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Struma Ovarii: A Case Series and Literature Review of Current Management

Struma Ovarii: Güncel Yönetim Stratejilerine İlişkin Olgu Serisi ve Literatür İncelemesi

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ABSTRACT

Struma ovarii (SO), also known as ovarian goiter, is a rare monodermal teratoma. About 5-20% of mature teratomas contain thyroid tissue elements, but of these, only 2% are diagnosed as SO. We highlight three cases of large SO with varying clinical presentations and disease progressions. The first case involved a postpartum woman who presented with a ruptured ovarian tumour, while the second case involved a woman who presented with acute urinary retention due to compression by the ovarian mass. The diagnoses of malignant SO were based on histopathological studies in both cases. The third case is a lady with known follicular thyroid carcinoma, who came back with a metastatic left iliac fossa mass and underwent a trial of chemotherapy. As of now, no definite treatment guidelines have been established. A multidisciplinary team approach is needed to manage this rare entity.

Keywords: Struma ovarii, teratoma, thyroid cancer

ÖZ

Struma ovarii (SO), over guatrı olarak da bilinen, nadir görülen monodermal bir teratomdur. Olgun teratomların yaklaşık %5-20'sinde tiroid dokusu bulunmasına rağmen, yalnızca %2'si SO olarak tanı almaktadır. Bu çalışmada, farklı klinik prezentasyonlar ve hastalık seyirleri gösteren üç büyük SO olgusunun sunulması amaçlanmıştır. Birinci olgu, postpartum dönemde rüptüre over tümörü ile başvuran bir kadındır. İkinci olgu, over kitlesinin basısına bağlı akut üriner retansiyon ile başvuran bir kadını kapsamaktadır. Her iki olguda da malign SO tanısı histopatolojik incelemeler ile doğrulanmıştır. Üçüncü olgu ise, bilinen folliküler tiroid karsinomu öyküsü olan ve metastatik sol iliak fossa kitlesi ile başvurarak kemoterapi tedavisi denemesi yapılan bir hastadır. SO, nadir görülen ve değişken klinik bulgularla prezente olabilen bir tümördür. Günümüzde bu antitenin yönetimi için kesinleşmiş tedavi kılavuzları bulunmamaktadır. Optimal yaklaşım için multidisipliner bir ekip çalışması gerekmektedir.

Anahtar Sözcükler: Yumurtalık struma, teratom, tiroid kanseri

INTRODUCTION

Struma ovarii (SO) is a rare monodermal teratoma that comprises either entirely or more than 50% of thyroid tissue. It is also defined as any mature teratoma with less than 50% of thyroid tissue, which contains thyroid-associated malignancy or causes hyperthyroidism (1). It is the most common type of monodermal teratoma, 1% of ovarian tumors. Ludwig Pick suggested that SO represents a teratoma in which thyroid tissue has overgrown the other elements (1). Approximately 5-20% of mature teratomas contain thyroid tissue elements, but of these, only 2% are diagnosed as SO. The age of onset varies widely, occurring mostly in women of fertile age, with a peak incidence in the fifth decade. Most cases occur unilaterally, usually affecting the left ovary and about 6% of cases occur bilaterally (2).

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We highlight three cases of large SO with varying presentations and disease progression.

CASE REPORT

Case 1

A 38-year-old woman presented with a right pelvic mass during her third pregnancy. Her abdominal ultrasound revealed a 13x8 cm right adnexal mass. She presented again at one month postpartum with abdominal pain. Exploratory laparotomy with right salpingo-oophorectomy, appendectomy, and washout was done. Intraop found a ruptured large right ovarian dermoid cyst with generalised peritoneal pus collections and dense adhesions between the cyst wall and greater momentum, ascending colon, transverse mesocolon, and anterior abdominal wall. This was complicated with a burst abdomen, which required a second laparotomy for adhesiolysis and washout. Histopathological analysis of the specimen revealed a uniloculated cyst measuring 12.5x11x6 cm. Microscopically, the teratoma consisted of all three germ cell layers: endoderm (skin appendages and hair follicles), mesoderm (fat, nerves, and blood vessels), and ectoderm (thyroid follicular cells, cuboidal and respiratory epithelium); contained papillary thyroid carcinoma arising from the mature cystic teratoma. Biological results showed an increased CA-125 level at 353 U/mL (35 U/mL). Her thyroid function test and neck sonography were normal. Total thyroidectomy followed by radio-ablation iodine (RAI) was offered to her, but she refused it.

Case 2

A 68-year-old woman with a history of hypertension presented with acute urinary retention symptoms. Clinical examination showed a palpable abdominal mass about 20-weeks in size. Computed tomography (CT) scan revealed a pelvic mass measuring 10.9x9.6x13.4 cm, which was thought to arise from the posterior wall of the uterus and a separate complex right ovarian cyst of 2.7x5.8 cm (Figure 1). The mass compressed both ureters, causing mild hydroureteronephrosis. A laparotomy, total abdominal hysterectomy and bilateral salpingo-oophorectomy were done revealing a huge right ovarian cyst with an atrophic uterus. Histopathological analysis of the specimen showed a greyish multiloculated cyst weighing 620 grams, measuring 15.9x 11.9x8.9 cm. It had a dominant cystic space containing yellowish-tan jelly-like material. In focal areas of the cyst wall, there is ectopic thyroid tissue with variably sized thyroid follicles containing colloid. Focal malignant transformation was noted by neoplastic follicular cells growing in papillae, exhibiting enlarged, overlapping, optically clear nuclei with nuclear grooving and occasional pseudonuclear inclusions. Thyroid function tests, cancer antigen (CA)-125 levels, and neck sonography were unremarkable.

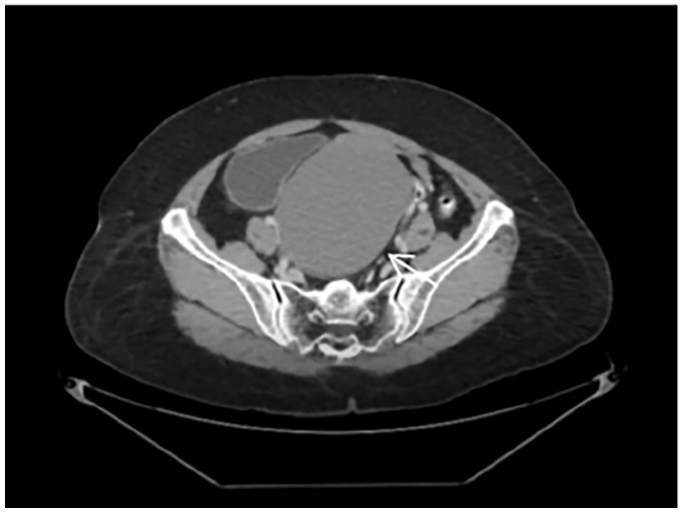

Figure 1. CT scan showing a large pelvic mass which was initially thought to arise from the posterior wall of the uterus causing local mass effect (white arrow).

CT: Computed tomography

Case 3

A 54 years old lady with underlying asthma presented in 2004 with an ovarian tumor with raised CA-125. She underwent a total abdominal hysterectomy, bilateral salpingo-oophorectomy, and omentectomy in the same year. Histopathology showed a left SO containing solid areas of lobules of thyroid follicles. The momentum showed spreading over thyroid cells. Subsequently, she defaulted on the follow-up for nine years. She came back in 2019 complaining of a left iliac fossa mass. CT scan showed a suspected appendicular mass with multifocal lung, liver metastasis, and extensive mediastinal lymphadenopathy. No focal thyroid lesion. Upper and lower endoscopy was normal.

An ultrasound-guided trucut biopsy of the left iliac mass showed metastatic follicular thyroid carcinoma. Immunohistochemistry staining was positive for pancytokeratin, TTF-1, thyroglobulin, and negative for synaptophysin and chromogranin, which excluded struma carcinoid. A repeat CT scan shows disease progression and demonstrates multiple solid cystic pelvic masses with calcification (Figure 2). The multidisciplinary meeting concluded that the patient has extensive metastatic disease and may not be able to shrink the tumor solely with RAI therapy and thyroidectomy. Hence, she was offered extensive surgery, which included thyroidectomy, debulking of pelvic, gastric, and mediastinal mass followed by radioactive iodine ablation. However, the patient refused both the operation and positron emission tomography scan to assess the extent of disease.

She remained asymptomatic from her SO. CT scan showed an enlarging mass with solid cystic component in the pelvic region, with central necrosis largest at the left iliac fossa, measuring 8x9.3x9.3 cm with multiple enlarged intra-abdominal and mediastinal nodes.

She underwent a trial of four cycles of palliative chemotherapy in which the tumour responded poorly. She could not proceed with the fifth cycle due to thrombocytopenia. The patient was subsequently tested positive for coronavirus disease-2019 infection.

DISCUSSION

SO has no specific clinical manifestation. They are often an incidental finding. If symptomatic, they may present with a palpable pelvic mass, abdominal or back pain, with vaginal bleeding, or frequent urination. Acute severe abdominal pain would suggest tumor rupture. In 5% of cases, there is hyperthyroidism. SO should therefore be considered in women with persistent hyperthyroidism

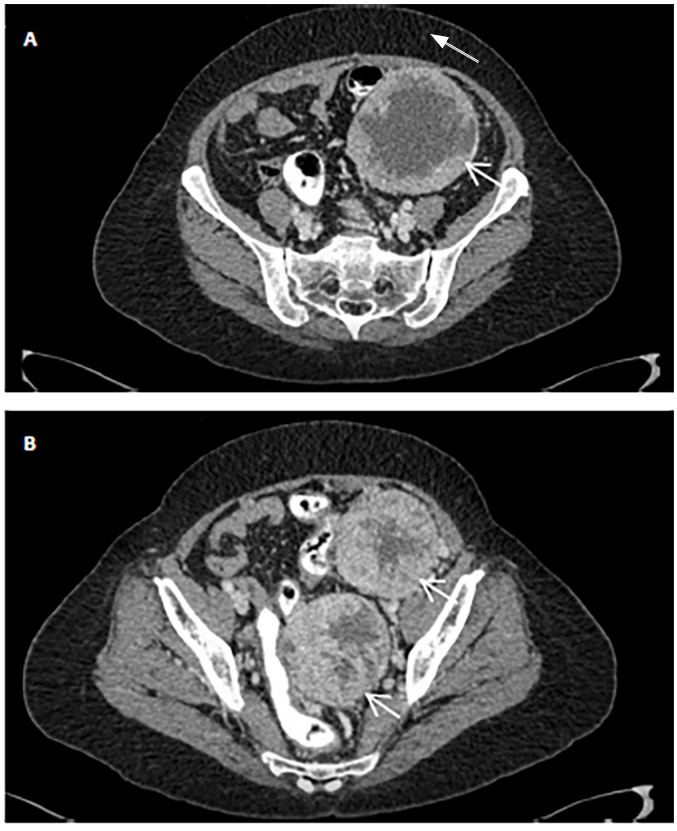

Figure 2. CT showing a lobulated heterogenous enchancing masses with solid cystic component at the pelvic region with central necrosis, largest at the left iliac fossa (white arrow).

CT: Computed tomography

and has absent goiter and radioactive iodine uptake in the neck with detectable serum thyroglobulin. Screening for pelvic ectopic thyroid tissue with iodine isotope imaging is recommended in such cases. Pseudo-Meigs' syndrome occurs in 17% of cases, and raised CA-125 levels occur in 30%, although CA-125 is non-specific (3).

The common thyroid-associated malignancies in SO are papillary and follicular thyroid carcinoma, and struma carcinoid (2). The presence of BRAF mutation in papillary thyroid cancers shows worse prognostic features including invasive growth, lymph node metastasis, and worse clinical outcomes than those which are negative for these mutations (4). The *BRAF* mutation suggests a common pathogenesis for papillary thyroid carcinoma in the thyroid gland and SO. In follicular thyroid carcinoma, mutations in the *RAS* gene predict poor prognosis, as the mutation rate of the *KRAS* gene is about 9% (2).

In our case series, there were no primary thyroid gland lesions. However, synchronous thyroid cancers can have an incidence of up to 9.1% as reported in one study.

Malignant SO (MSO) comprises 5-10% of all cases (2). This diagnosis is based on histology and the criteria for malignancy in SO are the same as those of a thyroid gland proper carcinoma (6). Prognosis of MSO is overall good with survival rates of 92–96.7% at 5 years, 85–94.3% at 10 years, 84.9% at 20 years and 79% at 25 years being reported (5). Ascites and/or pleural effusion, if present, usually disappear after surgery. Histological malignancy in SO, however, does not necessarily indicate a biological malignancy, as histological malignancy was ineffective in predicting the subsequent clinical course (6).

Metastatic MSO confers a less favorable prognosis. The most common histologic subtype is follicular carcinoma. One explanation for implantation of metastatic foci is the rupture of the capsule of the SO. Another cause may be the spread of highly differentiated follicular carcinoma. The novel entity of highly differentiated follicular carcinoma of ovarian origin was described by Roth and Karseladze (7), who characterized the extraovarian dissemination of thyroid elements, which histologically resembles normal thyroid tissue.

Many treatments are recommended; however, due to the rarity of SO, no definite guidelines have been established. Surgical considerations include preservation of fertility and beta-blockade in hyperthyroidism. In early stages of MSO, unilateral laparoscopic salpingo-oophorectomy may be offered alone to reduce postoperative adhesions. In advanced disease, a total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, and lymph node sampling or debulking surgery can be undertaken (8). This is usually followed by adjuvant thyroid suppression therapy. A popular approach is early thyroidectomy and RAI as it is believed to reduce recurrence risk. Some authors suggest that such measures are only advised in metastatic disease or in cases where risk of recurrence has been identified. These risk factors include measurable disease of >10 mm, close surgical margins, aggressive histopathological features such as and/or BRAF mutations (8). As in thyroid cancers, thyroglobulin is used as a biochemical marker to detect recurrence, where an iodine isotope scan is warranted.

CONCLUSION

SO is a rare ovarian goiter with diverse manifestations. Although specific treatment guidelines for MSO are yet to be determined due to its rarity, a multidisciplinary team approach involving surgeons, nuclear medicine, and gynecology teams is needed to ensure the best treatment to the patient. In early stages of MSO, unilateral laparoscopic salpingo-oophorectomy alone may be offered; meanwhile, in advanced disease, a total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, and lymph node sampling or debulking surgery can be undertaken. This is usually followed by adjuvant thyroid suppression therapy and radio-iodine ablation therapy.

Ethics

Informed Consent: Informed consent has been obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.Z.S., N.A.S.N.L., Concept: N.A.S.N.L., Design: C.L.P.S., Data Collection or Processing: C.L.P.S., Analysis or Interpretation: C.L.P.S., Literature Search: C.L.P.S., Writing: C.L.P.S.

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REFERENCES

1. Wei S, Baloch ZW, LiVolsi VA. Pathology of struma ovarii: A report of 96 cases. Endocr Pathol. 2015; 26: 342-8.
2. Zhang T, Chen P, Gao Y. Struma ovarii: a mini review. Int J Clin Exp Med. 2018; 11: 10364-71.
3. Schmidt J, Derr V, Heinrich MC, Crum CP, Fletcher JA, Corless CL, et al. BRAF in papillary thyroid carcinoma of ovary (struma ovarii). Am J Surg Pathol. 2007; 31: 1337-43.
4. Loizzi V, Cormio G, Resta L, Fattizzi N, Vicino M, Selvaggi L. Pseudo-Meigs syndrome and elevated CA125 associated with struma ovarii. Gynecol Oncol. 2005; 97: 282-4.
5. Goffredo P, Sawka AM, Pura J, Adam MA, Roman SA, Sosa JA. Malignant struma ovarii: a population-level analysis of a large series of 68 patients. Thyroid. 2015; 25: 211-5.
6. Robboy SJ, Shaco-Levy R, Peng RY, Snyder MJ, Donahue J, Bentley RC, et al. Malignant struma ovarii: an analysis of 88 cases, including 27 with extraovarian spread. Int J Gynecol Pathol. 2009; 28: 405-22.
7. Roth LM, Karseladze AI. Highly differentiated follicular carcinoma arising from struma ovarii: a report of 3 cases, a review of the literature, and a reassessment of so-called peritoneal strumosis. Int J Gynecol Pathol. 2008; 27: 213-22.
8. Addley S, Mihai R, Alazzam M, Dhar S, Soleymani Majd H. Malignant struma ovarii: surgical, histopathological and survival outcomes for thyroid-type carcinoma of struma ovarii with recommendations for standardising multi-modal management. A retrospective case series sharing the experience of a single institution over 10 years. Arch Gynecol Obstet. 2021; 303: 863-70.