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Mini Review

Clinical and Ultrasound Characteristics of Tubal Carcinoma: A Short Review

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ABSTRACT

Primary carcinoma of the fallopian tube is one of the rarest gynecological malignancies, accounting for 0.18% to 1.6% of all malignant neoplasms of the female reproductive tract, and typically presents in the 5th and the 6th decades of life.

The etiology of fallopian tube carcinoma is unknown. However, association with nulliparity and infertility and history of tuberculosis and salpingitis/pelvic inflammatory disease has been described.

Most carcinomas of the fallopian tube are adenocarcinomas and its commonest variant is serous papillary carcinoma; however, clear cell carcinoma, endometrioid carcinoma, and squamous cell carcinoma have been reported to arise from the fallopian tubes.

The most frequent clinical symptoms at presentation are vaginal discharge or bleeding and lower abdominal pain, and the most frequent clinical findings are a palpable pelvic and/or abdominal mass and suspicion of ascites. Tubal cancer usually spreads in an intraperitoneal, lymphatic, and hematogenous manner.

Treatment is similar to that for ovarian carcinoma and includes cytoreductive surgery and chemotherapy with a combination of platinum and taxane.

The most typical ultrasound feature of tubal cancer seems to be a sausage shaped solid mass or a sausage shaped or hydrosalpinx like structure with solid tissue projecting into it.

Keywords: Tubal carcinoma, Fallopian tube, Ultrasound characteristics

EPIDEMIOLOGY

Primary carcinoma of the fallopian tube is one of the rarest gynecological malignancies, accounting for 0.18% to 1.6% of all malignant neoplasms of the female reproductive tract. This prevalence is probably underestimated, because of the rarity of the disease, and because many advanced tubal cancers are misdiagnosed as ovarian cancer [1]. Fallopian tube carcinoma is a disease that typically presents in the 5th and 6th decades of life (mean age at diagnosis 55-60 years) [2,3]. The etiology of fallopian tube carcinoma is unknown. However, association with nulliparity and infertility and history of tuberculosis and salpingitis/pelvic inflammatory disease has been described [4,5]. One sociodemographic study has shown that the incidence of tubal cancer has increased simultaneously with the affluence of urban life [6].

PATHOGENESIS

It has been suggested that fallopian tube epithelium (benign or malignant) that implants on the ovary is the source of high-grade serous carcinoma rather than the ovarian surface epithelium as previously believed [7]. Traditionally, it was thought that ovarian high-grade serous carcinoma arises from the ovarian surface epithelium and epithelial inclusion glands and that the pathogenesis is de novo. However, a candidate precursor is now recognized in the fallopian tube, especially within the fimbriated end, i.e., Serous Tubal Intra-Epithelial Carcinoma (STIC). Accordingly, STIC is probably the earliest histologically recognizable lesion in the pathogenesis of high-grade serous carcinoma. With subsequent progression, STIC implants on the ovary and then develops into an invasive high-grade serous carcinoma with rapid tumor growth [8]. STIC is also the earliest morphologically recognizable form of tubal high-grade serous carcinoma, and it is considered the immediate precursor of invasive carcinoma of the fallopian tube [8]. Besides, an association of fallopian tube carcinoma with BRCA1 and BRCA2 mutations has been reported [9,10].

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MACROSCOPY

Bilaterality is infrequent (3%-13% of cases). The average tumor size at diagnosis is 5 cm (range 0.2 cm-10 cm) [11]. In slightly over one-half of cases the fallopian tube is dilated, so that intraoperatively tubal cancer may be mistaken for a hydrosalpinx, hematosalpinx, or pyosalpinx [11]. The tumor can appear as one or more yellow or tan nodules or a mass that fill the lumen of the salpinx. Hemorrhage or necrosis is frequent. Most tumors are within the distal two-thirds of the tube, and a small percentage is located in the fimbriated end [11].

HISTOPATHOLOGY

Most carcinomas of the fallopian tube are adenocarcinomas and its commonest variant is serous papillary carcinoma; however, clear cell carcinoma, endometrioid carcinoma, and squamous cell carcinoma have been reported to arise from the fallopian tubes [12,13]. In the largest clinicopathologic study the distribution of histologic types was as follows: serous (80%), adenocarcinoma not otherwise specified (10%), endometrioid (7%), clear cell (2%), mucinous (2%), and mixed serous-mucinous (1%) [13]. Most fallopian tube carcinomas are poorly differentiated. Well-differentiated tumors are very uncommon. The majority of tubal serous carcinomas are histologically indistinguishable from high-grade serous carcinomas of the ovary. They are characterized by broad papillae with epithelial stratification, irregular, slit-like spaces with micropapillary tufting, invasion by solid nests of variable size or sheets of tumor cells, necrosis, and psammoma bodies [14]. Most tubal endometrioid carcinomas are grade 2 or 3, but some are grade 1 [15]. Almost one-half of tubal cancers resemble Female Adnexal Tumors of Wolffian Origin (FATWO-like type) [16]. Independent primary endometrioid carcinomas can synchronously arise in the fallopian tube and uterus [17]. Non-invasive carcinomas of the fallopian tube have traditionally been considered "carcinoma in situ". With the recognition of early carcinomas not invading the underlying fallopian tube stroma and cytologic abnormalities in prophylactic bilateral salpingo-oophorectomy specimens from women with BRCA1 or BRCA2 mutations, the term Tubal Intraepithelial Carcinoma (TIC) has emerged. Histologically, TIC is the earliest morphologically recognizable form of tubal carcinoma. The cells in TIC resemble those of high-grade serous adenocarcinoma. For this reason, and because of the relationship between TIC and invasive high-grade serous carcinomas most TICs should be considered as being of serious histologic type. Therefore, the terms "Serous Tubal Intraepithelial Carcinoma (STIC)" and "Tubal Intraepithelial Carcinoma (TIC)" should be considered synonymous [18].

ULTRASOUND CHARACTERISTICS

The most typical ultrasound feature of tubal cancer seems to be a sausage-shaped solid mass or a sausage-shaped or hydrosalpinx-like structure with solid tissue projecting into it.

Recently, Ludovisi et al. [19] analyzed the ultrasound characteristics of 79 fallopian tube carcinomas collected in 13 different centers. They reported that the typical ultrasound appearance of tubal cancer is a) a sausage-shaped cystic structure with thin walls and solid tissue protruding into it like a papillary projection, b) a sausage-shaped cystic structure with thin walls and a large solid component filling part of the cyst cavity or c) an ovoid/oblong completely solid mass. Sometimes, tubal cancer is associated with ultrasound images of hydrosalpinx with incomplete septa and normal ovarian parenchyma adjacent to the lesion. When cyst fluid is present, the echogenicity is usually anechoic. Most tubal carcinomas manifest moderate or high color content at color or power Doppler examination. In theory, at ultrasound examination, acute salpingitis could be confused with tubal carcinoma. This is because protrusions of the solid tumor into a fluid-filled tube might be confused with swollen mucosal folds in a pyosalpinx and because both an acutely inflamed tube and a tubal carcinoma are richly vascularized at color Doppler examination. On the other hand, a transverse section through an inflamed tube often manifests a cog-wheel appearance with many swollen mucosal folds protruding relatively symmetrically into the tubal lumen, while in tubal cancer there is usually only one or two solid tumor protrusions. Moreover, the cyst fluid in tubal cancer is often anechoic, while it is usually of ground glass echogenicity (corresponding to pus) in a pyosalpinx. While the tubal wall is almost always thickened in a pyosalpinx [20,21] it is thin in most tubal cancers.

These results agree well with those of case reports [22-33] and small case series (up to seven cases) describing the ultrasound appearance of tubal cancer [26-28] in that the most typical ultrasound feature of tubal cancer seems to be a sausage-shaped solid mass or a sausage-shaped or hydrosalpinx like structure with solid tissue projecting into it. They also agree with those of textbooks of pathology 11 in that many tubal cancers were detected in asymptomatic women. The latter might be an effect of today's widespread use of ultrasound in asymptomatic women and of computer tomography and magnetic resonance imaging for assessing a wide variety of non-gynecological symptoms.

CLINICAL SYMPTOMS AND PROGNOSIS

The most frequent clinical symptoms at presentation are vaginal discharge or bleeding and lower abdominal pain, and the most frequent clinical findings are a palpable pelvic and/or abdominal mass and suspicion of ascites [1,13]. Other symptoms are abdominal distension, urinary urgency, changes in bowel function, low back pain1, and vulvar or inguinal mass [14]. The Latzko's triad of symptoms, i.e. intermittent, colicky pelvic pain, a pelvic mass, and bloody–watery vaginal discharge (also called "hydrops tubae profluence") suggests a diagnosis of fallopian tube cancer, but it is present in less than 10% of patients with tubal cancer [14]. The low incidence of tubal cancer and its unspecific and protean symptoms explain the difficulty with making a correct preoperative diagnosis. Tubal carcinoma can easily be mistaken for other gynecological entities, mainly ovarian malignancy, and may be found incidentally during surgery for unrelated conditions [29,30].

Tubal cancer usually spreads in an intraperitoneal, lymphatic, and hematogenous manner. Treatment is similar to that for ovarian carcinoma and includes cytoreductive surgery and chemotherapy with a combination of platinum and taxane. Residual disease after surgery is a poor prognostic factor [13,31]. The prognosis of patients with primary fallopian tube carcinoma is similar to that of patients with primary ovarian carcinoma. The overall 5-years survival for fallopian tube carcinoma for all stages combined varies between studies from 43% to 56% [32,33].

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