Imaging of Primary Carcinoma of the Fallopian Tube

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Learning objectives

In this poster, we will examine the some of the key sonographic and cross sectional imaging findings associated with primary carcinoma of the fallopian tube, a rare, yet highly aggressive, malignancy.

Background

Primary fallopian tube carcinoma (PFTC) is the rarest gynecological malignancy, with an overall occurrence rate of 1% among gynecological neoplasms. While the exact etiology is unknown, multiple risk factors have been proposed, including Caucasian race, low or nulliparity, and prior malignancy (i.e. breast or colon). The majority of patients are postmenopausal, with a mean age of 55 years. The greatest percentage of patients will present with nonspecific symptoms, while up to 15% may exhibit the classic triad of intermittent serosanguinous vaginal discharge, colicky lower abdominal pain, and adnexal mass, known as the Latzko triad. Hydrops tubae profluens, an uncommon yet pathognomonic feature, is defined by intermittent discharge of clear or bloody fluid with subsequent shrinkage of the adnexal mass.

To be defined as a PFTC, the main tumor has to be within the tube or the fimbrial end, a transition from benign to malignant epithelium must be demonstrated, and the ovaries/uterus should be normal or, if not, any pathological condition affecting those organs should be clearly different from the fallopian tube. While the majority of cases are unilateral, in some cases, both tubes may be affected. Types of growth patterns included nodular, papillary, infiltrative, and diffuse, with papillary serous being the most common. Of note, histologically, papillary serous carcinoma of the fallopian tube is identical to ovarian serous carcinoma. From a radiological standpoint, it may be difficult to distinguish tubal carcinoma from other ovarian masses.

Grayscale ultrasound imaging classically reveals a solid or partially solid and cystic adnexal mass with varying echotexture. Sonographic features of PFTC can be nonspecific, and may lead the radiologists to include other differential diagnoses such as tubo-ovarian abscess, ovarian tumor, and ectopic pregnancy in their clinical impression. Tumors of the fallopian tube tend to produce serous secretions, resulting in hydrosalpinx, recognized as an adnexal anechoic or hypoechoic tubular structure. Further analysis with Doppler interrogation will reveal low resistance vascular flow within the papillary projections or intraluminal masses. Sonographic 3D imaging may prove helpful in detecting tubal wall irregularities, including papillary projections and pseudosepta.

On CT, a primary fallopian carcinoma appears as a pelvic soft tissue mass which tends to enhance slightly less than the adjacent myometrium. When hydrosalpinx is present, the
mass appears heterogeneous with solid and cystic components, while a predominately solid neoplastic growth appears as a lobulated adnexal mass. Additional key findings include intrauterine fluid, peritumoral ascites and thickened tubal walls that demonstrate enhancement. On MR, the solid tumor will be homogeneously or heterogeneously iso- or hyperintense on T2 weighted images, and hypointense on T1 weighted images. Post contrast imaging will demonstrate enhancement of the solid components of the mass as well as the papillary projections.

**Findings and procedure details**

*Imaging Findings*

Figure 1: Transvaginal Ultrasound (Transverse View)

In the left adnexa, there is a tubular anechoic structure with a papillary projection.

Figure 2: Contrast Enhanced CT Axial Image

Evaluation of the gynecologic structures demonstrates a grossly normal appearance of the uterus. In the region of the left adnexal, there is a 6.0 x 4.9 x 5.0 cm (AP x TR x CC) predominately cystic mass, but which has solid nodular components peripherally.

Figure 3: Contrast Enhanced CT Coronal Image

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Figure 4: T1 Post Contrast MR Axial Image

There is a complex cystic and solid mass at the level of the left adnexa measuring up to 6.3 x 4.7 cm. There are peripheral areas of enhancing soft tissue nodularity.

Figure 5: T2 Weighted MR Axial Image
There is a complex cystic and solid mass at the level of the left adnexa measuring up to 6.3 x 4.7 cm. There are peripheral areas of soft tissue nodularity.

Figure 6: T2 Weighted MR Sagittal Image

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Images for this section:

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**Fig. 3:** Figure 5: Contrast Enhanced CT Coronal Image Evaluation of the gynecologic structures demonstrates a grossly normal appearance of the uterus. In the region of the left adnexal, there is a 6.0 x 4.9 x 5.0 cm (AP x TR x CC) predominately cystic mass, but which has solid nodular components peripherally.
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Conclusion

Primary tumors of the fallopian tube present as a solid or partly solid and cystic adnexal mass which dilate the involved fallopian tube with serous secretions. A radiological diagnosis can often be difficult, depending on if the more pronounced finding is the hydrosalpinx or the solid tumor. If hydrosalpinx is the predominant feature, then a fluid filled adnexal structure containing nodular or papillary solid components can be seen. A multiloculated cystic mass giving the classic spokewheel appearance is visualized when the dilated tube folds over on itself. On the contrary, when the predominant feature is the solid mass, a sausage shaped adnexal mass with heterogeneous enhancement is the principal finding.

In patients with a suspected adnexal mass, initial imaging with ultrasound is performed, followed by CT or MR for further characterization and staging purposes. Once the diagnosis is made, definitive treatment includes surgical resection (total abdominal hysterectomy, bilateral salpingo-oopherectomy, omentectomy, tumor debulking, and lymph node dissection) with chemotherapy reserved for more advanced or recurrent cases.

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References


