

# Gallbladder and muscular endometriosis: a case report

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## Abstract

A 55-year-old woman referred to Radiology Department, with abdominal mass and chronic indefinite and vague abdominal pain, most severe in right hypochondrium and accentuated during menstruation. A history of two cesarean sections was revealed. The patient underwent an ultrasound and Computed Tomography with intravenous contrast media revealing the presence of gallbladder and abdominal wall hyperenhancing masses. Finally, Magnetic Resonance study with intravenous administration of paramagnetic contrast media confirmed the involvement of gallbladder by a solid tissue and the presence of a solid nodule on the abdominal wall. Considering imaging features and the contrast enhancement of the nodules, the patient was sent to surgery. Surgical removal of both gallbladder and abdominal solid implant was performed and histology confirmed the diagnosis of gallbladder and abdominal wall endometriosis.

**Key words:** Computed Tomography—Gallbladder—Endometriosis—Magnetic Resonance

Endometriosis is a pathological condition defined as the presence of functional endometrial glands and stroma outside the uterine cavity. Up to 15% of menstruating women [1] are affected by endometriosis, presenting in most cases pelvic involvement. Pelvic endometriosis referred to endometrial tissue within pelvic organs, especially the ovaries, the uterosacral ligaments and the pouch of Douglas and the uterine musculature a condition called adenomyosis [2]. Endometrial implants, however, have been reported in many unusual sites outside the pelvis.

Extrapelvic endometriosis has been described in almost every area of the female body including the bowel, bladder, lungs, brain, umbilicus, and surgical scars on abdominal wall that may occur after surgical procedures that violate the uterine cavity, such as a cesarean section, allowing endometrial tissue to be transplanted [3, 4]. These hormonally active tissue present cyclical bleeding that results in anemia and pain. Extrapelvic endometriosis may be difficult to diagnose and it is often mistaken both clinically and radiologically for other abnormal conditions such as primary or metastatic cancer [5–7]. Endometriosis involving gastrointestinal tract has been found at surgery in ~12% of patients. The colon is the most common site of gastrointestinal endometriosis as well documented in literature while gallbladder endometriosis has been reported in only few cases [8, 9].

Here, we describe a very rare case of synchronous gallbladder and abdominal wall endometriosis as a complication following cesarean surgery.

## Case report

A 55-year-old woman referred to a plastic surgeon for the removal of a tattoo painted over the skin covering right quadrants of her abdomen. She also reported symptoms consisting of chronic indefinite and vague abdominal pain, most severe in right hypochondrium and accentuated during menstruation. During the physical examination, a solid mass on the right flank was revealed. A significant medical history of two caesarean sections with “Pfannenstiel” technique 20 years before was reported. In order to define the origin of symptoms and the nature of the mass, the patient underwent an abdominal ultrasound (US) study. In the site of the mass, the US revealed two solid nodules of 10 mm, with mixed echostructure, located on the abdominal wall in correspondence of internal oblique muscle. As a second important finding, an heterogeneous tissue infiltrating the gallbladder was shown.

No other findings were described. In the suspect of a cancer involving gallbladder, the patient underwent a Computed Tomography (CT) study with intravenous contrast media administration. This study showed a 2-cm-diameter mass with heterogeneous contrast enhancement infiltrating body and fundus of gallbladder (Fig. 1). A second solid tissue with similar contrast enhancement was described on the abdominal wall in correspondence of internal oblique muscle (Fig. 1). No more findings were reported. Considering the possibility of a gallbladder cancer with extraperitoneal implants on the anterior abdominal wall, Magnetic Resonance (MR) study was performed, with intravenous administration of paramagnetic contrast media. MRI showed the involvement of gallbladder by a solid tissue which appear hypointense in T2-weighted images with an high signal intensity small fluid collection inside. T1-weighted images, showed a non-homogeneous hypointense tissue with a punctuate focus of low signal intensity inside (Fig. 2). The tissue present homogeneous enhancement after intravenous administration of paramagnetic contrast media. Considering these features, the patients was sent to surgery. Surgical removal of both gallbladder and abdominal solid implant was performed. Macroscopic aspect of gallbladder showed the involvement of gallbladder fund by a solid tissue (Fig. 3). Abdominal implants appeared as a solid nodule of brown tissue with signs of hemorrhage. The pathological analysis described the presence of endometrial glands in endometrial connective tissue in both the specimens, with hemosiderin deposits and macrophages, surrounded by fibrosis (Fig. 4). These features excluded the possibility of cancer and allowed the diagnosis of endometriosis.

## Discussion

Endometriosis is a chronic inflammatory disease first described in 1860 by Von Rokitasky who defined it as the implantation of functioning endometrial tissue outside uterine cavity. This disabling condition is considered one of the most frequent diseases in gynecology, affecting 5–10% of women during childbearing age, [10] with a mean age at diagnosis of 25–29 years [11].

As normal eutopic endometrium, endometrial tissue implants contain a layer of cylindrical epithelial cells, below which there is a stroma with several simple tubular glands that open at the epithelial surface.

In women of reproductive age, each month, under the influence of sexual hormones, ectopic endometrial tissue implanted anywhere in abdominal cavity undergoes periodical changes characterized by the proliferative phase and the secretive phase until the final cellular exfoliation causing internal bleeding, in the same way that occurs normally in charge of the endometrium in the uterus. This bleeding results in chronic inflammation of surrounding tissue with consequent formation of scar tissue and fibrotic adhesions.

Endometriosis can be distinguished in the most frequent pelvic endometriosis and in extra-pelvic endometriosis that can potentially affect any organ in the human body as bowel, lung, abdominal wall, and many other extra-pelvic sites.

The exact cause and pathogenesis of endometriosis is unclear. Several theories exist that attempt to explain this disease though none have been entirely proven. Three theories of histogenesis have been proposed: (a) metastatic theory includes retrograde menstrual implantation, vascular and lymphatic spread, and iatrogenic implantation, (b) metaplastic theory, and (c) induction theory [3, 12].

Iatrogenic deposition of endometrial tissue has been found in some cases following gynecologic procedures and cesarean sections which can cause both pelvic and extrapelvic endometriosis.

Uterine surgery can determine falling of endometrial cells into peritoneal cavity and consequently their transportation by intraperitoneal fluid flow, directed by peritoneal bounds and ligaments that serves as watersheds and principally governed by force of gravity, peristalsis of intestines and intra-abdominal negative pressure produced during inspiratory movement of hemidiaphragm. All these events lead to randomly formation of endometrial tissue implants over intraperitoneal organs surfaces.

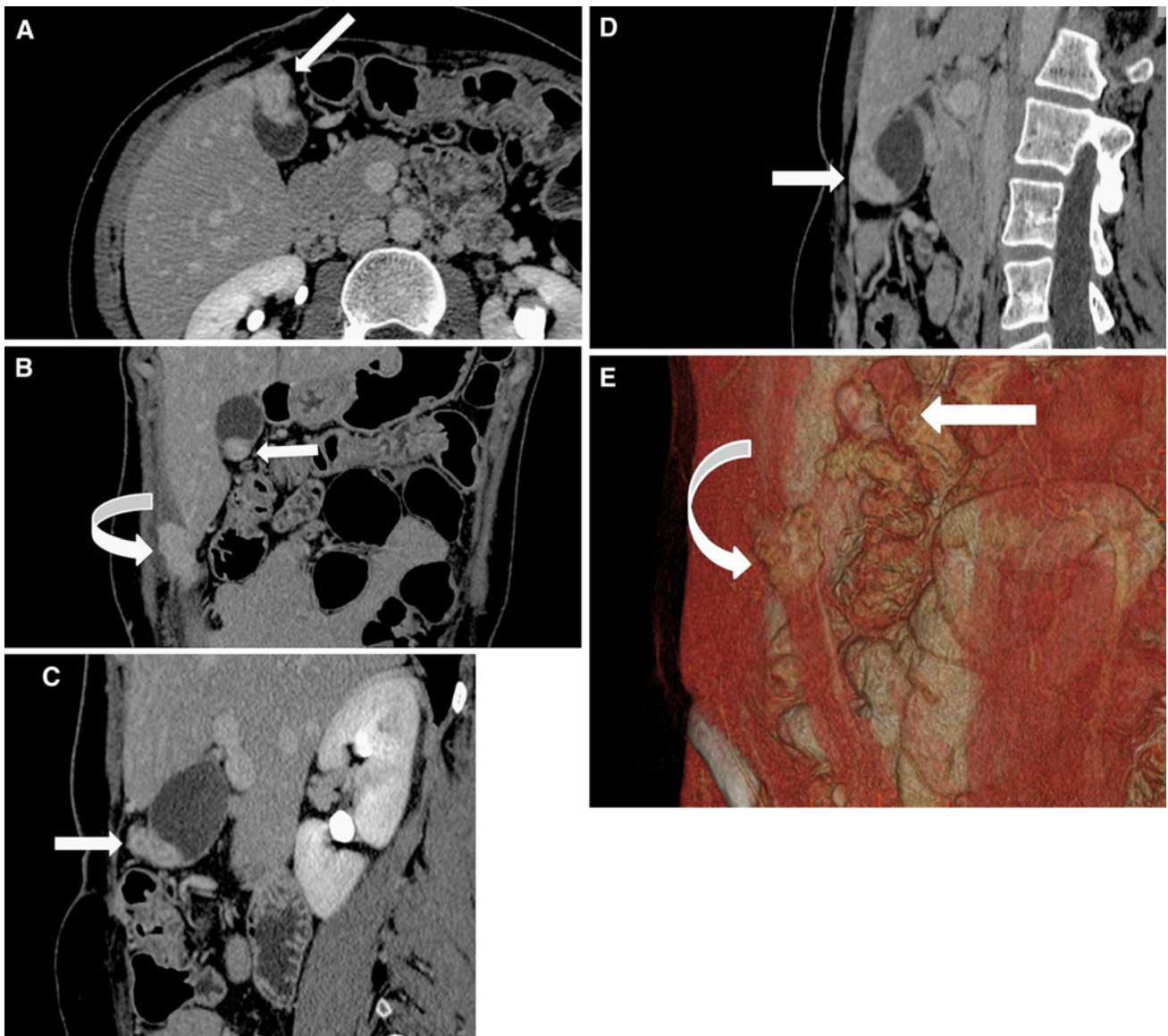
The most frequent site of iatrogenic extrapelvic endometriosis is the abdominal wall scar, commonly following cesarean section or hysterectomy with a prevalence of <1% [2].

Endometriosis implants involving gallbladder is a very rare occurrence both if it arises spontaneously or after uterine surgery [9]. Gallbladder endometriosis is characterized by the presence of a mass of hard-elastic consistency consisting of chronic inflammation and surroundings fibrosis. Patients usually present a pain or abdominal discomfort that is usually cyclic and may correlate to the menstrual period [13, 14]. A woman with a chronic pain in right upper quadrant necessarily requires the exclusion of many pathological conditions like gallstones, gallbladder carcinoma, chronic cholecystitis, duodenal ulcer, abscess and colonic cancer of right flexure.

The diagnosis requires a detailed medical history data collection, giving attention to prior gynecological surgery, clinical examination and evaluation of laboratory parameters [15].

Among the instruments of radiological imaging, US may show irregular thickening of the gallbladder wall or inhomogeneous mass of mixed tissue with solid and cystic component adherent to the wall and suggesting a possible gallbladder carcinoma or chronic cholecystitis with intramural abscess.

CT imaging has a fundamental role in confirming the presence of a soft tissue adherent to gallbladder wall,



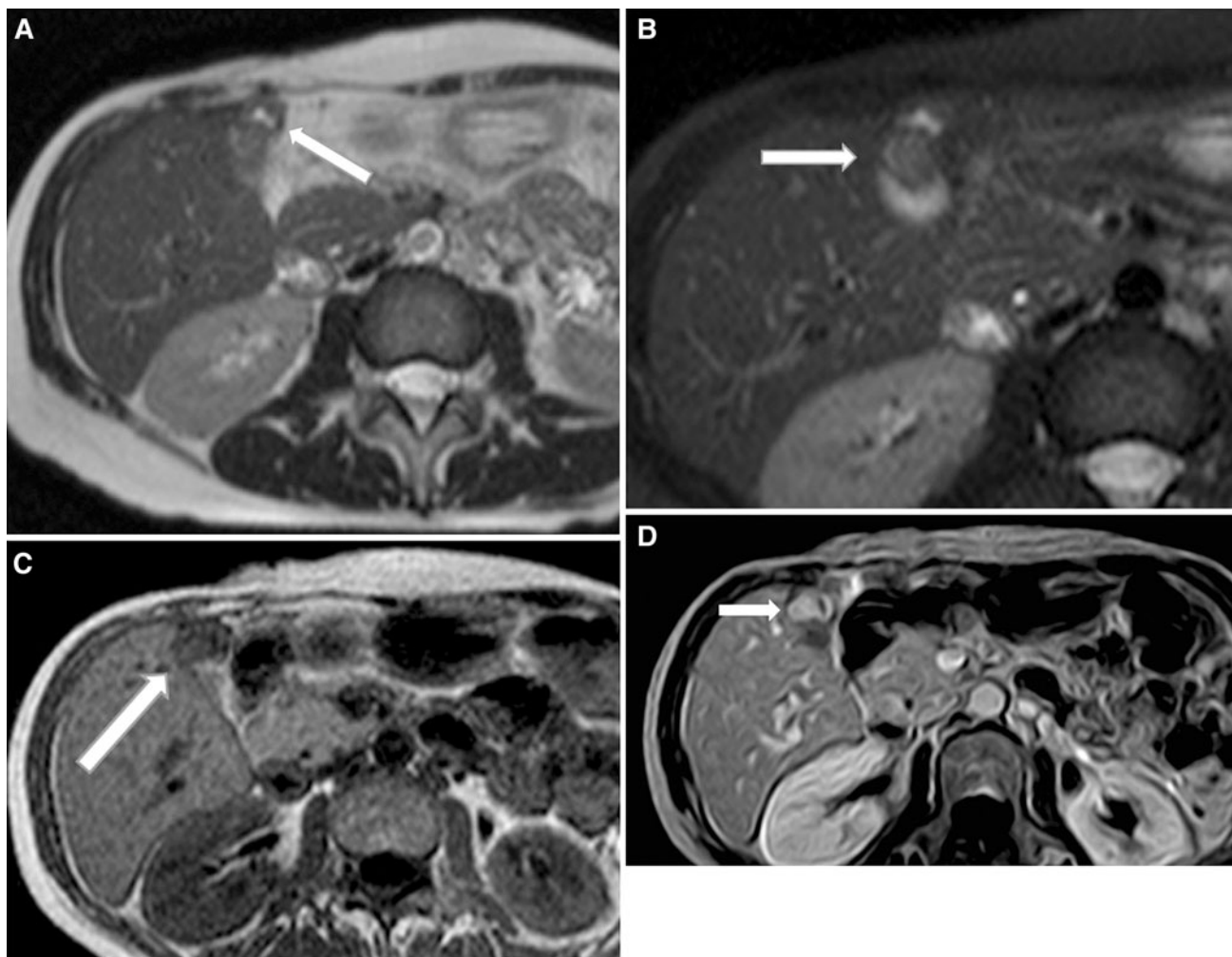
**Fig. 1.** **A** Contrast-enhanced axial CT scan showing the presence of a hyper-enhanced solid tissue (*arrow*) within gallbladder fundus. **B** Coronal multiplanar reformatted image showing the presence of two hypervascular solid nodules, respectively, located in proximity of gallbladder fundus (*straight arrow*) and close to internal oblique muscle (*curved*

*arrow*). **C** Sagittal and **D** oblique multiplanar reformatted image showing infiltration of gallbladder wall by a solid hyper-enhanced tissue (*arrow*). **E** Volume rendering CT reconstructed image showing the relationship of solid nodule with gallbladder fundus (*straight arrow*) and solid nodular implant above internal oblique muscle (*curved arrow*).

presenting as a solid homogenous tissue or as an heterogeneous tissue with solid and cystic areas containing blood. In non-enhanced images endometriotic implant can appear weakly hyperdense due to hematic component. After administration of i.v. contrast the solid part of endometriotic implant can present as non significantly enhanced tissue or as a nodule with a homogenous enhancement according to active inflammation process associated with endometriosis [15–17].

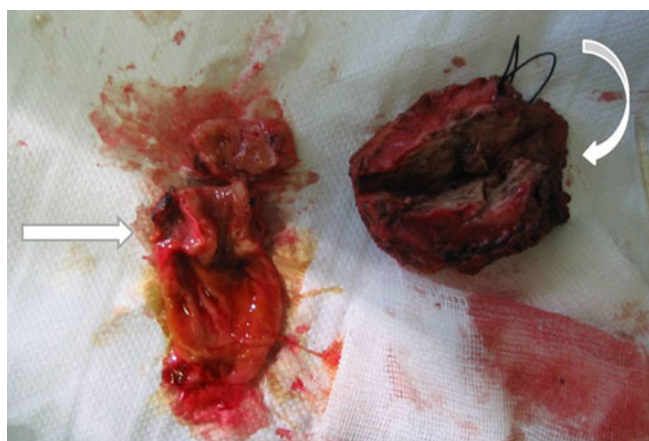
MR imaging has been shown to have greater specificity for the diagnosis endometriosis than other noninvasive imaging techniques [15]. It affords a larger field of

view than US, and the effect of adhesions on surrounding anatomic structures is better depicted. MRI imaging requires state of the art in high field magnets including at least 1.5 Tesla MR system with a phased-array surface coil that improves the signal to noise ratio, thereby increasing the spatial resolution and therefore the details of the anatomical structures concerned [17]. T2-weighted sequences performed in axial and coronal planes allow an accurate morphological study of upper abdomen allowing to identify most of the endometrial implants as homogeneously hypointense soft tissues or as heterogeneously hypointense nodules with one or more punctuate

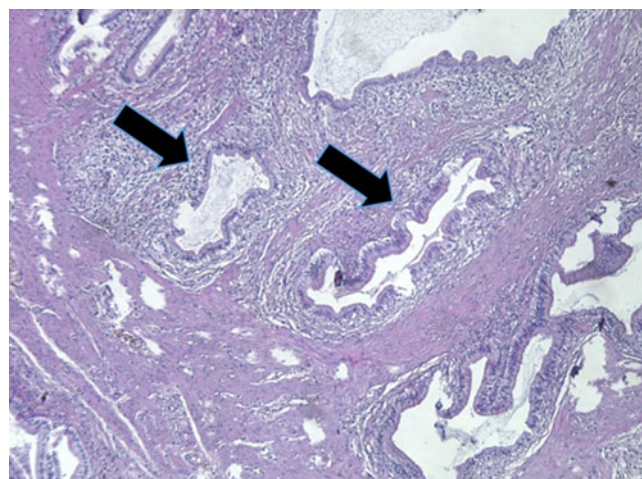


**Fig. 2.** **A** T2-weighted axial MR image showing mild hyperintensity within gallbladder fundus due to hematic collection (*arrow*). **B** T2-weighted fat sat axial MR image allows a clear differentiation between the solid tissue (*arrow*) and fat tissue. **C** T1-weighted axial MR image showing the presence of solid

tissue (*arrow*) characterized by a central hypointensity related to acute bleeding. **D** Axial T1 weighted MR image after intravenous administration of Gadolinium, showing the hyperenhancement (*arrow*) of solid tissue within gallbladder due to inflammation.



**Fig. 3.** **A** Surgical specimen showing opened gallbladder with solid tissue (*straight arrow*) and abdominal wall nodule (*curved arrow*).



**Fig. 4.** Microscopic appearance of an endometriotic implant. It is evident the presence of endometrial glands (*arrows*).

foci of high signal intensity representing hematic collections. These sequences allow also to better detect the presence of peritoneal fluid formed as a consequence of inflammation. On non-enhanced T1-weighted images implant of deep endometriosis implants can appear as solid uniformly hypointense nodules or as non-homogenous nodules with hematic areas. According to the state of hemoglobin degradation hemorrhagic collections can present an intensity varying from weakly hypointense in case of acute bleeding or markedly hypointense in case of chronic bleeding with hemosiderin deposits to hyperintense in case of subacute bleeding. GRE T1-weighted sequences with spectral fat suppression allow to recognize most of the endometriotic implants with subacute hemorrhagic content appearing hyperintense and differentiating them from non-endometriotic lesions containing fat tissue that appear hypointense [17, 18].

In case of gallbladder endometriosis injection of contrast material during MRI is mandatory because it can facilitate differential diagnosis between non-enhancing endometrial implant and gallbladder carcinoma that clearly appear as an enhancing mass due to tumoral angiogenesis [19]. However, if the endometriotic implant appears like an enhancing tissue due to active inflammation is not possible any differential diagnosis.

In conclusion, gallbladder endometriosis is a rare clinical condition which must always be considered in young women reporting chronic abdominal pain in right hypochondrium. A comprehensive study with US, CT, and moreover MRI with dedicated sequence is essential to exclude gallbladder carcinoma and to confirm diagnosis of gallbladder endometriosis. However, final diagnosis remain possible only through surgery.

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