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Case Report

Primarian fallopian tube carcinoma: Clinical and radiological keys for diagnosis ☆

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ABSTRACT

Primary fallopian tube carcinoma (PFTC) is seldom diagnosed preoperatively and is often mistaken for epithelial ovarian carcinoma (EOC). This report details a case of primary high-grade serous carcinoma (HGSC) of the fallopian tube, highlighting radiological and clinical indicators to aid in accurate diagnosis and avoid misdiagnosis. A 46-year-old premenopausal woman presented with symptoms and a transvaginal ultrasound (TVUS) indicating a malignant ovarian tumor. Further imaging with CT and MRI revealed a solid-cystic mass suggestive of a fallopian tube tumor rather than an ovarian origin. Oncological surgery confirmed the presence of a high-grade serous carcinoma in the fallopian tube. This case underscores the diagnostic challenges of PFTC and the superior sensitivity and specificity of MRI over CT and US in distinguishing adnexal lesions. Key MRI features such as the sausage-shaped mass and associated hematosalpinx were crucial in differentiating PFTC from EOC. The report emphasizes the importance of considering PFTC in differential diagnoses of adnexal masses to ensure accurate preoperative identification.

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Introduction

Primary fallopian tube carcinoma (PFTC) is rarely diagnosed preoperatively and is often confused with epithelial ovarian carcinoma (EOC). Over 90% of PFTC are high-grade serous carcinoma (HGSC) [1,11]. We present a case of a primary HGSC of the fallopian tube (FT) with radiological and clinical keys aimed at facilitating the accurate diagnosis of PFTC and preventing potential mistakes.

Case report

A 46-year-old woman was referred to the gynecological oncology unit of our hospital with the diagnosis of malignant ovarian tumor diagnosed by transvaginal ultrasound (TVUS). The patient, premenopausal and with a previous cesarean section, reported anorexia, weight loss in the last 6 months, colicky abdominal pain and sensation of a mass in the right lower quadrant that comes and goes. The above is accompanied by vaginal sanguinolent fluid with pain relief after vaginal discharge. Bimanual palpation confirmed an elastic and mobile mass at the right parametrial level. Tumor marker HE4 was high: 206.4 pmol/L; the other tumor markers studied were normal.

TVUS repeated in our hospital by a gynecologic expert ultrasonographer showed irregular complex solid-cystic mass measuring 57 × 44 × 72 mm with positive color Doppler. Computed tomography (CT) shows a homogeneous solid mass lo-

cated in the Douglas pouch that suggested a subserosal fibroid (Fig. 1). Completing study with magnetic resonance imaging (MRI) was recommended.

Pelvic O-RADS MRI protocol was performed in our center with T2-weighted high-resolution images, diffusion-weighted images (DWI) with b 1000 and ADC map and dynamic contrast enhanced (DCE) sequences with calculation of Time/Intensity curves (TIC) [14]. Tumoral sausage-shaped solid mass in the ampullary segment of the right FT, mildly hyperintense on T2WI, isointense on T1WI and with high restriction in DWI were depicted. This mass showed continuous rim enhancement and TIC revealed a high-risk pattern O-RADS MRI 5 tubal lesion. Associated ipsilateral FT dilation with hyperintense T1 content compatible with hematosalpinx was found. Normal ovaries were identifiable separated from the previous described tumor (Fig. 2).

With the suspicion diagnosis of malignant primary FT tumor, oncological surgery was performed. Intra-operatively a right FT mass with normal right ovary was confirmed. Histologically a right FT high grade serous carcinoma was demonstrated (Fig. 3).

Discussion

HGSC is the most common PFTC. Once considered rare (0.1% to 1.8% of gynecologic neoplasms), its incidence is now believed to be underestimated, as most are considered metas-

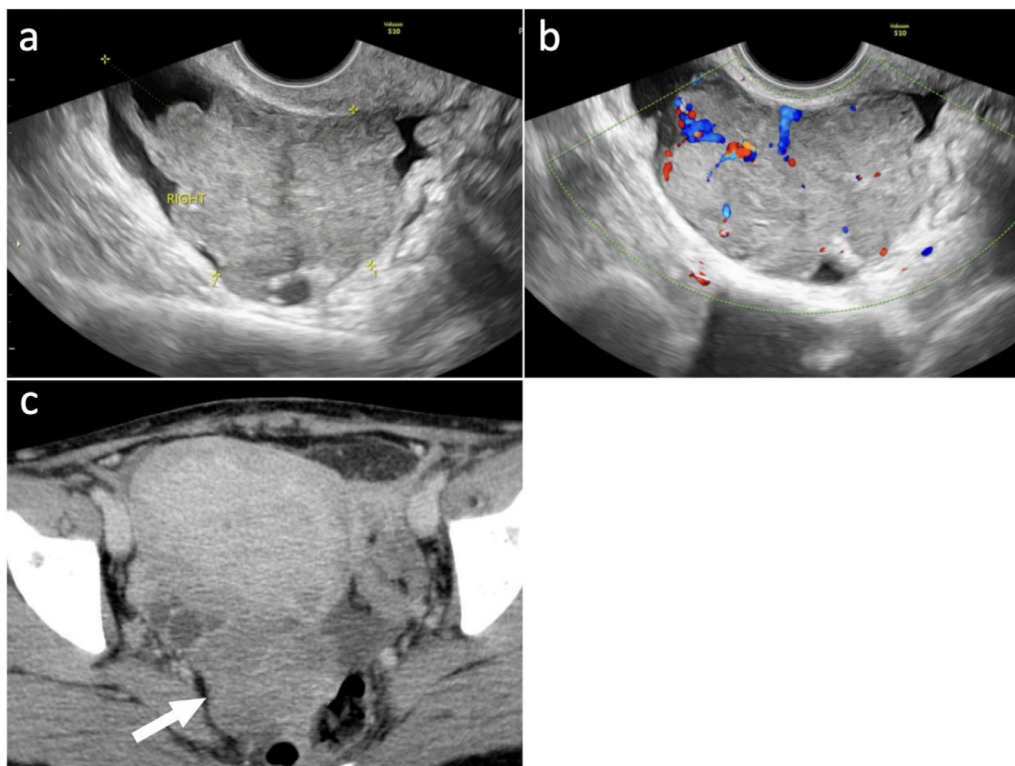


Fig. 1 – TVUS (A), TVUS with color Doppler (B), and CT with intravenous contrast (C). irregular complex solid-cystic mass measuring 57 × 44 × 72 mm (A) with positive color doppler (B), suspected of being a right malignant ovarian tumor. Homogeneous solid mass located in the Douglas pouch initially suggested a subserosal fibroid (white arrow) (C).

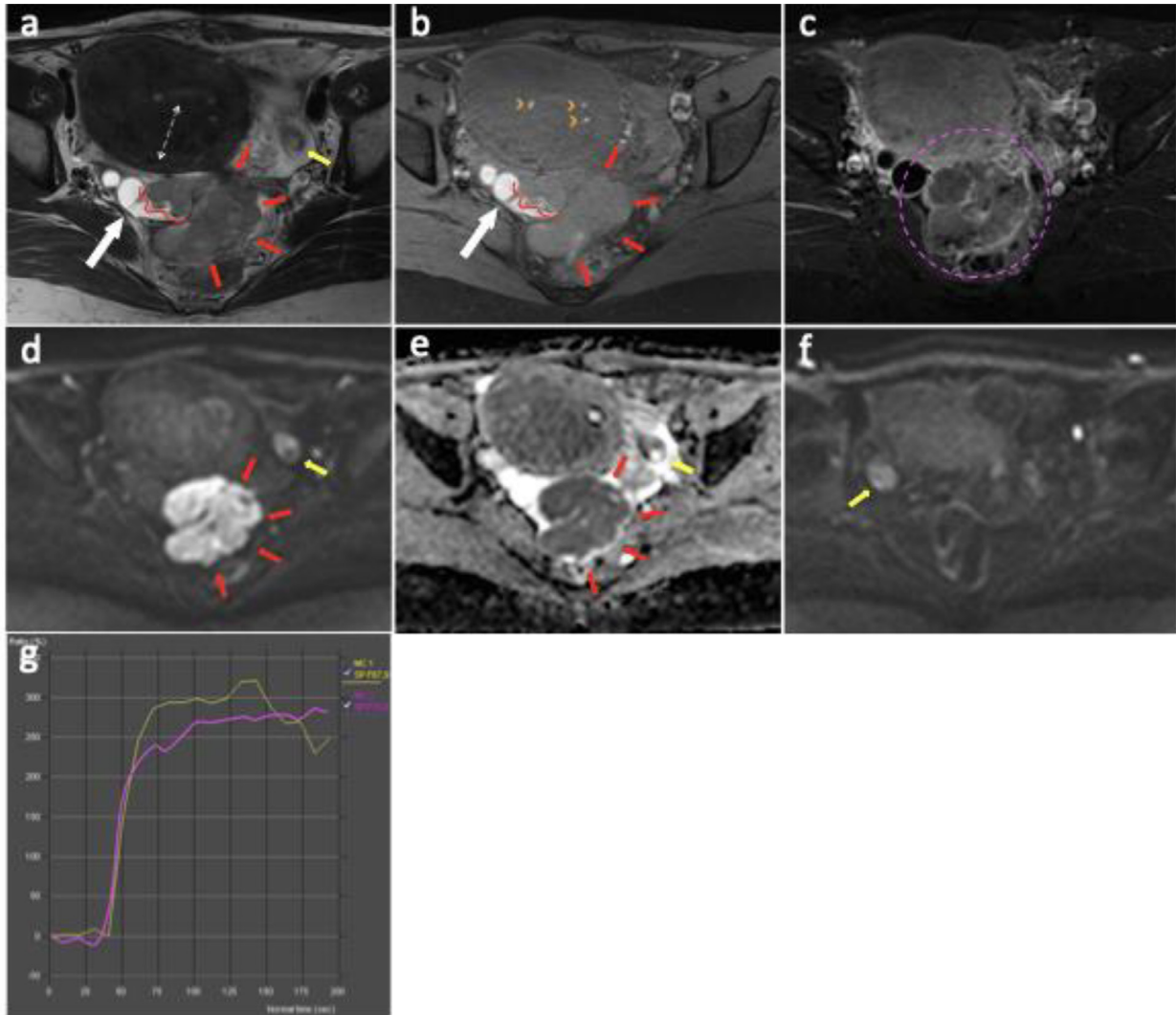


Fig. 2 – MR axial T2WI (A), T1WI Fat Sat unenhanced (B), DCE-T1WI with digital subtraction (C), synthetic b-1000 DWI (D and F), ADC map (E) and TIC pattern in DCE examination (G). Sausage-shaped tumoral mass (red arrow) in the ampullary segment of the right FT, mildly hyperintense on T2WI, isointense on T1WI, with high signal intensity on DWI and lower ADC map (A-E). Note the irregular margin of intraluminal mass (wavy red line) conspicuous thanks to the concomitant hematosalpinx (white arrow) (A and B). The mass exhibits continuous rim enhancement (pink dashed circle) (D). TIC reveals a high-risk pattern compatible with O-RADS MRI 5 tubal lesion (G). Ovaries (yellow arrow) are clearly identifiable separated from the FT mass (A,D,E,F). Diffuse thickening of the uterus junctional zone (double white dashed arrow) with small cystic images, some of which were hyperintense on T1WI (orange arrow head) reflecting diffuse internal adenomyosis (A and B).

tases from serous tubal intraepithelial carcinomas (STIC) originated in the FT [1–7].

The diagnosis of PFTC has historically been difficult given the low clinical suspicion and low specificity of ultrasound (US) findings, which in many cases is the only diagnostic imaging test performed before surgery. Therefore, the preoperative diagnosis rate ranges from 0% to 10% and is usually first detected during surgery or by the pathologist [8].

PFTC occurs most commonly in premenopausal women between 40 and 60 years 1, and it can present with very characteristic symptoms and signs consistent with Latzko triad and hydrops tubae profluens. Our patient presented the 2 of them. Latzko triad appears in up to 15% of PFTC cases consistent

with serosanguinous vaginal discharge, colicky pain relieved after vaginal discharge, and an abdominopelvic mass on physical examination [9,10]. Hydrops tubae profluens or intermittent hydrosalpinx, described by Sachse in 1839 [12], it is observed only in 5% of cases [13]. This pathognomonic sign is characterized by size reduction of the adnexal mass and pain relief after vaginal discharge of a transparent or bloody fluid.

On imaging, US describe PFTC often as a mixed solid-cystic mass, frequently leading to an erroneous preoperative diagnosis of an ovarian tumor. MRI substantially improves sensitivity and specificity of FT tumors due to its superior soft tissue contrast and multiplanar capabilities. The first step of our MRI diagnostic algorithm is to establish whether the lesion is in-

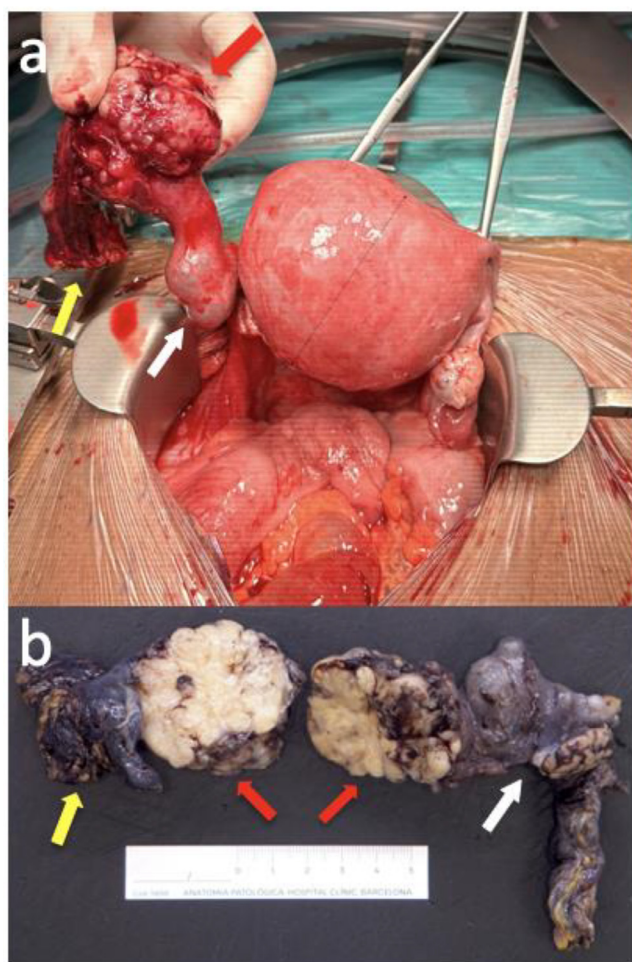


Fig. 3 – Images of the tumor in the intraoperative (A) and pathological anatomy after bisection (B). Right ovary (yellow arrow). Sausage-shaped tumoral mass in the ampullary segment of the right FT (red arrow). Dilated right FT with hematosalpinx (white arrow). Uterus with adenomyosis (double black dashed arrow).

deed ovarian. In this case, identifying the ovaries thanks to their normal restriction on DWI was extremely useful to rule out ovarian origin (Fig. 1).

The PFTC MRI characteristics have been widely described (Table 1). The presence of sausage-shaped mass inside the FT has 100% specificity for PFTC [10]. Visualizing its irregular internal margin delimited by hydro/hematosalpinx confirms its intraluminal location. FT tumors usually measuring less than 7 cm, are hypointense on T1WI, iso to mildly hyperintense on T2WI and shows restricted diffusion on DWI. Variable enhancement has been reported on DCE images [7,15]. In our case, the lesion showed continuous rim enhancement which is more prevalent, thicker, and exhibits higher continuity in PFTC than in EOC [15]. The high-risk pattern TIC was consistent with O-RADS MRI 5 tubal lesion. Note that O-RADS MRI classification includes FT tumors as all annexal masses can be studied.

Table 1 – MRI and clinical features of PFTC vs EOC lesions.

MRI features	PFTC	EOC
Sausage-shape	100% specificity [10]	no
Hidrosalpinx associated	100% specificity [10]	infrequent
Intrauterine fluid collection associated	100% specificity [10]	infrequent
Ring enhancement	100% incidence, 52% continuous [15]	68% incidence, 15% continuous [15]
DWI restriction	yes	yes
Clinical features	Ptfc	Eoc
Latzco triad	15% [9,10]	non characteristic
Hidrops tubae profluens	5% pathognomonic [13]	absent

Additionally, PFTC has other two 100% specificity auxiliary signs [10]: hydrosalpinx and intrauterine fluid accumulations (IFA). If the secretions of hydrosalpinx release from FT entering the uterine cavity will produce IFA. If it moves into the peritoneum via the fimbriae will generate ascites. Fluid movement from the FT may manifest with hydrops tubae profluens, and if the tumor has bled, the hydrosalpinx will actually be hematosalpinx, a finding that also suggests a FT tumor [7]. It should be noted that these two characteristics were present in our patient.

Conversely, EOC tend to be larger than 10 cm and display a more intricate combination of cystic and solid components, often accompanied by multiple papillary mural nodules. As a corollary, EOC typically do not exhibit hydrosalpinx or IFA [10,15], and if the adnexal lesion is accompanied by those findings, you should consider PFTC.

In our case, given the presence of hematosalpinx, differential diagnosis with endometrioid ovarian carcinoma must be made. The presence of intraluminal tubarian mass, sausage-like shape and visualization of normal ovaries can help to the correct diagnosis.

Ultimately, the objective of this case is to illustrate that, with meticulous consideration of clinical factors and a heightened level of suspicion, MRI significantly surpasses CT and US in the differentiation of adnexal lesions. When the preliminary evaluation directs our attention towards EOC, it is imperative to conscientiously incorporate PFTC into the differential diagnosis.

Patient consent

The author of this case report, Donna Zhan Chen, confirms that written, informed consent for publication of this case was obtained from the patient.

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