MALIGNANT TUMOUR
ARISING IN MATURE OVARIAN TERATOMA

Ihqaique WS1, Alam M1, Islam SMJ1, Karim MI1, Yeasmin S2, Ahmed P1

Abstract
Introduction: Malignant teratoma is a common ovarian tumour. They are predominantly cystic (rarely solid) composed exclusively by mature adult type tissues. Malignant transformation of the mature elements of mature teratomas is very rare, but malignant transformation may occur in any of the mature components of teratoma. Keeping in mind about this rare malignant transformation which often present as an incidental pathologic finding may allow early detection.

Objective: The objective is to observe prevalence of this rare form of tumour in Bangladesh and also to observe the pattern of malignant component of these malignant tumours.

Methods: This was a retrospective study carried out in Armed Forces Institute of Pathology (AFIP), Dhaka between the period February 2005 and January 2012. This study was based on retrieval of data of all cases with ovarian mature teratoma from the surgical pathology register of Histopathology Department of the Institute. The Histopathology report and microscopic sections are reviewed with available clinical information for the purpose of the study.

Results: A total of 255 cases of mature teratomas of ovary were diagnosed at AFIP during the study period. Among these 255 cases only two cases were identified as malignant tumour arising on the top of mature ovarian teratoma.

Conclusion: Though rare, malignant transformations of mature teratomas should be kept in mind for early detection which in turn is important for patient survival.

Keywords: Malignant teratoma, Malignant transformation, ovary, squamous cell carcinoma

Introduction
Mature cystic teratoma is the most common ovarian tumour. Predominantly cystic mature teratomas (MCT) are composed exclusively of mature adult type tissues. Malignant teratomas consist of well differentiated derivatives of three germ layers with any type of combination of mature, adult type tissues. Ectodermal tissue is the most abundant and typically manifests in the form of squamous epithelium, brain tissue, glia, retinoblastoma, choroid plexus and/or ganglia. Adipose tissue, smooth and skeletal muscle, teeth, bone and cartilage are common mesodermal components. Endodermal tissue may form bronchial and gastrointestinal epithelium, thyroid glands and/or salivary glands. Monodermal teratomas consist of exclusively endodermal or ectodermal tissue types. Ectodermal ovary is the most common monodermal teratomas of the endoderm. Malignant transformation of the mature elements of mature teratomas is very rare but that rare transformation may occur from any of the mature components of the teratoma. In this study we reviewed the reported cases of ovarian mature teratoma over last 7 years in Armed Forces Institute of Pathology, Dhaka with a search for components of malignant transformation.

Methods
This was a retrospective study carried out in Armed

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MCT with malignant transformation into squamous cell carcinoma (SCC): Fig 1 shows the microscopic section of a right ovarian cystic mass measuring 15.8 (L) x 12.5 (D) x 15.2 (W) cm with small percentage of hyperechoic tissue. Gross inspection showed a unilocular cystic evoid mass containing greasy sebaceous material and hair. External surface of the cyst wall was dusky and smooth. The oval shaped thickening was the most abundant Histopathologic examination of sections from cyst wall showed features of MCT mostly lined by benign epithelium with underlying dermal adnexae. Squamous lining at places showed dysplastic changes with foci of invasion in the wall (Fig 1) and diagnosed as a case of SCC. Mesodermal components like skeletal muscle were also noted.

Malignant struma ovari: Fig 11 reveals a case of thyroid type malignancy in the background of struma ovarii. She was a 52 years old lady admitted in a medical hospital with complaints of occasional dull aching non-radiating pain and sense of heaviness in the lower abdomen for 3 months. Examination there was no tender, non reducible, firm, movable mass in the right iliac fossa. Her USG examination detected a mass in right adnexal region measuring 7.4 x 4.8 x 4.0 cm with internal hypoechoic and echoic component. Macroscopic examination revealed partly solid and partly cystic ovarian mass. Microscopic examination showed mature teratoma exclusively consisting of thyroid follicles filled with colloid containing multiple foci of papillary thyroid carcinoma. The branching neoplastic papillae are lined by crowded epithelial cell having optically clear nuclei (Fig II). Immediately after surgery, the patient's thyroid function, thyroglobulin and TPO level were measured which were found to be normal.

Discussion
Twenty percent of ovarian tumours are mature teratomas. Like other studies and standard text books, this study revealed various benign components. Macroscopic examination of cystic mature teratoma derived from three germ layers10. Malignant transformation of mature tissue of teratomas is rare, occurring in less than 2% cases of mature of teratomas10. The most common malignancy is squamous cell carcinoma10. The reported other malignant tumours are adenosquamous10 thyroid glandular tumours10, serous10 and melanoma10. Though malignant transformation is rare, SCC accounts for 80% of secondary malignant transformations of ovarian teratomas. It is to be noted that SCC is the most abundant component in mature teratoma. Cystic mature teratoma lined by epithelium known as dermoid cyst is the most common pattern of dermal adnexa. First definitive description of dermoid cyst with illustration was found in literature more than 350 years ago10. The tumour in this study rose in the background of dermoid cyst. Squamous cell carcinoma is mostly reported in postmenopausal women (mean age 55 years)10. In this study the single case of squamous cell carcinoma developed at 35 years of age. Case Report and review of literature10 show squamous cell malignant transformation in an ovarian mature cystic teratoma in young women with age range of 19 to 49 years. The mean size of a squamous cell carcinoma arising from a MCT measured more than 100 mm was seen in review of literature10. In our case the size of the tumour was 110 mm in greatest dimension. As SCC arising in MCT is quite rare, one must exclude metastasis particularly from cervix. Ten percent of ovarian teratomas contain thyroid tissue10. The presence of thyroid tissue in the ovary was first described by Bilhore in 1889 and the term "struma ovarii colloidis" was coined by Meyer in 1903. Struma ovarii, a rare monodermal ovarian teratoma is defined when thyroid tissue is the predominant (>50%) or exclusive element and nearly 2.7% of ovarian teratomas are struma ovarii10. Five to ten percent of these Struma Ovarii are malignant10. The commonest type of malignant struma ovarii is papillary carcinoma which may be classified type or follicular variant of papillary carcinoma followed by follicular carcinoma; other forms of thyroid cancer occur only rarely10. Most of the struma ovarii can be seen in their 40s to 50s at the time of diagnosis of malignant struma ovarii10. Thyroid type carcinoma can also be seen as a component of strumal carcinoid. Strumal carcinoid is a form of ovarian teratoma characterized by a mixture of thyroid tissue and carcinoid10,10. Immunohistochemistry using TTF-1 (thyroid transcription factor 1), thyroglobulin, and neuroendocrine markers, such as chromogranin or synaptophysin may assist in the diagnosis. Struma ovarii containing thyroid-type carcinoma must be distinguished from rare cases of papillary or follicular thyroid carcinoma metastatic to the ovary10. Again metastasis of malignant struma ovarii is also rare; site of metastasis noted in literature are adjacent pelvic structures, including the contra-ovarian and distant metastases to the lungs, bone, liver, and brain10.
Among those 205 cases two cases identified as malignant tumor arising on the top of mature ovarian teratoma (Table II).

Malignant struma ovarii: Fig II reveals a case of thyroid type malignancy in the background of struma ovarii. She was a 52 years old lady submitted in a military hospital with complaints of occasional dull achening non-radiating pain and sense of heaviness in the lower abdomen for 3 months. On examination there was no tenderness, non reducible, firm, movable mass in the right iliac fossa. Her USG examination detected a mass in right adnexal region measuring 7.4 x 6.8 cm with internal hypoechogenic echo component. Macroscopic examination revealed partly solid and partly cystic ovarian mass. Macroscopic examination showed mature teratoma exclusively consisting of thyroid follicles filled with colloid containing multiple foii of papillary thyroid carcinoma. The branching neoplastic papillae are lined by crowded epithelial cell having optically clear nuclei (Fig II). Immediately after surgery, the patient's thyroid function, thyroglobulin and TPO level were measured which were found to be normal.

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Conclusion
Malignant transformations of mature teratomas are often presented as incidental pathological findings. Due to rarity of these tumours large scale prospective study is missing. The behaviour of malignant tumor is summarized in Table III. The report or small series of tumour. Prognosis and treatment largely depends on stage of the tumour. Though malignant transformation is rare still in this condition should be kept in mind for early detection. Early detection is important for long term survival.
References


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