FALLOPIAN TUBE CANCER

Tubal Cancer

An abnormal growth of fallopian tube tissue.

Diagnosis

Female

Related Diagnoses:

Hematosalpinx  |  Endometrial cancer

About Fallopian tube cancer

Fallopian tube cancer is a rare malignancy (progressively worsening), accounting for 0.5% of all female gynecological cancers. The etiology is poorly understood as it typically presents at an advanced disease stage, as symptoms are often absent in the initial period. As a result, fallopian tube cancer is generally associated with a poor prognosis.

An average of 20 to 30 new cases reported annually. The rarity of this cancer is due to the fallopian tube low oncogenic potential, in contrast to the vulnerability of the organ to infection. Cancer of the fallopian tube occurs most often after the fourth decade of life, with an average age of 62 years (17-88 years). No case is reported in childhood.

It is divided into primary and secondary carcinoma, of which secondary malignancies are more often the results of metastasis of tubal ovarian cancer or endometrial stumbled cancer. It usually originates from cancer of the ovaries, the endometrium, the gastrointestinal tract, the peritoneum (lining of the abdominal cavity), and the breast.

Primary cancer of the fallopian tube (Pic. 1) is a rare gynecological cancer. It is rarely seen clinically due to hidden lesions, an absence of recommended
screening methods, and relatively limited clinical experience, to the extent that a number of cases have been accidentally detected during other gynecological surgeries. Because the tubal wall has considerable flexibility, even if the tube is filled with fluid or tumor, the tubal wall can still remain quite complete. Tubal fluid can be discharged through the uterus-vagina route when fimbria (fringe of tissue that sweeps the egg into the fallopian tube) is blocked, and this is usually found in early cases. In case of an open fimbrial end, the tumor cells would come into the abdominal cavity where they could easily grow, and this is found mostly in advanced cases, where the prognosis is rather poor.

From the genetic background, cancer may be a result of mutation in either of the BRCA1 and BRCA2 genes, which are tumor suppressor genes related to fallopian tube cancer. Statistics for BRCA-related cancer typically encompass not only cancer of the ovaries themselves, but also peritoneal cancer and the very rare, but somewhat easier to detect, cancer of the fallopian tubes. Women with a BRCA mutation have more than 100 times the normal rate of fallopian tube cancer.

Preoperative diagnosis is difficult due to the lack of specific symptoms. Histologically and clinically, it can be difficult to differentiate from ovarian cancer, and the management of both is similar. Metastasis of fallopian tube carcinoma occurs via blood, lymphatic, and peritoneal routes as well as via direct extension. It can be misleading because it may not identify the primary tumor. Pelvic ultrasound can be used to assess “sausage-like” images, related to tubal distension, as well as vascular abnormalities using Doppler ultrasound. Depending on the series, there is a 3 to 4% rate of preoperative diagnosis.

The most often treatment consists of surgical removal of ovaries and fallopian tubes in combination with chemotherapy because of the structure of the organ and the risk of shedding cells out of the tubes and into the abdominal cavity.

International Federation of Gynecology and Obstetrics (FIGO) staging is done at the time of surgery:

- Stage 0: Carcinoma in situ.
- Stage I: Growth limited to fallopian tubes.
- Stage II: Growth involving one or both fallopian tubes with extension to pelvis.
- Stage III: Tumor involving one or both fallopian tubes with spread outside pelvis.
- Stage IV: Growth involving one or more fallopian tubes with distant metastases.

After treatment, it is necessary to follow up the cancer. Regular check up involves physical examination and CA 125 blood test (tumor marker found in
many patients with ovarian and/or fallopian tube cancer). CA 125 levels tend to drop after surgery and during chemotherapy treatment. It could rise again due to fallopian tube cancer recurrence, but also due to pelvic inflammatory disease and uterine fibroids.

Prognosis is highly dependent of stage at diagnosis. A 5-year survival can range between 50 and 60% (stage II) and 10 and 20% (stages III and IV). Other series report different survival rates, but use more aggressive chemotherapeutic protocols. There are some unfavorable prognostic factors besides stage: age above 50-years old, tubal muscular layer (>50%) and/or serosal invasion, less optimal cytoreduction and histological poor differentiation. Surprisingly, primary tumor size does not affect prognosis.

Associated diseases

Newer data now suggest that high-graded serious carcinoma (HGSC) of ovary, primary peritoneal carcinoma (PPC), and fallopian tube cancer originate in the fimbrial end of the fallopian tube. Due to the presumed rarity of fallopian tube cancer, most current and more recent ovarian cancer clinical trials have now included patients with fallopian tube cancer. It has similar pathogenesis and molecular biomarkers and that these cancers should more accurately be called pelvic serous carcinomas.

Complications

A microscopic spread of the tumor, from the fallopian tube to the ovary, may occur very early; thus, salpingectomy (see below) alone may be insufficient to protect against the development of ovarian cancer and may create a false sense of protection. Therefore further evaluation of this procedure, with long-term follow-up, is necessary.

Extensive metastasis in the upper abdomen without fallopian tube muscle and serous coats breach is possible due to the exfoliation (removal of the layer of dead cells) of malignant cells into the peritoneal fluid. As a result, issue from nearby organs, such as the spleen, gallbladder, stomach, bladder, or colon, may be affected. Additionally, women with a BRCA mutation may be more likely to have primary ovarian insufficiency.

Risk factors

- family history of either ovarian, breast or fallopian tube cancer
- genetics
- pregnancy history (not having children or pregnancy after 35)
- no birth-control pills use
- age (especially 40-65 years)
Impact on fertility

Although this type of cancer tends to occur especially in postmenopausal women, there are some cases the disease develops before they have completed their family. Fallopian tubal cancer affects fertility by two treatment ways – by surgery or as a result of chemotherapy that destroys ovaries and eggs. Total hysterectomy with salpingo-oophorectomy means a loss of fertility as a surgical removal of the uterus, fallopian tubes, ovaries and other surrounding structures in the vast majority of the fallopian tube cancer patients.

In a very few cases, if cancer still occurs in one fallopian tube, there is a chance to retain the uterus and second ovary with fallopian tube and to retain some fertility. This second ovary takes over egg production to maintain normal menstrual cycles and ovulation. Nevertheless, it is not mostly possible to save an ovary because the cancer is normally spread beyond the fallopian tube by the time it is diagnosed.

Prevention

There is no known way to prevent fallopian tube cancer. The only possible prevention is to detect its early precancerous stages.

High parity has been reported to be protective, and a history of pregnancy, breastfeeding and the use of oral contraceptives decrease the fallopian tube cancer risk significantly.

In women with high risk of ovarian or fallopian tube cancer, bilateral salpingo-oopheroctomy (see below) is highly recommended as prevention, especially in premenopausal women.

Symptoms

The internal location of the fallopian tubes makes it difficult to reach an early diagnosis. Symptoms are nonspecific and may consist of blood stained discharge per vaginum and abdominal pain. A pelvic mass may be detected on a routine gynecologic examination.
Therapies

Self therapy

Natural products

Naturally occurring plant components from traditional herbs are a significant source of potential therapeutic compounds for cancer treatment. The use of natural products as alternative anticancer therapies tends to increase, especially in developing countries. Thus, the study of medicinal plants to treat cancer has also increased to explore their therapeutic effect for cancer treatment. Indonesia is abundant of herbal medicines that can be used for an alternative therapy, such as Papua ant nest. The local people of Papua boiled the ant nest to treat several diseases and it has been used for the treatment of ascaris, cold, hemorrhoids, burn, including cancer. There is still limited scientific evidence to prove the efficacies of Papua ant nest to cure cancer, especially in ovarian cancer.

Conventional medicine

Pharmacotherapy

Pharmacotherapy is not used to treat fallopian tube cancer.

Surgical therapy

Salpingo-oophorectomy & hysterectomy

Current treatment of fallopian tube cancer is mostly mimicking the treatment of ovarian cancer, with surgery as the major clinical arrangement (Pic. 2), and where conservative operation is not a recommended practice.

Salpingo-oophorectomy (surgical removal of the ovaries and fallopian tubes) is the single most effective method of preventing ovarian and fallopian tube cancer. However, a small risk of primary peritoneal cancer remains, at least among women with BRCA1 mutations, since the peritoneal lining is the same type of cells as parts of the ovary. This
risk is estimated to produce about five cases of peritoneal cancer per 100 women with harmful BRCA1 mutations in the 20 years after the surgery.

BRCA2 related ovarian cancer tends to present in perimenopausal or menopausal women, so salpingo-oophorectomy is recommended between ages 45 and 50. If it is done before menopause, then the women also benefit from a reduced risk of breast cancer.

The surgery is often done in conjunction with a hysterectomy (surgical removal of the uterus) and sometimes a cervicectomy (surgical removal of the cervix), especially in women who want to take tamoxifen, which is known to cause uterine cancer, or who have uterine fibroids. Multiple styles of surgery are available, including laparoscopic (keyhole) surgery. Because about 5% of women with a BRCA mutation have undetected ovarian cancer at the time of their planned surgery, the surgery should be treated as if it were a removal of a known cancer.

The surgery also artificially induces menopause, which causes hot flashes, sleep disturbances, mood swings, vaginal dryness, sexual difficulties, difficulty with word recall, and other medical signs and symptoms. The side effects range from mild to severe; most can be treated at least partially. Many women with a BRCA take hormone replacement therapy to reduce these effects: estrogen-progesterone combinations for women who have a uterus, and unopposed estrogen for women whose uterus was removed. Estrogen can cause breast cancer, but as the amount of estrogen taken is less than the amount produced by the now-removed ovaries, the net risk is usually judged to be acceptable.

Some sources assume that oophorectomy before age 50 doubles the risk of cardiovascular disease and increases risk of hip fractures caused by osteoporosis in the relevant population.

**Other therapies**

**Chemotherapy**

Chemotherapy is a category of cancer treatment that uses one or more anti-cancer drugs. Given the mode of lymphatic and blood spread of this type of cancer, chemotherapy is warranted, especially in the early stages of the disease. The gold standard is the combination platinum-taxane, as in epithelial tumors of the ovary. The response rate of platinum-based chemotherapy (cisptain) is 53 to 92% (Pic. 3). By cons
there are few data on the response to this chemotherapy in advanced stages.

**Radiotherapy**

Radiation therapy uses high energy x-rays to kill cancer cells. Radiation therapy is used after surgery if there is the possibility of residual disease in the pelvis but the abdomen is cancer-free.

Generally, radiation therapy is not effective for advanced stages because when vital organs are in the radiation field, a high dose cannot be safely delivered and does not improve survival in people with well-differentiated tumors. Radiation therapy is then commonly avoided in such stages as the vital organs may not be able to withstand the problems associated with these ovarian cancer treatments.

**Assisted reproduction**

Surgical treatment of fallopian tube cancer makes the woman sterile (unable to bear children). Infertility services can be used to preserve her eggs, if wanted. However, as the benefits to the surgery are greatest close to menopause, most women simply postpone the surgery until they have already borne as many children as they choose to.

Egg freezing and ovarian tissue cryopreservation offers women with cancer the chance to preserve their eggs so that they can have children in the future. When a woman has no uterus, the embryo may be transferred to the surrogate mother’s uterus.

After the treatment of cancer genetic testing (PGS) is recommended. Preimplantation genetic screening allows studying the DNA of eggs or embryos to select those that do not carry certain damaging characteristics.

On the other hand, if a woman have no own eggs or their quality is not sufficient, donated ones may be used in combination with surrogate mother.
**Diagnoses**

**Hematosalpinx**
Hematosalpinx is a medical condition involving bleeding into the fallopian tube. Learn more at: [www.fertilitypedia.org/therapy/diag/hematosalpinx](www.fertilitypedia.org/therapy/diag/hematosalpinx)

**Endometrial cancer**
Cancer that arises from the endometrium, the lining of the uterus. Learn more at: [www.fertilitypedia.org/therapy/diag/endometrial-cancer](www.fertilitypedia.org/therapy/diag/endometrial-cancer)

**Therapies**

**Egg donation**
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research. Learn more at: [www.fertilitypedia.org/edu/therapies/egg-donation](www.fertilitypedia.org/edu/therapies/egg-donation)

**ICSI**
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg. Learn more at: [www.fertilitypedia.org/edu/therapies/icsi](www.fertilitypedia.org/edu/therapies/icsi)

**Sperm donation**
The procedure in which a man (sperm donor) provides his sperm for fertility treatment. Learn more at: [www.fertilitypedia.org/edu/therapies/sperm-donation](www.fertilitypedia.org/edu/therapies/sperm-donation)

**Standard IVF**
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used. Learn more at: [www.fertilitypedia.org/edu/therapies/standard-ivf](www.fertilitypedia.org/edu/therapies/standard-ivf)

**Gallery**
**Pic. 1: Primary fallopian tube carcinoma**
Hematoxylin and eosin stain showing total inclusion of tubal neoplasia growing inside the lumen (A); papillary serous adenocarcinoma with solid areas (B); moderate nuclear atypia (C).

**Pic. 2: Fallopian tube cancer**
Primary fallopian tube cancer (long black arrow), both ovaries (short black arrows) and uterus are seen uninvolved.

**Pic. 3: Response rates of single agent chemotherapies in platinum resistant and refractory setting**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly paclitaxel</td>
<td>21%</td>
</tr>
<tr>
<td>Gemcitabine</td>
<td>19%</td>
</tr>
<tr>
<td>PEGylated liposomal doxorubicin</td>
<td>26%</td>
</tr>
<tr>
<td>Pemetrexed</td>
<td>21%</td>
</tr>
<tr>
<td>Nab-paclitaxel</td>
<td>23%</td>
</tr>
<tr>
<td>Topotecan</td>
<td>20%</td>
</tr>
<tr>
<td>Docetaxel</td>
<td>22%</td>
</tr>
<tr>
<td>Oral etoposide</td>
<td>27%</td>
</tr>
<tr>
<td>Vinorelbine</td>
<td>20%</td>
</tr>
<tr>
<td>Ifosfamide</td>
<td>12%</td>
</tr>
<tr>
<td>Altretamine</td>
<td>14%</td>
</tr>
</tbody>
</table>

**Sources**

“Ovarian cancer (https://en.wikipedia.org/wiki/Ovarian_cancer)” — sourced from Wikipedia licensed under [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

“BRCA mutation (https://en.wikipedia.org/wiki/BRCA_mutation)” — sourced from Wikipedia licensed under [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)
“Potential of Terpenoid Bioactive Compound Isolated from Papua Ant Nest as an Alternative Ovarian Cancer Treatment” —by Hasanuddin et al. licensed under CC BY 4.0

“Asymptomatic Primary Fallopian Tube Cancer: An Unusual Cause of Axillary Lymphadenopathy” —by Healy et al. licensed under CC BY 3.0

“Primary fallopian tube carcinoma: a case report” —by Boufettal and Samouh licensed under CC BY 2.0

“Primary fallopian tube cancer: A case report and short literature review” —by Tayade et al. licensed under CC BY 4.0

“Refractory fallopian tube carcinoma – current perspectives in pathogenesis and management” —by Schama and Schilder licensed under CC BY-NC 3.0

“Fallopian tube cancer” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Small fallopian tube carcinoma with extensive upper abdominal dissemination: a case report” —by Oliveira et al. licensed under CC BY 2.0

“Fallopian tube blockage” —sourced from Fertilitypedia licensed under CC BY-SA 4.0

“Ovarian cancer” —sourced from Fertilitypedia licensed under CC BY-SA 4.0

“Clinical and survival analysis of 36 cases of primary fallopian tube carcinoma” —by Ma and Duan licensed under CC BY 4.0

“Chemotherapy” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Primary Fallopian Tube Clear Cell Adenocarcinoma in Pregnancy: Case Presentation and Review of the Literature” —by Malak and Klam licensed under CC BY 3.0