

## Bilateral Ovarian Collision Tumours: Serous Carcinomas and Fibrothecomas

T Ivković-Kapic<sup>1,2</sup>, B Andrejić-Višnjić<sup>3</sup>, A Mandić<sup>4,5</sup>

### ABSTRACT

*A patient had both ovaries affected by clearly demarcated colliding tumour masses of different gross appearance, histological features and immunohistochemical profiles, corresponding to bilateral collision papillary serous high-grade adenocarcinoma and fibrothecoma. Despite the applied chemotherapy, it led to a lethal outcome for the patient nearly a year after the surgery. Bilateral ovarian tumours raise the question of whether they are primary tumours or metastases. Simultaneous bilateral occurrence of surface epithelial tumours with other types of ovarian tumours is rare. Therefore, it poses a great challenge in proper differential diagnostics.*

**Keywords:** Fibrothecoma, high-grade serous carcinoma, multiple primary neoplasms, ovarian neoplasms

## Tumores de colisión ováricos bilaterales: carcinomas serosos y fibrotecomas

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### RESUMEN

*Una paciente tenía ambos ovarios afectados por masas tumorales en colisión, claramente demarcadas. Las mismas mostraban diferente aspecto macroscópico, y diferentes rasgos histológicos y perfiles inmunohistoquímicos, correspondientes a fibrotecomas y adenocarcinomas serosos papilares bilaterales de alto grado en colisión. A pesar de la quimioterapia aplicada, la condición condujo a un resultado fatal para la paciente, casi un año después de realizada la cirugía. Los tumores ováricos bilaterales plantean la cuestión de si se trata de tumores primarios o metástasis. La ocurrencia bilateral simultánea de tumores epiteliales superficiales con otros tipos de tumores ováricos es rara, y por tanto, plantea un gran desafío a la hora de realizar un diagnóstico diferencial adecuado.*

**Palabras clave:** Fibrotecoma, carcinoma seroso de alto grado, neoplasmas primarios múltiples, neoplasmas ováricos

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## INTRODUCTION

Two out of three main categories of primary ovarian tumours are epithelial tumours and sex cord-stromal tumours (1). Serous epithelial tumours are determined as a gynaecological malignancy with the highest case-to-fatality ratio, while ovarian fibrothecomas are an intermediate form (2–4).

The presence of two colliding tumour masses in both ovaries is a major diagnostic challenge (5, 6). To the best of our knowledge, this is the first case of serous carcinoma and fibrothecoma presenting as synchronous bilateral collision tumours.

## CASE REPORT

### Clinical history

A 50-year-old perimenopausal woman with lower abdominal pain was admitted after ultrasound verification of a tumour-like mass on the left ovary. Serum CA 125 levels were extremely high (3225.5 U/l). Bilateral salpingo-oophorectomy with subtotal hysterectomy and omentectomy was performed. Lymph node extraction was not performed. Postoperative course was uneventful, and the Oncological Committee of the Oncology Institute of Vojvodina prescribed the following chemotherapy protocol: 270 mg of taxol and 450 mg of carboplatin, through six cycles. Three months after the operation, a tumour mass (2 x 1 cm) was noted in the rectouterine pouch. Four months after the operation (after the sixth cycle of therapy), cytological analysis of the ascites was negative, CA 125 levels were within the normal reference values (according to the laboratory that conducted the testing), but magnetic resonance revealed progression of the disease (massive peritoneal implants, lymphadenomegaly, ascites). The Council of the Clinic for Gynaecology of the Oncology Institute prescribed another therapeutic approach: weekly cisplatin and etoposid.

After the third cycle of cisplatin (eighth postoperative month), clinical progression of the disease was verified (CA-125 levels were elevated, tumour mass enlarged).

Eleven months after the operation, only palliative symptomatic therapy was recommended. Nearly a year after the surgery, we received confirmation that the patient had passed away.

### Histological findings

The patient's uterus had regular morphology with two whitish nodes of storiform appearance in the myometrium and polypoid formation on the endometrium. The left

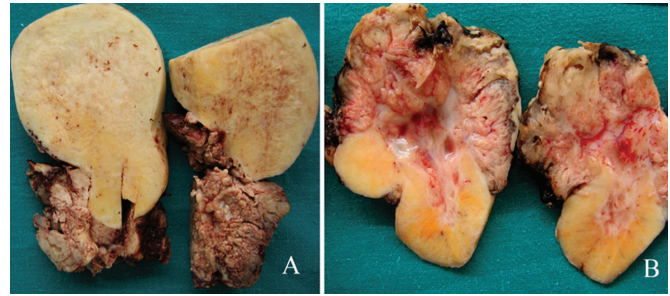


Fig. 1: Gross appearance of ovaries with distinctly two different types of tumour (A: left ovary; B: right ovary).

ovary (Fig. 1A) was enlarged, lobulated (13 x 11 x 6 cm, 426 g). On the cross-section, a part of the tumour (8 cm in diameter) was solid, elastic and white-yellow. The second part of the tumour tissue was at intimate contact with the previously described, but sharply demarcated. It was 6 cm in diameter and had papillary, necrotic consistency with areas of haemorrhage. The right ovary (Fig. 1B) (9 x 7 x 7 cm, 315 g) was involved by tumour lesions of the same characteristics as the left side. On cross-sections of the omentum, three nodes were found, measuring 4.5 cm, 3 cm and 1 cm.

Upon microscopic examination, two leiomyomas and one endometrial polyp were diagnosed. Ovarian tissue bilaterally was completely replaced by two different tumours. One, papillary and solid, was composed of medium to large cells with bizarre nuclei, prominent nucleoli, significant cytological atypia, mitotic activity (Fig. 2A), and extensive necrosis. This type of tumour was found in the omentum. These bilaterally present histological features indicated the diagnosis of papillary high-grade serous carcinoma (HGSC). The second tumour type (clearly demarcated from HGSC) was highly cellular, comprised of fascicles of cells in a storiform and whorl arrangement (Figs. 2B, 3). Cells were spindle-like or plump, and some had a clear cytoplasm with cytoplasmic lipid vacuoles. Mitoses were rare (1/10 high power field), and necrosis or haemorrhage was absent. The described morphologic pattern of tumour, indicating a fibrothecoma, was present bilaterally.

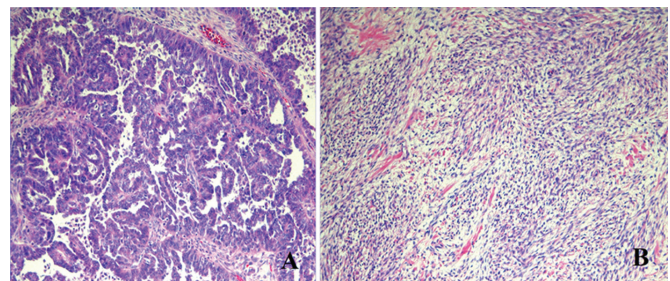


Fig. 2: Histologic features of tumours on standard haematoxylin and eosin stain (A: high-grade serous carcinoma; B: fibrothecoma).



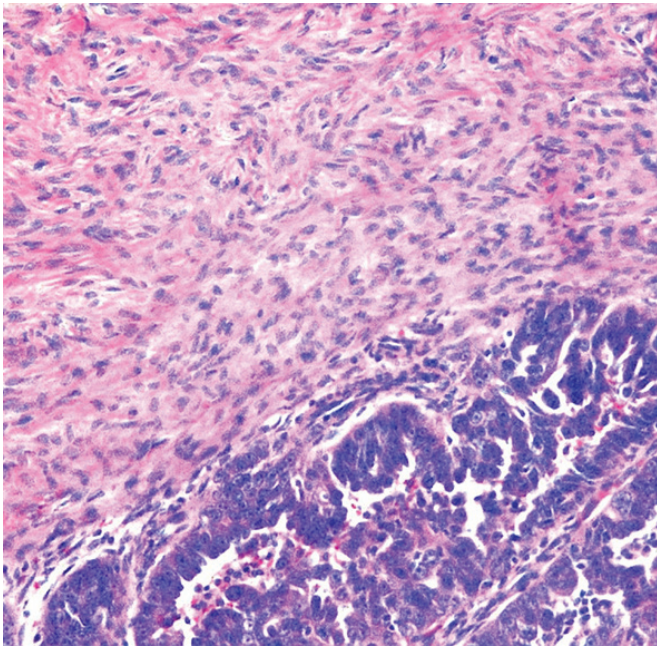


Fig. 3: High-grade serous carcinoma and fibrothecoma showing distinct boundaries without histologic admixture (haematoxylin and eosin).

Additionally, an immunohistochemical panel of antibodies (DAKO) (6, 7) was applied (Table, Fig. 4) to confirm HGSC and fibrothecoma.

## DISCUSSION

When diagnosed, most patients with HGSC present some of the signs of the advanced stage of the disease, and less than 10% are confined to the ovary (2). The omentum, as in our case, is almost always affected by tumour, causing the patient significant pain (3). In our case, lymphadenectomy was not performed, according to Serbian national Good Clinical Practice Guide for Diagnostics and Treatment of Ovarian Neoplasms (6). Recent studies report that patients who underwent systematic lymphadenectomy had significantly improved progression-free and overall survival with no gross residual disease (optimal surgery) or residual disease 0.1–1 cm (near optimal) (7).

In addition to morphological features, marked cytological and nuclear atypia, epithelial tumour mass had a high proliferative index and positive immunohistochemical staining of WT1 and AE1/AE3 that supported the diagnosis of HGSC.

Sex cord-stromal tumours of the ovary arise from the ovarian stroma, sex-cord elements or both. According to Mondal *et al*, tumours of the fibroma-thecoma group (including fibrothecomas) are the second most common type of sex cord-stromal tumours, with 13.3% cases of bilaterality (4, 5). Salemis *et al* reported a case of

Table: Proliferative index and immunohistochemical reactivity of ovarian tumour masses

	Ki-67	$\alpha$ SMA	Vimentin	S100	CD34	CD117	CD10	CK 5/6	CK 8/18	WT1	Calretinin	AE1/AE3
HGSC	60%	-	-	-	-	-	-	-	+++	+++	-	+++
FT	< 3%	-	+	-	-	-	-	-	-	++	++	-

HGSC: high-grade serous carcinoma; FT: fibrothecoma; -: negative; +: faintly or focally positive; ++: moderately positive; +++: strongly positive.

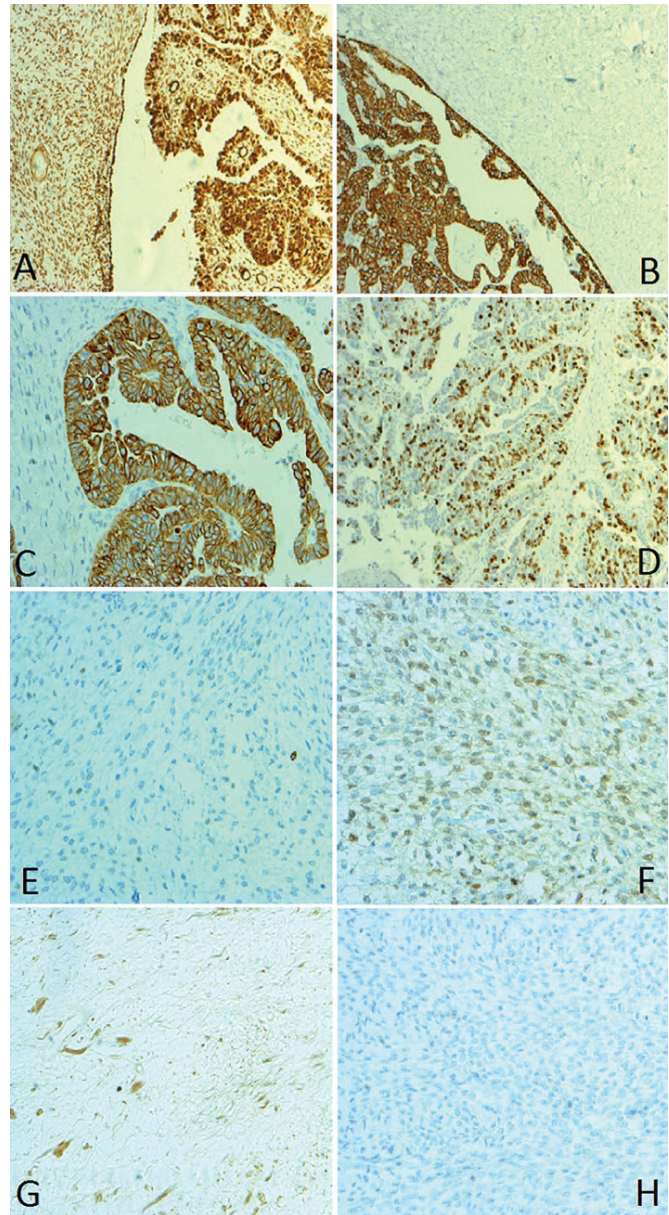


Fig. 4: Immunohistochemical profile of fibrothecoma (FT) and high-grade serous carcinoma (HGSC) of the ovaries (A: WT1 in FT and HGSC (x 100); B: CK8/18 in FT and HGSC (x 100); C: AE1/AE3 in HGSC (x 200); D: Ki67 in HGSC (x 100); E: Ki67 in FT (x 200); F: Calretinin in FT (x 200); G: Reticulin in FT (x 200); H: CD10 in FT (x 200)).

bilateral fibrothecomas with the argument that fibrothecomas should be considered in postmenopausal women with a pelvic/ovarian mass and abdominal pain, as in our case (4). Low mitotic count and proliferative index, lack of cytologic and nuclear atypia, necrosis and haemorrhage in sexcord-stromal mass indicated a benign nature. Fibrothecomas usually show inhibin, vimentin and calretinin positivity, but these markers are not specific compared to other sex cord-stromal tumours which may show a similar immunohistochemical profile (8).

It is not rare to find bilateral serous carcinomas or bilateral fibrothecomas, but simultaneous occurrence of surface epithelial tumours of the ovary with other types of ovarian tumours is rare (9, 10). So far, to the best of our knowledge, this article is the first to report collision tumours, HGSC and fibrothecoma, present in both ovaries at the same time.

The ovary is a very interesting location for the formation of collision tumours due to the possibility of co-existence of tumours with varying histogenesis (10). However, the pathogenesis of the collision tumours of epithelial and stromal origin is unclear (9). One of the proposed theories is ‘accidental meeting’ of two independent primary lesions (10). A different theory claims that two different tumours may occur in contiguity due to the fact that the ovaries were affected by the same carcinogenic stimulus, or that the presence of one tumour alters the local environment and a second tumour is more likely to develop nearby (10).

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#### AUTHORS’ CONTRIBUTIONS

T Ivković-Kapicl conceived and planned the work that led to the paper, and interpreted the pathology material presented in the paper. She reviewed successive versions of the manuscript and approved the final version.

A Mandić performed diagnostic procedures, surgical treatment and follow-up of the patient. He read the final version of the manuscript and approved it.

B Andrejić-Višnjić was involved in the pathology analysis of the material and the planning that led to the paper, and she wrote the paper.

The authors have no financial interests or dual commitments that could result in any conflicts of interest for any of the authors.

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