Case Report

Collision tumor of ovary: a rare combination of dysgerminoma and serous cystadenocarcinoma.

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Abstract:
Collision tumors of ovary are rare neoplasms and most commonly consist of a teratoma with mucinous tumor. Combination of papillary serous cystsdenocarcinoma and dysgerminoma was yet to be reported. A twenty years female patient presented with a large tumor of right ovary. Microscopically it was diagnosed as a collision tumor of ovary composed of dysgerminoma and serous cystadenocarcinoma.

Mixed tumour can arise from divergent differentiation of a single type of stem cell. But components of collision tumor must arise from separate clones. Possibility of collision tumour should always kept in mind during assessment of difficult ovarian tumors to avoid diagnostic error.

Key words: Collision tumor, dysgerminoma and serous cystadenocarcinoma.

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Introduction:

Tumors of more than one histological type can coexist in a single lesion or organ. Though rare, this type of composite tumors are reported from various organs like gastrointestinal tract, breast, bladder, prostate and ovary[1,2]. Developmentally composite tumors can arise due to divergent proliferation and differentiation of single type of tumor cells or can be originated from more than one neoplastic clone affecting different cell type seen close proximity to one another. Latter variant is termed as a collision tumor[1]. Various neoplstic components of a collision tumor remain histologically distinct and separated from each other by narrow stroma or their respective basal lamina. Each component of a collision tumor should be considered as separate primary neoplasms[3,4]. Collision tumors are infrequently reported from various organs like oesophagus, stomach, thyroid etc[5,6,7]. But collision tumors of ovary are extremely rare entities[4]. However, most common histologic combination of ovarian collision tumors is coexistence of teratomas with mucinous tumours[4,8]. Other combinations described as a case reports in the literature include serous papillary cystadenocarcinoma and granulosa cell tumor, papillary serous carcinoma and neuroendocrine carcinoma, mucinous carcinoma with angiosarcoma etc[2,4,9-12].

Here we are presenting a unique combination of collision tumor involving ovary – dysgerminoma with papillary serous cystadenocarcinoma. To the best of our knowledge this combination is the first case published in the English literature. Though rare things occur rarely, possibility should be kept in mind during the assessment of difficult histological variants of ovarian neoplasms to avoid diagnostic pitfalls.

Case report: 20 years unmarried woman presented with gradual swelling of lower abdomen for 3 months. Pre-operative radiological assessment revealed a large tumor about 13cm x 9cm size

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involving right ovary, predominantly solid in architecture. Right ovarian tumour was excised and subjected to histopathological examination. Grossly it was a large encapsulated tumor mass occupying the ovary 13cm x 9cm in size. Cut section showed two distinct features. Major portion is solid, smooth and whitish in colour (Figure1). Rest of the tumor exhibited complicated cystic architecture containing clear fluid. Both areas are completely demarcated. Sections were given from both areas and from adjacent zones. Microscopy confirmed existence of two distinct histological patterns – dysgerminoma and serous cyst adenocarcinoma of ovary (Figure2,3,4).

Discussion: Dysgerminomas account for about 55% of malignant germ cell tumors of ovary. Young females are commonly affected. Majority of the tumors are unilateral, solid in consistency with soft fleshy cut surface. Serous cystadenocarcinomas are commonest ovarian malignancies and about 65% of the tumors are bilateral. Women of 30-50 years age group are commonly affected. Grossly, the tumors are partly solid, partly cystic with complicated branching structures within cystic areas[3].

Collision tumour of ovary with dysgerminoma and serous cyst adenocarcinoma as two components was not reported previously. Different hypotheses are postulated to explain the formation of collision tumors. Coexistence of two primary neoplasms in same tissue is explained by “chance accidental meeting”. Another theory proposes that the presence of the first tumor alters the microenvironment of the adjoining tissue creating avenues for development of the second primary or seeding of metastatic tumor cells. There is also a third hypothesis suggesting origin of each primary tumor from a common stem cell. Mixed epithelial tumors or malignant mixed mesodermal tumors of ovary mostly originate from a common stem cell with capacity of multidirectional differentiation. But these tumors are characterised by intimate mixture of different neoplastic components unlike tumors where intact stroma separates different components[3,4].

Pre-operative diagnosis of collision tumors on radiological assessment is often possible. Kim SH[8] could correctly identify six out of total seven cases of collision tumor during radiological imaging (coumputed tomography, magnetic resonance imaging and ultrasonography) for ovarian teratomas and concluded that possibility of a collision tumor should always be considered when an ovarian teratoma has image findings can’t be explained solely by the teratoma itself. Intra-operative frozen section should be taken from multiple areas to avoid diagnostic confusion[8].

Differentiation of a true collision tumor from a composite tumour developed as a result of divergent differentiation of a single clone is often difficult. Immunohistochemistry provides information on the differentiation of the tumor cells and may fail to identify actual developmental route. But study of the tumor genetics can be useful to determine the way of development of a neoplasm. Examination and comparison of pattern of loss of heterozygosity (LOH) in two parts of composite tumor can provide useful clue of answering mono or multiclonal development of neoplasm[2]. In present case, both tumors were completely separated by intervening stroma making diagnosis of collision tumor easy and straight forward.

Conclusion: In conclusion ovarian collision tumors are rare, but even rarer are the combination of dysgerminoma and papillary serous cyst adenocarcinoma as presented by us. Careful gross examination and extensive histopathological study from different parts of the neoplasm is mandatory for proper diagnosis. We are presenting this case to emphasize inclusion of diagnosis of composite/collision tumor during interpretation of ovarian biopsies in order to avoid misdiagnosis.

Figure:1 Image1-Gross image of the resected tumour (Ovary)

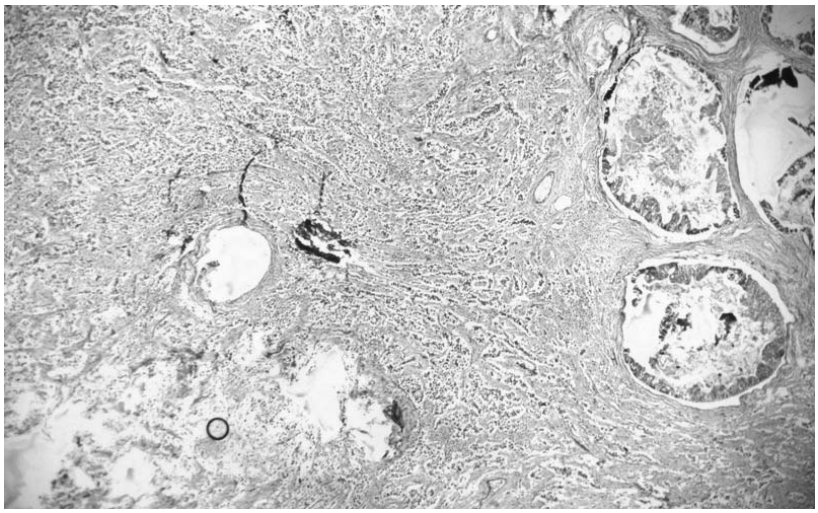

Figure-2: Low power view of collision of two component of dysgerminoma and serous cyst adenocarcinoma

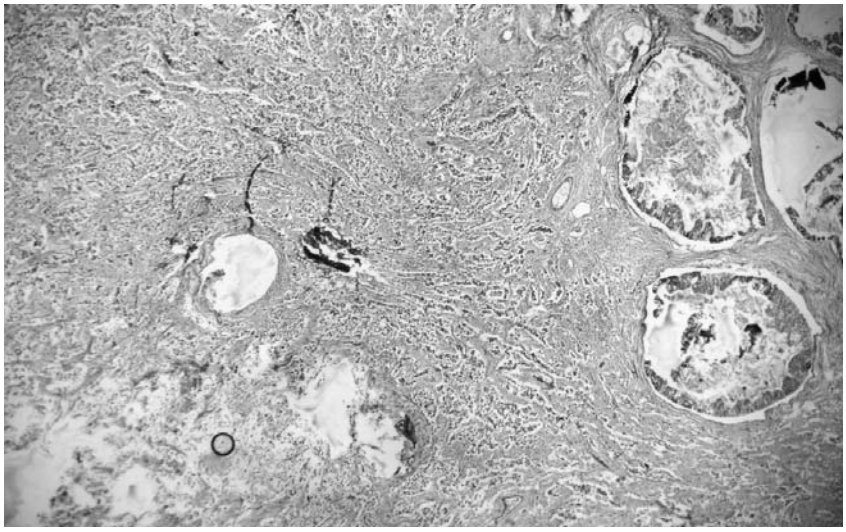

Figure-3: Collision tumor- dysgerminomatous component with serous cyst adenocarcinoma [H&E stain- low power]

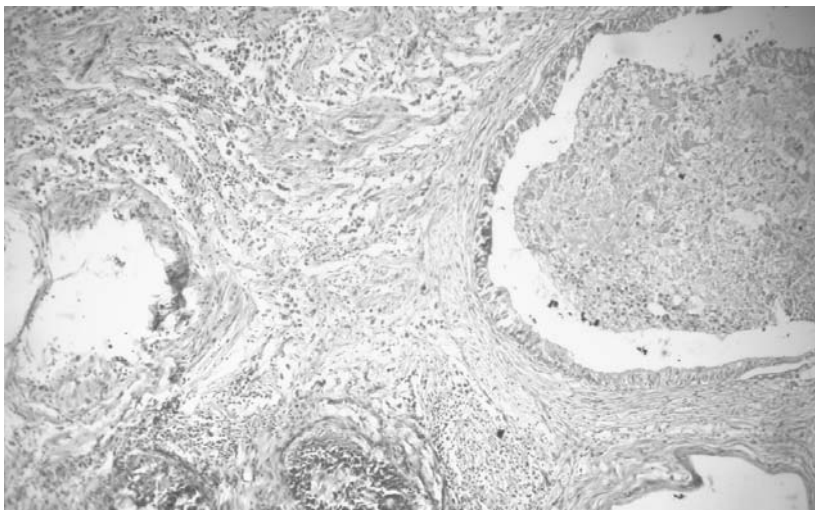

Figure-4: Fibrous lining seperating both the component [H &E- 10X]

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