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Case Report

Large Uterine Fibroids with Cystic and Malignant Degenerative Changes Mimicking Ovarian Carcinoma: A Rare Case Report

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Abstract

Uterine fibroids are the most common benign gynaecological tumors in women of reproductive age and remain the first cause of hysterectomy in women before menopause, with an estimated 0.1 - 0.8% risk of malignant transformation into sarcomas. Uterine fibroids may be responsible for a variety of symptoms including menorrhagia, pelvic pain, and compression symptoms when the myoma is very large, or be entirely asymptomatic. But, the large mass is still very rare. Abdominal and endovaginal pelvic ultrasound is the initial imaging method for the diagnosis of uterine fibroids, but it is not specific, especially in case of abdominal-pelvic mass. In case of diagnostic issues, multiple fibroids, large fibroids, degeneration, or as part of the pre-treatment assessment (conservative treatments), pelvic magnetic resonance imaging (MRI) is the modality of choice, thanks to its excellent tissue resolution and better interobserver reproducibility. We report here the case of a large fibroma with cystic and malignant degenerative changes, mimicking ovarian carcinoma on ultrasound, in a 46-year-old nulligravida and nulliparous woman, whose diagnosis is made by MRI. Our article aims to highlight the value of MRI in the diagnosis of this entity, with an emphasis on the typical and atypical radiologic imaging features of uterine fibroids the pitfalls, and mimics, to suggest an appropriate therapeutic approach.

Keywords: *Large Uterine Fibroids; Abdominal Pelvic Mass; Ultrasound; Magnetic Resonance Imaging; Degeneration*

Introduction

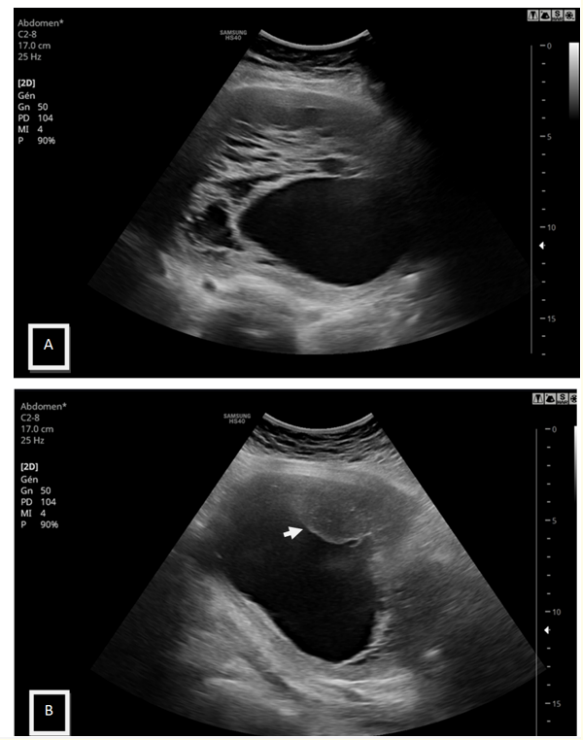
Uterine fibroids are the most common benign gynaecological tumors in women of reproductive age and remain the first cause of hysterectomy in women before menopause, with an estimated 0.1 - 0.8% risk of malignant transformation into sarcomas [1]. Uterine fibroids may be responsible for a variety of symptoms including menorrhagia, pelvic pain, and compression symptoms when the myoma is very large, or be entirely asymptomatic. But, the large mass is still very rare. Abdominal and endovaginal pelvic ultrasound is the initial imaging method for the diagnosis of uterine fibroids, but it is not specific, especially in the case of abdominal-pelvic mass. In case of diagnostic issues, multiple fibroids, large fibroids, degeneration, or as part of the pre-treatment assessment (conservative treatments), pelvic magnetic resonance imaging (MRI) is the modality of choice imaging modality, thanks to its excellent tissue resolution and better interobserver reproducibility [2,3]. We report here the case of a giant fibroma with cystic and malignant degenerative changes in a 46-year-old nulligravida and nulliparous woman, mimicking ovarian carcinoma on ultrasound, whose diagnosis is made by MRI. Our article aims to

highlight the value of MRI in the diagnosis of this entity, with an emphasis on the typical and atypical radiologic imaging features of uterine fibroids the pitfalls, and mimics, to suggest an appropriate therapeutic approach.

Case Report

A 46-year-old female patient with no medical history, in peri-menopause, nulligest, nulliparous, who consulted for an abdominopelvic mass that had gradually increased in size over the past 4 years, associated with menometrorrhagia and pollakiuria. Her abdomen was distended with a large pelvi-abdominal mass reaching the level of the umbilicus.

The pelvic ultrasound by suprapubic way objectified a voluminous abdominopelvic well-circumscribed mass, the exact origin of which could not be determined, mostly anechogenic containing fine septa, with individualization of an iso echogenic nodule, taking the color Doppler, the size of the mass interfered with the exploration of the uterus as well as the ovaries, in front of this aspect an ovarian carcinoma was suspected (Figure 1). A pelvic MRI was performed in complementary to determine the origin of the mass and for a better characterization of its structure. The MRI (Figure 2) demonstrate an Uterus increased in size, site of two myomatous lesions, the first one is posterior corporal, predominantly cystic in hyposignal T1, hyposignal T2, containing thin septa poorly enhanced after injection of Gadolinium, with individualization of an endoluminal parietal nodule of intermediary signal T1 and T2, with diffusion restriction, enhancing early and intensely after injection of Gadolinium, suggesting a cystic and malignant degeneration. The second is posterior corporal-fundial, T1 isosignal, T2 hyposignal, with diffusion restriction and lower Apparent diffusion coefficient (ADC), enhancing heterogeneously after Gadolinium injection, classified 4 according to the International Federation of Obstetric Gynecology (FIGO), in favor of hyaline degeneration. The ovaries were of normal size and morphology. There was a small pelvic and inter-anal effusion. This diagnosis was confirmed later by the anatomopathological study of the hysterectomy specimen.



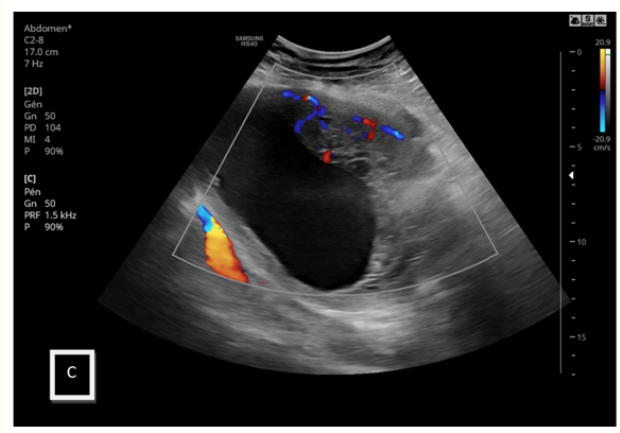
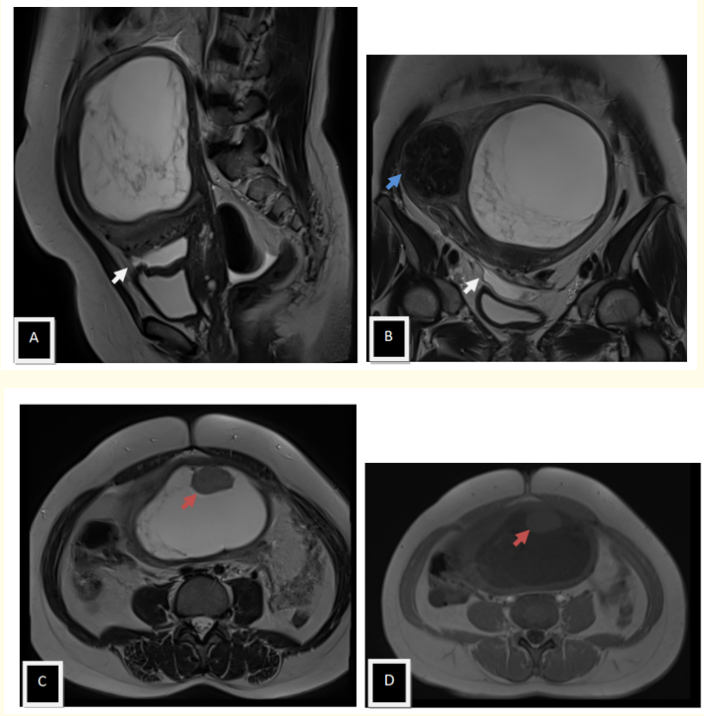


Figure 1: *Pelvic ultrasound by suprapubic way objectified a voluminous abdominopelvic well-circumscribed mass, the exact origin of which could not be determined, mostly anechogenic containing fine septa (A), with individualization of an iso echogenic nodule (B, White arrow), taking the color Doppler (C), the size of the mass interfered with the exploration of the uterus as well as the ovaries, in front of this aspect an ovarian carcinoma was suspected.*



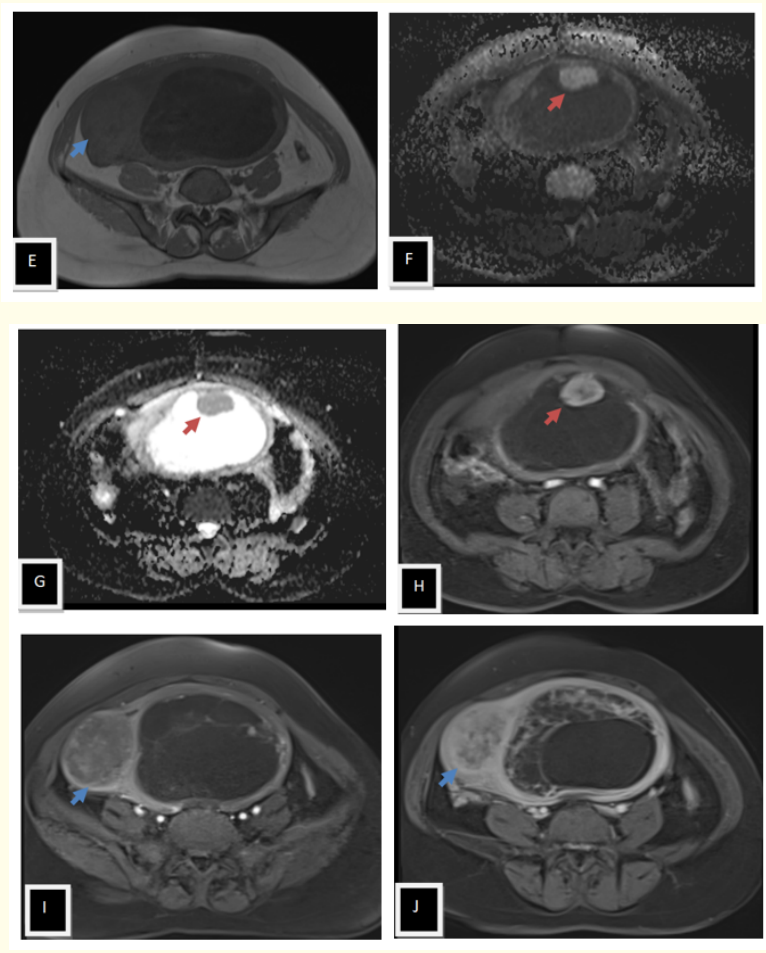


Figure 2: *Sagittal T2w (A), coronal T2w (B), axial T2w (C), axial T1w fat-saturated (D, E), axial diffusion B1000 (F), ADC cartography (G), and axial T1w post-contrast (H, I, J) images, demonstrate an Uterus increased in size, site of two well-circumscribed mass, the first one is posterior corporal, predominantly cystic in hyposignal T1, hyposignal T2, containing thin septa poorly enhanced after injection of Gadolinium, with individualization of an endoluminal parietal nodule (Red arrow) of intermediary signal T1 and T2, with diffusion restriction and lower ADC, enhancing early and intensely after injection of Gadolinium, suggesting a cystic and malignant degeneration. The second is posterior corporal-fundial (Blue arrow), T1 isosignal, T2 hyposignal, without diffusion restriction, enhancing heterogeneously after Gadolinium injection, FIGO 4, in favor of hyaline degeneration. Associated small pelvic effusion (White arrow).*

Discussion

Although uterine fibroids are a frequent pathology, we have here a rare case of large fibroids with cystic and malignant degenerative changes. Uterine fibroids, also known as uterine myomas or uterine leiomyomas, are the most common benign gynaecological tumors that arise from the smooth muscle and connective tissue [1]. The prevalence of affected women is estimated to be 20% - 40% [4]. Under

hormonal influences, leiomyomas are rare in prepubertal age and occur more commonly in women of reproductive age, with growth during pregnancy and involute following menopause [1,4], with an estimated 0.1 - 0.8% risk of malignant transformation into sarcomas [1]. It's the first cause of hysterectomy in women before menopause. Based on their location within the myometrium, leiomyomas can be classified as submucosal, intramural, or subserosal [5]. The current classification Federation of Gynecology and Obstetrics (FIGO) sub-classification system for uterine leiomyomas incorporates a tertiary classification has been summarized in figure 3 with a schematic representation [5]. The size ranges from a few millimeters to a few centimeters. Whether the fibroma is symptomatic or asymptomatic, the clinical presentation depends on the location, size, and evolution of the disease [1,3]. The most common symptom is menometrorrhagia, which is present in 35 to 47% of cases, with the main consequence being anemia due to martial deficiency. Fibroids can also cause pelvic discomfort/pain, dysmenorrhea, or urinary and digestive compression when it is particularly voluminous. Fibroids may also be associated with fertility disorders, but it is difficult to establish their cause. Acute pain generally corresponds to aseptic necrobiosis of the fibroid or, more rarely, to the rare torsion of a pedunculated fibroid [6].

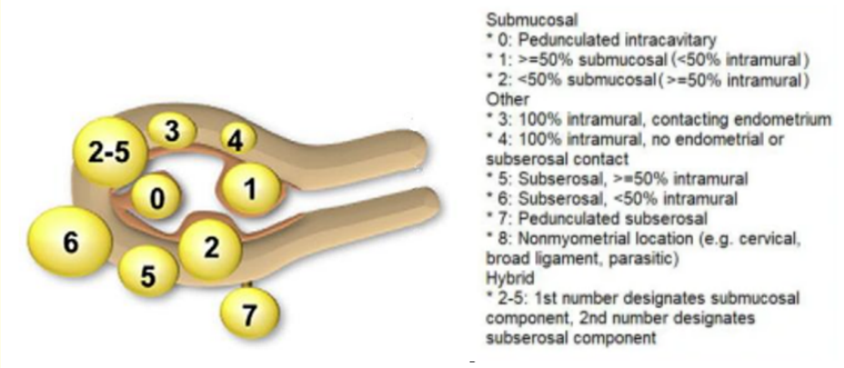


Figure 3: *FIGO classification of uterine fibroids according to Munro., et al. (2011).*

Ultrasound, performed transvaginally or transabdominally, remains the first-line imaging modality in the case of pelvic masses and in the exploration of metrorrhagia [1,7,8]. For tumors larger than 5 cm, the suprapubic approach is more interesting, but in this case, it's still insufficient, it only shows the mass without providing any details regarding its exact origin and extent [3]. Typically, uterine fibroids appear as well-defined, solid, concentric, hypoechoic masses that cause a variable amount of acoustic shadowing [1]. On color Doppler, we detect a marked peripheral vascularization without obvious central hypervascularization [9]. In some difficult cases when leiomyomas are small and iso-echogenic to the myometrium, the only visible ultrasound sign may be a bulge in the uterine contour [1]. Myomatous degeneration occurs within an ordinary myoma, most often due to insufficient vascular supply as a result of an increase in tumor size (more than 5 cm). The type of degeneration seems to depend on the rapidity of the growth rate. It can be, from the most frequent to the rarest, hyaline, edematous, cystic, calcified, hemorrhagic/red, fatty, myxoid, or malignant [9]. On ultrasound, the tumor size and heterogeneity of the mass (hyper- iso-, or anechogenic), or a significant internal flow on doppler is unusual and should suggest the diagnosis of uterine fibroids degeneration and lead to the performance of an MRI [1,9,11,12].

MRI with contrast enhancement is the complementary reference imaging, as ultrasonography is poorly, for demonstrating uterine leiomyomas because of its ability to diagnose, localize, quantify, and measure all lesions [4]. Superior contrast resolution, spatial resolution, and multiplanar capabilities provided by MRI allow for a detailed evaluation of the uterine zonal anatomy and the characterization

of tumors. MRI can also be used to diagnose alternative and/or coexistent pelvic pathology [4]. Typical imaging findings comprise a well-circumscribed mass, hypointense on T2-weighted hypointensity, and isointense on T1-weighted relative to the outer myometrium, without hypersignal on the diffusion sequences nor decrease in the apparent diffusion coefficient (ADC) (< 1.23) [4,9]. Contrast enhancement can vary and may be homogeneous, heterogeneous, or minimal [4]. Leiomyomas can demonstrate atypical imaging features due to fibroid edema, degeneration, variant subtypes, previous locoregional therapy, unusual locations, or rarely. Fibroids can range in size from millimeters to several centimeters, and there can be one or several [4,12]. Larger (> 5 cm) leiomyomas are more likely to display areas of degeneration, Various types of degeneration have been described, including hyaline, myxoid, calcific, cystic, hemorrhagic (or red), and malignant, table 1 summarizes the imaging findings in each type of degeneration [4,13]. A combination of findings, including areas of T2 hyperintensity, T1 hyperintensity, pockets of viable enhancing tissue, and diffusion restriction with a lower ADC (< 1.23), may be needed to alert the radiologist to the possibility of leiomyosarcoma [4].

Lesion	T1 signal	T2 signal	Contrast enhancement	Additional features
Typical leiomyoma (LM)	Iso	Hypo	Variable	Homogeneous
Edema	Hypo	Hyper	+	
Degeneration-hyaline	Iso	Hypo	Little to none	Similar to typical leiomyoma
Degeneration-cystic	Hypo	Hyper	None	Fluid-filled spaces
Degeneration-myxoid	Variable	Hyper	+	
Degeneration-hemorrhagic	Hyper	Hypo	None	
Cellular leiomyoma	Iso	Hyper	Avid	Homogeneous
Smooth muscle tumours of uncertain malignant potential (STUMP)	Variable	Variable	Variable	Range of features to mimic leiomyoma or leiomyosarcoma
Lipoleiomyoma	Hyper	-	-	Drop in signal intensity on frequency-selective fat saturation sequences
Post- uterine artery embolization	Hyper	Hypo	None	
Leiomyosarcoma	Hyper	Hyper	+	Heterogeneous. May be diffusion restricting. May have irregular margins

Table 1: *MRI features of degenerated leiomyomas (LM) including the various variants; and leiomyosarcoma [4,13].*

The main differential diagnosis is uterine sarcoma, a rapidly evolving mass in the peri-menopause, which is difficult to explore on MRI and whose diagnosis is also histological [3]. Giant fibroids can also mimic ovarian carcinoma associated with pseudo-Meigs syndrome [3,7].

The therapeutic management of uterine fibroids depends on the symptoms, age, future fertility desires, lesion number, size, and location impact on which treatment options are most suitable [10]. Common treatment options include hysterectomy, myomectomy (abdominal, laparoscopic, or hysteroscopic), gonadotropin-releasing hormone analog therapy, and uterine artery embolization [4].

Conclusion

Cystic and malignant degeneration in a large uterine fibroids are a rare entity. Pelvic MRI is the modality of choice assess the diagnosis of large uterine fibroids, to determine the type of degeneration, especially malignant degeneration. The radiologist needs to be aware of both the typical and atypical findings to better assist the referring clinician with diagnosis and management decisions.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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