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CASE STUDY

COLLISION TUMOR OF OVARY: SEROUS ADENOCARCINOMA AND MATURE CYSTIC TERATOMA

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ABSTRACT: Collision tumor is tumors which are composed of two histologically distinct tumors in the same organ without any intermixing of two components. Simultaneous coexistence of high grade serous adenocarcinoma with mature cystic teratoma is quite rare with only five cases reported till date. In this case report, we present an ovarian collision tumor in a 60 year old female.

KEYWORDS: Collision tumor, serous adenocarcinoma, teratoma

INTRODUCTION:

Collision tumor are tumors which are composed of two histologically distinct tumors in the same organ without any intermixing of two components. Although collision tumors have been described in many organs like brain, kidney, lung, liver, stomach, esophagus, thyroid and bone; but their occurrence in ovaries is quite rare. [1,2]

Combinations of different histological tumors in ovary have been reported in the literature like serous papillary cystadenocarcinoma with granulosa cell tumor, serous adenocarcinoma with steroid cell tumor, teratoma with granulosa cell tumor. [1]

In literature, to the best of our knowledge only five cases of collision tumor with combination of mature teratoma and serous adenocarcinoma have been reported till date and this is the sixth case.(**Table 1)**

AUTHOR & YEAR	SEX /AGE	LOCATION
Kajo et al. 2007 [4]	F, 45	Right ovary
Bige et al. 2009 [5]	F, 45	Left ovary
Singh et al. 2014 [3]	F, 40	Left ovary
Bhagat et al. 2015 [2]	F, 50	Bilateral ovaries
Kocak et al. 2015 [1]	F, 83	Right ovary
Present case	F, 60	Left ovary

Table 1-Literature summary of cases of collision tumor composed of serous adenocarcinoma and mature teratoma[1,2,3,4,5]

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CASE REPORT

A 60 year old, post menopausal, multiparous female presented with complain of abdominal distension and discomfort since 1 year. Physical examination revealed abdominal distention and tenderness. Sonography revealed solid cystic bilateral adnexal masses with gross ascites. In laboratory examination, her cancer antigen 125 [CA 125] level was raised to 3912 IU/ml (normal- 0-35 IU/ml).

PET-CT SCAN was done and it showed bilateral malignant adnexal masses showing solid mass with increased metabolic activity with associated heterogenous attenuating cystic lesion possibly mature cystic teratoma in the left adnexa. Ascitis and metastatic omental and peritoneal deposits were also noted.

Furthermore a CT guided biopsy from peritoneal deposits revealed metastatic high grade serous carcinoma. On this basis, patient was given 3 cycles of chemotherapy.

Again PET-CT was done which showed significant decrease in extent and metabolic activity of omental deposits, but still revealed metabolically active residual bilateral adnexal masses with associated left adnexal cystic lesion. Overall partial response was seen.

Patient underwent interval debulking surgery with total abdominal hysterectomy and bilateral salpingoopherectomy with bilateral pelvic lymp-hadenectomy, bladder peritonectomy and omenetectomy. These specimens were sent for histopathology.

Grossly, uterus and cervix was measuring 7.5x4x3 cm. Both ovaries were grossly replaced by tumor with multiple areas of capsular breach and surface deposits on both. Left ovary was enlarged measuring 7x6x3 cm. Cut section showed cystic areas filled with yellow pultaceous material and hair, while the grey white solid areas measured 3x1x1 cm. **(Fig.1)** Right ovary measured 3x2.2x1.5cm with cut surface showing solid, grey white areas. Omentum showed multiple tumor deposits ranging in size from 0.2 to 1.2cm.

Fig.1-Grossly the left ovary was enlarged with solid – cystic areas along with presence of hair and firm cartilaginous area.

Microscopic examination of left ovary revealed strips of stratified squamous epithelium, ciliated columnar epithelium, sebaceous glands, epidermal inclusion cysts, hair follicles, glial tissue and cartilage suggestive of mature cystic teratoma**. (Fig.2a)** Sections from the solid areas showed features of high grade serous carcinoma in the form of solid sheets, acini and papillae with moderate pleomorphism, vesicular chromatin, conspicuous nucleoli and moderate amount of cytoplasm. **(Fig.2b)** Right ovary revealed features of high grade serous carcinoma. Omentum showed metastatic tumor deposits.

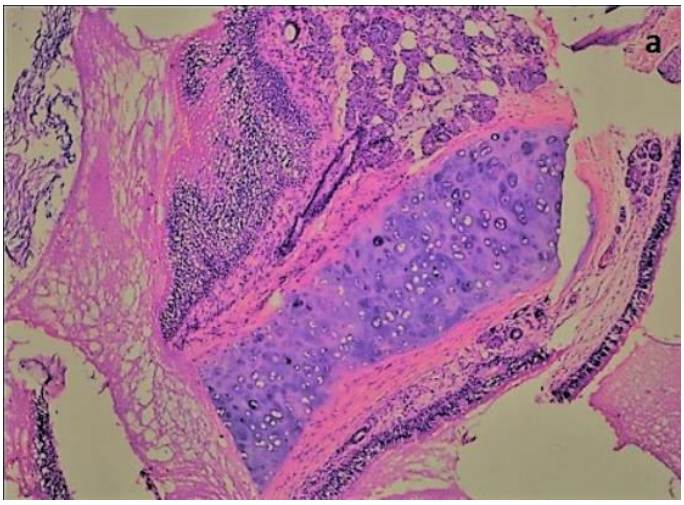

Fig.2a-(400X, H&E) microphotographs from left ovary showing strips of ciliated columnar epithelium, sebaceous glands, epidermal inclusion cysts, cartilage

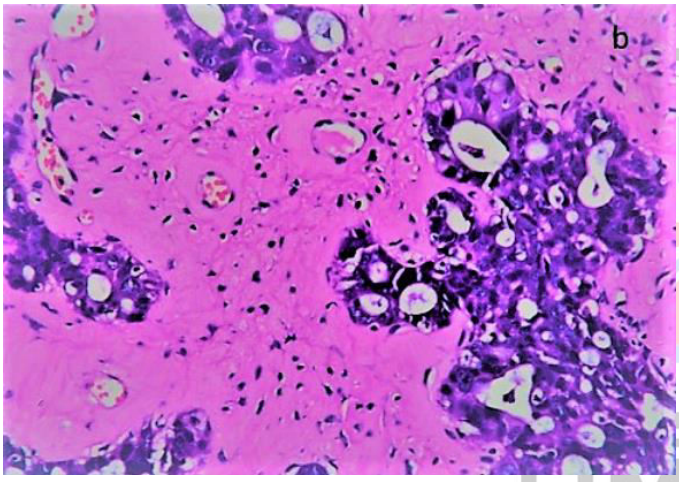

Fig.2b- (400X, H&E)microphotographs from the solid area of left ovary showed features of high grade serous carcinoma

DISCUSSION:

Collision tumors are tumors which are composed of two histologically distinct tumors in the same organ without any intermixing of two components. Although collision tumors have been described in many organs; but there occurrence in ovaries is extremely rare. [1,2]

This tumour is considered a multiple synchronous tumour in a single organ, as these components are separated from each other by stroma without histological intermixing. Teratoma is one of the most common component of collision tumor in ovary. Various combinations have been reported like combinations of serous cystadenomacarcinoma and teratoma, carcinosarcoma and dermoid cyst ,cystadenocarcinoma and dermoid cyst, teratoma and mucinous cystadenoma, choriocarcinoma and cystadenoma , sarcoma and mucinoustumor, sarcoma and serous carcinoma, serous cystadenoma and Sertoli-Leydig cell tumor, granulosa cell tumor and ovarian hepatoid carcinoma, granulosa cell tumour and endometroid carcinoma. Each component of collision tumor occurs coincidentally with no connection with each other, and the biologic behavior depends on their own tumor characteristics.[3]

Pathogenesis of collision tumour remains controversial however some of the hypotheses put forward to explain are:

1. It could be a coincidental occurrence, especially in tumors originating from neighbouring tissues or just a chance apposition of two unrelated tumors.

2. Simultaneous proliferation of two different cell lines.

3. Arising from a common origin from pluripotent precursor stem cell that differentiated into two components.

4. Interaction with a carcinogenic agent with different tissues may induce different tumors.

5. An oncogenic growth factor produced by a metastatic tumor could induce the growth of primary cancer at the site of metastases or it may favor the differentiation of metastatic lesion to mimic the histology of primary tumor from the organ of metastatic lesion.

6. Any alteration in the microenvironment, like angiogenesis or inflammation, by the primary tumor

could facilitate or help the growth of metastases from a second primary tumor from another organ.

Collision tumours are more often unilateral, and can vary in size from 2 to 200 cm with a wide age range of 17-66 years. [3]

Ovarian neoplasms are classified as epithelial, stromal and germ cell neoplasms according to the cell of origin. Mature cystic teratoma is the most common benign germ cell tumors of the ovaries accounting for about 30-45% of all ovarian neoplasms and 60% of all benign neoplasms. They usually occur during the reproductive years, but may occur in the postmenopausal females or even in childhood. Microscopically, it is composed of variable proportions of tissue originating from the ectoderm, mesoderm, and endoderm. It may contain skin, hair follicle, sweat gland, sebaceous glands, bone, nail, and teeth. [1]

Ovarian epithelial tumors are histologically classified into distinct morphologic categories: serous, mucinous, endometrioid, clear cell, Brenner tumors, mixed, and undifferentiated type. Papillary serous histology accounts for 75% of ovarian epithelial tumors. Ovarian epithelial tumors occur most commonly in sixth and seventh decades of life. [1]

Main screening tests for diagnosing ovarian carcinoma are pelvic examination, CA 125, and transvaginal ultrasound; ultrasound examination being the most useful noninvasive diagnostic test. The level of CA 125 is increased in 80% of patients with ovarian carcinomas .Early diagnosis is the key to successful treatment of ovarian cancer; however, ovarian epithelial tumors are rarely diagnosed at an early stage since they present with non specific symptoms. At the time of diagnosis, 62% of ovarian epithelial tumors already spread to the pelvis, upper abdomen, and distant organs. Surgery and subsequent histopathological examination are necessary for the diagnosis, staging, and treatment of ovarian epithelial tumors.[1]

The collision tumor can easily be diagnosed correctly by histolopathological examination. However, there is equivocal intermediate transitional zone between the tumors that may make it more difficult to differentiate between a collision tumor and a true mixed tumor. Other tumors like mixed epithelial tumors, mixed germ cell tumors, malignant mixed mesodermal tumor (carcinosarcoma), and teratomas with malignant transformation should be considered inthe differential diagnosis of collision tumor. The characteristic microscopic feature in mixed epithelial tumors is an intimate admixture of neoplastic components while in collision tumors, the different neoplastic components in collision tumors are histologically distinct and are seperated from each other by intact stroma. [1] 0.2 – 1.4% ofmature cystic teratoma can undergo malignant transformation from one of the components of teratoma like squamous epithelium (squamous cell carcinoma), adnexal glands (adenocarcinoma) and cartilage (chondrosarcoma). This transformation is more common in postmenopausal women, and has poorer prognosis. [1,2]

CONCLUSION:

Mature cystic teratoma is a common component of ovarian collision tumors however identifying the other component is essential because the treatment and prognosis vary depending on how ominous the other component is. Adequate sampling of the specimen is also very important to avoid missing the more malignant component occurring in collision with a mature cystic teratoma.

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