

# Coexistence of three benign and a borderline tumor in the ovaries of a 52-year-old woman

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## Summary

**Purpose of investigation:** In this paper, the authors describe a rare case of four simultaneous ovarian tumors. **Materials and Methods:** A 52-year-old postmenopausal woman underwent total hysterectomy and bilateral salpingo-oophorectomy. Multiple slides from the ovaries were examined. **Results:** Histological examination revealed the presence of three ovarian tumors on the right ovary, of the following types: cystadenoma, mucinous borderline ovarian tumor and mature teratoma, and also a benign Brenner tumor on the left ovary. **Conclusion:** Pathologists must examine multiple sections of both ovaries, regardless of the macroscopic or clinical specimen's appearance, in order to exclude the presence of malignancy, which could alter the surgical approach. Particular attention should also be paid to the frozen section of the contralateral ovary, as depending on the result, it could change the surgical approach. From the surgeon's perspective, bilateral salpingo-oophorectomy with total hysterectomy should be the treatment of choice in postmenopausal women with multiple ovarian tumors. The diagnosis of a malignant or borderline tumor on a normal-appearing ovary changes the radicality of the surgical approach. In such a case, staging surgery, including omentectomy, multiple peritoneal biopsies, and washes are required.

**Key words:** Borderline; Brenner; Mucinous; Ovarian tumor; Teratoma.

## Introduction

Ovarian tumors are frequent and usually benign. Borderline tumors are also relatively frequent and mainly occur in middle-aged women [1]. Although two different ovarian tumors can co-exist, the presence of four simultaneous tumors is an extremely rare fact.

Mucinous cystadenomas are benign ovarian tumors, representing about 15% of all ovarian neoplasms [2]. These tumors may become large, and cystomas weighing over 136 kg have been reported. It is believed that they derive from simple metaplasia of the germinal epithelium [3]. On the other hand, besides the fact that mucinous borderline tumors have almost similar macroscopic appearance to benign mucinous cystadenomas, they present microscopic differences such as nuclear abnormalities, intermediate mitotic activity between benign and malignant tumors, irregular hyperchromatic nuclei, and enlarged nucleoli [3, 4].

Brenner tumor is a rare type of epithelial ovarian neoplasm. Although it was initially believed that Brenner tumors were uniformly benign, a number of malignant tumors of this type have already been described. They arise from diverse sources as in surface epithelia, rete ovarii, and ovarian stroma [3].

Finally, mature teratomas are common (10% to 25% of all ovarian neoplasms) ovarian benign tumors with smooth, rounded, or ovoid shapes. Although ectodermal elements usually predominate, endodermal or mesodermal derivatives can also be found. Malignant transformation of these tumors is very rare (1% to 3%) [5].

## Materials and Methods

A 52-year-old postmenopausal woman, nulliparous, with four different synchronous ovarian tumors with multiple hematoxylin and eosin (H&E) stained slides, from both ovaries, were examined.

The patient presented at this hospital with abdominal inflation and an ovarian mass, diagnosed with ultrasound. The imaging characteristic of the tumor included both cystic and solid parts. There was no fluid in the pouch of Douglas.

The patient underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, and staging. During surgery, a 26 x 20 x 9.5 cm tumor of the right ovary was found while the other on left ovary measuring 3 x 2.5 x 2 cm. Frozen section of the specimen from the right ovary, confirmed the presence of mucinous cystadenoma and mature teratoma.

## Results

Macroscopic pathological examination revealed a smooth tumor of the right ovary, consisting of both unilocular and multilocular cystic areas. Multilocular area was covered by a fibroelastic wall and contained jelly fluid, while a four cm white-yellow colored area of localized growth, containing sebum and hairs, protruded into the unilocular cavity. Histopathology revealed three different histological tumors on the right ovary. Half of the tumor partially consisted of both mucinous cystadenoma (Figure 1) and of a mucinous borderline tumor of intestinal type (Figure 2), and the other half consisted of a mature teratoma (Figure 3). The latter contained a great range of mature tissues from all three germinal layers (epidermis, skin appendages, glial cells, bone, cartilage, intestinal and respiratory epithelium, and thyroid tissue). There was no invasion or immature neuroepithelial tissue. Neoplasm did not extended out of the ovary.

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Fig. 1

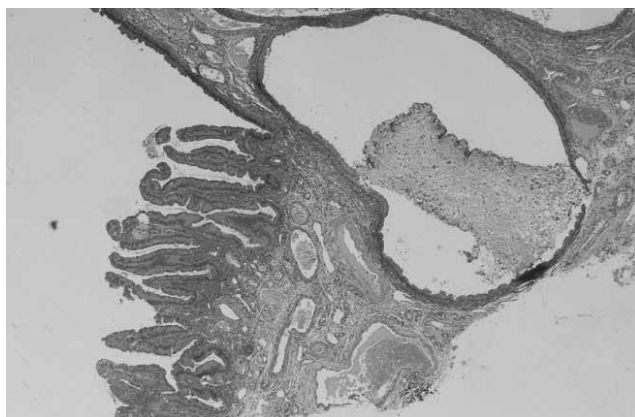


Fig. 2

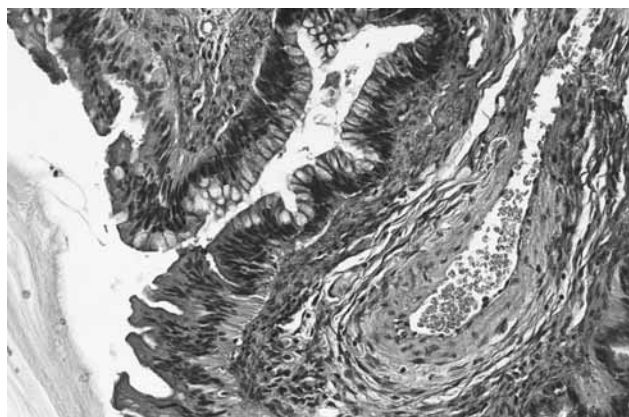


Fig. 3

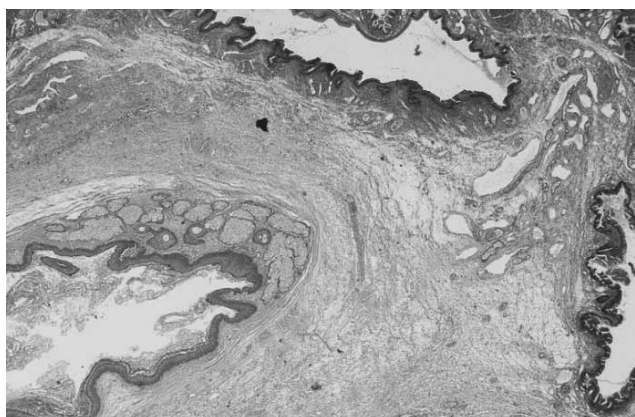


Fig. 4

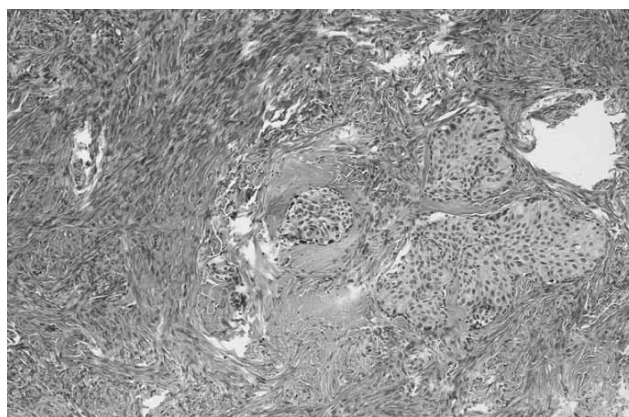


Figure 1. — Mucinous cystadenoma of the right ovary (H&E x 100).

Figure 2. — Intestinal-type mucinous borderline tumor (H&E x 200).

Figure 3. — Mucinous borderline tumor (upper part) and mature teratoma (down left quadrant) consisting of epidermis and dermal adnexa (H-E x 100).

Figure 4. — Small Brenner tumor of the left ovary (H&E x 100).

On the other hand, pathological examination on the left revealed an atrophic ovary with microscopic elements of benign Brenner tumor (Figure 4). There was also uterine leiomyomas, atrophic endometrium and an endometrial polypoid. Histological examination of the omentum and cytological examination of the peritoneal lavage indicated no malignancy.

Postoperative clinical situation was normal and patient was discharged home on postoperative day seven without any major complications. She received no additional treatment. At one year postoperatively, the patient still remains well with no residual symptoms.

## Discussion

Despite the rarity of the phenomenon, a connection between mucinous cystomas and mucinous borderline tumors has already been described. Actually, according to some reports, mucinous borderline tumors present a frequently heterogeneous composition with coexisting benign, borderline, and malignant elements [4].

Moreover, although simple metaplasia of the germinal epithelium is considered as the most accepted histogenetic

pathway of mucinous cystadenomas, some 30 years ago, the teratomatous hypothesis of mucinous cystomas' histogenesis was expressed. According to this theory, these tumors derive from monophyletic endodermal development of a teratoma [6].

## Conclusion

From a pathological view, the presence of a histological ovarian tumor does not exclude the coexistence of other tumors of various histological types on one or both ovaries. For these reasons the pathologist must examine multiple sections of both ovaries, regardless of the macroscopic or clinical specimen's appearance, in order to exclude the presence of malignancy. In postmenopausal women, particular attention should be paid to the frozen section not only of the clinically suspicious ovary, but also of the contralateral, as the surgical approach could be altered depending on the result.

On the other hand, preoperative clinical and imaging examination of the ovaries cannot always determine with certainty the benign or malignant nature of the tumors. Therefore, bilateral salpingo-oophorectomy with total hys-

terectomy should be the treatment of choice in postmenopausal women independently of frozen section's result. However, the diagnosis of a malignant or borderline tumor on a non-suspicious ovary, regardless of the benign nature of the contralateral and more suspicious ovary, changes the radicality of the surgical approach. In this situation, instead of a conservative operation, a staging surgery, including omentectomy, multiple peritoneal biopsies, and washes is needed.

In premenopausal women, the decision of the radicality of the surgery, considering the need of a possible fertility-sparing approach, is more complicated. Simple unilateral salpingo-oophorectomy, excision of any suspicious peritoneal lesion, multiple biopsies, washes, appendectomy, and pelvic and para-aortic lymphadenectomy could be applied in well-selected patients, depending on the histological type, grade, and stage of the disease [7]. In this case, the decision of single or multiple "blind" biopsies of the other normal-appearing ovary is controversial. On the other hand, in patients with borderline ovarian tumors, a fertility-sparing procedure could include the wedge resection or the ovarian cystectomy of the contralateral ovary [8].

The probability of multiple ovarian tumors in both ovaries, dictates the realization of a multicenter study, in order to determine with accuracy the best treatment approach of these patients, especially in premenopausal ones.

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