

Case Report

Malignant follicular thyroid carcinoma arising in struma ovarii: A case report and review of the literature

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Abstract

Struma ovarii is a rare (2.7%) ovarian teratoid tumour that can be diagnosed only when thyroid tissue is the predominant element. The malignant struma ovarii is even more rare, and makes up 5% of all cases of struma ovarii. Here we report a case of malignant struma ovarii.

A 76-year-old women gravida 3 and parity 3, referred to our gynecologic oncology clinic. She underwent bilateral salpingo-oophorectomy suspicious with malignancy in another hospital where she was referred from. Tumor markers were reported as Ca 19.9: 8.2 U/ml, Ca 125: 6.8 U/ml, α -feto protein: 1.2 IU/ml and CEA: 4.3. The patient underwent hysterectomy and omentectomy in our hospital.

Frozen section pathology was consistent with malignancy. Final pathology revealed an extensive proliferation of thyroid follicular epithelium. Two months after the operation, the patient was died of disease.

Here, we report the case of malignant struma ovarii including foci of follicular thyroid carcinoma

Key words:

Struma ovarii, follicular thyroid carcinoma, ovarian teratoma

Introduction

Struma ovarii is a rare ovarian teratoid tumor (2.7%) that can be diagnosed only when thyroid tissue is the predominant element [1,2]. The age at which they are presented and clinical manifestations are usually the same as for teratomas. The real incidence of malignancy in struma ovarii is difficult to assess due to the rare nature of this condition and the lack of standard criteria for its diagnosis [3]. The malignant struma ovarii makes up 5% of all cases of struma ovarii, with distal metastases being extremely uncommon [4,5,6]. Malignant transformation has been reported to vary from 5% to 37% of cases, metastasis is seen in 23% of cases and it is mainly intra-abdominal. Given the exceptional character of malignant forms, there does not appear to be unanimous agreement on a standard therapy for this type of lesion with a somewhat uncertain prognosis [7].

Struma ovarii is a rare monodermal ovarian teratoma, diagnosed when a teratoma specimen contains at

least 50% thyroid tissue. These represent about 2% of monodermal ovarian teratoma and most commonly occur in the fifth or sixth decades of life. Malignancy within struma ovarii occurs in roughly 5%, or roughly 0.1% of monodermal ovarian teratoma. Typically these malignancies are found postoperatively. These carcinomas can be classified into three types: papillary, follicular variant of papillary, and follicular [3].

Primary ovarian carcinoid tumors are also very rare and account for fewer than 0.1% of all ovarian carcinomas. They can be subdivided into four types: insular, strumal, trabecular, and mucinous. They may occur with or without an associated monodermal ovarian teratoma, and although most commonly as a singular subtype, mixed primary ovarian carcinoids have been reported. The insular type is most common and this is the only type that has been associated with the carcinoid syndrome [8]. Strumal carcinoid, the second most commonly observed subtype, is characterized by a mixture of carcinoid and thyroid tissue, and thought to be of endodermal origin with thyroid and C-cell differentiation [9,10]. Strumal carcinoids have been associated with virilism as well as postoperative thyroid storms and hypothyroidism [11].

Presented here is an unusual case of follicular thyroid cancer in struma ovarii and review of the literature including diagnostic and treatment guidelines of cases of malignant struma ovarii with follicular carcinoma.

Article history:

Received: 11 01 2014

Accepted: 20 01 2014

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Case presentation

A 76-year-old otherwise healthy postmenopausal woman (gravida 3 and parity 3) was referred to our institution for further consultation and treatment. She had complained of abdominal pain and underwent a bilateral salpingoophorectomy (BSO) for a right was measured 10x15 cm ovarian mass at another hospital. Pathological examinations revealed as malignant follicular thyroid carcinoma (Figure 1 and 2).

Her laboratory results were normal. The plasma level of CA-125 was 22 IU/ml (reference value <35 IU/ml). Other tumor markers were reported as Ca 19.9: 8.2 U/ml, Ca 125: 6.8 U/ml, α -feto protein: 1.2 IU/ml and CEA: 4.3. The patient had no signs or symptoms of hyperthyroidism and her free T3 and T4 were at 4.15 pg/ml and 2.68 ng/dl, respectively. She then underwent a total abdominal hysterectomy (TAH), omentectomy, and pelvic and para-aortic lymph node dissection in our institution. Intra-operatively, there was no ascites and the uterus was grossly normal. There was no significant free fluid within the pelvis or enlargement of the pelvic lymph or para-aortic nodes. Two months after the operation, the patient was died because of disease.

Discussion

Although struma ovarii has elicited considerable interest since it was first described, many diagnostic aspects are still unknown. Most cases are found incidentally and for this reason the only clinical data are obtained from retrospective reports. Studies have demonstrated that a big amount of patients with struma ovarii are asymptomatic or accompanied by non-specific symptoms. Unusual clinical presentations such as hyperthyroidism was reported to be 5% to 8% [12]. The pathophysiology of hyperthyroidism is unknown.

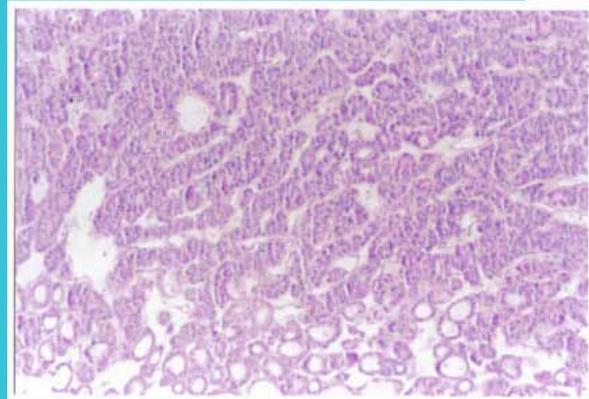
Malignant struma ovarii is an extremely rare subtype of ovarian germ cell tumors and comprises 5–15% of ovarian teratomas [13], predominantly of malignant thyroid tissue [14]. Germ cell tumors constitute approximately 15–20% of ovarian tumors. Most patients with struma ovarii present with a pelvic mass, and pelvic ultrasonography characteristically shows a heterogeneous, solid mass, occasionally with ascites.

The patient commonly undergoes surgery, because an ovarian malignancy is suspected. Intraoperative frozen section often only reveals a teratoma, and the diagnosis of struma ovarii is usually made postoperatively. Benign thyroid tissue can also be found in small foci on the peritoneal surface, and this finding is termed strumosis. Clinical and biochemical hyperthyroidism is unusual,

occurring in less than 5% of cases [15]. Immunohistochemical staining for thyroglobulin is helpful for confirming the presence of differentiated thyroid-type tissue [13]. Metastasis to the ovary from primary thyroid carcinoma is ruled out by clinical thyroid examination, often including ultrasonography.

Struma ovarii generally contains more than 50% thyroid tissue [16] and, depending upon the histological thyroid pattern, is classified as benign or malignant struma ovarii. Malignant struma ovarii occurs in 5–10% of cases [13]. The criterion for histopathological diagnosis of malignant struma ovarii has varied over the years [16–18]. Malignant struma ovarii can be classified histopathologically into three types [19]. The first, papillary carcinoma, shows malignant nuclear features, “ground glass” or “optically clear” overlapping nuclei, and nuclear grooves. A variant of papillary carcinoma, known as follicular variant of papillary carcinoma, shares similar nuclear cytological features of papillary carcinoma but has a follicular architecture. Lastly, follicular carcinoma is noted when there are mitotic figures that form follicles along with invasion of vascular or capsular spaces [3]. Papillary carcinoma is the most common variety of malignant struma ovarii and limited cases of follicular type has been reported in the literature. Our case is also follicular type of malignant struma ovarii. The follicular type thyroid carcinoma arising in struma ovarii cases have been reported and our case is the third case in English literature (Table 1) [20, 21].

Figure 1.

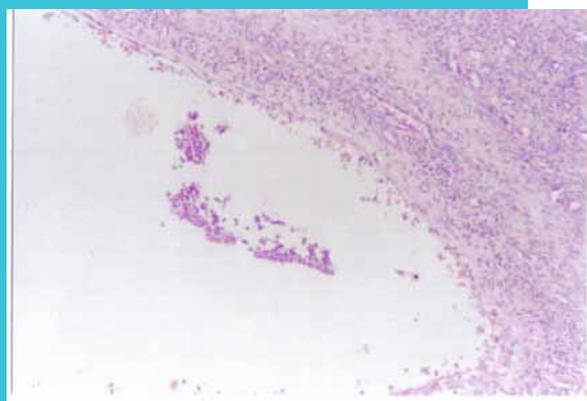


Monomorphic ovarian teratoma (struma ovarii) on the basis of follicular thyroid carcinoma (Grade II), well-differentiated follicular structures, trabecular and solid growth pattern showing the formation leans areas (x10 HE).

The behavior of malignant struma ovarii is based on summaries of single case reports and small case series [15, 17]. The predominant sites of metastasis were adjacent pelvic structures, including the contralateral

ovary, but some patients had distant metastases, including metastases to the lungs, bone, liver, and brain; however, in other small series the rates of metastasis were lower [16]. Thyroid type carcinoma in struma ovarii has to be differentiated from cystadenoma and other primary ovarian cancers or metastatic tumors. Struma ovarii appeared as a smoothmargin multicystic mass with a high attenuation signals during pre-contrast on CT scan. T1-weighted images usually have intermediate to high signal intensities, and those on T2-weighted images were low as recently reported by Shen and colleagues. The majority of tumors showed a mixed cystic and solid mass [22].

Figure 2.



Opposite side vascular tumors in the ovarian stroma involvement by tumor cells is observed in the vessel lumen (x10 HE).

In the cases reviewed by Makani *et al.* [3], it was reported that an average of 4 years was required for detection of true recurrence, where authors also concluded that at least a period of 10 years was recommended for follow-up in cases of malignant struma ovarii. In addition, In a recent review of 56 cases reported in the literature since 1966, sites of recurrence included

adjacent pelvic structures, lung, liver, bone, lymph nodes, skin and brain [14].

Currently, no consensus exists on the surgical and postoperative treatment of patients with malignant struma ovarii. Because ovarian malignancy is often suspected preoperatively, initial pelvic surgery may include a total abdominal hysterectomy and bilateral salpingo-oophorectomy with omentectomy, peritoneal washings and lymph node sampling. To preserve fertility, however, a unilateral oophorectomy or strumectomy is often performed in young patients [18]. Laparoscopic surgery is not standardized for these uncommon conditions [22]. Some authors believe that patients with malignant struma ovarii should be treated as if they have a thyroid cancer. When there is residual malignant disease after surgery, they recommend a total thyroidectomy and radioablation with ¹³¹I [17, 23, 24]. Some authors recommend adjuvant therapy including thyroidectomy ablation with ¹³¹I for patients with advanced disease and those with metastases or recurrent disease [25]. In a manner analogous to treatment of patients with thyroid carcinoma, monitoring of serum thyroglobulin can then be performed. Thyroglobulin is a well established marker for monitoring the recurrence of malignancy [15]. Additional therapeutic modalities including chemotherapy and external beam radiotherapy [3] as well as thyroid suppression have been used for the treatment of recurrent or metastatic disease. Rotman-Pikielny *et al.* used recombinant human thyrotropin for the diagnosis and treatment of a highly functional metastatic struma ovarii [23]. In addition, intraperitoneal ³²P or radioactive colloidal gold have also been used for the treatment of metastatic disease [14, 23].

Conflict of interest statement

The authors declare no conflict of interest.

Table 1. Literature review of the follicular thyroid carcinoma cases arising from struma ovarii

Reference	n	Pathology	Surgery	Results
Prased <i>et al.</i> (20)	1	FTC	TAH/BSO	Exitus 4 year after surgery
Janszen <i>et al.</i> (21)	1	FTC	BSO	Exitus 2 year after surgery
Yilmaz <i>et al.</i> (Present case)	1	FTC	TAH/BSO Omentectomy PLND	Exitus 2 month after surgery

FTC= follicular thyroid carcinoma, TAH/BSO= Total abdominal hysterectomy/bilateral salpingoopherectomy, PLND= pelvic lymph node dissection

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