Primary fallopian tube adenocarcinoma: Preoperative diagnosis, treatment and follow-up

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Summary

Preoperative diagnosis of fallopian tube carcinoma is difficult due to the rarity and silent course of this neoplasm. We present herein the case of a 58-year-old woman with primary fallopian tube carcinoma that was diagnosed preoperatively on the basis of a positive for adenocarinoma Papanicolaou vaginal smear, repeated episodes of vaginal bleeding, negative endocervical and endometrial curettage, characteristic features on ultrasonography and elevated CA-125 levels. The patient was treated by total abdominal hysterectomy, bilateral salpigno-oophorectomy and omentectomy. Pathologic confirmation of primary serous papillary adenocarcinoma of the left fallopian tube was made. Peritoneal washings were positive for malignancy. FIGO stage was considered as IIIb and the patient received six courses of combined carboplatin-taxol chemotherapy. At two years from onset of therapy the patient underwent a modified radical mastectomy and lymphadenectomy because of primary carcinoma of the right breast. The patient was started on tamoxifen therapy, which she is still taking. At 60 months after initial surgery, the patient is alive and well. In conclusion, our study suggests an association between fallopian tube carcinoma and breast cancer and a good response of the patient to platinum-based chemotherapy.

Key words: Ultrasonography; Hydrosalpinx; Positive Papanicolaou vaginal smear; Negative D&C; Chemotherapy; Fallopian tube carcinoma; Breast carcinoma.

Introduction

Primary fallopian tube adenocarcinoma is very rare and accounts for 0.3% to 1.1% of all malignant tumors of the female reproductive tract [1]. Fallopian tube adenocarcinoma carries five-year survival rates of about 68-76% for Stage I, 27-42% for Stage II and 0-6% for Stages III and IV [2]. It is therefore most important to diagnose these neoplasms in the early stages [3-7].

The rarity and silent course with almost no symptoms in early stages of fallopian tube cancer make the preoperative diagnosis difficult. Fortunately, the advanced technology of ultrasound scanners has made correct preoperative diagnosis of fallopian tube adenocarcinoma increasingly possible [8, 9]. Ultrasonographic images of fallopian tube adenocarcinoma show complex, predominaltly cystic or "sausage-like" cystic adnexal masses with papillary projections [8-10]. Occasionally, a positive Papanicolaou vaginal smear associated with characteristic clinical symptoms such as vaginal bleeding, watery vaginal discharge, abdominal or pelvic pain, a subsequent negative endocervical and endometrial curettage and the presence of an adnexal lesion detected by ultrasonography indicate the location of the malignancy in the fallopian tube [11].

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In this study, we report a very rare case of primary left fallopian tube adenocarcinoma in a postmenopausal patient. The positive Papanicolaou vaginal smear consistent with adenocarcinoma, the repeated episodes of vaginal bleeding, the negative endocervical and endometrial curettage, the characteristic ultrasonographic findings and the elevated CA-125 levels were highly suspicious of fallopian tube carcinoma.

Case Report

A 58-year-old woman, gravida 2, para 2, who completed menopause at age 47 was admitted because of an abnormal Papanicolaou smear showing a few malignant cells consistent with adenocarcinoma. The malignant cells were round or oval with a small amount of cyanophilic, finely vacuolated cytoplasm, high nucleocytoplasmic ratio and enlarged hyperchromatic nuclei with irregular chromatin clearings. The background of the smears was watery and glandular with several inflammatory cells, erythrocytes and some cellular debris (Figures 1, 2, 3). Also, the patient complained about repeated episodes of vaginal bleeding for the previous three months. Her past medical history included myositis diagnosed ten years before. A speculum examination showed an atrophic cervix. At bimanual gynaecologic examination no pelvic mass was detected. The uterus was normal. Both uterine adnexa could not be evaluated. The patient underwent fractional dilation and curettage to rule out endocervical or endometrial carcinoma, but the pathologic findings were unremarkable.

Figure 1. — Papanicolaou smear showing normal squamous cells, a watery glandular background and two malignant cells with a high nucleocytoplasmic ratio and hyperchromatic nuclei (Papanicolaou stain, x 100).

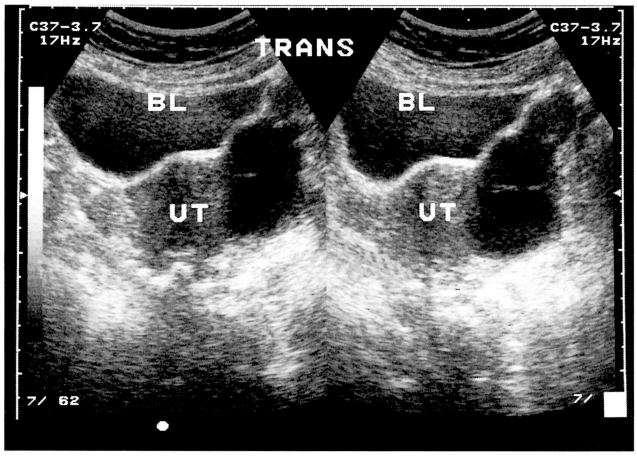
Figure 2. — Two malignant cells with cyanophilic, finely vacuolated cytoplasm and enlarged hyperchromatic nuclei with irregular chromatic clearings (Papanicolaou stain, x 400).

Figure 3. — A rounded malignant cell with cyanophilic cytoplasm, a high nucleocytoplasmic ratio and enlarged atypical nucleus showing abnormal chromatin distribution with irregular nuclear clearing (Papanicolaou stain, x 400).

Transabdominal ultrasonography demonstrated a 9 x 5-cm sausage-shaped irregular cystic structure corresponding to the left fallopian tube and separate from the uterus; the wall of the cystic mass was thickened (Figures 4, 5). A distinctly separate left ovary was not seen. The uterus was well defined and no abnormalities were detected. The right adnexal region was unremarkable. No ascites or peritoneal masses were seen. Preoperative serum levels of CA-125 were 52.5 IU/ml, whereas other serum tumor markers such as carcinoembryonic antigen (CEA), CA 19-9, and AFP were in the normal range. Fallopian tube carcinoma was suspected. Chest-X ray and mammography were normal. Preoperative MR imaging of the upper and lower abdomen demonstrated the presence of a dilated left fallopian tube with thickened wall and solid elements within it. No other abnormal findings were found.

Exploratory laparotomy revealed a cystic sausage-shaped left fallopian tube involving its entire length. Tumoral nodules involving the sigmoid colon, rectum, posterior uterine wall and omentum were seen. Ascitic fluid was not present. Peritoneal washing was taken at the time of surgery for cytologic examination. No tumoral implants were palpated on the lobes of the liver. Also, no paraortic or pelvic nodes were palpated. The examination of the other intra-abdominal organs was negative. A rapid intraoperative-frozen section revealed histological evidence of adenocarcinoma. A total abdominal hysterectomy, bilateral sapingo-oophorectomy and omentectomy were performed. Residual neoplastic deposits were less than 1.5 cm in diameter on the cul-de-sac and rectum. Peritoneal washings were positive for malignancy. Postoperative CT scan of the upper and lower abdomen showed that the liver, spleen, pancreas, adnexal glands, kidneys and bladder were without abnormal findings. There was no abnormal dilation of the bilateral ureters. No definite inguinal, iliac or paraaortic lymphadenopathy was identified. At the anatomic position of the left uterine adnexae, a lesion with the dimension of 1.7 x 1.4 cm and hyperdensity was observed.

On microscopic examination, a moderately differentiated (grade 2) serous papillary adenocarcinoma of the left fallopian tube was revealed according to the diagnostic criteria determined by Hu *et al.* [12] and modified by Sedlis [13]. The neoplasm had spread to the serosa of the left fallopian tube. Involvement of the lymphatic space was found. Metastatic invasion to the left ovary, uterine serosa and omentum were detected. The multifocal implants on the omentum had a maximum diameter from 0.5 cm to 1 cm, while on the uterine serosa a maximum diameter from 0.1 cm to 0.5 cm. No other neoplasmatic findings were found in the uterus. The right ovary and right fallopian tube were unremarkable. FIGO stage was considered as IIIb and the patient was referred for chemotherapy treatment. She was given six courses of systemic combination chemotherapy of carboplatic and taxol, at 4-week intervals. Monthly serum assays of CA-125 from the first to the sixth



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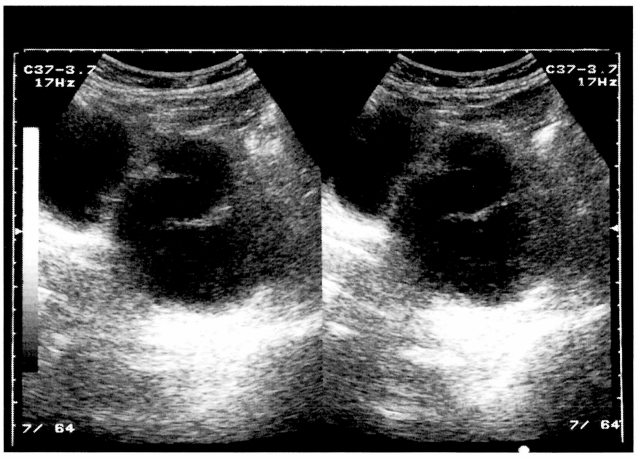

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Figures 4 & 5. — Transabdominal ultrasonography demonstrates a sausage-shaped irregular cystic structure with thickened walls, corresponding to the left fallopian tube. The lesion is apparently separated from the uterus.

cycle of chemotherapy treatment indicated the levels of 214 IU/ml, 87 IU/ml, 54 IU/ml, 13 IU/ml, 11 IU/ml, 8 IU/ml and 7 IU/ml, respectively.

Two years after surgery for primary fallopian tube carcinoma, during the routine examination of the patient's breasts by mammography, an area suspicious for malignancy was found in the right breast. Subsequent fine needle aspiration (FNA) examination of this area suggested the presence of breast carcinoma. The patient underwent a modified radical mastectomy and lymphadenectomy. Pathology revealed one focus with a maximum diameter of 1.3 cm of *in situ* ductal adenocarcinoma. Also, two foci with a maximum diameter of 1.5 and 0.3 cm of invasive ductal adenocaricoma were found. The invasive ductal adenocarcinoma was of a non-specific type and poorly differentiated (grade 3). Tumor involvement of the vascular-lymphatic spaces was found. Four of the 23 removed axillary lymph nodes were found to be positive for metastatic carcinoma (T1N1M0). The expression for estrogen receptors was intensively positive, while for progesterone receptors it was negative. The final pathologic diagnosis was primary breast carcinoma. The patient was started on tamoxifen, at a dose of 20 mg daily, which she is sill taking.

Five years after surgery for the primary left fallopian tube carcinoma, the patient is alive. A recent CT scan of the upper and lower abdomen was negative for local recurrences of the disease or secondary metastases. Serial serum CA-125 measurements have been normal so far.

Discussion

Primary adenocarcinoma is the most common histologic malignant type of the fallopian tube. Other less common histologic types include squamous cell carcinoma, sarcoma, carcinosarcoma, lymphoma and transitional cell carcinoma [1, 10, 14-16]. Choriocarcinoma of the fallopian tube has also been found following an ectopic pregnancy [10].

As regards the pathologic diagnosis of primary fallopian tube adenocarcinoma, there are some difficulties due to the similarities shared between fallopian tube adenocarcinoma and epithelial ovarian adenocarcinoma. Hu *et al.* [12] established diagnostic criteria to distinguish fallopian tube adenocarcinoma from primary ovarian adenocarcinoma. This classification was modified in 1978 by Sedlis [13], which stands as:

(i) The tumor arises from the endosalpinx.

(ii) The histological pattern reproduces the epithelium of tubal mucosa.

(iii) Transition from benign to malignant epithelium is found.

(iv) The ovaries are either normal or with smaller tumor.

These criteria were fulfilled in our case.

Cases of primary fallopian tube carcinoma have been reported in women from the ages of 17 to above 80 years [14]. However, it occurs more frequently in patients in their fifth and sixth decades with a significant proportion presenting within five years of menopause [5, 10]. There appears to be a higher incidence in Whites versus Blacks [17].

The etiology of primary fallopian tube neoplasms is not certain, but there are some clues suggesting chronic salpingitis, tubal tuberculosis and tubal trauma as possible predicting factors. In addition, associations with infertility and nulliparity have been suggested [10, 18, 19]. Moreover, an association between fallopian tube carcinoma and breast carcinoma has been described. Peters *et al.* [6] found that six of 115 fallopian tube cancer patients (5%) had breast carcinoma and Alvarado-Cabrero *et al.* [20] reported that 11 of 103 patients with invasive fallopian tube carcinomas (11%) had breast cancer. This association is also supported by our case. A theoretical background for this association seems to be the responsiveness of both fallopian tube and breast epithelium to ovarian hormones [20].

Although the triad of: (a) profuse watery vaginal discharge (hydrops tubae profluens), (b) abdominal pain, and (c) adnexal mass has been suggested as a diagnosis of fallopian tube cancer, it is uncommon in most reported series [14] and the presenting symptoms are usually non-

specific [14]. Postmenopausal bleeding is a common symptom of fallopian tube cancer and it is reported by more than 50% of these patients [21]. When the patients complain of abdominal pain, it is usually colicky and lower abdominal in nature. The pain may probably be related to the distention of a partially blocked fallopian tube by blood or fluid (discharge); the pain is then relieved by the passage of blood or discharge through the uterus [14].

A preoperative diagnosis of fallopian tube carcinoma is not usually suspected because it occurs extremely rarely and in most cases it is often misdiagnosed as an ovarian neoplasm. Alvarado-Cabrero *et al.* [20] reported that a correct preoperative diagnosis of fallopian tube cancer had been made preoperatively in only 4.6%. In this study the negative diagnostic curettage in nine of 22 patients with abnormal vaginal bleeding six months to three years before surgery reinforces the common warning in the literature about considering the possibility of fallopian tube cancer when postmenopausal bleeding persists after a negative curettage. The authors also reported that a curettage specimen that contained carcinoma led to a misdiagnosis of endometrial cancer in 13 cases. However, such error is difficult to avoid in the absence of a palpable or ultrasonographically demonstrable adnexal mass. Eddy *et al.* [22] analyzed the data of 74 patients regarding fallopian tube malignancies and only two cases of fallopian tube carcinomas were correctly diagnosed before surgery (2.7%). Podratz *et al.* [23] detected only three cases of fallopian tube cancer among 47 patients (6.4%). Ayhan *et al.* [24] reported a study of eight cases of primary fallopian tube carcinoma. No patient was operated with a preoperative diagnosis of tubal cancer. Soundara *et al.* [25] published a review of fallopian tube carcinomas over 20 years. Nine cases of fallopian tube carcinoma were found among approximately 9,000 gynecological malignancies. Seven patients were preoperatively diagnosed as having malignant ovarian tumors, while in two cases surgery was performed because of suspected Meig's syndrome and acute hemoperitoneum. However, at the time of surgery fallopian tube malignancy was detected and proven by frozen section.

Some investigators have reported up to 60% abnormal Papanicolaou smears in patients with fallopian tube carcinoma [26]. However, others have suggested less than a 13% incidence of abnormal Papanicolaou smears [27-29]. When adenocarcinoma cells are found in vaginal smears it is impossible to determine the site of origin cytologically (endocervix, endometrium, fallopian tube, ovary). Cells or cell clusters of an adenocarcinoma are usually derived from the endocervix or endometrium. Cells of an extrauterine carcinoma in Papanicolaou vaginal smears originate mostly from an ovarian tumor and this diagnosis is sometimes supported by the presence of psammoma bodies. A primary carcinoma of the fallopian tube is usually not suspected because of its rarity. In our case, despite the extremely small number of abnormal cells, a correct initial diagnosis of adenocarcinoma was made by cytology. Although the distinction between an adenocarcinoma of endocervix, endometrium or extrauterine sites is very difficult or impossible in Papanicolaou smears, there are some criteria enabling us to suggest the primary site of origin. In our case, we excluded the possibility of an endocervical origin of the adenocarcinoma cells and we postulated that the endometrium seemed to be the most likely site of their origin. Thus, in the cytologic report, we recommended further gynecologic examination and endometrial curretage. The cytologic findings suggestive of endometrial adenocarcinoma included the small number of malignant cells, their arrangement as single cells or in small loose clusters, their morphology (rounded or oval cells with cyanophilic cytoplasm and micronucleoli) as well as the presence of mild tumor diathesis (focally watery granular background with erythrocytes, inflammatory cells and some cellular debris). The presence of cytology consistent with adenocarcinoma, the persistent unexplained abnormal vaginal bleeding or discharge in the absence of any cervical or endometrial pathology confirmed by diagnostic curettage, the persistent lower abdominal or pelvic pain and the presence of an adnexal lesion detected by ultrasonography should raise the possibility of an ovarian or fallopian tube malignancy [5, 14]. Moreover, an exploratory laparotomy should be performed when adenocarcinoma cells are found in Papanicolou vaginal smears and the diagnostic endocervical and endometrial curettage is negative even though no clinical symptoms are present.

Endometrial brush cytology can be helpful in the preoperative diagnosis of fallopian tube carcinoma. Minato *et al.* [30] reported a case of intraepithelial adenocarcinoma of the left fallopian tube that was detected by endometrial brush cytology. In this case a small number of clusters of atypical cells was found. The clusters were three-dimensional, and some of them showed micro-glandular formations. The nuclear/cytoplasmic ratio of the cells was high. Nuclei were located eccentrically. Emperipolesis was not present. In contrast to endometrial carcinoma, carcinoma of the fallopian tube shows the following findings: (i) clear background, (ii) small number of malignant cells, (iii) malignant cells showing papillary or globular formations, (iv) malignant cells often degenerated and (v) less emperipolesis [30-32]. These findings have been confirmed by other researchers.

Pelvic ultrasonography should be helpful in the preoperative diagnosis of fallopian tube carcinoma. However, in the international literature there are few reports on the ultrasonographic features of fallopian tube cancer [5, 8]. The ultrasonographic findings in the reported cases of fallopian tube cancer are complex, predominantly cystic adnexal masses or sausage-shaped structures apparently separated from the uterus [33]. The explanation for the ultrasonographic appearance of fallopian tube carcinoma as a complex mass might be the liquefaction necrosis within the tumor; the necrotic areas could be recognized ultrasonographically as cystic areas within a solid mass [10]. The differential diagnosis in these cases includes an ovarian cystadenoma, endometrioma, dermoid cyst and

tubo-ovarian abscess. Also, solid ovarian tumors have to be included in the differential diagnosis [8]. Finally, when a tubal mass appears to be separate from the uterus, pedunculated uterine myoma with areas of cystic degeneration should be considered [8]. In addition, a sausage-shaped cystic mass with papillary projections attached to the hydrops tubae and the passing of free fluid from the tubal mass through the uterine cavity, accompanied by symptoms of profluens described by the patient during the examination has been reported [9, 34]. When a lesion is detected ultrasonographically as a sausage-shaped cystic mass apparently separated from the uterus the differential diagnosis includes hydrosalpinx, hematosalpinx and fallopian tube malignancy. At surgery, the intraluminal extent of the tumor may be recognized only when the tube is opened [8]. In our case, transabdominal ultrasonography demonstrated a sausage-shaped irregular cystic structure with thick walls. The lesion was apparently separated from the uterus. The ultrasonographic picture of fallopian tube carcinoma as a sausage-shaped adnexal lesion is due to tubal distension by the intraluminal growth of the fallopian tube neoplasm. Transvaginal color Doppler may aid in the diagnosis of fallopian tube malignancy. Shalan *et al.* [35] diagnosed preoperatively a case of primary adenocarcinoma of the fallopian tube by color and pulsed Doppler ultrasonography. Also, Kurjak *et al.* [36] reported a successful preoperative diagnosis in a 60-year-old woman with postmenopausal bleeding and vaginal discharge. The Papanicolaou cervicovaginal smear was normal. Transvaginal ultrasonography revealed a 14 x 6 x 4-cm sausage-shaped cystic mass, separated from the uterus fundus. This mass showed papillary projections extending from its inner surface. Color Doppler ultrasonography evaluated neovascularization within the solid part with a resistance index (RI) of 0.39 and a pulsality index (PI) of 0.45. According to the Doppler criteria fallopian tube carcinoma was suspected and histology proved the preoperative findings. Podobnik *et al.* [37] published the case of a 69-year-old women with medical history of right-sided lower abdominal pain accompanied by profuse watery vaginal discharge for the previous three months. Inspection of the vulva, vagina and cervix was unremarkable. Transvaginal ultrasonography demonstrated a right sausage-shaped cystic mass, 6 x 4 x 2.5-cm in size, with papillary projections extending from the inner surface of the lesion. The right ovary was considered of normal size, shape and echogenicity. During transvaginal ultrasonography, this mass changed in shape and size, accompanied by the passage of free fluid through the uterine cavity. Color Doppler imaging demonstrated a color-coded flow area at the periphery of the papillary structure of the right fallopian tube; the RI was 0.34 and the PI 0.62. The ultrasonographic findings, combined with the clinical presentation, were highly suspicious of fallopian tube malignancy, which was confirmed at surgery.

Kawakami *et al.* [38] reported the characteristics of primary fallopian tube carcinoma by magnetic resonance imaging (MRI) and computed tomography (CT) in ten patients. According to their findings, if a small, solid, lobulated tumor is revealed in the adnexal portion and if it is associated with intrauterine fluid collection, primary tubal carcinoma should be included in the differential diagnosis, especially if the patient has clinical symptoms such as vaginal discharge or abnormal genital bleeding. In the past, hystero-salpingography (HSG) has also been employed in some reports but has not gained popularity due to the fear of extruding malignant cells through patent tubal ostia [18]. The preoperative diagnosis of the fallopian tube carcinoma could be assisted by the measurement of serum levels of CA-125 [14, 31, 37, 39, 40]. Baekelandt *et al.* [41] reported that in 40 patients with primary fallopian tube carcinoma in whom serum CA-125 levels were measured preoperatively, the levels were elevated in 65%. Also, Rosen *et al.* [42] found a similar correlation in a study of 13 patients. In our patient, the preoperative serum levels of CA-125 were 52.5 IU/ml (normal < 33 IU/ml).

Fallopian tube carcinoma spreads by local invasion, transluminal migration, and via the lymphatics and the bloodstream [10]. As regards the lymphatic spread from the fallopian tubes, there are three main streams: (i) the first stream from the proximal part of the fallopian tube near the uterus toward the paraaortic region, (ii) the second stream from the distal portion of the fallopian tube near the fimbriae into the pelvic nodes, and (iii) the third stream following the round ligaments toward the inguinal nodes [43]. The most frequent site of metastasis from fallopian tube malignancies is the pelvic peritoneum, followed by the ovaries and uterus; the intestines, lung, liver and diaphragm can also be involved [10]. In addition, pelvic and paraaortic metastases can frequently be found [43]. Schneider *et al.* [44] found five out of 11 patients (46%), in whom a pelvic/paraortic lymph node dissection had been performed, to have lymph node involvement. In 15 patients, Tamimi and Figge [28] found 53% with pelvic and 33% with paraaortic lymph node metastases. Di Re *et al.* [43] reported in an analysis of 17 patients, lymph node involvement in 59% for all FIGO stages; in Stage I disease they found lymphatic spread in 33%. This potential for nodal metastasis may explain the poor survival rate reported even when the disease is apparently limited to the fallopian tube [45]. Early blood-borne spread to the bone, brain and lungs is a rare event [46].

Minimal surgical procedures in most centers have been total abdominal hysterectomy, bilateral salpingo-oophorectomy and omentectomy [45]. The FIGO staging of fallopian tube carcinoma is surgical based on that for ovarian cancer. This staging system includes pelvic and paraaortic lymphadenectomies [47]. The reported high rate of lymph node metastases in fallopian tube cancer, as well as the notable incidence of extraperitoneal recurrences in early stages points out the need for a thorough evaluation of the lymph nodes at the time of surgery. Therefore, lymph node sampling guides adjuvant chemotherapy [45]. Peritoneal washings should be taken at the time of surgery as positive peritoneal washings suggestive of extratubal spread increase the risk of lymph node metastases with an adverse effect on prognosis [14, 48].

The use of chemotherapy in fallopian tube cancer is based on that for epithelial ovarian cancer [14]. It seems that platinum-based chemotherapy is the most promising chemotherapy [45]. High rates of responses have been reported using platinum-based chemotherapy [14, 48]. Peters *et al.* [49] described an 87% response rate with a cisplatin-based regime as compared to 29% with a multi-agent regime without cisplatin, while Morris *et al.* [50] reported a response rate of 53% with the combination of cisplatin, doxorubicin and cyclophosphamide. In our case, the patient received six courses of carboplatin and taxol and is still alive five years after surgery for primary fallopian tube carcinoma. Also, recent CT scans of the upper and lower abdomen were negative and the serial levels of CA-125 have been negative so far. Therefore, our study suggests a good response of the patient to platinum-based chemotherapy.

Patients without lymph node metastasis, without intraoperative tumor rupture, and with tumors that do not infiltrate the serosa may be followed with close observation only. No convincing evidence is available that adjuvant therapy is beneficial for patients with early stage fallopian tube carcinoma. However, patients with Stage I disease and a higher risk of recurrence such as tumors infiltrating the serosa or tumors that have ruptured preoperatively or intraoperatively, probably should be offered the same treatment as higher stage patients [41]. Consecutive serum CA-125 measurements have the same importance in response assessment and follow-up of patients with fallopian tube carcinoma that they have in patients with ovarian carcinoma [28, 42, 51]. The value of second-look laparotomy will remain limited until effective salvage therapy is developed [45]. The likelihood that the resistant disease will respond again to first-line chemotherapy is very limited [45].

The most important prognostic factor in fallopian tube carcinoma is FIGO stage of the disease at laparotomy [14]. Also, depth of invasion of the fallopian tube has been proposed as a prognostic feature of the disease. Patients with non-invasive or superficial invasive tumors have a relatively favorable prognosis. The prognosis worsens as the tumor invades the outer wall of the fallopian tube or when there is extra-tubal disease [49]. Although grading of the disease is thought to not be of significance to 5-year survival rates, there appeared to be an improvement in survival beyond five to ten years, when comparing grade 1 and 2 disease versus grade 3 [7]. Also, vascular-lymphatic space involvement and inflammatory reactions were reported to be associated with survival [45]. A residual tumor smaller than 2 cm can have a prognostically-favorable impact on survival. Therefore, cytoreductive surgery as immensely as possible has been recommended [45].

The 5-year survival for women with fallopian tube carcinoma is poor. One of the reasons for the poor survival of patients with fallopian tube carcinoma is that the symptoms are uncharacteristic and ordinary gynecological examinations unreliable for the detection of small and soft masses in the lower pelvis [52-54]. Yoonessi [55] found distal metastases to be responsible for more than half of the failures in patients with Stage I and II disease. Semard *et al.* [56] reported that ten to 14 recurrent sites were extraperitoneal. Also, McMurray *et al.* [4] reported that in Stages I and II, 50% of incidences of recurrence were extraperitoneal.

In conclusion, we presented a very rare case of primary left fallopian tube carcinoma in a 58-year-old patient. The initial diagnosis of adenocarcinoma was made by positive cytology for adenocarcinoma in a Papanicolaou vaginal smear. We focused on the preoperative findings, which were highly suspicious of fallopian tube carcinoma. In addition, we reported the good response of the patient to platinum-based chemotherapy. Finally, we suggested an association between fallopian tube carcinoma and breast cancer, as our patient developed primary breast carcinoma two years after surgery for primary fallopian tube carcinoma.

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