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Case Report

Auto-amputated adnexa in a young woman: Multimodal imaging to rule in a pelvic rolling stone

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ABSTRACT

We report the case of a 26-year-old woman with a right auto-amputated adnexa and a free-floating mass in the pouch of Douglas using multimodal imaging studies including ultrasonography, computed tomography, and magnetic resonance imaging. The absence of an ovary and the evidence of an amorphous and potentially calcified mass, with no connection to the genital tract – in particular when it is found to be mobile – are the key imaging findings. Prospective diagnosis of adnexal auto-amputation could assist surgeons in patient management with a curative laparoscopy in symptomatic women, or potentially expectant management in young women who are asymptomatic or have unrelated symptoms.

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Introduction

Adnexal auto-amputation is the unilateral or bilateral absence of the tube and/or ovary. It is a rare condition, the cause of which is either congenital or acquired [1]. Adnexal torsion with or without an underlying ovarian lesion can lead to infarction and necrosis, and subsequent amputation of the adnexa. Confirmation or incidental diagnosis of an auto-amputated adnexa was made during surgery in most of the previously reported cases [1–5]. To the best of our knowledge, a complete multimodal radiological study with detailed imaging findings of adnexal auto-amputation has not been reported in any of the published cases with radiological exploration [1–6]. The present report aims to describe key imaging findings on ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI) for a prospective diagnosis that may alter patient management.

Case summary

A 26-year-old nulliparous woman was referred to our center for deep dyspareunia, and sporadic right pelvic pain, suspected to be pelvic endometriosis. Twelve years previously, she had history of undocumented lower back pain, suspected to represent a right renal colic.

On pelvic physical examination, normal internal and external genitalia were observed. Transvaginal US found a normal shaped uterus and normal left ovary. A hypoechoic mass with posterior acoustic shadowing suggestive of a calcified mass was present in the right part of the pouch of Douglas (Fig. 1A), and was mobile and rolled under the probe. No right ovary was visualized and a dermoid cyst of the right ovary was first suspected. Unenhanced low-dose pelvic CT was performed following US examination to confirm this hypothesis, but found a largely calcified mass with absence of fat tissue (Fig. 1B), no definite separate right ovary, and no other abnormalities of the lower abdomen or in the pelvis. MRI confirmed the absence of right ovary and the presence of a 3 cm-wide right pelvic mass in the pouch of Douglas, not connected to the genital tract, with a low signal and without any enhancement suggestive of an amorphous mass (Fig. 1C and D).

The absence of right ovary and a separated mobile pelvic mass in the pouch of Douglas supported the diagnosis of adnexal

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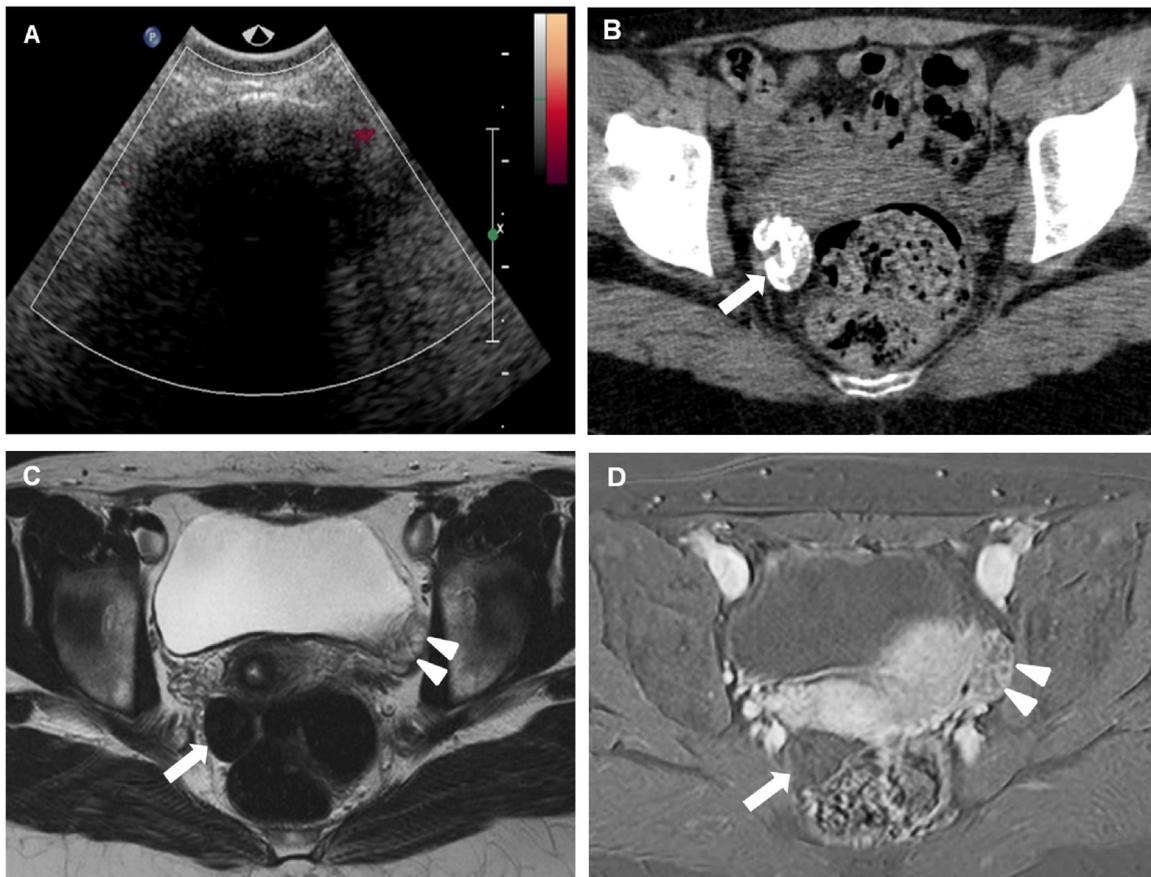


Fig. 1. Imaging work-up. (A) Transvaginal ultrasound image showing an attenuating mass with a large shadow cone in the Douglas-localization with no vascularization on color Doppler. (B) Unenhanced axial computed tomography scan with soft tissue windowing image showing a partially calcified right pelvic mass (arrow) without fat tissue. (C) T2-weighted and (D) contrast-enhanced subtraction magnetic resonance imaging showing a right-sided pelvic mass in the pouch of Douglas (arrows) with a low signal, without fat component and no enhancement. Note the normal aspect of the left ovary (arrowhead on C and D).

auto-amputation. Preoperative biological assessment included a normal blood count and C-reactive protein. There was no tumor marker analysis performed. As the patient was symptomatic a laparoscopic exploration to remove the mass was decided. At laparoscopy, the right tube ended blindly about 3 cm from the uterine horn, with a progressive thin aspect and no ampulla nor fimbria (see [supplementary video](#)). There was no homolateral ovary, and the infundibulo pelvic ligament terminated blindly as well. A 3 cm-wide free-floating pelvic mass was found in the posterior

cul-de-sac, consistent with the mass described on imaging. The mass was hard and smooth, not inflamed and removed without any adhesiolysis. Surgical findings also included normal uterus, and normal left adnexa. The left ovary appeared to have neither compensatory hypertrophy nor tumor appearance ([Fig. 2](#)). No laxity of the left adnexa was found and no ovariopexy was carried out.

Pathological assessment found a fibrous calcified mass, with neither evidence of residual mass, nor malignancy or inflammatory alterations. The patient's intra-operative and immediate

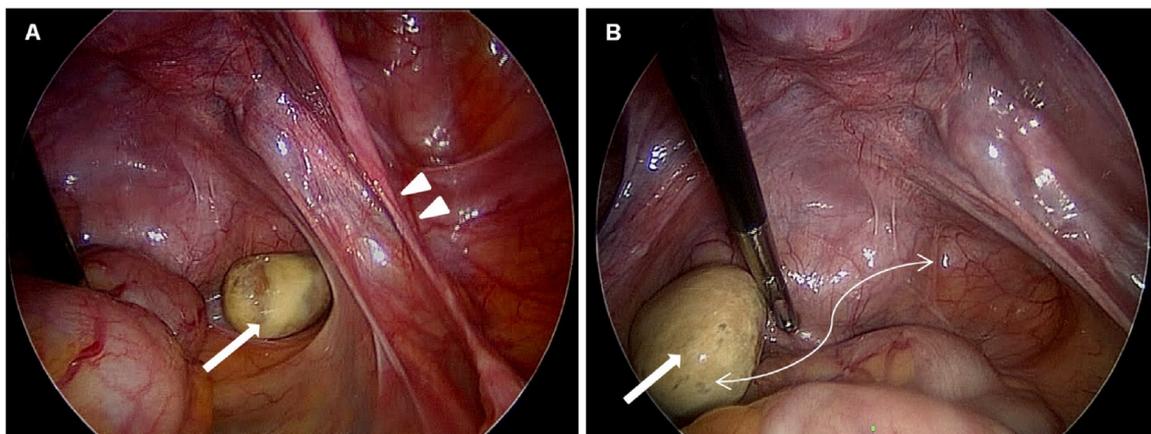


Fig. 2. Laparoscopic exploration. (A) Laparoscopic view shows a right tube ending at the level of the ampulla (arrowheads), with no right ovary. (B) Laparoscopic view shows a smooth surface yellowish mass in the pouch of Douglas (arrow), free-floating with mobility under laparoscopic forceps moving to the left side of the pouch of Douglas compared to (A) (double headed arrow). See the supplementary video.

post-operative course was unremarkable. She remained well and asymptomatic at clinical follow-up 12 months after surgery.

Discussion

The first etiopathogenic theory to explain adnexal auto-amputation is the mechanical hypothesis, in which an acute or chronic torsion, disrupting the blood flow, leads to auto-amputation with subsequent atrophy due to ischemia. This remaining mass is either absorbed or evolves toward an auto-amputated ovary or more complete adnexa, and may adhere to surrounding structures or not with a free-floating peritoneal mass [1–5]. Adnexal torsions are in most cases due to the presence of adnexal masses, ovarian cyst or teratoma, or malformations of tubal or ovarian ligaments with over adnexal laxity [4,5,7].

Adnexal auto-amputation is mostly reported in neonates, but also during the intrauterine life, secondary to abnormal imaging findings on routine US examination showing pelvic mass [1,3,5]. In teenagers or adults, this phenomenon is more rarely reported but it may also be under-diagnosed as most patients are asymptomatic [1,4]. Furthermore, when symptoms do occur they are non-specific, and mostly consist of chronic pelvic pain with or without palpable mass at physical examination [1,2,4]. Previous history of acute lateralized pelvic pain may contribute to the diagnosis of adnexal autoamputation, as was the case in the patient reported herein who presented undocumented lower back pain initially thought to be right renal colic. In some women who do not report any history of pain, an undiagnosed fetal or neonate torsion is possible, because it most likely occurs during these periods [3–5]. Laparoscopic findings classically describe a pelvic mass, either adherent or engulfed to the omentum or to pelvic structures, or free-floating in the pelvic cavity, as in the present case [1,2,5], yet in certain cases no adnexal remnant is found consistent with complete resorption [3,4]. On histopathological examination, the mass is often calcified or necrotic, and usually presents ovarian or tubal remnant of phagocytized ovary [4].

In this context, auto-amputated adnexa in teenagers or adult patients is usually diagnosed incidentally during surgery for other causes or at laparoscopy in absence of definitive radiological diagnosis of a pelvic mass found incidentally or while exploring pelvic symptoms. Preoperative imaging work-up may be challenging in this rare condition, and only a few cases have been reported on plain X-ray, CT, or MRI [5,6]. To the best of our knowledge, the case presented herein is the first to describe key multimodal imaging findings of auto-amputated adnexa in an adult woman, and also highlights that a combination of techniques may be needed to make a positive diagnosis before surgery and rule out differential diagnosis. The main differential diagnosis is ovarian mass or peritoneal calcified bodies. US is usually the first-line exploration and ovaries are usually well depicted in young patients thanks to the presence of follicles and sometimes compensatory hypertrophy of the contralateral adnexa, in the absence of ectopia. The first key finding that should suggest the diagnosis of auto-amputated adnexa is the presence of a hypoechoic pelvic mass without surrounding functional ovarian parenchyma and absence of homolateral ovary. The second key finding, that can be assessed on US through movement of the probe, is the presence of mobility with a rolling effect of the mass in areas such as the pouch of Douglas in absence of adhesions. However, differentiation of adnexal remnant of auto-amputation and an ovarian attenuating mass such as such as dermoid cyst [6,8] and fibrothecoma [9] on US can be difficult, such as to ascertain that the mass is extraovarian and that one of the two ovaries is absent. In this context, MRI may help owing to its high contrast resolution and larger field of view to rule out an ovarian mass and highlight key findings of adnexal auto-amputation that are the

absence of an ovary [6], exclusion of ectopic location, and evidence of an amorphous homolateral mass without clear connection to the lombo-ovarian vessels. While MRI is recommended to characterize complex pelvic masses and may provide diagnosis of adnexal auto-amputation in combination with US, CT is not recommended because of its lack of contrast resolution and associated radiation exposure. However, CT is widely used owing to its availability and low cost, and adnexal auto-amputation may be incidentally found. CT is the best technique to depict calcification and may therefore identify adnexal remnant that is often calcified. It can also show the absence of an ovary, or conversely easily rule out the differential diagnosis of dermoid cyst that shows fat component with negative density and calcification corresponding to ectopic teeth or bone fragments [8]. Moreover, CT may be very useful to rule out other causes of peritoneal loose bodies; these are defined as fatty or calcified bodies arising as a result of organic changes within the peritoneal cavity and lying free within it [10], and most often derive from auto-amputated tissue such as epiploic appendages as a result of its torsion followed by partial atrophy and calcification [6,10].

Adnexal auto-amputation is rare and surgical management remains controversial. Laparoscopy is usually performed to remove the mass when the patient is symptomatic. Some surgeons may also be afraid of missing a pelvic tumor or to leave potential adhesive bowel obstruction due to an incompletely resorbed necrotic mass [1,3]. However, this fear is unfounded when the imaging diagnosis is certain for Focseaneu et al. [1] and Trotman et al. [3]. Other authors, such as Sankaran et al. [2], justified laparoscopic surgery to check-out the contralateral adnexa, test ligament laxity, and potentially carry-out a prophylactic ovariopexy to prevent the torsion of the other adnexa, which would be dramatic for the patient's fertility [1,2,4]. However, there is no consensus regarding laparoscopic ovariopexy after adnexal auto-amputation and such surgery seems seldom performed. Prospective diagnosis of adnexal auto-amputation could thus assist surgeons in counseling patients and to obtain informed consent for curative laparoscopy in symptomatic patients and potentially expectant management in young women who are asymptomatic or have unrelated symptoms.

Conclusion

Adnexal auto-amputation is a rare entity that can be adequately diagnosed by imaging, based on key findings that may need a combination of US, MRI, or CT. Prospective diagnosis of adnexal auto-amputation could assist surgeons in patient management.

Ethical statement

Institutional review board in accordance with French laws ruled that patient approval was not required for this study.

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None.

Disclosure of interest

The authors declare that they have no competing interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.jogoh.2018.04.008](https://doi.org/10.1016/j.jogoh.2018.04.008).

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