Fallopian Tube Cancer: Diagnosis and Treatment

Fallopian tube tumors are rare with an incidence of 3.6 per one million. Fallopian tube carcinoma is of epithelial origin and shares similar pathogenesis mechanisms with epithelial ovarian cancer. Early obstruction of the fallopian tube results in a rapid onset of symptoms such as abdominal pain and distension and patients with fallopian tube carcinoma usually present at an early stage. Treatment of choice for early-stage fallopian tube carcinoma is surgical removal of the tumor and any involved pelvic structures.

Epidemiology

The Fallopian tube is a paired structure between the pouch-like fundus of the uterus and the ovaries. Suspended in the broad ligament, the tube is divided into the infundibulum, ampulla, isthmus, and intramural portion (see images below) and lined with ciliated columnar epithelium.

Carcinomas of the fallopian tube are a rare form of gynecological cancer responsible for approximately 1.8% of female genital cancers. In the United States, the incidence of these carcinomas is 3.6 per million.

Fallopian tube carcinoma is epithelial and is therefore identical to epithelial ovarian cancers. This histopathological overlap explains why many patients with primary fallopian tube carcinoma are misdiagnosed with ovarian cancer with extension to the
Etiology

The exact etiology of fallopian tube cancers is unknown; however, several risk factors that may lead to an increased risk of developing this form of cancer have been identified.

Because fallopian tube cancers are of epithelial origin, the same risk factors as for epithelial ovarian cancer also play a role in predisposing patients to primary fallopian tube cancer. For example, nulliparity and history of early menarche may put the patient at an increased risk of primary fallopian tube tumors, while multiparity and the use of combined oral contraceptive pills lower the risk of epithelial ovarian cancer and fallopian tube carcinoma.

Unlike other forms of cancer, fallopian tube carcinoma is not related to age or tobacco smoking. As well, endometriosis, which is known to increase the risk of ovarian cancer, is not related to fallopian tube carcinoma.

As with epithelial ovarian carcinoma, fallopian tube cancer is more commonly found in patients with BRCA1 and 2 mutations.

Pathophysiology

The exact pathological mechanism for fallopian tube carcinoma is not fully understood. However, high estrogen states and certain genetic mutations are known to be associated with a higher risk of fallopian tube carcinoma.
BRCA1 and 2 mutations result in abnormal chromosomal configurations leading to cancerous transformation. These abnormal chromosomal changes are similar in all forms of epithelial cancer of the ovaries, breast, and fallopian tubes.

Because of this close relationship between BRCA mutations and fallopian tube tumors, any patient with a BRCA mutation who is undergoing a prophylactic hysterectomy should also undergo total removal of the fallopian tubes and ovaries.

**Clinical Presentation**

The typical patient with fallopian tube cancer is a 55-year-old woman who has large quantities of serosanguinous vaginal discharge, lower abdominal pain, and an abdominal mass. However, this typical picture is only evident in about 15% of cases; the remainder of patients usually have a less specific presentation.

On physical examination, applying pressure to the abdominal mass may result in the release of often-bloody vaginal discharge. This finding is pathognomonic of fallopian tube cancer.

Fortunately, fallopian tube cancer is usually diagnosed at an early stage due to the rapid development of pain resulting from fallopian tube obstruction. Ascites can develop in patients with fallopian tube carcinoma.

**Diagnostic Work-up**

Cytological examination of vaginal discharge and Papanicolaou tests are not useful in the diagnosis of fallopian tube carcinoma. While up to 20% of patients have an abnormal Pap smear, this finding is not specific for fallopian tube carcinoma and only indicates possible gynecological malignancy.

Cancer antigen 125 (CA-125) test is very useful in confirming the diagnosis of fallopian tube carcinoma as this protein is usually elevated in epithelial carcinoma. It cannot, however, differentiate between epithelial ovarian cancer and fallopian tube cancer, and it may be elevated in a variety of benign conditions. However, in patients with proven fallopian tube cancer, an elevated CA-125 is very useful for monitoring the patient during treatment and to detect recurrence.

In any patient with typical symptoms of a possible pelvic malignancy (abdominal distension, vaginal discharge, and abdominal pain) and elevated CA-125, transvaginal ultrasonography is indicated, as it helps evaluate the pelvic organs and can exclude possible tubal pathology. Usually, transvaginal ultrasonography reveals a multicystic mass with multiple nodules and solid components. Unfortunately, this is sometimes
confused with an ovarian tumor. Fallopian tumors are highly vascularized and therefore **Doppler studies** are useful in their evaluation.

**Pelvic and abdominal computed tomography** and **magnetic resonance imaging** can help confirm the diagnosis of a fallopian tube mass and help in staging the disease. Usually, at some point during the evaluation of the patient with a fallopian tube tumor, a **biopsy** is indicated, usually via fine-needle aspiration. In most cases, pathological examination reveals **serous, endometrioid, or mixed pathohistological pattern**. Occasionally, the tumor type is an undifferentiated, transitional, or clear cell. **P53 alterations** are common in fallopian tube cancer.

The staging of primary fallopian tube carcinoma is the same as for epithelial ovarian cancer. **Stage I** disease indicates cancer that is limited to the ovaries and may be unilateral or bilateral. **Stage II** disease indicates that the cancer has spread to other pelvic organs. In **stage III**, the **peritoneum** is involved. Finally, **stage IV** indicates distant metastasis.

Fortunately, the majority of cases of fallopian tube cancer are diagnosed at stage I and II; patients with advanced disease are usually in stage III.

**Treatment**

Patients with stage I and II disease should undergo **surgical treatment**. Even in patients with advanced disease, surgical removal of the tumor and any involved structures has been proven to improve survival.

Patients with advanced disease may benefit from **neoadjuvant chemotherapy** before debulking surgery. Additionally, fallopian tube carcinoma is likely to spread through the lymphatic system; therefore, pelvic and **para-aortic lymphadenectomy** is indicated. When lymphadenectomy is performed, median survival is estimated to be about 43 months.

Patients who wish to **preserve fertility** can benefit from conservative surgery and with selective tumor debulking only if the tumor is well-differentiated and at stage I.

**Radiotherapy** is no longer recommended in the management of fallopian tube carcinoma except in **cases of recurrent disease**.
receive chemotherapy. Other patients with invasion of the serosa or the pelvic structures, even in early disease, may benefit from adjuvant chemotherapy that is platinum-based.

**Combination chemotherapy** is always superior to single-drug chemotherapy in the management of fallopian tube carcinoma. Patients with advanced disease usually need adjuvant cisplatin-based chemotherapy followed by a taxane such as docetaxel (see image).

Taxanes stabilize GDP-bound tubulin in the microtubule, thereby inhibiting the process of cell division as depolymerization is prevented. Additionally, patients with stage III and IV disease are possible candidates for paclitaxel, another taxane chemotherapeutic for epithelial gynecological carcinoma.

**Second-look laparotomy** is also useful in the management of patients with fallopian tube cancer. Several authors have recommended its routine use in fallopian tube carcinoma as a guide to further treatment. The goal of second-look laparotomy in primary fallopian tube carcinoma is to detect any residual disease or recurrence, especially peritoneal implants, as finding none at second-look laparotomy has a good prognostic significance.

**References**


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