Papillary Thyroid Carcinoma Arising in Ovarian Teratomas: A Report of Three Cases

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Abstract
Somatic malignancies arising in mature cystic teratomas are rare events and thyroid tumors are very few among these. Papillary thyroid carcinoma is the most common thyroid malignancy encountered in ovarian tumors. We are presenting three such cases. Two cases show papillary carcinoma arising in the mature cystic teratomas containing structures of all three germ layers while one papillary carcinoma is arising in struma ovarii. Metastatic deposits were appreciated in fallopian tube wall and omentum in one mature teratoma associated and one struma ovarii associated carcinoma.

Keywords: Ovary, Papillary carcinoma, Teratoma

Introduction
Mature cystic teratoma is the most common type of ovarian germ cell neoplasm and thyroid tissue is a frequent constituent of mature cystic teratoma demonstrated in 15-20% of the cases.¹ Struma ovarii is the term reserved for the lesions comprising either entirely or predominantly of thyroid tissue; at least 50%.² Most cases of struma ovarii are benign however malignant transformation can occur in 5% of the cases. Papillary thyroid carcinoma including its follicular variant is the most common type of carcinoma arising in struma ovarii followed by follicular carcinoma.³

Case Reports
Case 1: A 20 year female underwent left salpingoophorectomy and omental biopsy and specimen was sent to our laboratory with history of left ovarian cyst and increased serum CA125 levels. On gross examination there was a solid gray white ovarian mass measuring 15x10x6 cm almost entirely replacing ovarian parenchyma and rupturing the capsule. Fallopian tube was unremarkable. Histological examination revealed a neoplasm composed of follicles lined by cuboidal tumor cells having round to oval optically clear nuclei with finely dispersed chromatin. Frequent nuclear grooves and occasional intranuclear cytoplasmic inclusions were appreciated. Follicles also contained amorphous eosinophilic thick colloid. Omental biopsy revealed metastatic deposits. TTF1 immunohistochemical stain performed on the ovarian tumor was positive (Fig 4). A diagnosis of papillary thyroid carcinoma, follicular variant arising in Struma ovarii was made. (Fig 1)

Case 2: A left salpingoophorectomy of a 25 year lady was sent to our lab with history narrating complaint of left ovarian cyst. Gross examination revealed a cyst measuring 11x9.5x7.5 cm filled with yellowish cheesy material containing hairs. A solid area of 2.5 cm was identified. Histological examination of mature teratomatous component comprised of skin with associated adnexal structures, fat, cartilage and respiratory epithelium. A tumor arranged in papillary architecture was also appreciated. Lining cells had oval nuclei showing nuclear overlapping, grooving and intranuclear cytoplasmic inclusions. A diagnosis of papillary thyroid carcinoma arising in the background of teratoma was rendered. (Fig 2)

Case 3: A 65 year lady underwent total abdominal hysterectomy with bilateral salpingoophorectomy. Specimen was sent to our lab. Gross examination revealed a right ovarian mass measuring 8.5x5.5x3 cm. Mass had solid and cystic cut surface. Total solid area measured 2.8x2.5 cm. Cyst was filled with thick yellowish material and tufts of hair. Histological examination revealed mature teratomatous components represented by benign thyroid parenchyma, skin with adnexal structures and cartilage. Admixed with thyroid parenchyma was a tumor arranged in papillary and follicular pattern. Tumor cells exhibited nuclear clearing, overlapping and grooving. A histological diagnosis of papillary thyroid carcinoma arising in mature cystic teratoma was given. (Fig 3)

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Discussion

Mature cystic teratoma is most common type of ovarian teratoma and comprises approximately 20% of all ovarian neoplasms. It is most common during the reproductive years, however they are often seen over a wide range of age and can be encountered from infancy to old age. Mature teratoma constitutes well differentiated structures representing all three germ layers each of which has a potential to undergo malignant transformation. Struma ovarii is the term designated to a teratoma when at least 50% of the component is thyroid parenchyma. Malignant transformation is quite rare in mature cystic teratoma comprising approximately 2% of the cases. Squamous cell carcinoma is the most common secondary malignancy (75%) followed by adenocarcinoma and sarcoma. Papillary thyroid carcinoma arising in a component of mature cystic teratoma is extremely rare. Various case reports have been published over the past few years regarding the histological diagnoses and treatment options. The diagnoses of thyroid carcinomas arising in teratomas should be made following the guidelines for diagnosing carcinomas in thyroid gland. Disease is treatable with good outcome in most cases. Only 7% and 14% of patients with papillary carcinoma and typical follicular carcinoma, respectively died of disease. Due to rarity of disease no consensus on treatment has been made, however treatment options include oophorectomy, additional thyroidectomy, radioactive iodine and long term follow up with serum thyroglobulin measurement. An online search by the name of malignant struma ovarii and teratoma revealed many case reports and reviews. Two such case reports and series review noted average ages of 42.9 and 44 years and pain as the most common presenting symptom. However in our case series two of the patients are quite young with 20 and 25 years of age.
Recurrence rates were reported as 15 and 38% in reviews with average time to recurrence was 4 years. A review published in 2002 included 24 patients: 16 patients without and 8 patients with adjuvant treatment, most commonly thyroidectomy and one of the 24 patients experienced persistent disease postoperatively, but 8 of 23 recurred after complete response to initial surgery. All eight recurrences were noted in patients who did not receive adjuvant therapy. No recurrences were noted in the group of seven patients receiving adjuvant therapy after complete response to initial surgery.

Another case report and literature review published by Salman et al in 2010 suggests that standard treatment of a patient with thyroid malignancy in struma ovarii is total abdominal hysterectomy, bilateral salpingo-oophorectomy, and complete surgical staging, including peritoneal washings for cytology, pelvic and para-aortic lymph node sampling, and omentectomy.9,10

**Conflict of interest**

There is no conflict of interest to declare by any author.

**References**


