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Case Report

Primary Strumal Carcinoid Tumor of the Ovary: a Case Report

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ABSTRACT

Primary ovarian carcinoid tumors of the ovary are rare and represent less than 0.1% of ovarian malignancy. One of its subtypes is the strumal carcinoid in which the thyroid tissue is seen in intimate association with carcinoid tumor. We here report a 47-year-old woman with strumal carcinoid of the right ovary presented with cessation of menstrual periods in the past 3 months and was referred due to a possible menopause-related symptom. A firm pelvic mass was found in physical examination and a large mass (20 × 15 × 8 cm) in the right ovary was reported in ultrasound evaluation. The spiral CT scan reported masses in both ovaries. The patient underwent total abdominal hysterectomy plus bilateral salpingo-oophorectomy. The pathological evaluation revealed strumal carcinoid tumor with thyroid tissue in right ovary and benign cystic teratoma in left ovary. Our case was alive at 8 years after the operation with no disease recurrence.

Keywords: **Carcinoid Tumor, Ovarian Neoplasms, Struma Ovarii**

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Introduction

Carcinoid (also called carcinoid tumors) is a slow-growing type of neruroendocrine tumors originates from primitive gut derivation and mainly derives from the intestine and the bronchopulmonary system. They represent an unusual and complex disease spectrum with various clinical appearances (1, 2). Primary ovarian carcinoid tumors are of germ cell origin and of them in Western countries, the insular type is the most common type. This type derives from the midgut and associated with classical or typical carcinoid syndrome caused by serotonin and its precursors and derivatives secreted from the tumors. Contrary to it, strumal and trabecular carciniod tumors are found in Japan (1, 2). They derive from foregut or hindgut and are associated with severe constipation induced by the production of peptide YY (PYY), an inhibitor of intestinal mobility (1, 2). Primary ovarian carcinoids are rare and most cases have been reported in menopause or pre-menopause ages.

It accounts for less than 0.1% of all ovarian malignancy and only 5% of carcinoid tumors are ovarian (3). Strumal carcinoid tumor of the ovary is a composed of thyroid tissue admixed with carcinoid tumor. Nonspecific symptoms may occur, but any clinical evidence suggestive of carcinoid syndrome is not observed in patients with strumal carcinoid tumor of the ovary (3).

We present here a case of primary carcinoid of the ovary.

Case Report

A 47-year old woman presented in June 2005 to Vali-Asr Tertiary Teaching Hospital, Birjand, South Khorasan, Iran with cessation of menstrual periods in the past 3 months. She had suffered from attacks of tachycardia, and abdominal pain during the past 12 months which were treated symptomatically. The thyroid and heart were normal. The patient was referred by a cardiologist for hormone therapy due to a possible menopause-related symptom. On physical examination, the only positive finding was a firm pelvic mass. Ultrasound evaluation revealed a large mass (20×15×8) cm in the right ovary with a tumor density and the uterus, left adnexum, and other abdominal organs showed no abnormalities. The spiral CT scan reported masses in both ovaries measuring 20 ×15 × 10 cm in right ovary and 10 × 7 × 6 cm in left ovary.

Evaluation of the liver and other abdominal organs were normal. Besides, IVP and barium enema were normal. The patient underwent laparotomy based on a preoperative diagnosis of ovarian tumor. Surgery revealed clear peritoneal fluid, uterus with normal size, bilateral ovarian tumors with an intact capsule, and normal abdominal viscera. Peritoneal lavage was carried out and then a total abdominal hysterectomy plus bilateral salpingo-oophorectomy was performed. In report of pathology, the tumor of right ovary measured 12×11×9 cm and weighed 120 g (strumal carcinoid tumor with thyroid tissue) and left ovary mass measured 8.5 ×5 ×5 cm and weighed 60 g (benign cystic teratoma), uterine size was 5×4 ×2.5 cm, and cervix was 3 × 2.5 × 2 cm.

The endometrium and myometrium measured 0.5 cm and 1.5 cm, respectively. The cut surface of right ovary revealed cystic formations filled with dense green mucoid secretion placed in yellowish solid areas. In the left ovary cysts containing hair in yellow and cheese-like material and with a smooth internal wall structure were observed.

The microscopic findings of our case showed an atrophic endometrium and an adenomyosis in

the myometrium. A chronic inflammation of the cervical epithelium and a metaplastic cervical epithelium had been observed.

The right ovary contained numerous tumor cell clusters composed of small, round cells forming rosette-like or trabecular structures. The trabecular foci composed of one or two layers of monomorphic cells with abundant, uniformly granular cytoplasms. The nuclear chromatin was finely granular and "salt and pepper" in appearance. In some foci of the right ovary, a transition from carcinoid structures to thyroid follicles was seen (Fig. 1). The immunohistochemical study revealed a strong positivity for Synaptophysin and Chromogranin A (Fig. 2). Pathology revealed a cystic teratoma in the left ovary. The diagnosis of the pathologist was atrophic endometrium, chronic cervicitis, adenomyosis, strumal carcinoid in sections of the right ovary, and cystic teratoma in sections of the left ovary. Peritoneal washings were negative for malignant cells. The patient was discharged 4 days after surgery with a good general condition. After 8-year follow-up, the patient had no signs of tumor recurrence.

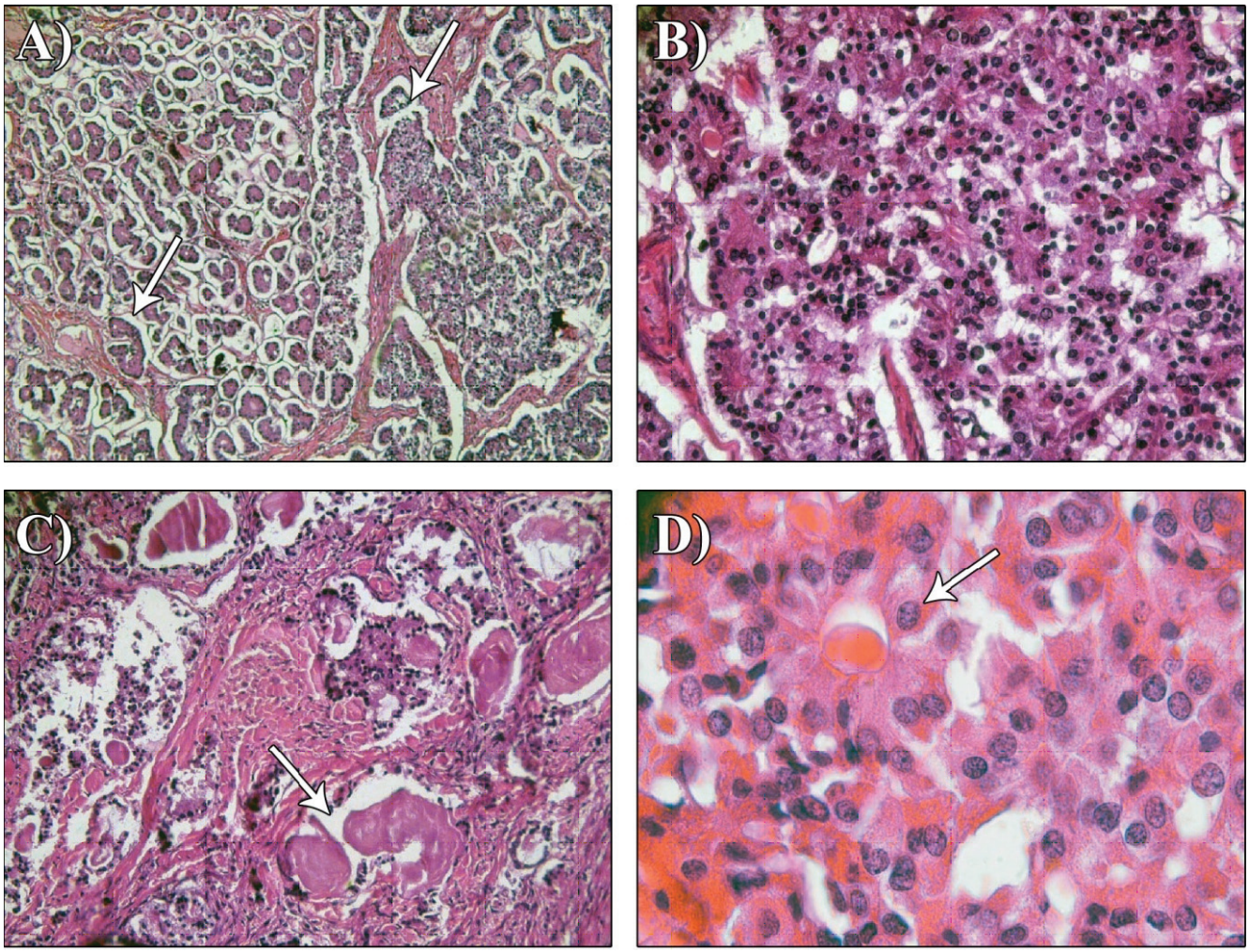

Fig. 1: Strumal carcinoid of right ovary: **A)** Insular and rosette like arrangements (HE ×40);

B) Carcinoid of right ovary (HE ×100);

C) The thyroid tissue is intermingled with carcinoid elements (HE ×100);

D) Rosette like arrangement / round nuclei cells with salt –and-pepper chromatin (HE ×400).

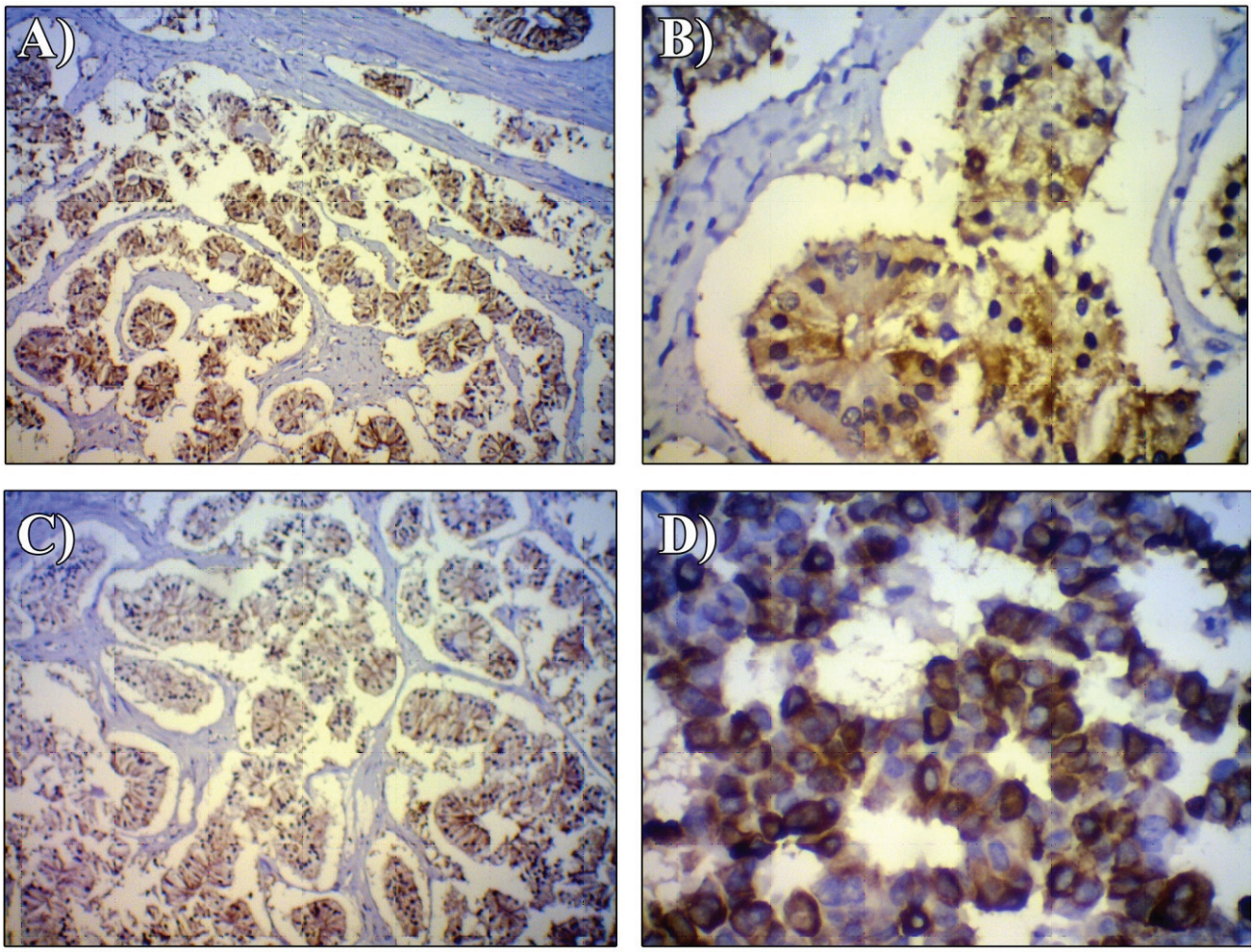

Fig. 2: The immunohistochemical study revealed a strong positivity for Chromogranin A (A, B, C) and Synaptophysin (D).

Discussion

Ovarian primary carcinoid tumor is an exceptionally rare tumor and estimated that less than 0.1% of ovarian cancers are of this type. The WHO tumor classification defined five subtypes of primary carcinoid tumor of the ovary based on their histopathological patterns. Among these subtypes including insular (midgut derivation), trabecular (foregut or hindgut derivation), strumal carcinoid (endodermal origin with evidence of thyroid and C-cell differentiation), mucinous (globlet or adenocarcinoid), and mixed type (insular and trabecular), the insular type is the most common type of ovarian carcinoid (4). The strumal carcinoid is rare among ovarian carcinoid tumor subtypes which in the English literature less than 100 cases have been reported yet (3). Carcinoid tumors of the ovary were reported in a wide range of ages from 14 to 83 years; however, the most were seen in peri- or post-menopausal women (5). In our case, the patient was 47 years old and presenting at the onset of the perimenopause.

Ovarian strumal carcinoid tumor is mainly composed of carcinoid and thyroid tissues and it is a rare form of ovarian teratoma (6). There is no association between this type of carcinoid tumor and any specific clinical finding such as carcinoid syndrome (flushing, diarrhea, cardiac murmur, hypertension, or pedal edema) and the diagnosis is usually made on postoperatively pathologic examination of the lesion. However, some reported its association with signs or symptoms apart from the carcinoid syndrome such as severe constipation due to Peptide-YY, as well as melanosis or hyperinsulinemic

hypoglycemia (1, 7-9). In some cases, clinical signs of androgen production with endometrial hyperplasia, hirsutism, or virilism have been reported (10, 11). In the largest case series of strumal carcinoid tumor of ovary consisting of 50 cases, the contralateral ovary in 10% of patients contained another type of neoplasm, usually a dermoid cyst (11). Similarly in our patient the contralateral ovary had a cystic teratoma that contained developmentally mature skin complete with hair follicles. These ovarian carcinoid tumor with cystic teratoma/dermoid lesions are significantly smaller in size (44.7 mm vs. 89.8 mm), has a lower rate of metastases (5.8% vs. 22.1%) and a higher 5-year survival rate (93.7% vs. 84.0%) compared with ovarian carcinoids without a teratomatous component (12).

The diagnosis is based on the recognition of the tumor characteristics in microscopic features with hematoxylin-eosin–stained sections. The characteristic cytopathological findings suggestive of strumal carcinoid tumor of the ovary in cytology includes: 1) dispersed or small clusters of neoplastic cells forming sheets, loose structures with abundant cytoplasm, 2) a fine granular nuclear chromatin with "salt and pepper" in appearance with occasional tiny nucleoli, 3) a plasmacytoid appearance of the nucleus, 4) small fragments of thyroidal colloid-like structures, and 5) a faintly basophilic transparent cytoplasm with an occasional cytoplasmic inclusion (3). The identification of the above cytopathological features, diffuse and strong cytoplasmic staining for chromogranin A, synaptophysin, CD56 and immunoreactivity thyroglobulin, and thyroid transcription factor-1(TTF-1) stains of small fragments of thyroidal colloid-like structures on smears or histological preparations, in combination with histopathological and immunohistochemical results are essential for establishing a correct diagnosis of strumal carcinoid tumor of the ovary (3).

Three major differential diagnoses must be taken into consideration for primary strumal carcinoid tumor of the ovary including granulosa cell tumor of the ovary, metastatic carcinoid tumor of the ovary, and carcinoma of the thyroid arising in struma ovarii (3). In granulosa cell tumors of the ovary (especially in its microfollicular pattern), a clustering of variable-sized clusters of medium-sized cells with granular cytoplasm and monomorphic, coffeebean shaped oval nuclei, with inconspicuous nuclei may commonly observed. The main differences from strumal carcinoid tumor are the presence of numerous nuclear grooves on smears, the immunoreactivity of a-inhibin, the lack of positivity for neuroendocrine markers such as chromogranin A or synaptophysin, and the absence of thyroidal colloid structures in distinguish granulosa cell tumors (3). A metastatic carcinoid tumor in the ovary may mimic all types of ovarian carcinoid tumor. The need to differentiate the primary versus the metastatic origin of an ovarian carcinoid is important for their prognoses. Whereas primary ovarian carcinoids tend to present at an early stage and follow a largely benign course, the majority of patients with a metastatic carcinoid have an extremely poor prognosis (13). Metastatic carcinoids in the ovary are generally of the insular type, and occasionally, trabecular or mucinous type. Tumor cells of strumal carcinoid tumor may contain characteristic fragments of thyroidal colloid-like structures. If material is available for a cell block, immunostaining with the antibody to TTF-1 or thyroglobulin can be useful in establishing a differential diagnosis (3). Carcinoma of the thyroid arising in struma ovarii or a mature cystic teratoma contains thyroid tissue, strumal carcinoid, or one without a precursor lesion. The cytopathologic presentation of a malignant thyroid-type neoplasm arising in ovarian struma may be morphologically similar to strumal carcinoid tumor. However, malignant cells with characteristic ground glass nuclei, nuclear grooving and the presence of psammoma bodies on a smear would strongly support a diagnosis of a carcinoma of the thyroid rather than

strumal carcinoid tumor (3).

Strumal carcinoid in the majority of patients is benign, and treatment with oophorectomy or salpingo-oophorectomy is effective. In all locally advanced primary ovarian carcinoid tumors, simple surgical excision has been reported to be associated with a good prognosis (14). Our case was alive at 8 years after the operation (hysterosalpingo oophorectomy) with no disease recurrence.

Acknowledgements

The authors declare that there is no conflict of interests.

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