Ovarian Fibroma Presenting as Painful Mass in the Pelvis

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ABSTRACT

A 79 female patient presented with acute lower abdominal pain at our emergency department. She described a subjective increase in lower abdominal circumference. Thirty years ago, she had laparoscopic adnexectomy for ovarian fibroma. Transvaginal ultrasound performed at the emergency department revealed high suspicion of a mainly solid mass posterior to the uterus that was obscured by artefacts. The imaging findings showed a well circumscribed mass on the right-side posterior to the uterus, the histological report confirmed an ovarian fibroma after the laparoscopic resection.

CASE REPORT

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Transvaginal ultrasound performed at the emergency department revealed high suspicion of a mainly solid mass posterior to the uterus that was obscured by artefacts. Color Doppler did not demonstrate flow. Subsequently the patient was referred for CT of the abdomen for further immediate work-up of the unclear mass.

The abdominal intravenous contrast enhanced CT scan showed a well circumscribed mass on the right-side posterior to the uterus. The mass measured 12 cm x 8 cm and presented small punctuated calcifications and increased heterogeneous attenuation values, suspicious for organized haemorrhage (Figure 1a-1c). Due to a lack of fatty tissue adjacent to the rectum, a possible infiltration could not be excluded. No other findings indicating malignancy could be demonstrated.

Ileocoloscopy was performed, a non-movable mass was visible anterior of the rectum, no infiltration was visible. Laparoscopic resection of the mass and salpingectomy was performed with curettage of the uterus (Figure 2).

Histological analyses revealed the diagnosis of fibroma of the ovary with focal necrosis (Figure 3-5).

DISCUSSION

Etiology & Demographics

Ovarian fibromas and thecomas belong to a wide range of benign tumors originating from stromal cells. They are a subtype of the granulosa-theca cell tumors and represent 6 % of all primary ovarian tumors [2]. Unlike thecomas, which arise from theca cells and have estrogenic activity, fibromas are formed from collagen-producing spindle cells and do not present any estrogen production [1,2].

Both pre- and post-menopausal women can be diagnosed with an ovarian fibroma, the mean age being 48 years [1].

Clinical & Imaging Findings

It is often an incidental finding during routine investigations, but as they grow, ascites or pain can occur [1,3].

The usual CT presentation is a unilateral, well-delineated, solid mass with no or poor enhancement and rarely calcifications. Although the common imaging appearance is mainly homogeneous, an inhomogeneous CT presentation with subsequent haemorrhage and necrosis is suggestive for the occurrence of complications such as ovarian torsion [4]. The clinical symptoms are also closely related to the complications, as this kind of benign tumor rarely cause pain [1]. If symptoms occur, however, pain is the most common [5].

Treatment & Prognosis

The definitive diagnosis is mainly histological [2].

Ovarian fibromas have a good prognosis after surgical removal [1].

Differential Diagnoses

Leiomyoma
Thecoma

TEACHING POINT

Even in the case of a postmenopausal patient and clinical history must be considered, in order to exclude possible

rezidives of prior diseases. Of the same importance is to keep in mind variations of characteristics of uterine tumors, such as calcifications.

QUESTIONS

Question 1: Which of the following sentences regarding ovarian fibromas are correct?

1. Fibromas have estrogenic activity.
2. Fibromas contain collagen-producing cells. (applies)
3. Calcifications are mandatory.
4. They never cause any complication.
5. They appear as cystic masses on CT-scan.

Explanation

1. Fibromas have estrogenic activity. [fibromas are formed from collagen-producing spindle cells and do not present any estrogen production]
2. Fibromas contain collagen-producing cells. (applies) [fibromas are formed from collagen-producing spindle cells and do not present any estrogen production]
3. Calcifications are mandatory. [The usual CT presentation is a unilateral, well-delineated, solid mass with no or poor enhancement and rarely calcifications]
4. They never cause any complication. [Although the common imaging appearance is mainly homogeneous, an inhomogeneous CT presentation with subsequent haemorrhage and necrosis is suggestive for the occurrence of complications such as ovarian torsion]
5. They appear as cystic masses on CT-scan. [The usual CT presentation is a unilateral, well-delineated, solid mass with no or poor enhancement and rarely calcifications]

Question 2: Which of the following statements about ovarian fibroma is false?

1. Ovarian torsion is a possible complication.
2. Ovarian fibromas are malignant tumors. (applies)
3. Ovarian fibromas can be diagnosed at premenopausal age.
4. It is an incidental finding.
5. Ovarian fibromas are benign tumors.

Explanation

1. Ovarian torsion is a possible complication. [Although the common imaging appearance is mainly homogeneous, an inhomogeneous CT presentation with subsequent haemorrhage and necrosis is suggestive for the occurrence of complications such as ovarian torsion]
2. Ovarian fibromas are malignant tumors. (applies) [Ovarian fibromas and thecomas belong to a wide range of benign tumors]
3. Ovarian fibromas can be diagnosed at premenopausal age. [Both pre- and post-menopausal women can be diagnosed with an ovarian fibroma]
4. It is an incidental finding. [It is often an incidental finding during routine investigations]
5. Ovarian fibromas are benign tumors. [Ovarian fibromas and thecomas belong to a wide range of benign tumors]

Question 3: Which is the definitive diagnostic tool for an ovarian fibroma?

1. Histology (applies)
2. Ultrasound
3. MRI-T2
4. PET-CT
5. CT

Explanation

1. Histology (applies) [The definitive diagnosis is mainly histological]
2. Ultrasound [The definitive diagnosis is mainly histological]
3. MRI-T2 [The definitive diagnosis is mainly histological]
4. PET-CT [The definitive diagnosis is mainly histological]
5. CT [The definitive diagnosis is mainly histological]

Question 4: Which of the following statements regarding the etiology of ovarian tumors is true?

1. Ovarian tumors originate from theca cells
2. Ovarian tumors have estrogenic activity
3. Ovarian tumors are formed from collagen-producing cells (applies)
4. Ovarian tumors are not a subtype of granulosa-theca cells
5. All of above

Explanation

1. Ovarian tumors originate from theca cells [Unlike thecomas, which arise from theca cells and have estrogenic activity, fibromas are formed from collagen-producing spindle cells and do not present any estrogen production]
2. Ovarian tumors have estrogenic activity [Unlike thecomas, which arise from theca cells and have estrogenic activity, fibromas are formed from collagen-producing spindle cells and do not present any estrogen production]
3. Ovarian tumors are formed from collagen-producing cells applies [Unlike thecomas, which arise from theca cells and have estrogenic activity, fibromas are formed from collagen-producing spindle cells and do not present any estrogen production]
4. Ovarian tumors are not a subtype of granulosa-theca cells [They are a subtype of the granulosa-theca cell tumors and represent 6% of all primary ovarian tumors]
5. All of above [Incorrect]

Question 5: Which is the most common clinical symptom related to ovarian fibroma?

1. The clinical symptoms are also closely related to the complications (applies).
2. Vomiting and diarrhea.
3. Exacerbating pain in epigastrium.
4. Inguinal pain.
5. Unilateral inguinal edema

Explanation

1. The clinical symptoms are also closely related to the complications applies
2. Vomiting and diarrhea [The clinical symptoms are also closely related to the complications, as this kind of benign tumor rarely causes pain.]
3. Exacerbating pain in epigastrium. [The clinical symptoms are also closely related to the complications, as this kind of

benign tumor rarely cause pain.]

4. Inguinal pain. [The clinical symptoms are also closely related to the complications, as this kind of benign tumor rarely cause pain.]

5. Unilateral inguinal edema. [The clinical symptoms are also closely related to the complications, as this kind of benign tumor rarely cause pain.]

AUTHORS' CONTRIBUTIONS

Cassandra Rovetto contributed with the CT-Images and Diagnosis, manuscript preparation

Rüdiger Mascus contributed with the surgery's photos, surgical intervention

Maurus Murer contributed with the pathology's photos, pathology assessment

Tilo Niemann contributed with the CT-Images and Diagnosis, manuscript preparation

CONSENT

Yes

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FIGURES

Figure 1a: 79-year-old female with uterine fibroma. FINDINGS: Axial contrast enhanced CT of the abdomen in the venous phase demonstrating an inhomogenous mass (arrow) in the pelvis. TECHNIQUE: Axial CT, 588mAs, 100kV, 3mm slice thickness.

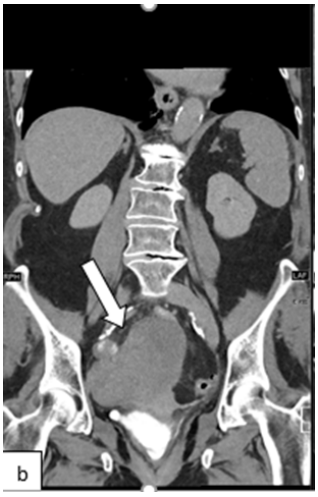

Figure 1b: 79-year-old female with uterine fibroma. FINDINGS: Coronal contrast enhanced CT of the abdomen in the venous phase demonstrating an inhomogenous mass (arrow) in the pelvis. TECHNIQUE: Axial CT, 442mAs, 100kV, 3mm slice thickness.

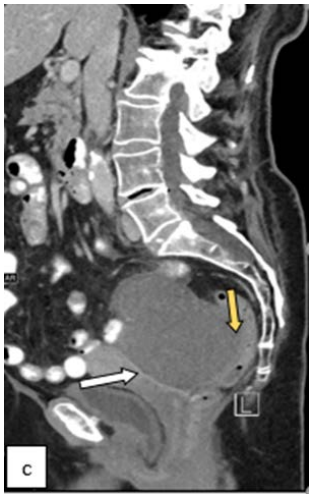

Figure 1c: 79-year-old female with uterine fibroma. FINDINGS: Sagittal contrast enhanced CT of the abdomen in the venous phase demonstrating a doubtful/missingl fatty tissue division to the colon. TECHNIQUE: Sagittal CT, 442mAs, 100kV, 3mm slice thickness.

Figure 2: 79 year old female with uterine fibroma. FINDINGS: Axial contrast enhanced CT of the abdomen in the venous phase demonstrating small punctuated calcifications inside the uterine mass. TECHNIQUE: Axial CT, 568mAs, 100kV, 1mm slice thickness.

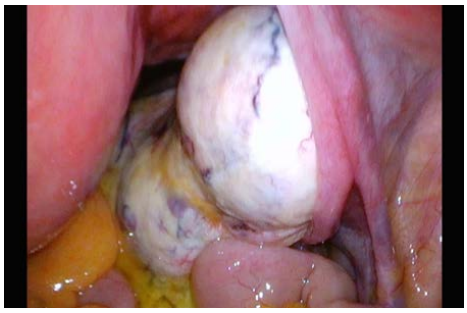

Figure 3: 79 year old female with uterine fibroma. FINDINGS: intraoperative insight of the solid mass detected in CT. TECHNIQUE: surgery

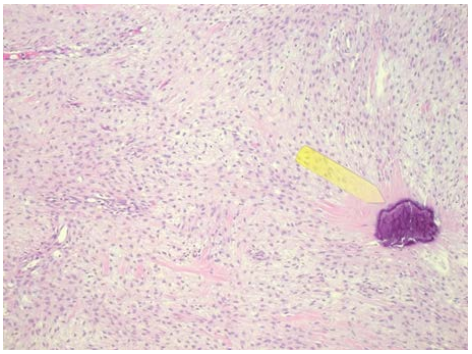

Figure 4: 79 year old female with uterine fibroma. FINDINGS: calcification (yellow arrow) embedded in fibrous tissue and surrounded by normal stroma cells. No criteria for malignancy depictable. TECHNIQUE: HE 100x

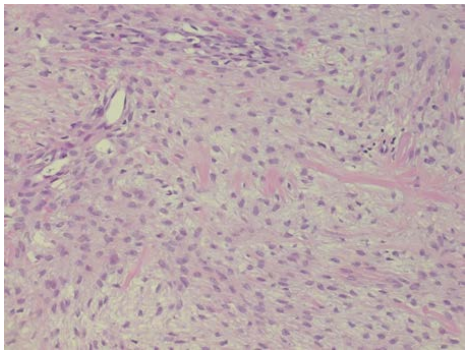

Figure 5: 79 year old female with uterine fibroma. FINDINGS: fibrous tissue and normal stroma cells. No criteria for malignancy depictable. TECHNIQUE: HE 200x

Summary table: Presenting the most important information about the discussed tumor.

Etiology	benign tumors originating from stromal cells, a subtype of the granulosa-theca cell tumors
Incidence	6 % of all primary ovarian tumors
Gender ratio	Exclusively female prevalence
Age predilection	pre- and post-menopausal women can be diagnosed with an ovarian fibroma, the mean age being 48 years
Risk factors	none
Treatment	Surgical removal
Prognosis	Good prognosis
Findings on imaging	Usually homogenous mass, rarely associated with punctuated calcifications

Differential table: Presenting the imaging findings according to the different modalities in relations to the differential diagnosis.

	X-Ray	**US**	**CT**	**MRI-T1**	**MRI T2**	**MRI-DWI**	**Pattern of contrast enhancement**	**PET**
Thecoma	Not diagnostic	Usually non-specific: an echogenic mass with distal acoustic attenuation, a well-defined hypoechoic mass, or an anechoic lesion with through-transmission	unilateral, solid ovarian mass	More amount of fibrous tissue within the tumor produces low signal intensity	Usually hyperintense (often from edema and cystic degeneration), but may be variable, may mimic more common malignant ovarian tumors	Not specific	Degree of contrast enhancement varies with the amount of fibrous tissue within the tumor. While theca cells in the normal ovary are highly vascularized, the fibrous tissue is known for delayed weak enhancement at dynamic contrast-enhanced imaging	Not specific
Leiomyoma	Popcorn calcification within the pelvis may suggest the diagnosis	Uncomplicated leiomyomas are usually hypoechoic, but can be isoechoic, or even hyperechoic. Ccalcification is seen as echogenic foci with shadowing. Cystic areas of necrosis or degeneration may be seen.	Soft tissue density lesions and may exhibit coarse peripheral or central calcification	High T1 signal. An irregular, T1 hyperintense rim around a centrally located myoma suggests red degeneration, which is caused by venous thrombosis.	Low signal intensity, but high T2 signal if cystic degenerated. Hyaline degeneration is demonstrated as low T2 signal	Not specific	Variable enhancement is seen with contrast administration. Marked high signal intensity with gradual enhancement (albeit mild) suggests myxoid degeneration	Mild to intense FDG uptake

KEYWORDS

Ovaries; Fibroma; Female imaging; CT; Benign tumors