Peptide YY producing strumal carcinoid tumor of the ovary

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Summary

Background: Primary ovarian carcinoid tumor is uncommon and represents less than 0.1% of ovarian malignancies. The strumal carcinoid may be complicated by carcinoid syndrome induced by peptide YY (PYY). *Case report:* We describe a 45-year-old woman with a bilateral ovarian tumor diagnosed through periodical gynecological examination. She presented with severe constipation. Right ovarian cyst laparoscopically resected was diagnosed as a strumal carcinoid tumor; the left one was mature cystic teratoma. No metastatic findings were seen macroscopically on the ovarian surface and pelvic peritoneum. Constipation was drastically improved by resecting the tumor. The carcinoid tumor cells were positive for tumor-producing PYY by mRNA analysis. *Conclusion:* It is important to be aware of this entity in the pathological diagnosis of ovarian tumors, in the presence of any clinical indicator of carcinoid tumor/syndrome, as it carries a markedly better prognosis and clinical outcome in comparison with most other malignant ovarian tumors.

Key words: Ovarian strumal carcinoid; PYY; Carcinoid syndrome.

Introduction

Carcinoid tumors are rare slow-growing neoplasms that arise from the neuroendocrine cells and produce biogenic amines and various polypeptides [1]. However, carcinoids of the ovary are uncommon, especially primary ovarian carcinoids, which form approximately 0.3% of all carcinoid tumors [2]. Women with carcinoid tumors may present with clinical carcinoid syndrome characterized by amine-related symptoms such as skin changes (facial flushing, telangiectasia), abdominal pain and constipation, and pulmonary and cardiovascular effects. Certain symptoms of carcinoid syndrome could be induced by a gastrointestinal hormone called as PYY (the peptide (P) having an N-terminal tyrosine (Y) and C-terminal tyrosine (Y)) that has a strong inhibitory effect on intestinal motility [3]. Additionally, PYY and its analogs have been shown to inhibit the growth of various cancer cells *in vitro* and *in vivo* [4]. We examined a rare case of ovarian strumal carcinoid that was symptomatic for PYY expression.

Case Report

We present the case of a 45-year-old woman, gravida 0, para 0, with an ovarian tumor diagnosed through periodic gynecological inspection. She complained of no gastrointestinal symptoms including constipation or loose bowel movement. Magnetic resonance imaging demonstrated an 8-cm sized cystic tumor with fat saturation in the left ovary in which hairball was depicted. The right ovary had a 2-cm diameter solid tumor-like mass. The level of serum CA19-9 was elevated to 94.6 U/ml; CA125 and CEA levels were within normal limits. The patient was diagnosed with mature cystic teratoma and underwent laparoscopic bilateral ovarian cystectomy. The ovarian surface and pelvic peritoneum appeared to be macroscopically normal. After aspiration of the tumor contents, ovarian cystectomy was performed, and the tumor was removed from the abdominal cavity using a plastic bag. Tumor spillage occurred, and the pelvic cavity was washed extensively with 3 l of saline. Constipation was drastically improved by resecting the tumor.

The removed left ovarian tumor, measuring 9 cm in the greatest dimension, contained hair, teeth, and fat, but macroscopically the solid portion was unclear. No malignant component was microscopically observed. Pathologic examination of the right ovarian tumor showed a complex tumor containing a carcinoid component representing about two-thirds of the tumor mass admixed with abnormal thyroid tissue, consistent with an ovarian strumal carcinoid (Figure 1). Argyrophilic granules were demonstrated in the cytoplasm using the Grimelius staining methods. When examined by mRNA analysis according to the previously described protocol (shigeta, matsuda), the tumor cells expressed PYY as well as neurohormonal polypeptides including serotonin.

Two months after cystectomy, the patient was submitted to right salpingo-oophorectomy to look for residual tumor. The extensively sampled adnexa tissue was histologically uninvolved by the tumor. The patient was advised regular follow-up for one year at the time of her discharge.

Discussion

Primary carcinoids are subdivided into four categories: insular, trabecular, mucinous, and strumal. Primary strumal carcinoid of the ovary is very uncommon and complicated sometimes by carcinoid syndrome that is a result of various bioactive polypeptides produced by tumor [3, 5]. Ovarian stumal carcinoid is of low malignant potential and its prognosis is usually good in the majority of patients. The tumor extended beyond the ovary in only four reported cases: one of which was a patient with strumal carcinoid containing trabecular carcinoid, in whom the metastatic tumor resembled a well-differentiated thyroid follicular carcinoma [6]. The second patient was a case of strumal carcinoid containing

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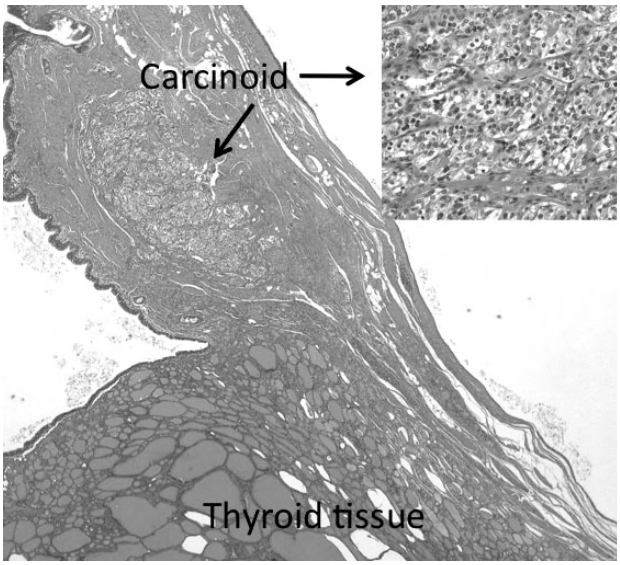

Figure 1. — Photomicrograph showing areas of the tumor with strumal pattern (hematoxylin-eosin, 12.5 x, *inset* 200 x).

largely trabecular and partially insular carcinoid, in whom the metastatic tumor was poorly differentiated adenocarcinoma [7]. Matsuda *et al*. [3] describe an interesting case with ovarian strumal carcinoid tumor who suffered from carcinoid syndrome severe constipation, which was relieved by tumor removal but recurred with recurrent hepatic disease. She suffered again from constipation. Another case was a 44-year-old woman who had metastasis in the contralateral ovary, myometrium and lungs [8].

Carcinoid syndrome is mediated by bioactive polypeptides produced from carcinoid tumor cells, which are of germ cell origin. The syndrome is less frequent in primary ovarian carcinoid than in that of the intestine. It was postulated that the syndrome typically occurs in the absence of extraovarian spread because the ovarian venous drainage, unlike intestinal origin, bypasses the liver which inactivates the substances responsible for the syndrome [3]. Our case was a strumal carcinoid composed of thyroid tissue and trabecular carcinoid, in which PYY mRNA was not detected. Constipation was drastically improved by resecting the tumor. This fact could provide evidence of the correlation between constipation and PYY. It is important to be aware of this entity in the pathological diagnosis of ovarian tumors, in the presence of any clinical indicator of carcinoid tumor/syndrome, as it carries a markedly better prognosis and clinical outcome in comparison with most other malignant ovarian tumors.

In conclusion, our case provides more convincing information to indicate that PYY protein, produced by ovarian carcinoid tumor of strumal component, may be associated with a favorable prognosis predictor.

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