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CASE REPORT

Radiological diagnosis of endometriomas in young women with chronic pelvic pain

Diagnóstico radiológico de endometriomas en mujeres jóvenes con dolor pélvico crónico

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SUMMARY

Chronic pelvic pain is a symptom that may represent a disease in a specific organ system, a chronic pain syndrome, or both. Endometriosis is one of the local diseases that cause chronic pelvic pain. Sometimes their diagnosis can become a real challenge. This article presents a series of five cases with clinical and radiological diagnosis of endometriosis, with the aim of describing the most frequent symptoms, signs and radiological findings. Chronic pain in the lower abdomen and lesions of different aspects were identified as a common symptom, although fundamentally cystic, located in the pelvic organs, and identified by ultrasound and pelvic magnetic resonance imaging. The latter technique was the most sensitive for the non-invasive diagnosis of this entity. The updated literature review showed similar findings in works by other authors.

Keywords: CHRONIC PELVIC PAIN; ENDOMETRIOMA; ENDOMETRIOSIS; ULTRASOUND; MAGNETIC RESONANCE.

Descriptors: PELVIC PAIN; ENDOMETRIOSIS; ULTRASONICS; MAGNETIC RESONANCE SPECTROSCOPY.

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Julio César Salazar Ramírez

RESUMEN

El dolor pélvico crónico es un síntoma que puede representar una enfermedad en un sistema orgánico específico, un síndrome de dolor crónico o ambos. La endometriosis es una de las enfermedades locales que causan dolor pélvico crónico. En ocasiones su diagnóstico puede convertirse en un verdadero desafío. En este artículo se presenta una serie de cinco casos con diagnóstico clínico y radiológico de endometriosis, con el objetivo de describir los síntomas, signos y hallazgos radiológicos más frecuentes. Se evidenció como síntoma común el dolor crónico en bajo vientre y lesiones de diferentes aspectos, aunque fundamentalmente quísticas, localizadas en los órganos pélvicos, identificadas en ultrasonido y resonancia magnética de pelvis, siendo esta última técnica la más sensible para el diagnóstico no invasivo de esta entidad. En la revisión actualizada de la literatura se encontraron trabajos realizados por otros autores con hallazgos similares.

Palabras clave: DOLOR PÉLVICO CRÓNICO; ENDOMETRIOMA; ENDOMETRIOSIS; ULTRASONIDO; RESONANCIA MAGNÉTICA.

Descriptores: DOLOR PÉLVICO; ENDOMETRIOSIS; ULTRASONIDO; ESPECTROSCOPÍA DE RESONANCIA MAGNÉTICA.

INTRODUCTION

Chronic pelvic pain (CPP) is a symptom that may represent a disease in a specific organ system, a chronic pain syndrome, or both. As women with CPP may have more than one etiology for their pain, evaluation goals include identifying treatable causes of pain and differentiating specific peripheral causes from those that overlap with centralized pain syndromes, because treatments may differ substantially, [1] the endometriosis, is included in the large group of local diseases that cause CPP, the diagnosis of which sometimes become a real challenge.

Endometriosis is defined as endometrial glands and stroma located outside the uterine cavity. Lesions are typically located in the pelvis and/or at multiple sites, including the bowel, diaphragm, and pleural cavity. The ectopic endometrial tissue and the resulting inflammation cause dysmenorrhea, dyspareunia, chronic pain, and infertility. It is a benign, estrogen-dependent inflammatory disease that affects women during their premenarchal, reproductive, and postmenopausal hormonal stages. [2]

Se desconoce la prevalencia exacta de la endometriosis, pero se estima que oscila entre el 2 % y 10 % en la población general y hasta el 50 % en mujeres infértiles. [3] Cada año, unas 100 mujeres ingresan en las unidades de hospitalización de *Hamad Medical Corporation* (HMC) debido a endometriosis y complicaciones relacionadas. [4]

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Some authors are based on a score to locate patients with suspected endometriosis, using the history, several clinical signs and symptoms, giving each patient a score to calculate the risk of having pelvic endometriosis, (3) subsequently confirming or ruling it out using different diagnostic techniques. Diagnosis at the Cuban Hospital of Qatar is based mainly on clinical information, a history of dysmenorrhea, pelvic pain, dyspareunia, infertility, followed by radiological findings that include pelvic ultrasound to demonstrate simple or complex cystic lesions and magnetic resonance imaging of pelvis with intravenous contrast, observing cystic or punctate lesions with hyper intense signals in T1, and hypo intense on T2, usual behavior of endometriosis lesions depending on the state of degradation of the blood from their lesions, located at any point of the pelvic cavity or abdominal.

Although the development of new diagnostic techniques, the increase in the sensitivity of known radiological equipment and the results of clinical investigations have facilitated the identification of ectopic endometrial foci, the diagnosis of endometriosis continues to be a challenge. In this sense, we present several patients diagnosed with pelvic endometriosis using radiological techniques, diagnosed at the Cuban Hospital in Qatar, with the aim of showing the clinical and radiological findings of this disease, with the corresponding discussion and bibliographic review.

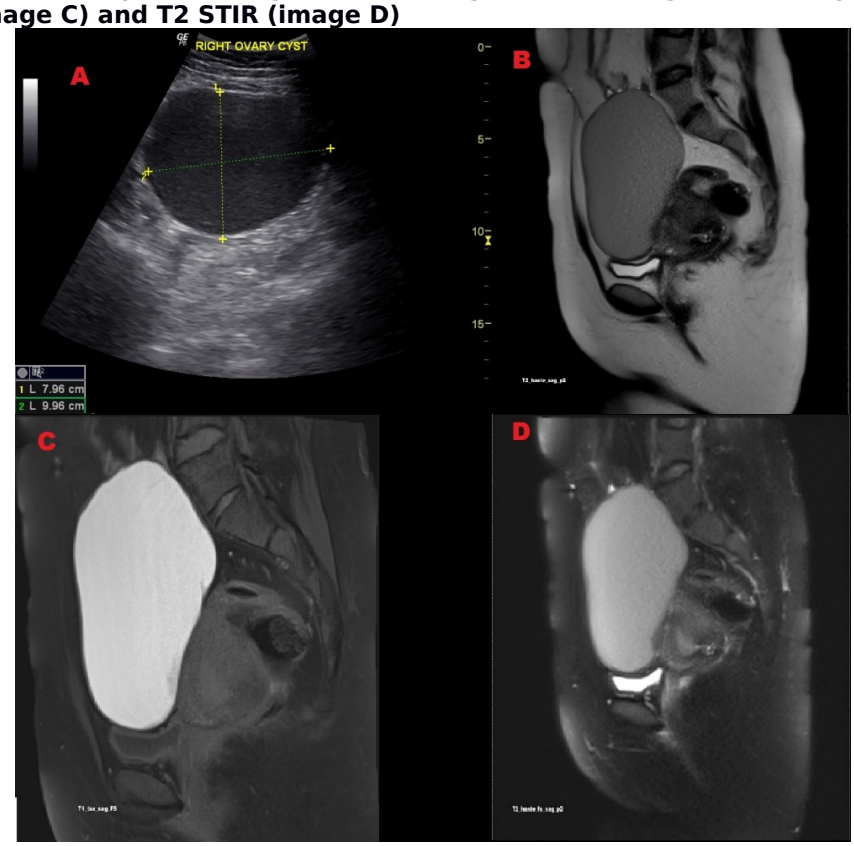
CASE PRESENTATION

Patient 1

31-year-old Tunisian female, her body mass index (BMI) 26 kg/m2, she has history of chronic lower abdominal pain, increasing during menstrual period, asthma, there is no history of genetic disease, obstetrics records G0 P0 A0 (pregnancies, deliveries and abortions). Only demonstrated slight pain on deep palpation on physical examination.

Laboratory examination was requested with results: white blood cell count (WBC) 4.4 mmol/L, hemoglobin (Hgb) 13.2 mmol/L, alanine aminotransferase (ALT) 51 mmol/L, aspartate aminotransferase (AST) 32 mmol /L, cancer antigen (CA) 125: 27.9 U/mL, CA 15-3: 7.2 U/mL, CA 19-9: 8.7 U/mL, prolactin: 873 U/mL. Ultrasound result: right ovary shows rounded avascular image with small echoes inside, measuring 79 x 99 mm. Magnetic resonance imaging (MRI): There is cystic lesion with hyper intense signals on T2, T1, and T1 with fat saturation, hypo intense on T2 sequence and TIRM, measuring 123 x 89 x 82 mm, with thin wall, without elements inside, contacting the right ovary (**image 1**).

IMAGE 1. Endometriosis cyst, note hypoechoic image on US (image A), and hyper intense on T2 (image B), T1 (image C) and T2 STIR (image D)



The diagnosis was: cystic endometrioma, based on the magnetic resonance imaging finding. The patient was operated and removed the cystic lesion, the pathology report was an endometriosis cyst. Currently the patient continues fallowing up with a gynecologist, she reports that the lower abdominal pain disappeared.

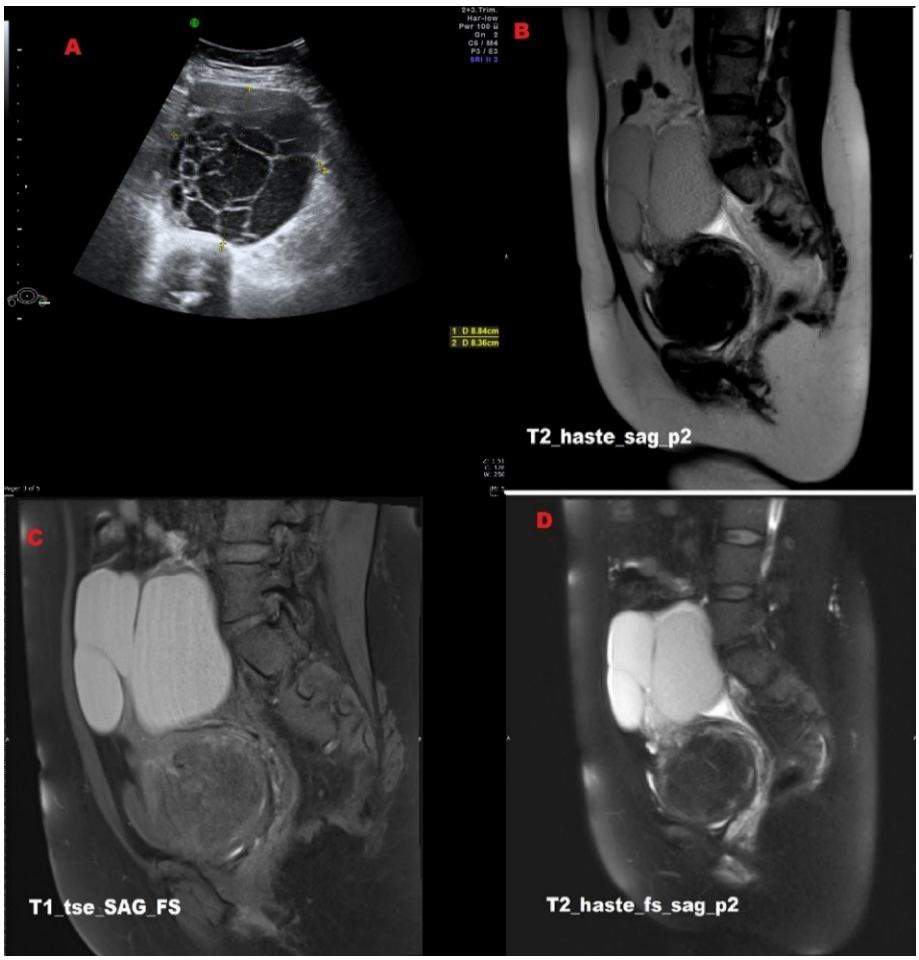
Patient 2

A 46-year-old patient, Cuban nationality, BMI 23.33 kg/m2, denies any surgical history, she has obstetric history G1 P0 A1, went to the gynecologist for lower abdominal pain, more intense during menstruation. Significant on physical examination, tender on deep palpation of the lower abdomen.

Laboratory results showed: WBC: 8.15 mmol/L, Hgb: 11.3 mmol/L, ALT: 17 mmol/L, AST: 16 mmol/L, CA 125: 34.6 U/mL, CA 15-3: 20.0 U/mL, CA 19-9: 9.4 U/mL. Ultrasound finding: left ovary, occupied by a mixed mass, predominantly anechoic, multi-lobed, thin-walled, measuring 88 x 83 mm. Magnetic resonance findings: uterus is in anteverse position, measures 131 x 76 x 739 mm, several well-defined, rounded hypo intense nodules are seen, located in the myometrium, the largest located in the anterior wall, measuring 73 x 71 x 51 mm, with radial enhancement after intravenous contrast administration, the uterine cavity is slightly deformed, without significant enhancement after intravenous contrast administration, endometrium measures 5.8 mm. There are several hyper intense punctate signals on T1 and T2 in the myometrium due to foci of adenomiosis, a septate, cystic-looking lesion is observed projected on both ovaries with variable signals emitted due to the different stage of blood degradation, measuring 55 x 37 x 32mm on the right side and 102 x 87 x 82mm on the left side. There is also evidence of a small nest inside the bladder, cervix and Douglas pouch (**image 2**).

The patient is under gynecological control with hormonal medical treatment.

IMAGE 2. Endometriosis cyst, note hypoechoic image with several internal septa on US (image A), and hyper intense on T2 (image B), T1 (image C) and T2 STIR (image D)

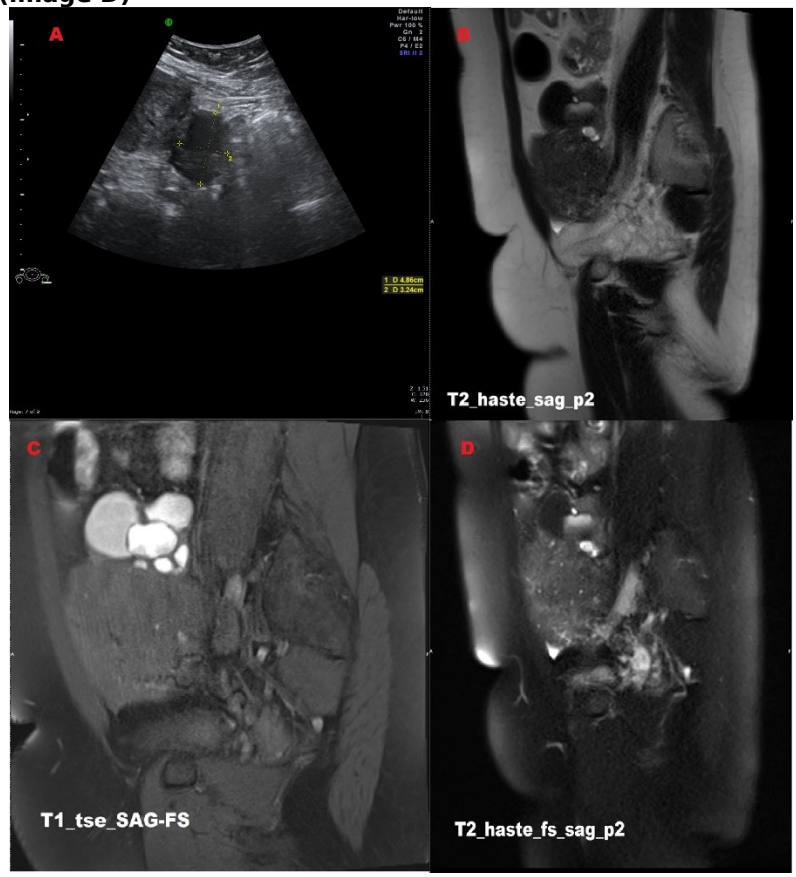


Patient 3

A 38-year-old woman, BMI 31 kg/m², married, Filipina, G1 P1 A0 obstetric history, caesarean section, went to the gynecologist for a history of post-pregnancy uterine fibroid, denied pain, negative physical examination. Laboratory test results: WBC: 8 mmol/L, Hgb: 9.5 mmol/L, ALT: 11 mmol/L, AST: 10 mmol/L, CA 125: 404 U/L, CA 19-9: 86.5 U/L. Ultrasound of the pelvis: fibroid-like uterus, heterogeneous texture, 140 x 107 x 80 mm, well defined, distorted endometrium of 10 mm is observed, left ovary size 48 x 32 mm, several thick-walled translucent images are seen, with echogenic content. MRI result: anteroverse position of the uterus measuring 157 x 102 x 91 mm with a rounded, hypo intense, well-defined nodule on the posterior wall measuring 91 x 79 x 59 mm, associated with several small punctate lesions, hyper intense on T1, representing endometriosis nidus, endometrium measuring 6 mm, not deformed. Left ovary globally enlarged, measuring 58 x 37 x 36 mm, with several hyper intense grouped with septate cystic appearance images, well-defined on T1 sequences and hypo intense on T2 sequences (**image 3**).

It was prescribed medical treatment, and is awaiting surgery. Follow-up by gynecology.

IMAGE 3. Endometriosis cyst, note hypoechoic multilobulated ultrasound (image A), hypo intense and hyper intense on T2 (image B), hyper intense on T1 (image C) and hypo intense also hyper intense on T2 STIR (image D)



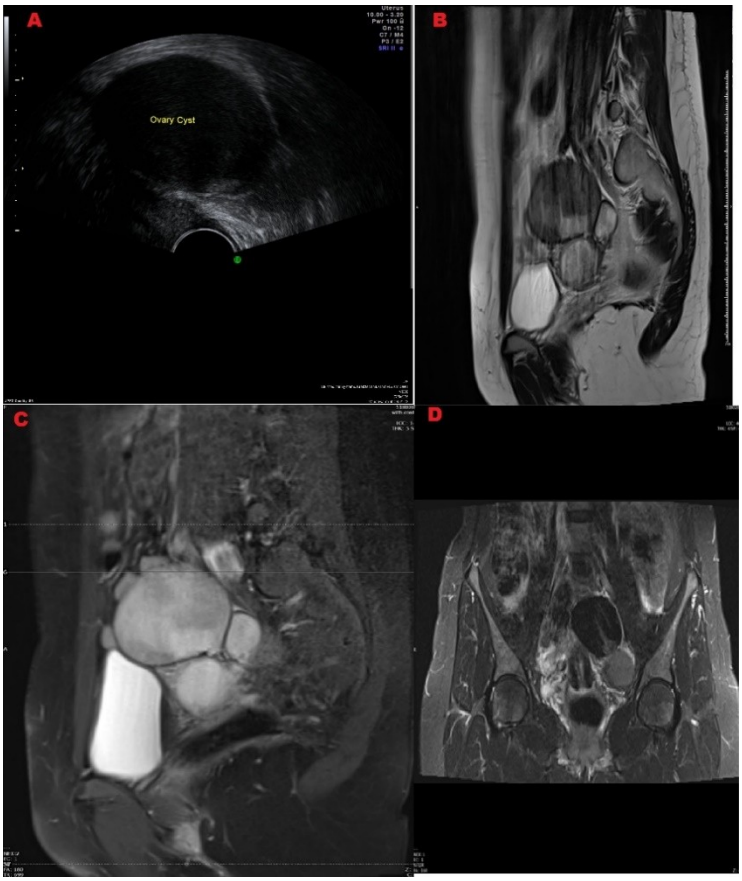
Patient 4

39-year-old female, Filipina, BMI 21.27 kg/m2 with a history of lower abdominal pain, G0 P0 A0, regular menses. No surgical history. Mild lower abdomen tender to palpation on physical examination. Laboratory test results: WBC: 8.8 mmol/L, Hgb: 13.8 mmol/L, ALT: 9 mmol/L, AST: 17 mmol/L, CA 125: 71 U/L, CA 19-9: 35 U/L , CEA: 2. Transvaginal ultrasound: left ovary shows an image of a cystic appearance with high cellularity inside, it measures 55.9 mm by 48.8 mm, the rest of the organs are nondescript. MRI findings: there are two cystic images on the right ovary, showing hyper intense signal on T1 and T1 fat saturation, mild isointense signal on T2 and T2 TIRM, measuring 2.8 x 2.7 x 3.2 cm and 1, 8 x 1.9 x 1.9 cm, without significant enhancement after intravenous contrast administration and shadowing inside on T2 with the appearance of cystic ovarian endometriosis. In addition, there is a small normal follicle. Left ovary: a cystic image is observed, measuring 4.4 x 4.7 x 5.3 cm, showing hyper intense signal on T1 and fat saturation T1, with some septum and debris inside, with the appearance of an endometrioma. In

addition, there are two other images, 3.9 x 4 x 3.8 cm and 2.2 x 1.4 x 1.4 cm, showing T1 hyper intense signal and rapid T1 saturation, shaded within in T2 and without significant enhancement after intravenous contrast administration, with the appearance of cystic ovarian endometriosis (**image 4**).

This patient after the diagnosis was followed by a gynecologist and hormone treatment is prescribed.

IMAGE 4. Endometriosis cyst, note hypoechoic multilobulated ultrasound (image A), hypo intense and hyperintense on T2 (image B), hyper intense on T1 (image C) and hypo intense also hyper intense on T2 STIR (image D)

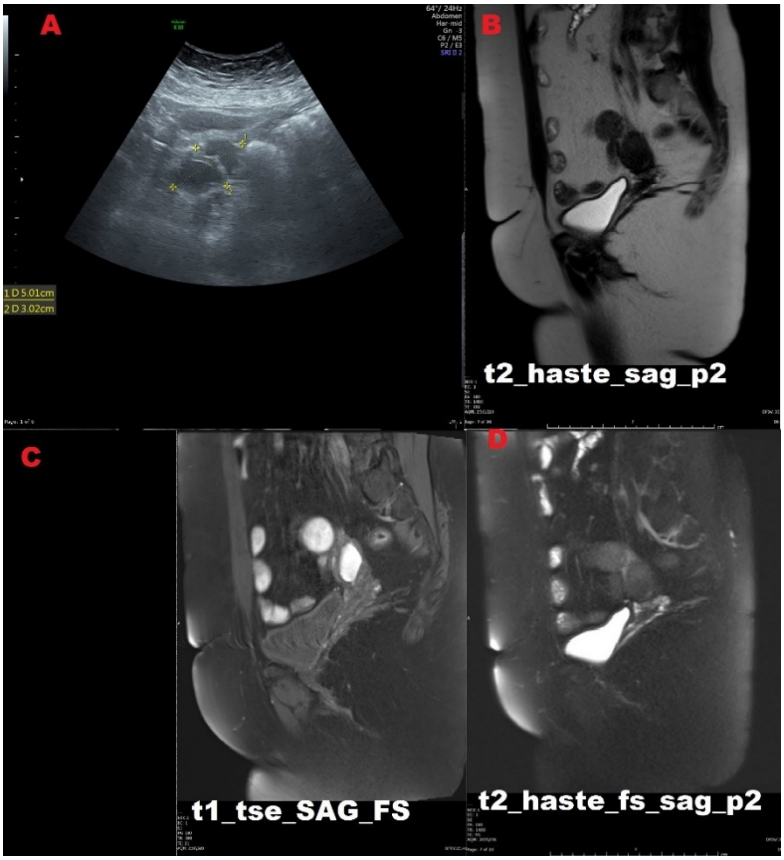


Patient 5

A 48-year-old female, Cuban, BMI 29.26 kg/m2 with a history of lower abdominal pain, hysterectomy, obstetric history G2 P2 A0, reported scant vaginal bleeding 15 days before. There is no history of any other chronic condition. Laboratory test results: WBC: 7.3 mmol/L, Hgb: 13.7 mmol/L, ALT: 25 mmol/L, AST: 23 mmol/L, CA 125: 57.3 U/L, CA 15-3: 14.2 U/L, CA 19-9: 34.4 U/L. Ultrasound shows an echogenic image in vaginal cuff measuring 16 x 8 mm vaginal valt. A complex cystic lesion is observed in the pelvis measuring 50 x 30 mm, with internal septa. The magnetic resonance showed: right ovary hyper intense multilobed image on T1 and T1 tirm, hypo intense on t2 and T2 tirm with well-defined internal septa measuring 47 x 37 mm, adhered to the vaginal cuff (**image 5**).

Treatment prescribed with tranexamic acid and follow-up by gynecology, will be re-evaluated and define surgical conduct.

IMAGE 5. Endometriosis cyst, note hypoechoic multilobulated ultrasound (image A), hypo intense and hyper intense on T2 (image B), hyper intense on T1 (image C) and hypo intense also hyper intense on T2 STIR (image D)



DISCUSSION

Endometriosis is the presence of endometrial tissue outside the uterine cavity, this tissue can bleed due to the monthly stimulation of female hormones, [2] they can be presented as endometrioma, cystic lesions with blood contained in different stages of degradation, or punctate foci of endometriosis and uterine adenomiosis, each of them show peculiar characteristics, either by ultrasound or magnetic resonance technique. [6,7] MRI of the pelvis is the most sensitive radiological technique for the diagnosis of this disease, due to the fact that the hemo group present in the blood has a very interesting behavior under a magnetic field, usually showing us hyper intense signals on T1 sequence and hypo intense signals. in T2.

The common symptoms in women with endometriosis are: chronic lower abdominal pain, dyspareunia, dysmenorrhea, gastrointestinal and genitourinary symptoms, [2,3,8,9] some of them, seen in this series of cases, with a history of infertility and/ or surgery previous pelvic.

The distorted images shown in the ultrasound, due to the associated inflammatory process, fibrosis, echoes due to the presence of blood, added to the clinical information, can lead to suspicion of endometrioma. Tumor markers such as CA 125, CA 19-9, and CA 15-3 are often altered. [10,11]

Small foci of endometrioma included within the uterine wall called adenomiosis can be detected, or adhered to the Douglas pouch, sacral-uterine ligament, bowel and bladder wall, identified as deep endometriosis. The images shown by ultrasound may suggest endometrioma, but magnetic resonance imaging is the study of choice for the non-invasive diagnosis of any type or form of ectopic endometrium. [6,7]

Capron et al, in 2022, concluded in their study that a clinical questionnaire, used and created by them, could be a useful tool to identify patients who are candidates for scanning for a focus of endometriosis, they show that clinical variables such as a family history of endometriosis, primary infertility, BMI 32 kg/m^2 short regular cycles (<28 days), dysmenorrhea > 6, dyspareunia, gastrointestinal and lower urinary tract symptoms were predictive variables in suspected endometriosis. [5] Some of these clinical findings occurred in the patients shown.

Bauşic et al, B Gerges et al, 2022, in their review of 70 relevant articles regarding the use of transvaginal ultrasound and MRI, concluded that transvaginal ultrasound in expert hands is more useful for endometriosis cyst, although MRI it is more sensitive for those patients with suspected deep endometriosis focus. (6)

In our hospital, due to cultural habits that limit vaginal examination, also based on the low incidence of this disease, which limits the experience of the operator and the distribution of the population itself; Consisting mainly of expatriate men, further reducing the frequency of gynecological diseases, we use MRI for non-surgical diagnosis, because the images are more standardized and less dependent on the operator. However, we believe that it would be useful to carry out comparative studies between both techniques, since the evaluation of the patients is always preceded by a pelvic ultrasound.

Tang Y et al, in 2020, demonstrated that, in general, there was no association between BMI and the incidence of endometriosis, but there was a significant increase in the incidence of endometriosis in obese women, compared to women with normal weight. Obesity was also a risk factor for severe dysmenorrhea. [8] However, Liu Y et al, 2017 in a meta-analysis concluded that the highest body mass index is related to a low risk of endometriosis. [9] There was diversity in the patients in this case series with respect to weight. Clinically all had suffered dysmenorrhea, it is recommended to carry out investigations with a large sample of patients to evaluate these variables.

In the study carried out by Abrao et al, in 2017 they found a direct relationship between patients with endometriosis and a high level of CA-125 [10]; Shen et al, in 2017 also reached the same conclusion, including CA19-9, for them, CA15 -3 was not a significant biomarker for the general population, however it was directly related in patients with advanced disease. [11] Three of the patients presented in this work had very high levels of CA 125, only one of them had a moderately high value of CA19-9, but CA15-3 was not significant or not recorded.

The presence of endometrial tissue outside the uterine cavity seems to be more frequent than expected, more research should be done to prove this hypothesis. The best study in the diagnosis of these reported cases was MRI, one of the reasons was that the ultrasound technique depends on the skill of the operator to obtain the best images and these are similar for various pelvic conditions, however, the technique MRI provides more standardized images and the different stages of blood degradation. After treatment all symptoms improved. Early diagnosis is probably the most important issue in this disease, future research should consider this approach.

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Contribution of the authors

Alexander Sosa-Frias | *https://orcid.org/0000-0001-5170-2916*. He participated in: conceptualization and ideas; investigation; methodology; formal analysis; display; writing of the original draft; writing review and editing.

Conflict of interests

The authors declare that there are no conflicts of interest.