimester will result in miscarriages between the 16th week and term. The 45,X karyotype is seen in 1% of stillbirths, about 10% of miscarriages, and 2% of live births. [1, 4]

The 45, X karyotype is associated with more abnormality and is the most severe phenotype, in which of women the X chromosome is of maternal origin. 45 X / 46 XY TS mosaicism has a higher risk for promoting gonadoblastoma (a rare neoplasm in the GBY critical region), whereas the Xq isochromosome is a structural change that is associated with autoimmune diseases and deafness. The 45 X/ 46 XX karyotype is the least severe phenotype. [4]

With regard to clinical manifestations, the main evidence is short stature (PAR1 gene located on the short arm of the X chromosome) in which final height is between 143 and 147 cm, as well as short neck, high arched palate, wide chest, dysplasia of the nails, genu valgum, premature ovarian failure (due to haploinsufficiency of a gene, which may be ZFX or DFFRX) and renal abnormalities (double collecting system or absence of kidney), skeletal (vertebral hypoplasia that contributes to short stature , short neck and scoliosis), metabolic (hypothyroidism), lymphedema (present in fetuses with mosaicism 45, X) and inflammatory gastrointestinal disease that have a high risk of developing Crohn's disease and ulcerative colitis (about twice as much). [1, 4, 5]

We present a case of intrauterine chromosomal diagnosis, and the respective phenotype, both in the first trimester screening and in the 2nd trimester morphological study.

CASE PRESENTATION

A 25-year-old female patient underwent ultrasound screening for first trimester chromosome disorders at 12 weeks and 3 days. The examination was performed by a physician specialized in diagnostic imaging using equipment with a convex volumetric transducer via the transabdominal route, following the standard proposed by the Fetal Medi-

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cine Foundation.

At 23 weeks and 2 days, the 2nd trimester morphological study was carried out with the same medical specialist and equipment.

IMAGE FINDINGS

The images from the first trimester exam show Nuchal translucency (NT) measuring 7mm, unidentified nasal bone, ductus venosus with IP of 0.99 (> 95th percentile), no pathological tricuspid regurgitation and heart rate of 170 beats per minute (bpm) . (Figures 1 to 3).

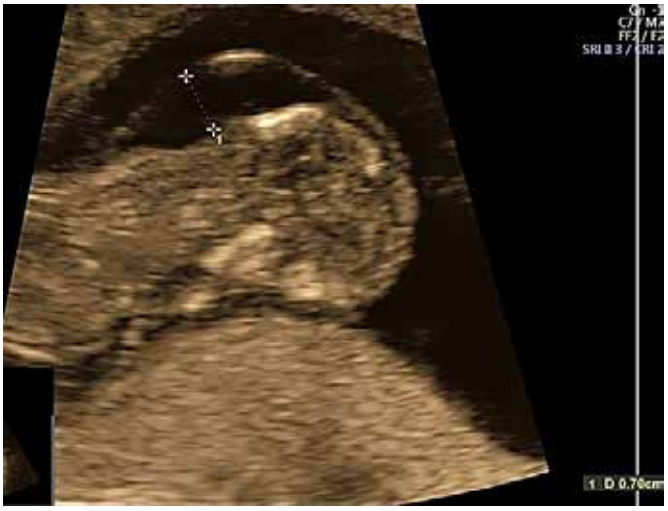

Figure 1 - Chromosomal markers: unidentified nasal bone and 7 mm increased nuchal translucency.

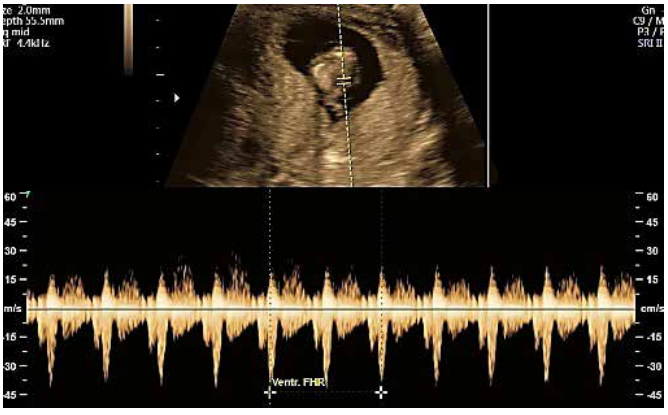

Figure 2 - Fetal heart rate of 170 beats per minute (bpm).

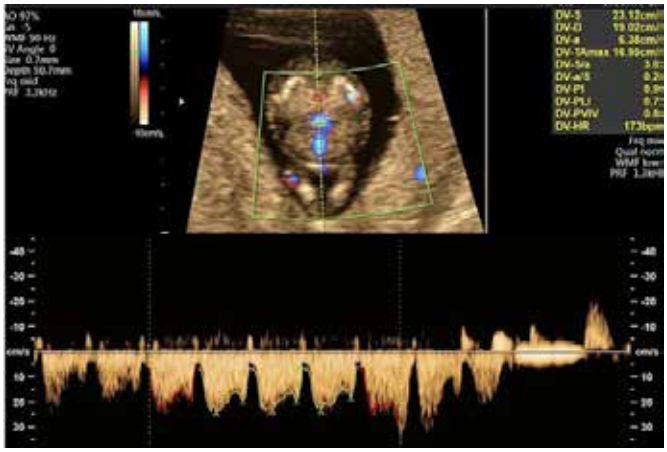

Figure 3 - Duct venosus with "A" wave present and Pulsatility Index (PI) of 0.99.
Karyotype research was performed in amniotic fluid and 45,X was detected in all analyzed cells.

The morphological images of the second trimester show Cystic hygroma, generalized edema, pleural effusion, enlargement of the right chambers of the heart, bilateral renal hypoplasia and hyperechogenicity, bladder very little full and bilaterally framed by the respective umbilical arteries, and anhydramnios. (fig. 4 to 9)

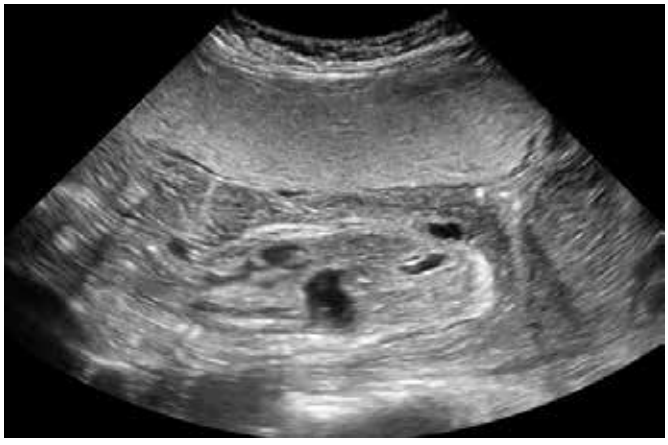

Figure 4 - Second trimester ultrasound at 23 weeks and 2 days, performed in a longitudinal situation, breech presentation, posterior dorsum, anhydramnios

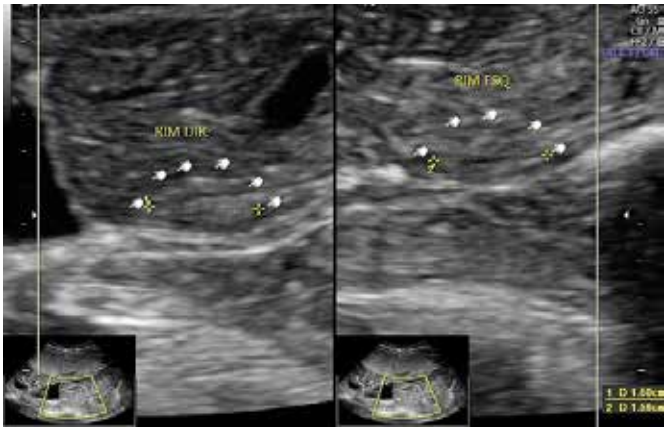

Figure 5- Images of the kidneys with increased echogenicity and decreased dimensions.

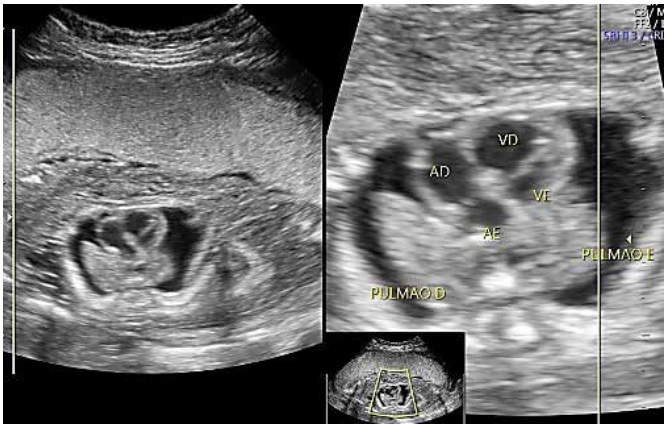

Figure 6 - 4-chamber view showing dominant right chambers and bilateral pleural effusion.

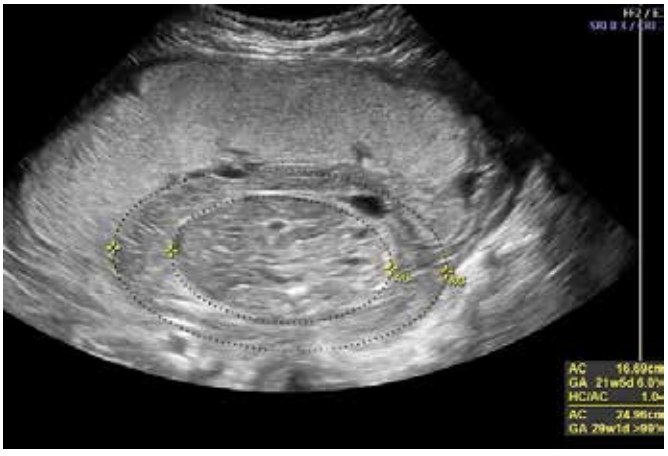

Figure 7 – Plan of the abdomen with anasarca and it is not possible to identify the gastric bubble.

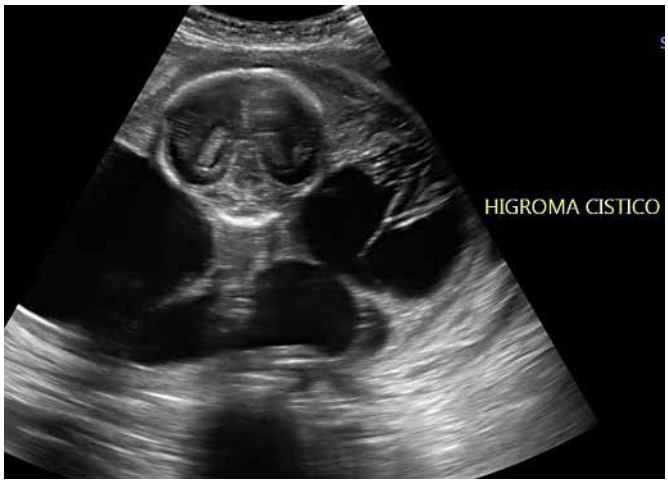

Figure 8 - Large cystic hygroma.

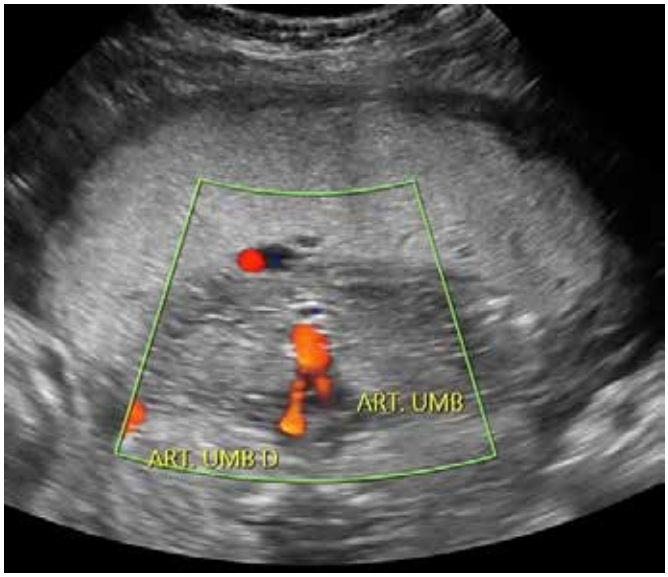

Figure 9 – Virtually empty bladder framed by the umbilical arteries.

DISCUSSION

The diagnosis of TS occurs during the prenatal examination using ultrasound or by signs of lymphedema or congenital heart disease. It is also necessary to perform a complete analysis of the karyotype to have a correct diagnosis of the pathology. [1]

Transvaginal echocardiography in the 1st trimester is a useful method to determine early-stage fetal cardiac alterations, but this method is not easily accessible for the entire health system, as it requires high-quality equipment often found only at the tertiary level of care. [6]

In the 1st trimester ultrasound, the characteristics that can favor the diagnosis of TS are: short femur, narrow aortic arch, cardiac defects on the left side (coarctation of the aor-

ta). [7] Screening is performed by neural tube defects, maternal serum alpha-fetoprotein, high levels of HCG, low levels of estriol, and detection of acetylcholinesterase in amniotic fluid. Ultrasound tracking is done by measuring NT between 10 and 14 weeks of gestation. [2,8,9,10]

Other criteria that favor the diagnosis are the measurement of the crown - rump length (minimum of 45 mm and maximum of 84 mm), the analysis of the ductus venosus to verify the pattern of the pulsatility index above the 95th percentile for gestational age and the karyotyping by chorionic villus biopsy (repeat postnatally for confirmation), which can be performed in the presence of a clinical feature such as cystic hygroma or fetal hydrops. [8.10]

The use of molecular methods will quantify the polymerase chain reaction (PCR) genes by identifying the sites that are occurring specific CpG methylation to inactivate the X chromosome. Fluorescent in situ hybridization (FISH) test can be considered in virilized girls and when the Y chromosome was not displayed by standard karyotype analysis. Other confirmation methods are sequencing technologies such as genomes, exomes and the genetic panel [1, 10] .

In the first trimester, cystic hygroma is relatively associated with fetal autosomal aneuploidy [5, 6]. In the second trimester, this finding tends to be associated with TS, manifesting itself through generalized edema, pre-ductal aortic coarctation and decreased number of lymphatic vessels.[2]

Ultrasound findings are frequent in fetuses with TS, being much more frequent in non-mosaic cases (92 x 55%). The most common structural anomalies are: cystic hygroma; non-immune hydrops; severe subcutaneous edema; cardiac alterations (the most frequent ones are predominance of the right heart and coarctation of the aorta); and genitourinary alterations (mainly those related to the kidneys). [7]

CONCLUSION

Prenatal ultrasonography is the main screening tool for the diagnosis of TS even with the incorporation of other tests in routine clinical practice, the high sensitivity and specificity associated with the low cost and easy access of the exam makes it the first choice for prenatal screening. The documented findings and their severity are compatible with the karyotype and those described in the literature. The case progressed to fetal death.

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A CASE REPORT

ECOGRAPHIC DIAGNOSIS OF FOURNIER GANGRENE - A CASE REPORT

CARLOS EDUARDO L. DE S. CRUZ, JOÃO PEDRO C. CORREIA, PAULA DE O. SILVA, TÁBATA DE O. SILVA, JOBE PETTER

ABSTRACT

Fournier's gangrene is a disease classified as a soft tissue necrotizing infection. In fact, it is a rare and fatal disease. It must be effectively diagnosed within the emergency department and referred for treatment as soon as possible to avoid unfavorable outcomes. The present paper aims to describe a case of Fournier gangrene, showing the usefulness of ultrasonography for the diagnosis and management.

KEYWORDS: FOURNIER'S GANGRENE, NECROTIZING FASCIITIS, SONOGRAPHY, SCROTUM, DIABETES MELLITUS, DIABETES COMPLICATIONS.

INTRODUCTION

The term Fournier's gangrene (FG) refers to a necrotizing infection that extends to the perianal and genital area[1]. This infection mainly affects men, with only 4 to 10% of cases in female patients[2].

This infectious process usually starts in the genitourinary tract, expanding quickly and can cause organic dysfunctions throughout the body[3]. FG is a polymicrobial infection, the main microorganisms found in infectious sites and affected sites are: *Escherichia coli*, *Bacteroides and Streptococci*, *Staphylococcus*, *Enterococcus*, *Clostridium*, *Pseudomonas and Proteus*. This synchronous activity between the anaerobic and aerobic microbiota enables an exponential growth and rapid spread of the infection[3].

The diagnosis is most often obtained from the physical examination associated with the clinical history, and laboratory and imaging tests can be used in the management of these patients[2]. Despite that, FG can be confused by several scrotal and pelvic pathologies of necrotizing character, thus, imaging exams can be very useful in the management of these patients, since delays in diagnosis result in a mortality of up to 88%[4].

CASE REPORT

Male, 54 years old, with pain and testicular edema for three days, associated with fever. He has type 2 diabetes mellitus and arterial hypertension, taking metformin and enalapril. On physical examination with hyperemia and increased scrotal volume associated with crepitation. White blood cell count with 20 thousand total leukocytes. Ultrasound (US) confirmed scrotal and perineal wall edema associated with subcutaneous emphysema, in addition to showing atrophy of the left testicle (figures 1 to 5). The clinical and echographic findings are compatible with Fournier's gangrene, which was confirmed by surgery. He had a good evolution with the use of antibiotic therapy and surgical debridement.

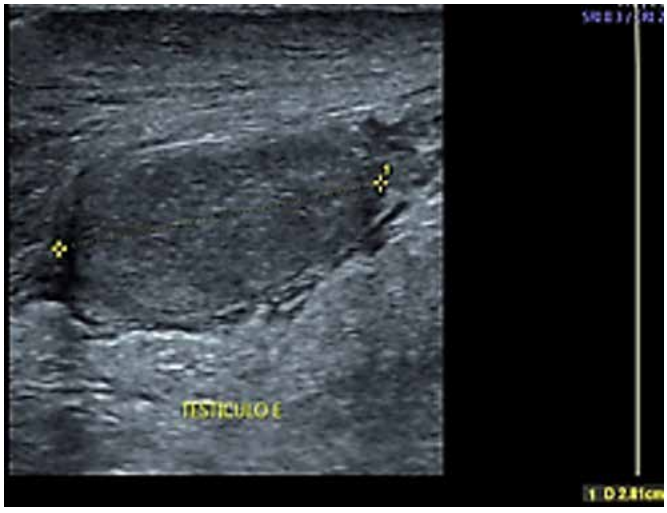

Figure 1: Left testicle with reduced volume and thickening of the scrotal sac walls

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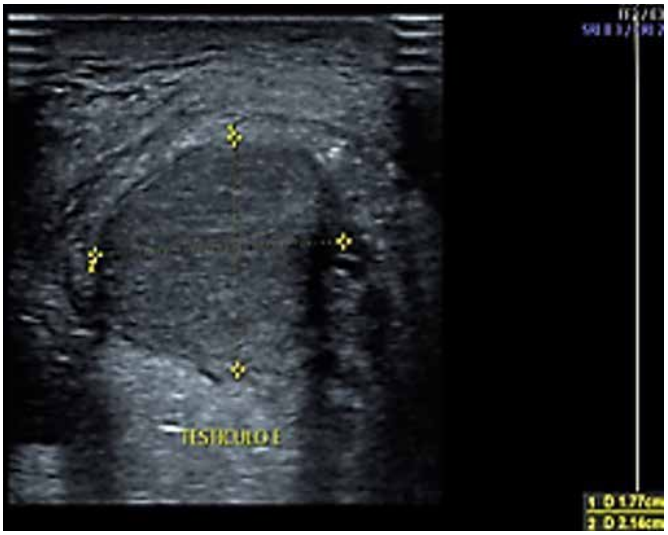

Figure 2: Left testicle with reduced volume and thickening of the scrotal sac walls.

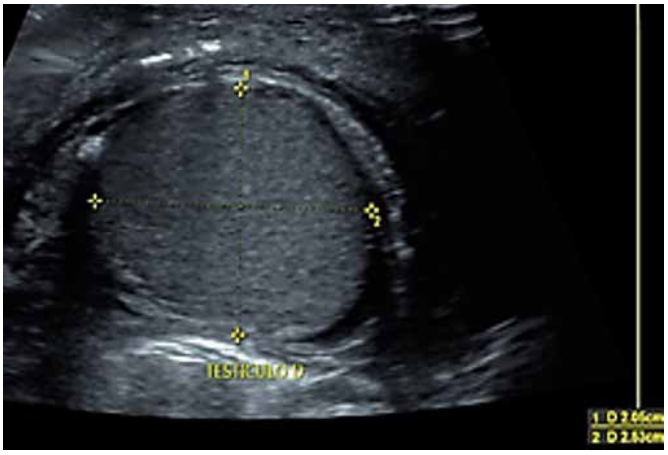

Figure 3: Right testicle without volume changes, scrotal wall edema and subcutaneous emphysema.

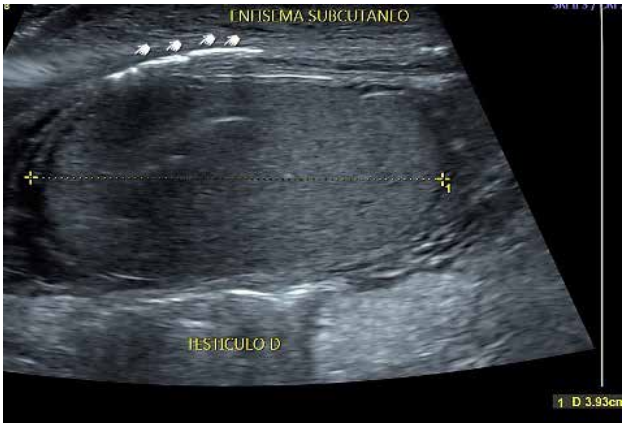

Figure 4: Right testicle without volume changes, scrotal wall edema and subcutaneous emphysema.

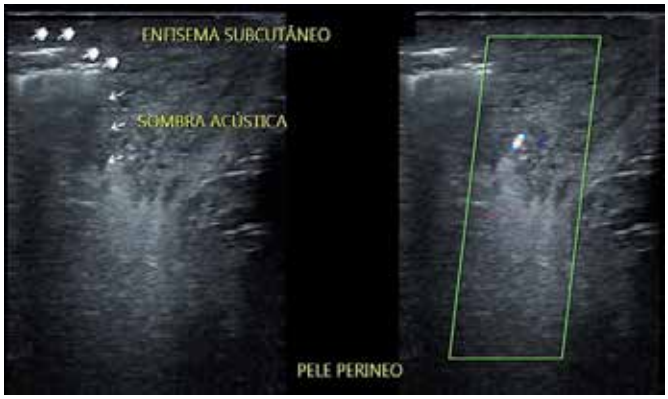

Figure 5: Subcutaneous edema and emphysema (gas) in the perineum

DISCUSSION

FG presents with fever and lethargy as signs of the prodrome phase of the disease. Symptoms can evolve with pain in the intense region of the genital region, associated with increased sensitivity and signs of edema, which can appear between two and seven days, the final phase of the infection is marked by a subcutaneous cracking and skin darkening that, when evolving it arrives in gangrene and necrosis itself[2].

It is a condition that mainly affects male patients, between 50 and 60 years of age, and has an average incidence of 1.6 per 100,000 men. Although the diagnosis is essentially clinical, imaging tests are used in many cases as tools for confirming cases with ambiguous clinical features, to investigate an underlying etiology and understand the extent of the infection[5].

US allows the visualization of soft tissue inflammation, collections, abscesses and subcutaneous emphysema, among the findings we can find perineal tissue thickening caused by inflammation and edema, acoustic shadow caused by subcutaneous gas resulting in the "snow globe" sign and "dirty shadow" caused by the hyperechoic focus. Doppler can be extremely important to assess the vascular supply of the testicle[1]. It is important to differentiate the emphysematous hyperechoic focus, which is external to the testicle, from a possible testicular microlithiasis or tumor calcifications that appear within the testicular area[5]. All of these ultrasound findings demonstrated a specificity of up to 93% and a maximum sensitivity of 88%[1].

Compared with other diagnostic modalities, US has a much higher sensitivity than conventional radiography, which is (49%) and similar specificity (94%). US performs very similarly to computed tomography (CT) with high sensitivity (88.5%) and specificity (93%), evidencing findings such as fluid collections, abscesses, asymmetric thickening of fascias, blurring of adjacent fat and subcutaneous emphysema[4]. CT still manages to assess superficial and deep fascias, allowing the search for differential diagnoses that present with edema, erythema and cellulitis, due to less aggressive entities than FG[5]. Eventually, the use of magnetic resonance

imaging (MRI) may be indicated due to its greater sensitivity (100%) for the study of soft tissues, which can identify involvement of the deep intermuscular fascia and thickening of fascia structures[5], although it has a slightly lower sensitivity (86%)[1].

CONCLUSION

Because it is an exam with high availability, accessibility, and does not require preparation or use of contrast, ultrasound is a very efficient technique in the differential diagnosis of acute scrotum. Patients clinically doubtful can benefit from this examination, in addition to speeding up the process of clinical and surgical management.

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CASE REPORT

GALLSTONE ILEUS: A CASE REPORT

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ABSTRACT

The authors present a case of mechanical bowel obstruction, uncommon, due to the passage of a gallstone through a cholecystoenteric fistula. The clinical presentation, the pathophysiology, the diagnosis and treatment possibilities are commented on. The diagnosis requires high clinical suspicion, since symptoms are usually nonspecific and complementary exams don't always help in the etiopathogenic diagnosis.

KEYWORDS: GALLSTONE ILEUS; BILIOENTERIC FISTULA; ULTRASOUND.

INTRODUCTION

Gallstone ileus is an obstruction of the intestinal transit caused by the migration of a large gallstone to the intestinal lumen, which in 70% of cases occurs through a cholecystoduodenal fistula [1]. This is a rare cause (1-4%) of intestinal obstruction, although it may correspond to up to 25% of non-strangulated obstructions in patients over 65 years [2]. The mean age of presentation is 74 years and the mean diagnosis delay is 3.5 days [3].

Biliary ileum-related mortality ranged from 5.5-30% [4-6] depending on the site of obstruction and surgical approach.

Abdominal computed tomography (CT) with contrast is the gold standard imaging test 7, with sensitivity, accuracy and specificity of 93%, 100% and 99%, respectively 8 for the diagnosis of gallstone ileus.

In this case, however, the suspicion of the gallstone ileus was due to the ultrasound findings of evident perforation of the gallbladder wall, echogenic formation with posterior shadow suggestive of calculus in the proximal intestinal loop, and clear retrograde mobility of the intestinal liquid content to the gallbladder lumen during peristalsis.

CASE REPORT

A 78-year-old female patient sought medical attention due to acute discomfort in her upper abdomen. On examination she had a globose abdomen, slightly painful on palpation. She received symptomatic treatment returning for three days in a row.

On the third day, she reported worsening of abdominal discomfort, as well as onset of bloating and vomiting. She was evaluated by the surgeon on duty and had a flaccid, painless abdomen, with no signs of peritoneal irritation.

She was referred for a total abdominal ultrasound, which showed the following findings:

- Atypically shaped gallbladder, without evident content, with irregular walls and an area suggestive of communication (1.35cm) with a thin loop, in whose light an arched hyperechoic image is observed, with an intense posterior acoustic shadow, suggestive of calculus, measuring [3], 2cm in diameter – appearance suggestive of cholecystocolonic fistula (figure 1).
- Presence of distended slender bowel loops (4.0 cm), with evident conniving valves and mobile liquid content, with increased peristalsis and retrograde flow, especially in the left hemi-abdomen (figure 2).
- Observation of anechoic laminar areas between the loops and in the hepatorenal space, suggestive of free fluid.
- Normal liver and bile ducts.
- Conclusion of the report: echographic signs suggestive of intestinal obstruction (gallstone ileus).

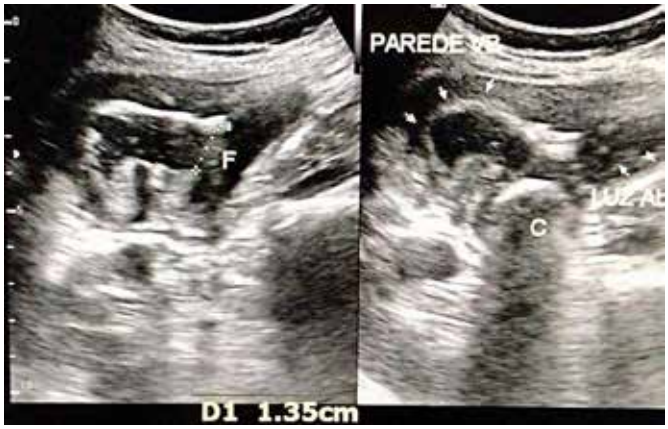

Figure 1: Left: minimum parietal opening of 1.35cm, communicating with the thin loop lumen (cholecystoenteric fistula). Right: calculus (C) and characteristic posterior acoustic shadowing. Arrowheads: anterior wall of the gallbladder (VB).

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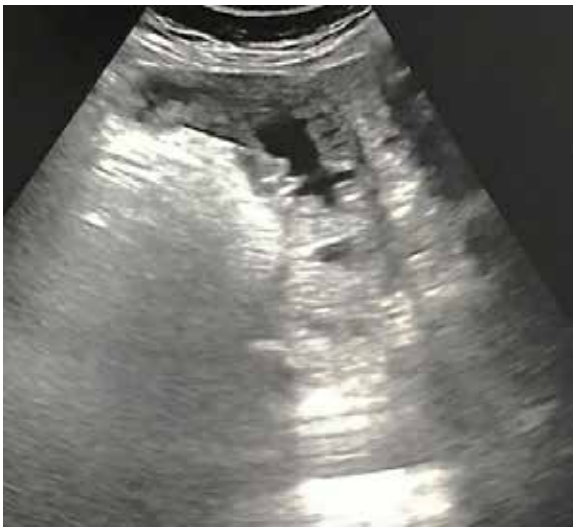

Figure 2: Sentinel loop segment.

The patient was admitted for follow-up by the surgical team.

Initial laboratory tests showed no changes. Upper digestive endoscopy (UDE) was performed, which showed:

- Esophagus: normal

- Stomach: large amount of bilious secretion, with normal endoscopic appearance of mucosa and mucosal relief of the fundus and body.

- Duodenum: bulb deformed by the presence of a deep ulcer in the posterior wall, with an irregular and necrotic background. Regurgitation of bilious intestinal material. Second portion without macroscopic changes, showing the regurgitation of bilious material in large volume (figure 3).

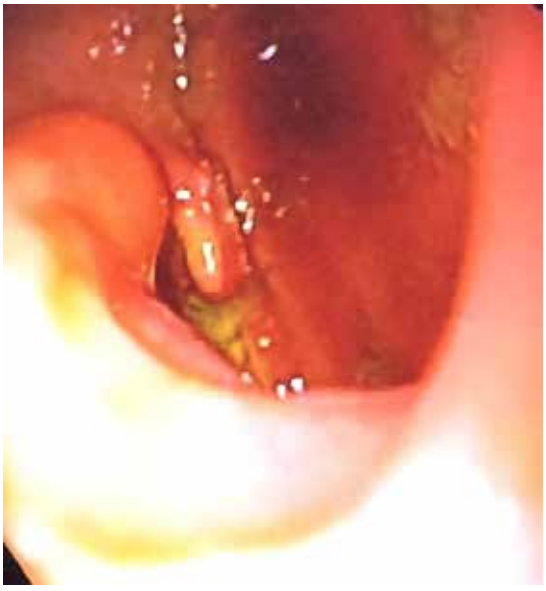

Figure 3: Cholecystoenteric fistula and biliary reflux seen in the UDE.

Expectant conduct was initially adopted, due to the patient's clinical stability. Abdominal CT was requested for follow-up, which showed:

- Marked distension of thin loops up to 4.5 cm in caliber and abrupt tapering in the midline of the hypogastrium, findings suggestive of intestinal subocclusion, without identification of the obstructive factor.

- Signs of hepatic aerobilia and unidentified gallbladder.

On the 6th day of hospitalization, she presented with vomiting and cramping abdominal pain. On the 8th day, she evolved with prostration, darkened vomiting in large volume and worsening of abdominal distension and pain, still without signs of peritoneal irritation.

She underwent exploratory laparotomy on the 9th day of hospitalization. Upon inspection of the cavity, obstruction of the small intestine near the terminal ileus was observed, in a place of abrupt narrowing. Through the enterotomy, two gallstones were removed (figure 4-6), with subsequent enterorrhaphy, revision of the cavity and closing by planes.

Figure 4: Intraluminal calculus

Figure 5: Stone removal by enterotomy

Figure 6: Gallstones.

On the 3rd postoperative day, the patient developed pneumothorax, which was managed with chest drainage, until hospital discharge on the 9th, in good conditions.

DISCUSSION

The gold standard for imaging diagnosis of the gallstone ileus remains the contrast-enhanced CT of the abdomen [7,8]. However, abdominal US can prove to be a valuable tool in the detection of such cases in geographic regions where access to tomography is limited. Early diagnosis in this case contributed to surgical planning.

Except in cases of cholecystoenteric fistula in which the point of perforation of the gallbladder is in places of difficult access to ultrasound examination, and/or in which the stones have already migrated to the more distal portions of the small intestine, where they may be obscured due to the interposition of intestinal loops and gases, ultrasonography is a useful tool that can contribute to the reduction of the high morbidity and mortality related to this condition [9].

There are two possible surgical strategies for treating gallstone ileus. The first consists of just alleviating the obstructive process, by removing the stone by enterotomy. The second is to perform cholecystectomy and approach the fistula and its closure. The latter is associated with higher mortality (16.9%) when compared to the first (11.7%) [2].

The general conditions of the patient and local inflammatory conditions, which increase technical difficulty, surgical time, and morbidity and mortality, must be considered. Thus, a second elective procedure can be performed, avoiding future biliary complications. The treatment of obstruction remains the basic pillar in the gallstone ileus.

CONCLUSION

Gallstone ileus is an uncommon condition in the general population, but it contributes to the causes of intestinal obstruction in older patients, with considerable mortality. Clinical suspicion must be high, so that patient management is as effective as possible.

In this case, the diagnostic suspicion was given by ultrasound examination, while the abdominal CT did not identify the obstructive factor.

We emphasize here the importance of abdominal ultrasound as an easily accessible diagnostic tool and the choice of the best surgical approach for each patient.

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CASE REPORT

THIRD TRIMESTER PRENATAL DIAGNOSIS OF MECONIUM PERITONITIS FOLLOWING ILEAL ATRESIA: CASE REPORT

MARCELLO VIGGIANO, BRUNA TAVARES, JOÃO LUCAS NETO

ABSTRACT

Ileal atresia in association with meconium peritonitis is a rare condition for which the mechanism underlying the bowel perforation has not been fully recognized. We present a case of fetal meconium peritonitis with ileal atresia and a hyper-coiled umbilical cord. Clinically, the cause of obstruction and perforation is considered to be a consequence of congenital vascular anomalies.

The infant was born at 35 weeks of gestation and survived after postnatal multidisciplinary treatment. Our experience suggests that ultrasound recognition of this rare condition will enable early diagnosis and adequate surgical management for fetuses with meconium peritonitis following bowel obstruction.

KEYWORDS: MECONIUM PERITONITIS; ILEAL ATRESIA; PRENATAL DIAGNOSIS

INTRODUCTION

Meconium peritonitis (MP) is a local sterile chemical peritonitis that results from perforation of the bowel in the uterus 1. It has an estimated prevalence of 1 in 35,000 births. Possible causes and pathogenesis include mesenteric ischemia, volvulus, intestinal atresia, meconium plugs, internal hernia, Hirschsprung's disease, colon atresia and cystic fibrosis 1-5. All cases of MP have the same etiology; intrauterine bowel perforation and intraperitoneal inflammation by subsequent leakage of meconium. The differences between the types of diseases (generalized, cystic and fibroadhesive) depend on the time of perforation during pregnancy.

Lately, the survival rate for MP has increased as a result of advances in fetal diagnosis techniques and proper management, including postnatal surgical procedures and neonatal intensive care. 2,4,6,7

Here, we report a case of a routine third trimester ultrasound that was helpful in establishing a diagnosis of meconium peritonitis and determining a neonatal management plan.

CASE REPORT

A 24-year-old primigravid was referred to our hospital at 35+1 weeks of gestation due to local fetal intestinal expansion and mild polyhydramnios. On referral, a detailed ultrasonography showed an intra-abdominal cystic-type meconium peritonitis of 6.3 x 4.8 cm associated with bilateral hydrocele, hypercoiled umbilical cord and an amniotic fluid index of 27.2 cm (Figures 1-4).

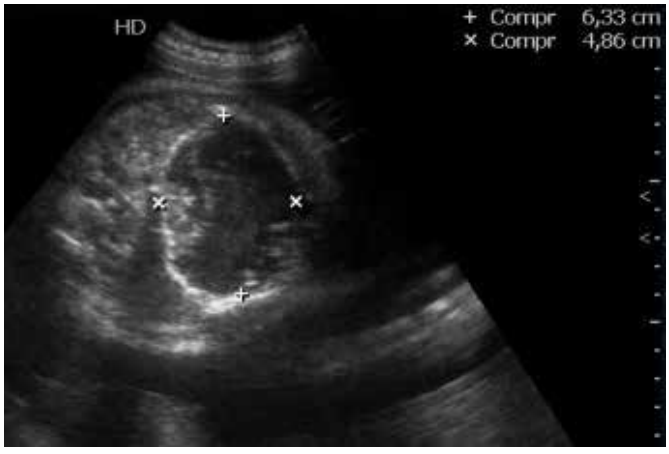

Figure 1. Large intra-abdominal cystic-type meconium peritonitis (6.3 x 4.8 cm).

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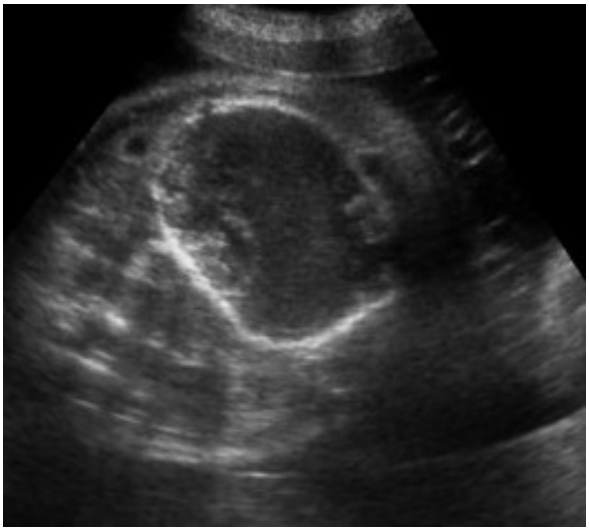

Figure 2. Intra-abdominal hyperechogenic areas representing peritoneal calcifications.

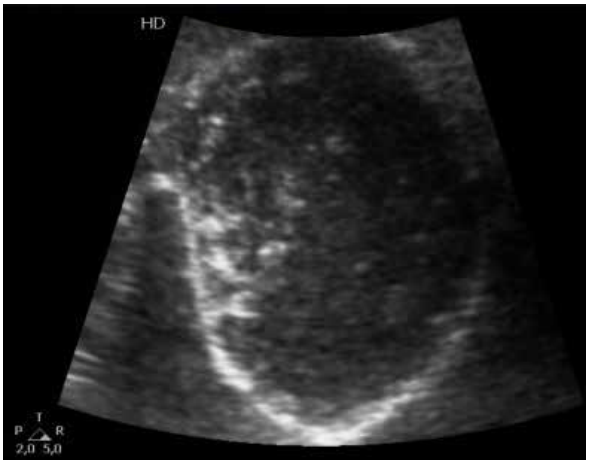

Figure 3. Peritoneal calcifications inside the cystic-type meconium peritonitis.

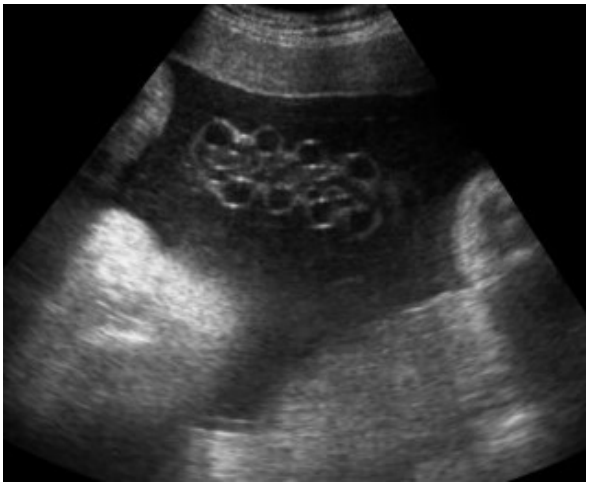

Figure 4. Hypercoiled umbilical cord.

A fetal anatomical survey excluded structural anomalies. Maternal immunoglobulin M analysis excluded TORCH infections. The patient had no medical or family history of illness.

An acute worsening of intestinal obstruction was suspected on follow-up examination, with an increase in amniotic fluid to 31.5 cm. Cesarean section was performed and a male baby was born weighing 2,531g with Apgar score of 8 and 9. At two days of life, exploratory laparotomy was performed for abdominal distention, which confirmed the suspicion of cystic-type meconium peritonitis. Due to the difficulty in delineating the viable bowel, a 15cm terminal ileum resection was performed after the diagnosis of perforated ileum atresia with mucosal fistula formation (Figure 5).

Figure 5.Terminal ileum resection with a mucous fistula creation.

In the last two months of follow-up, this child showed normal growth without any gastroenterological complications; and is awaiting the second stage approach to reconstruct bowel continuity.

DISCUSSION

Meconium is a complex mixture of bile salts, cell debris and proteins. Shedding of these constituents has been shown to activate immune cells, including macrophages 1,3. Macrophages infiltrate the peritoneum and participate in a variety of cellular functions, including phagocytosis, release of chemical mediators, and antibody-dependent cell-mediated cytotoxicity.8

Meconium peritonitis can have a wide variety of disease causes and clinical presentations. In this case report, the cause

and pathogenesis of MP was intestinal atresia, which is consistent with the published literature, confirming the high rate of intestinal obstruction that affects these pregnancies. 2-4

Ultrasonographic diagnosis is based on the presence of intra-abdominal hyperechogenic areas that represent peritoneal calcifications and, additionally, dilated intestinal loops, ascites, and meconium pseudocyst. The incidence of chromosomal abnormalities and genetic syndromes is not higher; but there is an elevated risk of cystic fibrosis of up to 75%. 4.6

Several studies have evaluated the accuracy of prenatal ultrasound testing to diagnose MP and predict patient outcomes. 2,6,8 The surgical strategy combined with decompression of the cyst drainage followed by temporary enterostomy soon after birth delays the reconstruction of intestinal continuity, and is recommended, by some reports, for the cystic type of MP, but the procedure after birth depends on the clinical presentation and general condition of the patient. 3.7

To improve the critical condition of patients, intrauterine surgical intervention, such as fetal paracentesis, can be beneficial, reducing intra-abdominal pressure and removing inflammatory residues and cytokines. 8-10

In conclusion, prenatal diagnosis is important for the first stage of perinatal MP therapy, and routine third-trimester ultrasound should be considered for some late-onset abnormalities. Timing of delivery and fetal intervention according to fetal conditions should be discussed with neonatologists and pediatric neonatal surgeons in perinatal and tertiary maternal care centers. Proper surgical procedures to reduce systemic and abdominal inflammation after birth can improve the outcome of severe cases of MP.

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CASE REPORT

BECKWITH-WIEDEMANN SYNDROME: A CASE REPORT

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ABSTRACT

Beckwith-Wiedemann Syndrome (BWS) is a rare congenital anomaly, with similar manifestation in both sexes and an approximate prevalence of 1/13,700 live births. The main characteristic of this condition is the alteration in the development of certain human organs, which results in growth abnormalities, such as macroglossia, gigantism, hemihyperplasia and visceromegaly, especially in the second half of pregnancy and in the first years of life.

Case report: TVM, female, 26 years old. Patient underwent obstetric 4D US with a gestational age of 33 weeks (+/- 7 days). The presence of a projected tongue between the lips was noted, suggesting macroglossia and with a diagnostic hypothesis of Beckwith-Wiedemann Syndrome.

Discussion: In the case reported, a SBW diagnosed with US 4D during the 33rd week of pregnancy was observed. Although not all criteria for BWS could be confirmed in the prenatal examination, the finding of a major sign of possible macroglossia - due to the presence of a projected tongue between the lips - suggested such a diagnostic hypothesis, which was confirmed after delivery.

Conclusion: Through this case, we can observe that imaging tests, such as the US, are of great value, allowing not only to adequately advise the patient, but also to prepare adequate neonatal support at the time of delivery.

KEYWORDS: BECKWITH-WIEDEMANN, CONGENITAL ANOMALY, ULTRASOUND

INTRODUCTION

Beckwith-Wiedemann Syndrome (BWS) is a rare congenital anomaly, with equal manifestation in males and females and with an approximate prevalence of 1/13,700 live births.[1] This syndrome alters the pattern of development of certain human organs, especially in the second half of pregnancy and during the first years of life, however adult height is usually normal. In this sense, the growth abnormality is characterized by gigantism, macroglossia and/or hemihyperplasia (can lead to speech and feeding difficulties), visceromegaly, omphalocele and a higher incidence of embryonic tumors.[2] It is noteworthy that individuals affected by this syndrome may present all or only some of the characteristics mentioned above, therefore BWS is considered as a clinical spectrum.

The etiology of this condition comes from epigenetic and/or complex genetic alterations that misadjust genes on chromosome 11p15.5, which will be subject to imprinting in the control regions (ICR). The inheritance pattern is of the autosomal dominant type.[3]

The diagnosis of Beckwith-Wiedemann Syndrome can be made in the postnatal period with clinical findings (macroglossia, advanced bone age, omphalocele, neonatal hypoglycemia, visceromegaly, among others).[4] However, a prenatal diagnosis based on ultrasound scans, via criteria such as macroglossia and estimated weight for such gestational age, is of enormous relevance for the continuity of pregnancy in the perinatal period.[5] This is because it allows adequate pediatric support for recurrent problems, such as hypoglycemia at birth and embryonic neoplasms. [6]

Next, we will present a case of BWS that was diagnosed in the 33rd gestational week through a "4D" obstetric US.

CASE REPORT

TVM, female, 26 years old. Patient underwent obstetric 4D US with a gestational age of 33 weeks (+/- 7 days). Upon examination, a fetus of probable female sex was observed in longitudinal situation, cephalic presentation, anterior dorsum and with the presence of rhythmic cardiorespiratory movements (155 bpm). Closed endocervical canal, normal amniotic fluid and umbilical cord with two arteries and one vein inserted normally. Placenta of anterior topical insertion, 25mm thick, heterogeneous texture and maturity grade I. A height of 47.3cm (growth consistent with gestational age), weight of 2263 g (+/- 10%), absence of pre- peritoneal, grade II intestinal staging and other biometric parameters within the appropriate values. Finally, the presence of a pro-

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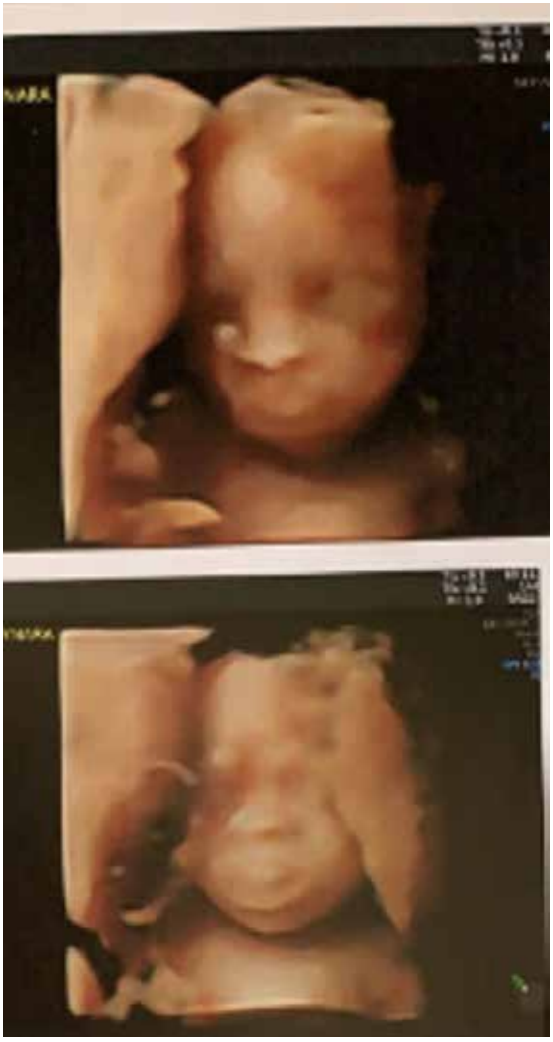
jected tongue between the lips was noted, suggesting macroglossia and with a diagnostic hypothesis of Beckwith-Wiedemann Syndrome, which was confirmed after delivery.



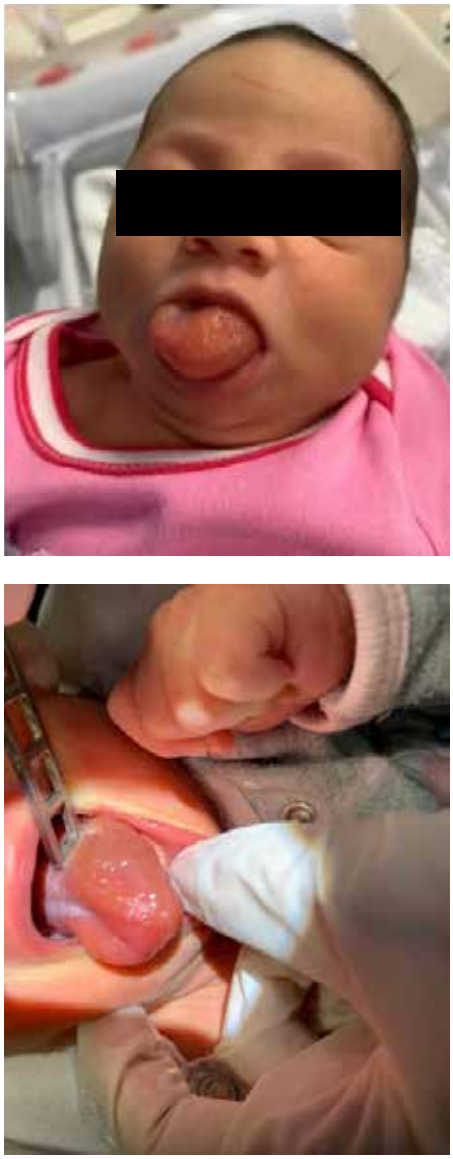
Figures 1 and 2: Macroglossia

DISCUSSION

In 1963 and 1964, Beckwith and Wiedemann, respectively, reported a syndrome present in newborns, characterized by macroglossia, omphalocele, gigantism, visceromegaly, renal dysplasia, facial nevi, advanced bone age, ear folds and an increase in embryonic neoplasms.[7] Referred to as one of the main clinical aspects of this syndrome, macroglossia (97% present) is mostly due to excessive anteroposterior growth of the tongue or muscle hypertrophy, causing its protrusion and, consequently, several possible functional changes in the individual, such as breathing disorders, swallowing, phonation and even psychological consequences.[8]

Although, the diagnosis of BWS is usually performed in the postnatal period through the characteristic clinical findings of the condition; the prenatal diagnosis of the condition is still of great value for perinatal continuity, both at birth and in subsequent medical and pediatric care (neonatal hypoglycemia, congestive heart failure, upper airway obstruction and increased risk for neoplasia). [4] Thus, obstetric ultrasound is used as the standard for detecting major syndromic signs - macrosomia, abdominal wall defect and macroglossia - as well as minor ones - polyhydramnios, nephromegaly, renal dysplasia and adrenal cytomegaly. [4]

In the case reported, a BWS diagnosed with US 4D was observed during the 33rd week of gestation. Although not all criteria for BWS could be confirmed in the prenatal examination, the finding of a major sign of possible macroglossia - due to the presence of a projected tongue between the lips - suggested such a diagnostic hypothesis.



Figures 3 and 4: NB with Macroglossia

FINAL CONSIDERATIONS

Thus, we believe, through the case reported, that imaging tests, such as obstetric ultrasonography, are very useful and valuable for the prenatal diagnosis of Beckwith-Wiedemann Syndrome, therefore making possible not only the psychological preparation and understanding of the disease by the parents, but also the adequate training of the multidisciplinary medical team.

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CASE REPORT

DIZYGOTIC TWINS WITH CONCORDANT MYELOMENINGOCELE – CASE REPORT

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ABSTRACT

Neural tube defects are the second most frequently observed defect at birth, with an incidence of 1:1,000 live births. Our aim was to describe dizygotic concordant twins for myelomeningocele, an association considered rare.

KEYWORDS: NEURAL TUBE DEFECTS, MENINGOMYELOCELE, PRENATAL DIAGNOSIS, TWINS, DIZYGOTIC TWINS.

INTRODUCTION

Multiple pregnancies have become more frequent in the last three decades, due to the greater use of assisted reproduction technology and the occurrence of pregnancies at an older age [1].

Twin pregnancies can be divided and classified according to their zygosity and chorionicity. Zygosity refers to the type of conception. If twins come from the fertilization of two sperm and two eggs, they are called dizygotic or fraternal twins. Monozygotic or identical twins are seen when there is fertilization of a sperm and an egg, with the formation of a zygote, which then undergoes cleavage, forming twins. In spontaneous conception, dizygotic twins are more common than monozygotic twins, at a ratio of 7:3 [2].

Chorionicity refers to the type of placentation. In dizygotic pregnancy, each fetus has its own chorion and amnion, that is, it is a gestation of diamniotic and dichorionic twins. In monozygotic pregnancy, chorionicity and amnionicity are determined by the moment of cleavage. After fertilization of an egg by a sperm occurs, a zygote is formed. When there is an early cleavage, before blastocyst formation, that is, before the 4th day after fertilization, the result is two blastocysts, with formation of two placentas, two amnions and two fetuses (diamniotic and dichorionic twin pregnancy). Since the chorion forms before the amnion, if there are two chorions there must be two amnions. In case of zygote cleavage between the 4th and 8th day after fertilization, the blastocyst has already been formed, and thus, there is only one placenta and two amnions (monochorionic and diamniotic twins). If the cleavage occurs on the 8th day after fertilization, after the formation of the chorion and amnion, what divides is the embryonic disc. This leads to the development of a monoamniotic and monochorionic twin pregnancy. If this separation of the embryonic disc is incomplete, on the 13th day of gestation, there is formation of Siamese twins (imperfect twinning) [2].

The incidence of congenital malformations is considerably increased in multiple pregnancies compared to single pregnancies. Monozygotic twins have more structural defects than dizygotic twins and singletons. Among all anomalies, those involving the central nervous system are considered the most common. Among them are neural tube closure defects (NTCD), such as myelomeningocele [3].

Thus, our objective was to describe a rare case of dizygotic twins concordant for myelomeningocele, whose diagnosis was made in the prenatal period.

CASE REPORT

A 29-year-old woman was referred to high-risk prenatal care at approximately 20 weeks of pregnancy due to dichorionic and diamniotic twins (with matching sexes), maternal hypothyroidism, spina bifida and Arnold-Chiari type II malformation in fetuses. She denied the use of folic acid supplementation during pregnancy. She was taking 75mcg levothyroxine a day for hypothyroidism. The previous pregnancy had evolved uneventfully, with a healthy female newborn, born by cesarean delivery. The patient's husband, 32 years old, was healthy and not consanguineous. There was a family history of neural tube closure defect, in this case, a sister of the husband with myelomeningocele who died in the first month of life.

First trimester ultrasound screening was normal. Nuchal translucency measurements were 1.5mm and 1.4mm, respectively. The ultrasound examination performed at 22 weeks of gestation showed, in both fetuses, a lemon sign and a flattened cerebellum (banana sign), in addition to lumbosacral myelomeningocele. Ventriculomegaly was initially verified

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only in the second twin (the diameter of the lateral ventricle was 15mm). The estimated fetal weights were in the 50th percentile (twin 1) and 25th percentile (twin 2) (Figure 1). The fetal echocardiography of the twins was normal, and the fetal magnetic resonance imaging confirmed the findings observed in the ultrasound (Figure 2).

The children, two boys, were born by cesarean delivery at 38 weeks of pregnancy. The first twin was born weighing 3275g and the second twin 2545g. Both had Apgar scores of 9/9. Their clinical evaluation confirmed the presence of fetal findings. The anatomopathological evaluation of the placentas also confirmed that the pregnancy was dichorionic and diamniotic. Both babies had the same blood type (A+). However, these were physically different. Complementary examination, through cerebral ultrasonography, demonstrated the presence, in both newborns, of a dilated ventricular system. Correction of myelomeningocele occurred in both children on the first day after birth, and the placement of a ventriculoperitoneal valve was indicated.

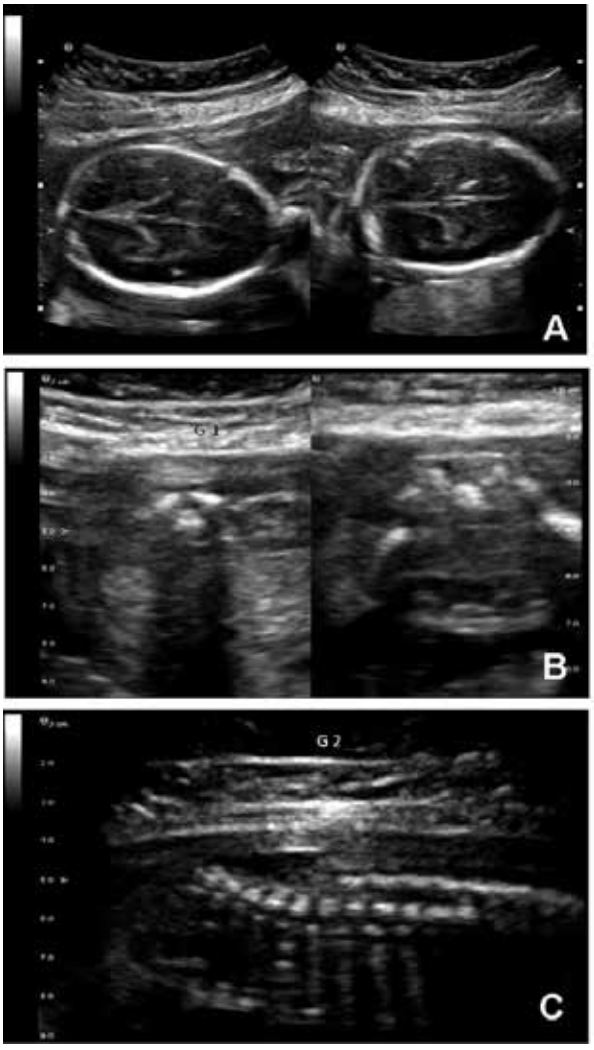

Figure 1. Fetal ultrasound performed at 22 weeks' gestation showing the lemon sign on the skull (A) and lumbosacral myelomeningocele (B and C) presented by both fetuses (G1: Gemelar 1 and G2: Gemelar 2).

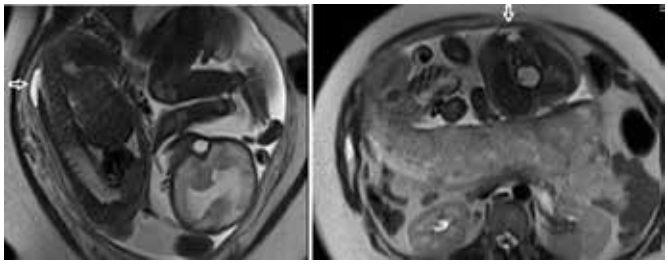

Figure 2. Fetal magnetic resonance imaging showing lumbosacral myelomeningocele, seen through a sagittal view (left image) and a transverse view (right) (the arrows indicate the locations of the myelomeningoceles).

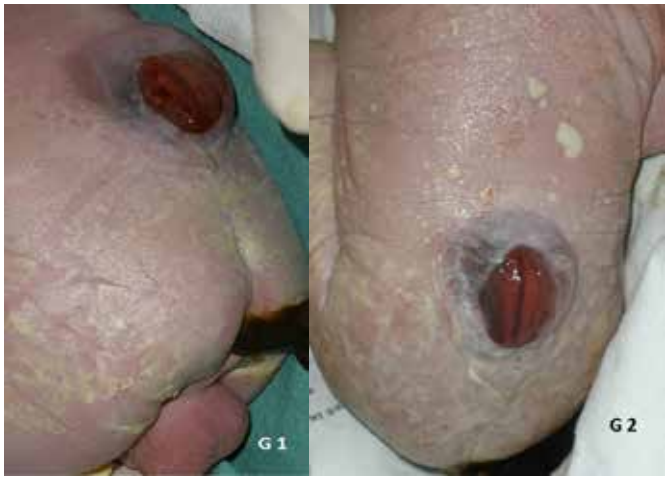

Figure 3. Postnatal aspect of myelomeningoceles presented by twin 1 (G 1) and twin 2 (G 2).

DISCUSSION

The description of concordant dizygotic twins for myelomeningocele, as observed in our patients, is considered quite rare. In our literature review, using the PubMed/MEDLINE, SciELO and LILACS databases, we identified the report of only three cases [4-6].

In ultrasonographic examinations of twin pregnancies, in case of observation of different fetal sexes, by definition the twins must be dizygotic and, thus, dichorionic. If the fetuses are of the same sex, as in our case, zygosity, such as chorionicity, cannot be determined using this criterion [2]. To confirm it in our patient, in addition to some ultrasonographic findings, anatomopathological evaluation of the placenta after birth was observed, which confirmed the finding of dichorionic pregnancy.

As stated earlier, children from multiple pregnancies are at increased risk of having birth defects. Twin births have been associated with all types of NTDs. Twin studies, although generally based on very small databases, show NTDs concordance rates of 7.7% for monozygotic twins and 4% for dizygotic twins. On the other hand, other studies report con-

cordance rates of up to 40% for monozygotic twins [7].

NTDs represent a common group of congenital malformations of the central nervous system. They affect about 1 to 2 children per 1,000 births. However, its incidence has been described as variable between different populations. NTDs occur well initially during pregnancy, between the second and sixth weeks of gestation and are caused by a partial or complete failure of neural tube closure during embryogenesis. Most cases present in the form of anencephaly or spina bifida [8]. In the latter, myelomeningocele is included, which is the type of defect observed in our patients.

Most NTD cases are not syndromic, that is, they occur in isolation and have a multifactorial etiology [8]. In relation to syndromic cases, described alterations include certain chromosomal abnormalities (especially trisomies of chromosomes 13 and 18, and triploidy) and some genetic diseases, such as Meckel-Gruber syndrome. Environmental factors related to an increased risk for NTDs include geography, socioeconomic status, maternal age, maternal diet, diabetes mellitus, maternal obesity and hyperthermia, and exposure to medications, especially antiepileptic medications such as valproic acid [9].

In our case, we believe that mainly two factors may have corroborated the agreement for myelomeningocele in both twins. The first would be a positive family history for NTD, affecting a very close relative (in this case, the twins' uncle). For example, the recurrence risk in siblings of a child with NTD is approximately 2 to 5%, representing a more than 50-fold increase in risk over the general population [10]. The second factor would be non-supplementation of folic acid, especially in a family with a previous history of NTD. It is known today that this reduces the risk of occurrence of defects by up to 60 to 70%. Interestingly, flour supplementation is routinely performed in our country. However, despite the apparent reduction in the number of NTD cases, this does not seem to be able to completely abolish its occurrence. Some authors have noted that fortification of foods with folic acid in the United States resulted in a significant reduction in the occurrence of spina bifida, but was not sufficient to completely abolish the cases. This suggests that other factors, in addition to maternal folic acid deficiency, are involved in the etiology of spina bifida [9].

There is also growing evidence that the child's gender has an influence on the development of NTDs. There is an excess of males among patients affected by low spinal lesions 8, as observed in our patients.

The possibility of a monozygotic pregnancy cannot be totally ruled out either. As stated before, in this one, chorionicity and amnionicity are determined by the moment of occurrence of the zygote cleavage. When this occurs early, before the 4th day after fertilization, the result is the formation of two placentas, two amnions and two fetuses [2], as observed in our case. Therefore, although unlikely, even due to the physical discrepancy between both babies, we cannot rule out that the pregnancy of our patients may actually be of the monozygotic type, which would help to explain the agreement of myelomeningoceles between them, as in these cases the malformations agreement index is higher.

Thus, the association observed among our patients is considered rare. However, we cannot exclude the possibility that the factors previously described may have contributed to the greater chance of affecting both fetuses. Events related to twinning itself, as well as other intrinsic genetic factors not known, cannot be ruled out either.

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REVIEW ARTICLE

ULTRASONOGRAPHIC DIAGNOSIS OF PNEUMONIA IN CHILDHOOD: A LITERATURE REVIEW

MARIANA BAMONTE SEOANE, JOSÉ HÉRACLES RODRIGUES RIBEIRO DE ALMEIDA, LÍVIA FRANCHI, LEONARDO DE SOUZA PIBER

ABSTRACT

OBJECTIVES: Review the ultrasound technique and establish the diagnostic benefits brought in relation to primary investigation methods for pneumonia in pediatrics.

METHODS: This is a narrative literature review with search in the main databases: PubMed, Cochrane Library and Scielo, using the MeSH terms in the search strategy: Pneumonia AND Child AND Ultrasonography. As inclusion criteria, we used randomized clinical trials, systematic reviews and narratives of the literature, as well as case reports on the subject. As an exclusion criterion, articles whose theme touched the central theme or which presented the theme SARS-CoV-2 were removed through manual review by two authors.

RESULTS: Pneumonia is one of the three leading causes of death in pediatric settings worldwide. The lack of an exam considered the gold standard, capable of diagnosing pneumonia with a high degree of accuracy, drives the search for new diagnostic methods. The increasing use of Point-Of-Care (POCUS) ultrasound in emergency rooms is sparking interest in considering it a first-line test. The non-exposure of pediatric patients to radiation, the reduction in cost compared to chest X-rays, in addition to the high sensitivity (96%) and specificity (93%), corroborate the perspective that the method is increasingly closer to being implanted in the gold standard diagnosis of the investigation, although, to define it as such, it is necessary to analyze other broader variables.

CONCLUSION: Despite the benefits, further studies are needed in order to elucidate the capacitive potentials of the POCUS, thus promoting the implementation of an adequate diagnostic tool.

KEYWORDS: PNEUMONIA, ULTRASONOGRAPHY, RADIOLOGY, CHILD, DIAGNOSTIC IMAGING.

INTRODUCTION

Lower respiratory tract infections are pathologies with a significant impact in terms of morbidity, mortality and hospitalization, whether in the adult population or in the pediatric age group. In children, the problem takes on even greater proportions, mainly referring specifically to a clinical condition: pneumonia.[1]

Pneumonia is one of the three leading causes of death in the pediatric context in the world, accounting for a significant epidemiology with about one million deaths per year in children under five years of age. Another major problem of this pathology is the significant impact on public health expenses, especially in developing countries, since many cases evolve to prolonged hospitalization and may even require admission to an intensive care unit. [2-4]

On the other hand, some aspects related to the improvement of living conditions, especially adequate nutrition, preventive aspects and good vaccinal adherence of the main pathogens of this pathology, show us a downward transition in relation to its incidence. [4]

Although the incidence of this pathology in the pediatric age group is declining, there are still problems related to diagnosis. Currently, there is still no exam considered the gold standard capable of diagnosing pneumonia with a high degree of accuracy. [3, 4]

The clinical findings of pneumonia consist of symptoms commonly present, also, in viral respiratory infections such as fever, cough and tachypnea, reflecting a great conflict between possible differential diagnoses. This fact, together with the non-specific findings of the physical examination and the lack of an imaging exam with reliable specificity and sensitivity, reflect the difficult specific diagnosis of pneumonia, a pathology in which an early diagnosis prevents future complications. [3, 4]

The test considered as the first line to start the investigation of a suspected condition of pneumonia is the chest X-ray, however, it cannot be considered the gold standard since it has low sensitivity and specificity, is a dependent examiner and exposes pediatric patients to radiation.[5-9]

Given this scenario and the new perspectives with the increasing availability and use of ultrasonographic methods, the benefits of this modality for diagnosing pneumonia in the pediatric setting have become notorious, exemplifying the non-exposure to radiation, less economic impact. There-

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fore, this study aims to bring what is most current and relevant about the topic that can directly affect the paradigms of current medical practice, in the case of the ultrasound diagnosis of pneumonia in childhood.

OBJECTIVE

The study aims to review the ultrasound technique as well as to establish the diagnostic benefits brought in relation to primary investigation methods for pneumonia in pediatrics.

MATERIALS AND METHODS

The present study consists of a narrative review of the literature. To identify the articles on the subject, on July 27, 2021, a search was carried out in the main databases: PubMed, Cochrane Library and Scielo, using descriptors in English, Spanish and Portuguese, according to the requirements of the database in the search strategy: Pneumonia AND Child AND Ultrasonography. This search obtained the results described in table 1:

DATA BASE	RESULTS
PUBMED	216
COCHRANE	5
SCIELO	2

Table 1: Search results for articles in their entirety, without inclusion criteria.

After the first search for inclusion of the screened articles, the following criteria were used: publications in the three predetermined languages, from the last five years (2016-2021), resulting in a total of 132 articles, 129 on the PubMed platform and one on the platform Cochrane Library and two on the Scielo platform.

As a means to establish the best in the literature, the following types of articles were also selected as inclusion criteria after the first search: clinical trial, randomized clinical trial, systematic review and meta-analysis, narrative literature review and report of cases. Resulting in a total of 40 articles (PubMED), one article (Cochrane) and two articles (Scielo).

In order to be as homogeneous as possible, articles (18) containing the use of ultrasonography in patients diagnosed with SARS-CoV-2 (18) (coronavirus) were excluded.

For the purpose of avoiding bias and duplicate articles, two reviewers performed the analysis based on the abstracts of publications, excluding duplicate articles in the databases and articles whose abstracts did not present the approach to the proposed theme.

After applying all criteria, a total of 17 articles were selected, which were read in their entirety by a group of two reviewers, who wrote the present study.

RESULTS AND DISCUSSION

Ultrasonography, still little used as a diagnostic method, is usually performed as a complementary exam to radiography in more complicated cases. Currently, with the growing search for new methods and the increasingly recurrent use of this tool in emergency and emergency rooms using the Point-Of-Care ultrasound method (POCUS), there is an interest in considering it as a first-rate exam line for diagnosing pneumonia. According to the World Health Organization, ¾ of the world population does not have access to modern imaging equipment, making the "point of care" ultrasound a very important diagnostic tool. [2,3]

The technique consists of a systematic analysis of the chest, in the transverse, parasagittal and coronal planes, with assessment of the anterior and posterior midclavicular line and in the mid-axillary region up to the diaphragm (Figure 1), with the choice of a linear transducer that allows better visualization. .[1.10]

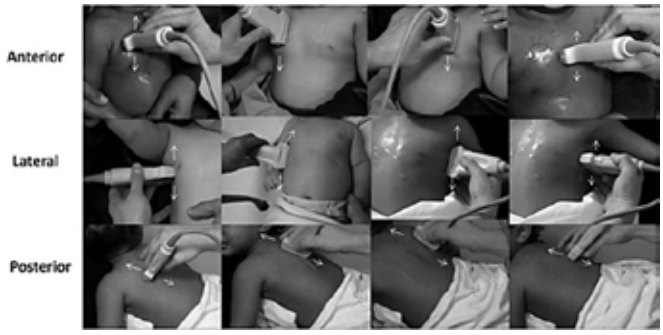

FIGURE 1: Systematic approach for evaluating the entire chest during the procedure. Adapted from: Vazquez et al, 2016 [10].

Ultrasonographic findings consist of understanding the pathophysiology of the entire process of lung disease, taking into account the air-fluid ratio present in the parenchyma. A healthy lung is well aerated and, therefore, it is not possible to visualize its functional structure, but only the images generated by the transducer itself. The presence of air in the lung parenchyma acts as a deflector of the waves emitted by the device, so that when the waves reflect on the pleuropulmonary interface, they form a mirror image.[11]

The lung parenchyma, when affected by some pathology, loses areas that were previously aerated, being re-

placed by regions that will have a predominance of fluid. When there is total loss of aeration, it is possible to visualize the parenchyma.[11]

On ultrasound, there is a representation of two lines, the A-lines, horizontal, representing a normal aerated lung, and possibly the B-lines, vertical, always being pathological (Figure 2). [10.11]

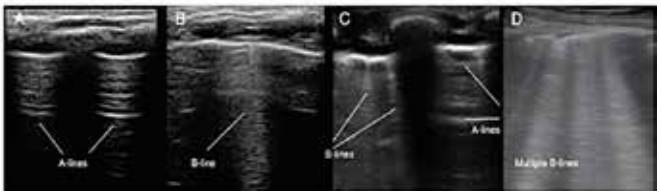

FIGURE 2: A-lines - hyperechogenic, horizontal and parallel (A); B-lines - hyperechogenic and transverse (B); Lines A and B, perpendicular to each other (C); Multiple B-lines (D). Retrieved from: Toro et al 2021 [11]

The A-lines are formed by the reflection of waves emitted by ultrasound at the pleuropulmonary interface, they are hyperechoic, horizontal, parallel and equidistant from each other. They indicate that the lung is well aerated and may even represent a pneumothorax. The pleura will also have its image reflected in the form of a horizontal and hyperechoic line, however, it will be possible to visualize its movement.[11]

The B-lines are hyperechoic and perpendicular to the A-lines, promoting their erasure. The presence of this line is also related to the air/fluid ratio present in the lung, being present in greater numbers when there is lung parenchyma affection. [11]

Consolidation, in turn, very characteristic although not pathognomonic of pneumonia, is represented on ultrasound by hypoechogenic images, with ill-defined borders and presence of vertical artifacts in adjacent areas, formed by the projection of the lung parenchyma, when there is at least involvement of two lung segments [11,13] (Figures 3, 4 and 5).

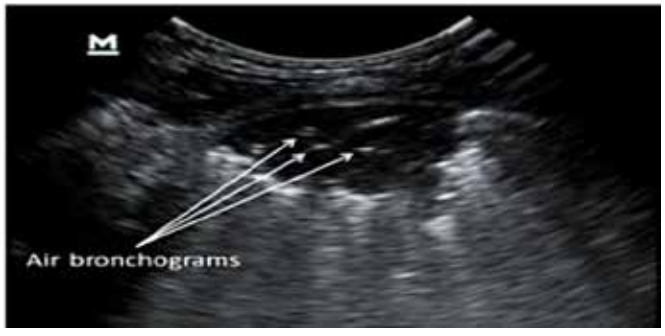

FIGURE 3: Consolidation with air bronchogram. Retrieved from: Stadler et al 2017 [2]

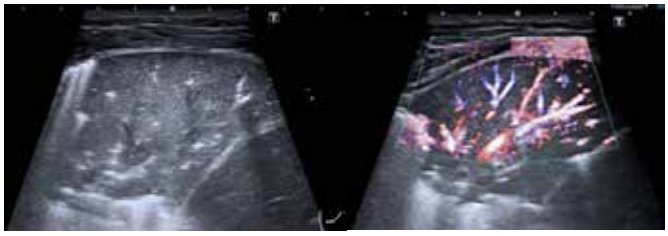

FIGURE 4: Consolidation with dynamic air bronchogram, without and with Doppler analysis.Taken from: Najgrodzka et al, 2019 [1].

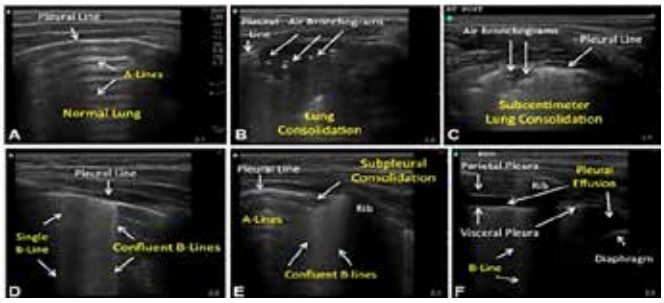

FIGURE 5: Ultrasound images of the lung. Normal lung with the presence of A-lines (A); Focal, radiographically apparent pneumonia - greater than 1 cm - of pulmonary consolidation with air bronchograms (B). Focal, radiographically occult pneumonia - pulmonary consolidation <1 cm - with air bronchograms (C). B-lines, confluent B-lines, subpleural consolidation most commonly associated with viral pneumonia or bronchiolitis; no visible ultrasonographic air bronchograms (D-E). Pleural effusion - anechoic space - between the lung and the chest wall or diaphragm (F). Retrieved from: Jones et al, 2016 [3].

The ultrasound image formed by the consolidation of pneumonia is very similar to that of atelectasis, and the figure often raises diagnostic doubt. It is then possible to differentiate the image of pneumonia from atelectasis by observing respiratory variance in air bronchograms, which are branched echogenic structures present in the consolidated area, commonly present in pneumonia.[12]

In the pediatric context, the thymus is an important organ to be differentiated in imaging exams, especially in cases of suspected pneumonia. The thymus is a more prominent organ in young children, located in the parasternal region, being represented by a hyperechoic image known as "starry sky", with no air bronchogram (Figure 6). The image of the thymus is usually adjacent to the consolidation and, therefore, its distinction on ultrasound becomes increasingly relevant. In these cases, chest radiography can also be associated with ultrasound to corroborate the diagnosis.[13]

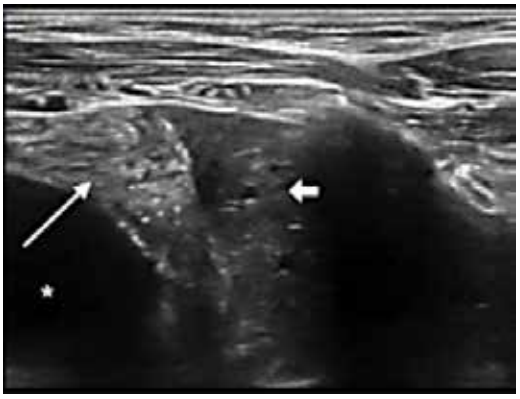

FIGURE 6: Thymus represented by the larger white arrow on the left, with the characteristic of "starry sky", while the smaller arrow on the right represents consolidation with hepatization and fluid bronchograms compatible with a picture of pneumonia. Retrieved: Harvey et al, 2017 [13]

Chest radiography is currently still the exam of choice for diagnosing pneumonia. With the rise in the use of Point-of-Care ultrasound associated with the lack of availability of the radiography device in various hospital settings, as well as the presence of international evidence-based studies demonstrating the accuracy of POCUS in various contexts for the diagnosis of pneumonia, made the scientific community wonder about making it the exam of choice for pediatric diagnosis of this pathology.[3]

In recent years, several studies have evaluated the reliability of ultrasound as a diagnostic method for pneumonia in the pediatric setting and most of the results obtained were favorable, since the sensitivity, specificity, positive and negative predictive values were similar or in some cases even better than chest X-ray. A recent meta-analysis, aimed at evaluating the performance of ultrasonography, resulted in a sensitivity of 96% and a specificity of 93%, with the main findings being: consolidation, positive air bronchogram, abnormal pleural lines and pleural effusion.[12,14,15]

In most of the literature that presented disagreement regarding the result, the chest X-ray was not able to identify some cases precisely observed by ultrasonography. This fact occurred mainly in radiographs where only the anteroposterior and/or posteroanterior projections were analyzed, in which the consolidation was seen in regions that the radiography does not accurately assess. In addition, the accuracy of radiography was much lower when it was necessary to differentiate between alveolar and interstitial pneumonia.[4,12]

The American Academy of Pediatrics recommends caution regarding the use of chest radiography, mainly because of the exposure of very young patients to radiation, besides disagreement in the interpretation of the result, delay in the delivery of the image as well as the inability to repeat the exam.[1]

Ultrasonography also stands out in the scenario of non-exposure to radiation, in relation to monitoring and follow-up, especially regarding the response to antibiotic therapy. The evaluation of the response obtained by performing the USG 48 hours after antibiotic therapy can be beneficial by decreasing the exposure to radiation from a new radiograph, for example, and showing classic signs of re-aeration of the union itself or of the bronchogram formed16 (Figure 7).

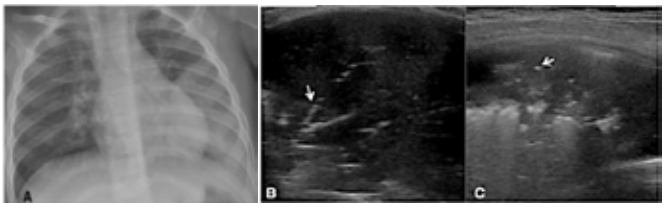

FIGURE 7: Initial assessment performed using a chest X-ray of a patient with pneumonia on the left (A); Ultrasonography demonstrating a large area of hepatization and consolidation of the lung parenchyma (B); Ultrasonography after 48 hours of treatment demonstrating consolidation of the consolidation process, as well as more visible air bronchograms (C). Retrieved from: Buonsenso et al, 2020 [16].

Although most studies to date are in favor of ultrasound with expressive numbers of sensitivity and specificity of the test, the choice as a substitute method or even as a screening depends on multiple variables not obtained in the current literature. Clinical aspects that are relevant from a practical point of view, such as what should be done from a negative initial ultrasound, the request for additional evaluation with other diagnostic methods, or issues involving the safety of not prescribing antibiotic therapy when the initial assessment via ultrasound is normal, encourage further discussions that a priori revoke the establishment of the method as the gold standard in the initial screening.[2,3]

A recently published article evaluated the diagnostic accuracy of ultrasonography when performed by experienced physicians versus newly trained ultrasonographers. During the study, newly graduated physicians in the specialty received, for a week, practical training and didactic classes on ultrasound and even so, their results were insufficient when compared to more experienced professionals.[17] This need for specific training to obtain results expressives is very well described in the literature and demonstrates the need for specific training or early and continuous contact, both in undergraduate and in specialization, either with the POCUS methodology or with conventional ultrasonography itself to obtain accurate diagnoses.[11,17]

CONCLUSION

Amidst all this scenario under the presence of two main parallels, namely, the high rate of morbidity and mortality of the disease and the rise of an increasingly accessible method from which a less invasive perspective and results similar to the current diagnostic method , more and more studies are

needed in order to elucidate its capacitive potentials to increasingly implement this early diagnostic tool in the context of pneumonia in the pediatric age group.

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REVIEW ARTICLE

ABDOMINAL ULTRASOUND DIAGNOSTICS AT COVID-19

RENATA DOS SANTOS, JAMILI EL BACHA, LEONARDO PIBER

ABSTRACT

COVID-19 affects multiple systems, manifesting itself in the most diverse clinical or associated forms. The world medical community is still learning about this entity and a pandemic as a whole. The literature has publications that formalize the abdominal manifestations of COVID-19, as well as its most adequate diagnostic methods. Ultrasonography stands out as a method of diagnosis and auxiliary procedures in therapeutics.

The purpose of this is to review and study abdominal ultrasound findings in patients with COVID-19. This is a narrative literature review, searching the Pubmed, Scielo and LILACS database, using the following descriptors: ultrasonography, COVID-19 and abdomen. All articles with ultrasound images published since December 2019 were included. Abdominal ultrasound images of cases diagnosed with COVID-19 were included.

A B-mode analysis, associated with Doppler, is associated with the vascular involvement characteristic of this viral entity. Among the recent publications on the subject, changes related to portal venous gas due to mesenteric vascular injury, portal vein thrombosis, distended gallbladder, biliary stasis, diffusely bulky pancreas without focal lesions or gallstones, areas of renal infarction, are evidenced. ascites, thickening of the intestinal wall, interstitial and / or hemorrhagic cystitis.

The mastery of ultrasound findings related to COVID-19 abdominal changes, if necessary, as an urgent contemporary need.

KEYWORDS: ULTRASONOGRAPHY, IMAGING DIAGNOSIS, ABDOMEN, COVID-19, CORONAVIRUS

INTRODUCTION

Coronavirus 2019 disease (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was officially reported in December 2019 in Wuhan City, Hubei Province, China, and has since led to a pandemic.1 Disease severity ranges from subclinical infections to serious illnesses that require hospital admission. As the number of infected individuals increases, it is noticed that not only the lungs but also other organs can be affected by the virus.

Gastrointestinal symptoms, such as diarrhea, vomiting, nausea or abdominal pain, are frequent in patients with COVID-19. Additionally, alimentary tract symptoms may precede the respiratory presentation of SARS-CoV-2 infection. This can lead to late diagnosis and inadequate management of infected patients.[2]

Viral RNA was found in faecal samples, despite negative breath tests and in the gastrointestinal epithelium, suggesting a possible route of faecal-oral transmission.[3]

SARS-CoV-2 is thought to gain access to cells through surface expression of the angiotensin-2 converting enzyme (ACE2). Thus, it is assumed that tissues with high levels of ACE2 expression are susceptible to direct infection. ACE2 surface expression is most abundant in lung alveolar epithelial cells, small bowel enterocytes, and vascular endothelium. The large amount of surface expression of ACE2 in the gastrointestinal tract and even less in the biliary epithelium have been offered as possible explanations for gastrointestinal symptoms and liver damage. In addition, SARS-CoV-2 has been identified in stool samples from a substantial proportion of infected patients.[4]

Thus, in this severe scenario of an acute pandemic, patients who arrive at the emergency room with an acute abdomen should also be considered for COVID-19 infection, even in the absence of respiratory symptoms.[5]

In the clinical investigation of this patient, imaging exams are common in surgical decision-making and can help to understand the abdominal phenomena in SARS-CoV-2 infection. Therefore, it is important that ultrasonographers are aware of abdominal imaging findings in patients with COVID-19.

Considering the cost-effectiveness of the imaging used, ultrasound is a non-ionizing, portable, bedside imaging modality with a high diagnostic impact in emergencies and intensive care units in pandemics. In addition, ultrasound can provide

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real-time diagnostic and therapeutic interventions.[6]

Contrast ultrasonography can also play an important role, as it offers the possibility of analyzing dynamic microcirculatory disorders in real time in a dynamic way, without risk to the kidneys and thyroid gland, even in severe cases of progressive disease.[7]

The aim of this study is to review and study abdominal ultrasound findings in patients with COVID-19.

METHODS

Narrative literature review, searching the Pubmed, Scielo and Lilacs databases, using the following descriptors: "ultrasonography, COVID-19 and abdomen" (ultrasonography AND COVID-19 AND abdomen). All articles with ultrasound images, published since December 2019, in Portuguese and English, were included; and those articles that do not continue with images or that were not in accordance with the objective of this research were excluded.

RESULTS AND DISCUSSION

The liver is frequently affected by COVID-19. The ACE2 receptor has been found to be expressed in the liver, specifically in cholangiocytes (bile duct epithelial cells) rather than in hepatocytes, thus viral infection with SARS-CoV-2 alters the barrier and bile acid transport functions of the cholangiocytes through dysregulation of genes involved in the formation of closed junctions and the transport of bile acid. This could explain the accumulation of bile acids and resulting liver damage. [8]

Figure 1 shows echogenic ramifications, with acoustic reverberation, corresponding to portal venous gas that may be related to intestinal pneumatosis due to ischemia or infarction of the intestinal segment, in a 34-year-old patient with abnormal liver enzymes.

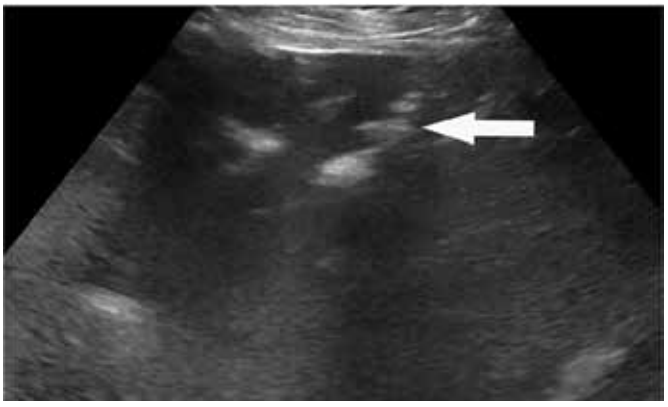


Figure 1 – Liver ultrasound showing echogenic ramifications in peripheral portal segments. [4]

Thrombosis of mesenteric, splenic and portal vein vessels may be present in COVID-19 infection, even in non-severe cases of the disease. [9]

Figure 2 refers to the importance of Doppler analysis of the portal vein. This is a 44-year-old man with a recent history of COVID-19 disease, who presented severe abdominopelvic pain of progressive and insidious onset. B-mode thrombus is not characterized; however, abnormal flow is observed on Doppler, with a diagnosis of thrombosis of the portal vein.9 Portal vein with signs of cavernomatous transformation on Doppler study.

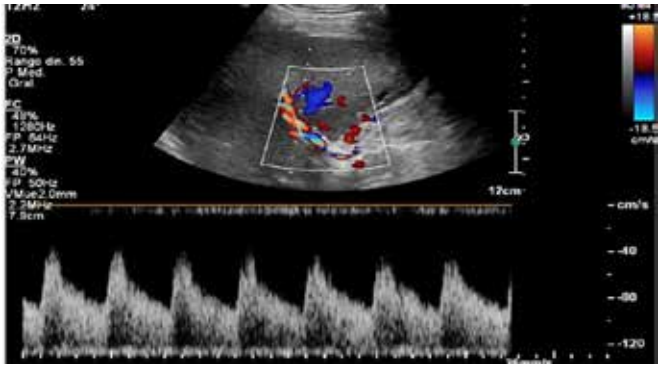


Figure 2 – Ultrasonography with Doppler analysis, whose diagnosis of thrombosis was evidenced by the change in flow. The thrombus was not characterized in B-mode. [9]

Biliary stasis can be diagnosed by gallbladder recognition and intrahepatic biliary ductal dilatation, without a causal obstructive mass or calculus. It is important to note that acute cholecystitis can develop as a result of biliary stasis. [8]

Figures 3A and 3B show a gallbladder with increased volume, thick bile, thickened wall and hyperflow on Doppler. These findings were related to the diagnosis of acute cholecystitis in a 64-year-old man with sepsis. He underwent cholecystostomy and bacterial bile culture was negative, confirming the diagnosis of biliary stasis. [8]

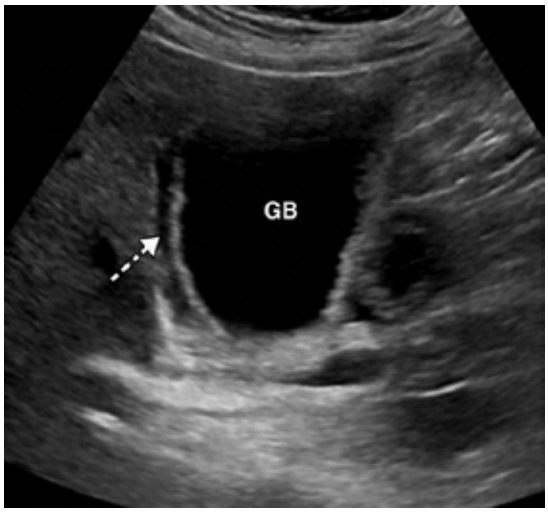


Figure 3A - Gallbladder ultrasonography (B mode) shows gallbladder with increased volume (GB) and significant wall edema (white dashed arrow). Findings suggest biliary stasis and acute cholecystitis. [8]

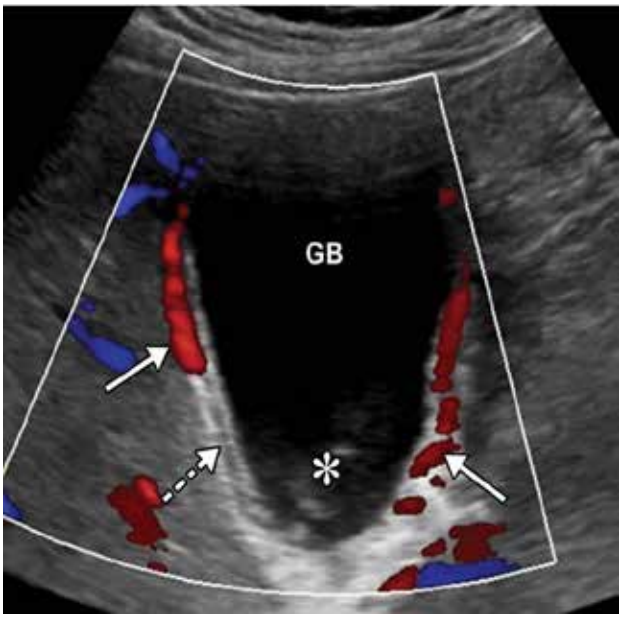


Figure 3B - Gallbladder ultrasonography (color Doppler) showing gallbladder with increased volume (GB) and thick bile (*). Significant wall edema (white dashed arrow) and hyperflow (solid white arrows). Findings suggest biliary stasis and acute cholecystitis. [8]

Figures 4A and 4B show a case similar to the previous one, this is an 83-year-old man with elevated liver enzymes and sepsis, with a distended gallbladder and thick bile. These findings are suggestive of cholestasis. The patient also underwent ultrasound-guided cholecystostomy. The bile was not infected.[4]

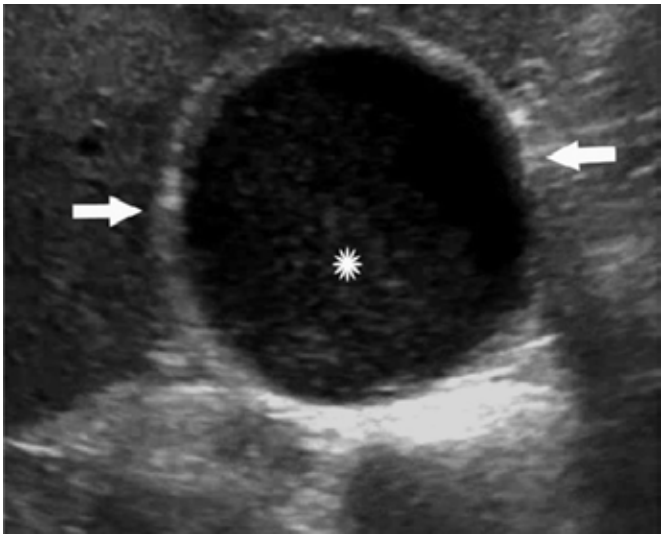


Figure 4A - Gallbladder ultrasonography (cross section) showing distension (arrows) and containing thick bile (*), suggestive of cholestasis. [4]

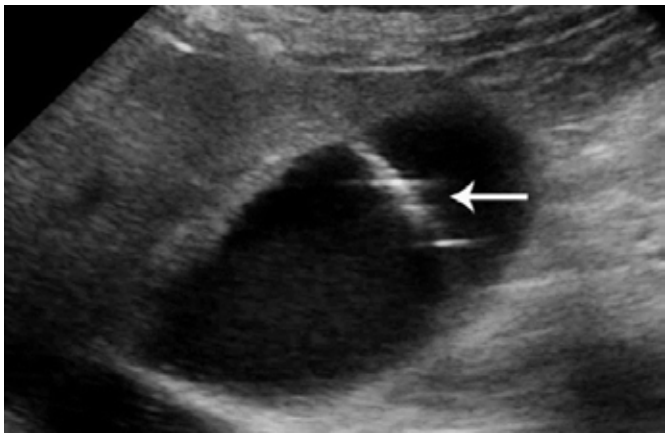


Figure 4B - Gallbladder ultrasonography (longitudinal section) showing a needle during the guided cholecystostomy procedure. [4]

Figure 5 depicts a 4-year-old boy with a medical history of prematurity and mild asthma who presented with fever, abdominal pain, diarrhea, hypotensive shock, and evidence of myocardial dysfunction with positive coronavirus disease. Image shows gallbladder wall thickening but no gallstones. [10]

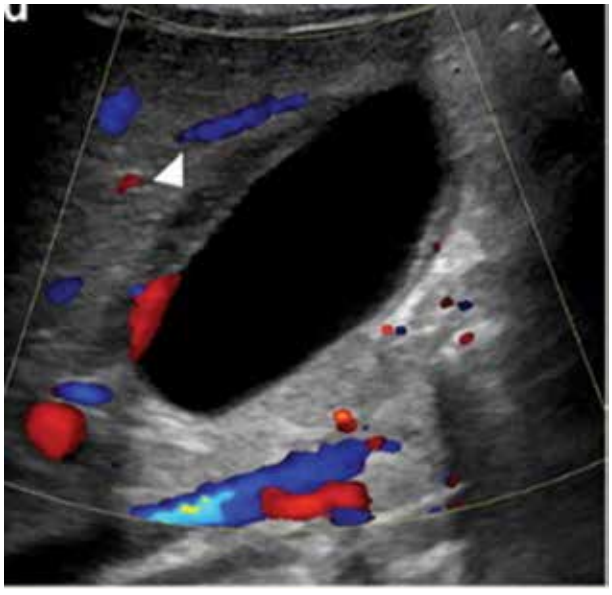


Figure 5 - Gallbladder ultrasonography (longitudinal section) with Doppler analysis, showing gallbladder wall thickening (arrowhead). [10]

Solid organ infarctions can also be visualized on abdominal imaging in patients with COVID-19, affecting the kidney and liver.

Figure 6 refers to a 52-year-old patient, severely affected

by COVID-19, evolving to orotracheal intubation, presenting oliguria, with high creatinine levels, whose diagnosis was renal infarction.

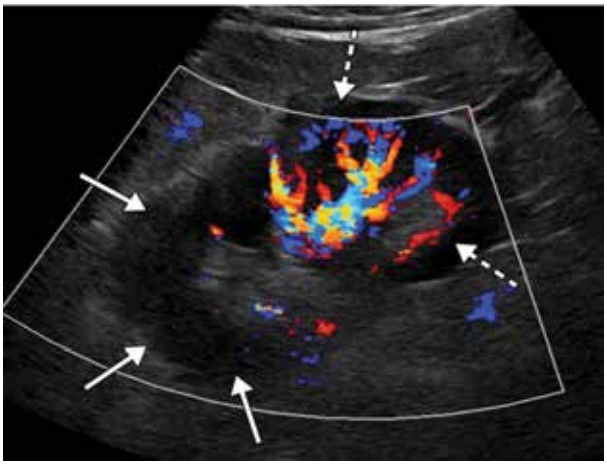


Figure 6 – Renal ultrasound (longitudinal section) with Doppler analysis showing a focal area of hypoperfusion (solid arrows) in the upper pole of the left kidney, compatible with infarction. Normal perfusion (dashed arrows) is seen at the lower pole of the kidney. [8]

Pancreatic lesion was described in COVID-19 and is believed to be the result of direct or indirect mechanisms. The direct mechanism stems from a cytopathic effect mediated by local viral replication (pancreatic islet and exocrine gland cells have abundant ACE2 receptors), while the indirect mechanism refers to a systemic response to respiratory failure or a self-induced harmful immune virus response. Up to 17% of patients with COVID-19 have pancreatic damage. 8

Figure 7 shows an examination of a 47-year-old female patient with diffusely enlarged pancreas suggestive of acute pancreatitis, without focal changes or gallstones.

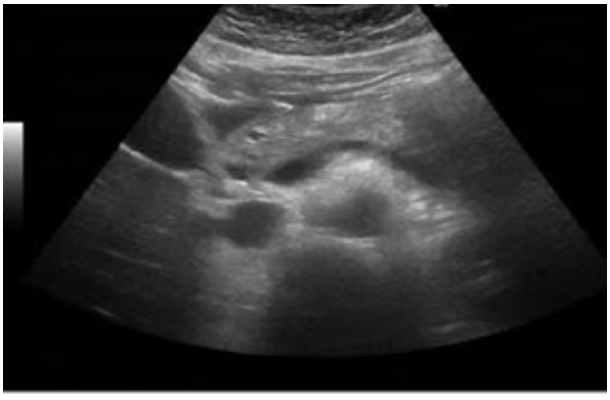


Figure 7 – Pancreas ultrasonography showing increased volume. [3]

Figure 8 shows an examination of a seven-year-old girl with diffuse pancreas enlargement (black arrows) and heterogeneous pancreatic echogenicity (white arrow); findings related to acute pancreatitis.[11]

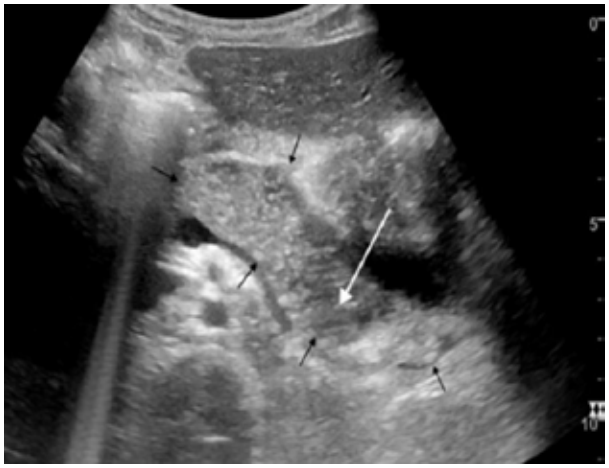
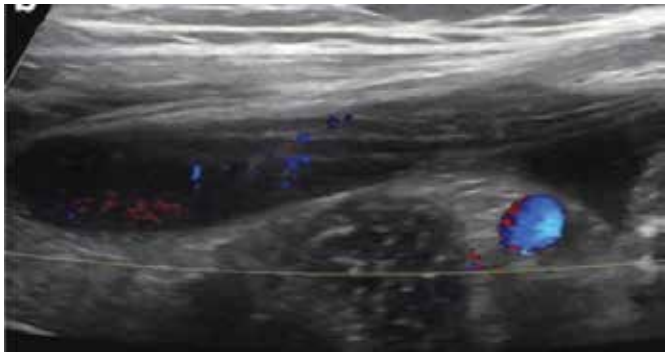


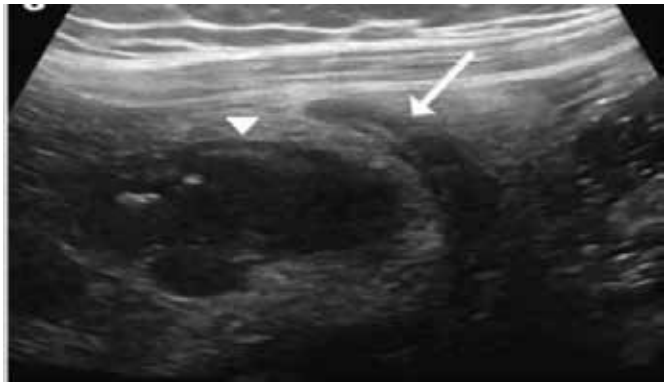
Figure 8 - Pancreas ultrasonography (black arrows) reveals diffuse pancreas enlargement and heterogeneous pancreatic echogenicity (white arrow).[11]

Intestinal involvement results from direct viral infection, virus-induced intestinal inflammation, or intestinal wall ischemia. In patients with COVID-19, bowel wall ischemia occurs in the context of macro or micro arterial thrombosis or venous occlusion, with congestion and mesenteric inflammation.[8]

Figures 9A and 9B are of a seven-year-old girl who presented with fever, abdominal pain, diarrhea, rash, and evidence of myocardial dysfunction with a diagnosis of COVID-19. This child was initially diagnosed with appendicitis. However, she evolved with small-volume ascites and mesenteric edema adjacent to an enlarged borderline appendix and thickened distal ileum segment. [10]



Figures 9A - Abdominal ultrasound with Doppler analysis of the right lower abdominal quadrant demonstrates small volume ascites. [10]



Figures 9B - B-mode abdominal ultrasound of the right lower abdominal quadrant demonstrates mesenteric edema adjacent to an enlarged borderline appendix (white arrow) and a thickened loop of distal ileum (white arrowhead).[10]

Figure 10 shows the right lower abdominal quadrant of a 15-year-old girl, who presents with fever, abdominal pain, conjunctivitis, headache and hypotensive shock. Image shows thickening of the intestinal wall of the distal ileum with surrounding mesenteric edema. [10]

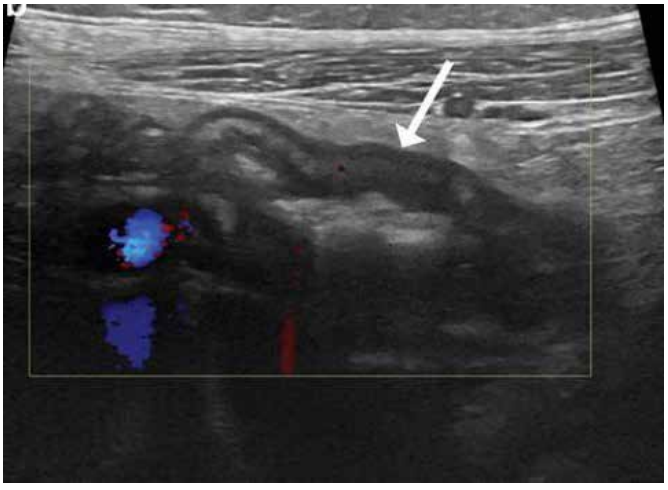


Figure 10 – Abdominal ultrasound with Doppler analysis of the right lower abdominal quadrant shows thickening of the intestinal wall of the distal ileum (arrow) with surrounding mesenteric edema. [10]

The sonographic findings in Figure 11 may correspond to interstitial cystitis and/or hemorrhagic cystitis in an 85-year-old male patient with pneumonia caused by COVID-19, who progressed to hematuria and acute renal failure.[8]

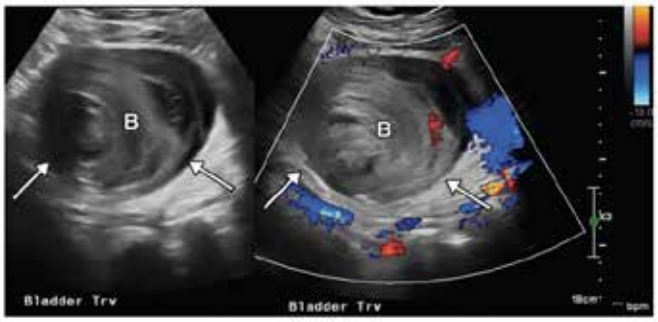


Figure 11 – B-mode bladder ultrasound and Doppler analysis, respectively, showing a distended urinary bladder (B) filled with avascular heterogeneous echogenic material, indicative of vesicle bleed (arrows). [8]

CONCLUSION

Ultrasonography is an important method in the abdominal assessment of patients diagnosed with COVID-19. B-mode analysis, associated with Doppler, is indicated due to the characteristic vascular involvement of this viral entity. Among recent publications on the subject, changes related to portal venous gas due to mesenteric vascular injury, portal vein thrombosis, distended gallbladder, biliary stasis, diffusely voluminous pancreas without focal lesions or gallstones, areas of renal infarction, ascites, intestinal wall thickening, interstitial and/or hemorrhagic cystitis.

The domain of ultrasound findings related to abdominal changes in COVID-19 has established itself as an urgent contemporary need.

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REVIEW ARTICLE

APPROACH WITH ULTRASOUND-GUIDED PIRIFORMIS BLOCKS FOR PAIN RELIEF AND CONFIRMATION OF THE CLINICAL DIAGNOSIS OF DEEP GLUTEAL PAIN

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ABSTRACT

OBJECTIVE: The objective of this study was to demonstrate the clinical efficacy in immediate pain improvement after the ultrasound-guided puncture procedure, followed by infiltration and administration of lidocaine and betamethasone in the piriformis muscle belly.

MATERIALS AND METHODS: This retrospective and comparative study used ultrasound equipment for the punctures together with a medical tuning fork and a power Doppler. Data analysis of the last 500 cases of echo-guided procedures was performed in a reference clinic in the city of Goiânia-GO. Among these cases, ultrasound reports that contained data related to deep gluteal pain (piriformis syndrome) were selected. The following information was analyzed: age, sex, laterality and confirmation of pain improvement using the visual analog scale (VAS). All patients underwent piriformis block with ultrasound-guided puncture, followed by infiltration and administration of 2% lidocaine, without vasoconstrictor, 6ml and betamethasone dipropionate (5mg / mL) + betamethasone disodium phosphate (2mg / mL).

RESULTS: Of the 500 procedures, 53 were related to deep gluteal pain (Piriformis Syndrome). The average age of the patients was 58 years old, being the youngest patient 21 years old and the oldest 84 years old. As for sex, there were 11 male patients, which corresponds to 21% of the cases and 42 females, which corresponds to 79% of the cases. As for laterality, the left side was the one that appeared most frequently, with 70%, which is equivalent to 37 patients. The right side affected only 14 patients, corresponding to 26% of the cases. In addition, in two patients the involvement was bilateral, which is equivalent to 4% of cases.

CONCLUSION: The echo-guided block in the piriformis muscle belly proved to be effective for diagnostic confirmation and treatment of pain relief in deep gluteal pain syndrome, with 100% of cases showing pain relief between 0 and 3 in the VAS (Visual Analog Scale) of 0 to 10. With the female sex being the most frequent, with an average age from both sexes of 58 years and prevalence of 70% of cases on the left side.

KEYWORDS: PIRIFORMIS SYNDROME, DEEP GLUTEAL PAIN, ULTRASONOGRAPHY.

INTRODUCTION

Deep gluteal pain syndrome (DGS) is classified among the most common and underdiagnosed pains in medicine, making it a challenge for modern orthopedics, both in diagnosis and in its treatment. The origin of DGS may be in the anatomical structures of the gluteal region, particularly in the deep gluteal space, or even in the lumbosacral spine, sacroiliac joints and hips.

In the management of this syndrome, ultrasound guidance (US) has gained importance in the last decade and has been a useful tool in propedeutics, as well as serving as a guide for punctures for test blocks, blocks with hydrodissection and other procedures in the approaches to DGS, allowing visualization of the external rotator muscle group in the deep gluteal space in a specified way and avoiding complications such as inadvertent puncture of vessels or nervous structures.

The piriformis muscle was described in 1928 by Yeoman as an etiological factor in atypical sciatica due to its anatomical variations [1]. Since then, DGS has been a clinical condition popularly related to the name of piriformis syndrome (PS).

The piriformis syndrome has only 6% of incidence in the general population, being more common in females than in males and increases between the fourth and fifth decade of life, according to the literature.

The clinical diagnosis is given by anamnesis and physical examination, with resistance abduction maneuvers and external rotation of the thigh (Pace test). There is also the Friberg test, which consists of abduction and passive and forced internal rotation of the affected lower limb. In these cases, patients had pain in the deep gluteal space region.

The ultrasound method allows anatomical visualization

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of the piriformis muscle and its relationship with the sciatic nerve. Ultrasound-guided anesthetic piriform blockade can be performed effectively and reproducibly, with careful attention to the details of the procedure, it can be performed with minimal morbidity for the patient, and it can be performed in the office in a minimally invasive and very safe way for the patient. It can offer the opportunity for a real-time assessment of the pain relief response, using the visual analogue scale (VAS).

The objective of this study was to demonstrate the clinical efficacy in immediate pain improvement after the ultrasound-guided puncture procedure, followed by infiltration and administration of lidocaine and betamethasone in the piriformis muscle belly.

METHODOLOGY

A Samsung ultrasonography equipment, model HS 50, with multifrequency linear and convex probes was used. A 22Gx3-1/2 spinal needle was used for the punctures. In all cases, a 128Hz tuning fork was used as an aid in the diagnosis and location of trigger points, together with the use of power Doppler set at 500Hz – figure 1.

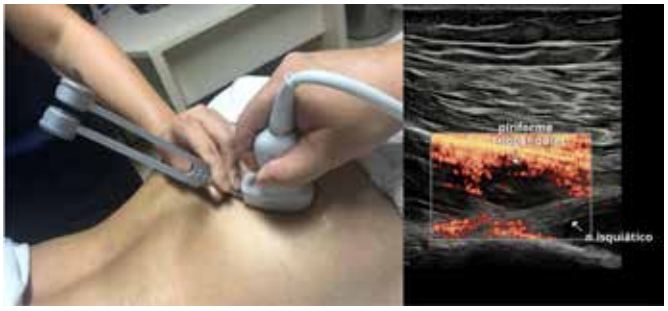


Figure 1: Intramuscular piriform trigger diagnosis using power Doppler using a 128Hz tuning fork stimulus. Note that in the Trigger Point zone, the speed of sound propagates differently, remaining different from the neighboring tissue.

This retrospective and comparative study of medical record data maintained patient privacy and data confidentiality throughout the research process. This study did not have direct contact with the study group, and all patient identifiers were discarded from the data set at the time of initial collection, thus obtaining the waiver of informed consent.

Data analysis of the last 500 cases of ultrasound-guided procedures was carried out in a reference clinic in the city of Goiânia-GO. And from these, the cases whose ultrasound examination reports contained data related to deep gluteal pain (piriformis syndrome) were selected. The following information was analyzed: age, sex, laterality and confirmation of pain improvement by the visual analogue scale (VAS). After data collection and computation via Epi Info™ app | CDC, the statistical information was obtained and tabulated using the Microsoft Excel program.

All patients underwent piriform blockade with ultrasound-guided puncture, followed by infiltration and administration of 2% lidocaine without 6ml vasoconstrictor and betamethasone dipropionate (5mg/ml) + betamethasone disodium phosphate (2mg/ml) – figure 2

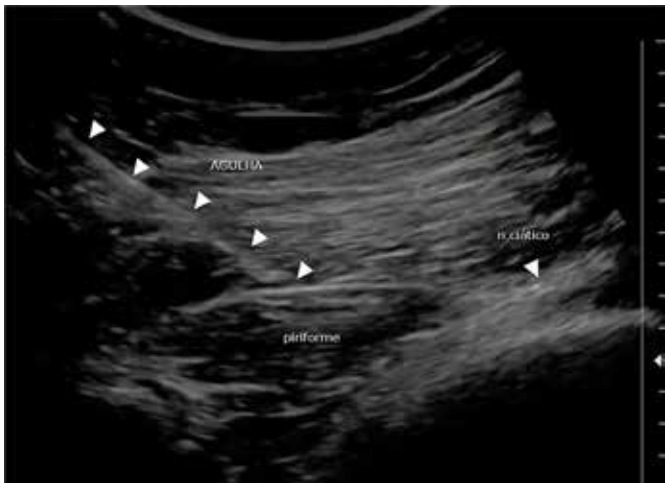


Figure 2: Ultrasound-guided piriform blockade.

RESULTS

The last 500 cases of ultrasound-guided procedures performed at the reference clinic for musculoskeletal ultrasound in Goiânia-GO, which provided the data for this research, were the basis of this work. Of these procedures, 53 (10.6%) were from patients whose ultrasonographic exams contained data on deep gluteal pain (piriformis syndrome). Those patients underwent ultrasound-guided puncture for piriformis blockade and administration of lidocaine and betamethasone.

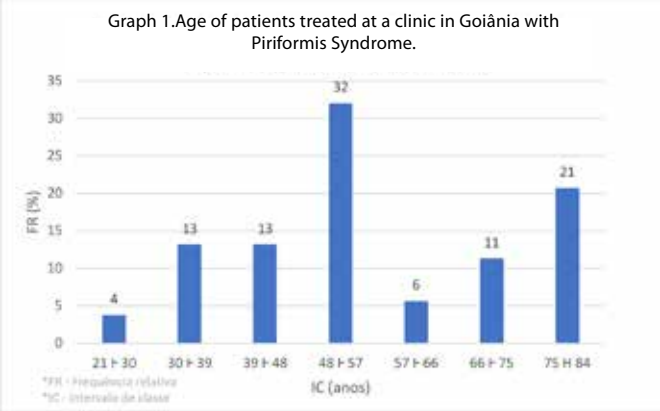
The mean age of patients was 58 years, with the youngest patient being 21 years old and the oldest being 84 years old. As for gender, there were 11 male patients, which corresponds to 21% of cases and 42 females, which corresponds to 79% of cases.

As for laterality, the left side was the one that appeared most frequently, with 70%, which is equivalent to 37 patients. The right side affected only 14 patients, corresponding to 26% of cases. In addition, in two patients the involvement was bilateral, equivalent to 4% of cases. The visual analogue pain scale (VAS) was applied 30 minutes after the ultrasound-guided procedure and showed that 100% of patients rated pain from 0 to 3. Data are shown in tables 1-4 and graphs 1 - 3.

IC(anos)	CC	FA	FR(%)	FRA(%)
21 ⊢ 30	26	2	4	4
30 ⊢ 39	35	7	13	17
39 ⊢ 48	44	7	13	30
48 ⊢ 57	53	17	32	62
57 ⊢ 66	62	3	6	68
66 ⊢ 75	71	6	11	79
75 ⊢ 84	80	11	21	100
TOTAL		53	100	

IC - Intervalo de classe. CC - Centro de classe. FA - Frequência absoluta. FR- Frequência relativa. FRA - Frequência relativa absoluta.

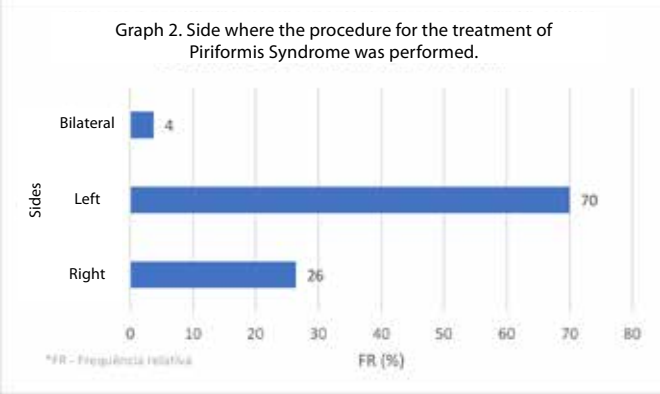
Table 1 – Age of patients treated at a clinic in Goiânia, with Piriformis Syndrome.



Graph 1.Age of patients treated at a clinic in Goiânia with Piriformis Syndrome.

Lados	FA	FR(%)	FRA(%)
Right	14	26	26
Left	37	70	96
Bilateral	2	4	100
TOTAL	53	100	

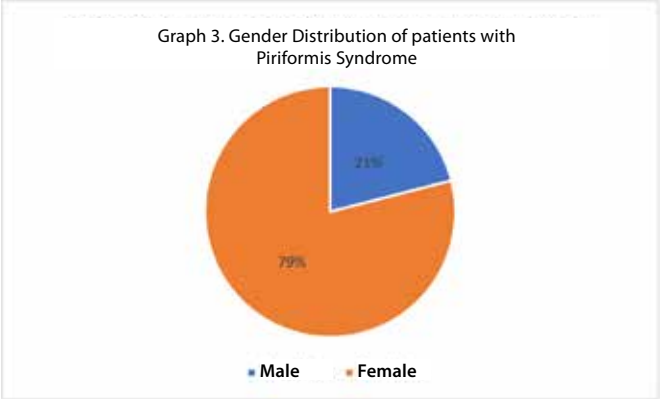
Table 2 – Side where the procedure for the treatment of Piriformis Syndrome was performed.



Graph 2. Side where the procedure for the treatment of Piriformis Syndrome was performed.

Gender	FA	FR(%)	FRA(%)
Male	11	21	21
Female	42	79	100
TOTAL	53	100	

Table 3 – Gender Distribution of patients with Piriformis Syndrome.



Graph 3. Gender Distribution of patients with Piriformis Syndrome

IC (EVA)	CC	FA	FR(%)	FRA(%)
0 ⊢ 3	2	53	100	100
3 ⊢ 6	5	0	0	
6 ⊢ 10	8	0	0	
TOTAL		53	100	

Table 4 – Visual Analog Scale (VAS) of pain after the procedure in patients with Piriformis Syndrome.

Bring your camera close to the QR Code to view the videos below:

Video: Piriform Infiltration

Video: Piriform with Tuning Fork

DISCUSSION

Piriformis syndrome is a common cause of lower back, gluteal, and thigh pain, often associated with sciatic nerve symptoms. Potential etiologies include muscle injury or chronic muscle stretching associated with gait disturbances. There is a common pathological terminal pathway involving hypertrophy, spasm, contracture, inflammation and scarring of the piriformis muscle, leading to sciatic nerve shock.

Ultrasound-guided piriformis injections are frequently used in the treatment of these pain syndromes, with most of the published literature describing muscle injection.

The piriformis muscle was described in 1928 by Yeoman as an etiological factor in atypical sciatica due to its anatomical variations1. Since then, DGS has been a clinical condition popularly related to the name piriformis syndrome (PS).

Beaton & Anson [2] in 1937 initially described the relationship of the sciatic nerve and its subdivisions with the piriformis muscle, showing the various anatomical variants in their emergence in the deep gluteal space and concluded that the emergence distal to the belly of the piriformis was present in 84% of the patients, 12% being between and below the piriform and the other cases in other forms of anatomical variation.

Durrani & Winnie [3], performed a retrospective review of 26 patients with sciatica due to piriformis muscle syndrome. Most patients had pain in the buttocks and sciatica, and most had difficulty walking and sitting, even for short periods of time. Reproduction of sciatica on deep palpation, via the gluteal or rectal route, was diagnosed. Reproduction of sciatica occurred in 92% of patients on deep digital palpation and in 100% of patients on rectal or pelvic examination. This study emphasizes that the diagnosis of piriformis muscle syndrome is clinical.

Polesello et al [4] in 2012 evaluated the anatomical variation of the piriformis muscle as a cause of deep gluteal pain and to be improved through magnetic resonance neurography.

Martin et al [5] studied the endoscopic decompression of the sciatic nerve in the treatment of patients with deep gluteal pain syndrome (DGS), in 35 patients (28 women and seven men). Postoperative results were assessed using the modified Harris Hip Score (MHHS), the Verbal Analog Scale (VAS) score, and a questionnaire specifically related to hip sciatica. The mean age of patients was 47 years (range 20 to 66 years). Endoscopic sciatic nerve decompression has been shown to be helpful in improving function and decreasing hip pain in sciatic nerve entrapment/DGS. Mean follow-up time was 12 months (range 6 to 24 months). The mean postoperative MHHS increased to 78.0 and the VAS score decreased to [2,4]. About 83% of patients did not experience postoperative sciatica (inability to sit for more than 30 minutes).

Carro et al [6] agree that deep gluteal pain is among the most common diagnostic and therapeutic challenges for orthopedists and radiologists. In this paper, they described the limits of the deep gluteal space, the posterior limit being the gluteus maximus muscle, the anterior limit being the posterior edge of the femoral neck; laterally by the linea aspera and by the lateral fusion of the layers of the gluteal medial and deep aponeurosis, reaching the tensor fascia lata muscle; the medial border by the sacrotuberous and falciform fascia; the superior limit at the inferior margin of the sciatic notch and the inferior limit at the origin of the hamstrings. They also described that the internal structures of the deep gluteal space are the superior and inferior gluteal nerves, the ischium, the sacrotuberous and sacrospinous ligament, the sciatic nerve and the external rotator muscles, being the piriformis, the superior gemelli, obturator internus, inferior gemelli and the quadratus femoris.

Demirel et al [7], in 2018, in Turkey, showed by a sonoelastography study that muscle elasticity and tissue hardening increased on the sick side both in the piriformis muscle belly and in the gluteus maximus. In this work with 28 patients, 21 female and seven male, the age ranged from 24 to 62 years old, with an average of 45 years old.

Smith et al [8] in 2006, proposed the description and verified the ultrasound-guided piriformis injection technique, providing very good prospects for using the US method in these procedures.

Monres JG [9], in his commented Atlas of musculoskeletal ultrasonography, in 2004, already described how to assess the deep gluteal space by US and reported that piriformis syndrome occurs due to an exaggerated tension of this muscle, its hypertrophy, or also a traumatic cause, in which the lower edge of the piriformis becomes thickened by reactive fibrosis. common in men with the continued use of wallets in the back pocket of their tight pants, determining chronic piriformis pain syndrome, which can manifest as pseudo sciatica syndrome.

In 2010, Smoll NR [10] reviewed the variations of the piriformis and sciatic nerves with clinical consequences and noted that the prevalence of anomalies in the emergence of sciatic nerves in the deep gluteal space in patients with piriformis syndrome is not significantly different from what is thought to be a healthy population, this indicates that this anomaly may not be as important in the pathogenesis of piriformis syndrome as previously thought.

Bevilacqua et al [11] in 2016, used the injection of the piriformis muscle with local anesthetics and corticosteroids in five patients and an ultrasound-guided approach was performed and all patients had pain improvement on the VAS and only one case presented as a sciatic complication that improved spontaneously. in 10 days. They concluded that the technique is easy to be performed and has a good safety profile and good results.

Burke et al [12] in 2019 described a safe and effective ultrasound-guided injection technique for the treatment of piriformis syndrome using targeted perineural sciatic hydrodissection followed by therapeutic corticosteroid injection.

Zhang et al [13], in 2019, included a total of 33 patients with clinically diagnosed PS (mean age 45 years; 16 men) and 26 healthy volunteers (mean age 54 years; 15 men)

in a cross-sectional study. They used US and RM for data comparison. Muscle thickness was measured through the cross-sectional area (CSA) in three consecutive axial slices from the point where the muscle was first visible in the greater sciatic foramen and the images were determined for each side. The images showed increased piriformis muscles on the symptomatic side in patients with PS, in addition to hypoechogenic texture and increased fascia acoustic enhancement. They concluded that US and MRI revealed similar muscle alterations in patients with PS. And these findings indicate that the US can be a reliable and convenient technique for the diagnosis of PS.

Wu et al [14], in 2020 in a single-center retrospective study in which 52 patients diagnosed with piriformis syndrome and 50 healthy volunteers were enrolled to undergo ultrasound examination of the piriformis and sciatic nerve and concluded that US can help in the clinical diagnosis of piriformis syndrome.

Our work covered a group of 53 patients whose US exams contained data related to deep gluteal pain (piriformis syndrome) and were submitted to US-guided puncture for piriformis blockade and administration of lidocaine and betamethasone. The mean age of patients was 58 years, with the youngest patient being 21 years old and the oldest being 84 years old. As for gender, there were 11 male patients, which corresponds to 21% of cases and 42 females, which corresponds to 79% of cases. As for laterality, the left side was the one that appeared most frequently, with 70%, which is equivalent to 37 patients. The right side affected only 14 patients, corresponding to 26% of cases. In addition, in two patients the involvement was bilateral, equivalent to 4% of cases. The analogue pain scale (VAS) was applied 30 minutes after the ultrasound-guided procedure and showed that 100% of patients rated pain from 0 to 3.

CONCLUSION

Ultrasound blockade in the piriformis muscle belly proved to be effective for diagnostic confirmation and treatment of pain relief in deep gluteal pain syndrome, with 100% of cases showing pain relief between 0 and 3 on VAS from 0 to [10]. The most frequent sex was female, with a mean age of 58 years and a prevalence of 70% on the left side.

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