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Primary ovarian carcinoid tumor arising within a mature cystic teratoma

Pierwotny rakowiak jajnika w obrębie dojrzałego potworniaka torbielowatego

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Abstract

Primary carcinoid tumor of the ovary in association with a mature cystic teratoma is very rare. Preoperative diagnosis of this tumor is difficult, particularly in the absence of symptoms of carcinoid syndrome. Here, we report a case of a premenopausal woman who underwent operative treatment due to an ovarian mass. The ovary was cystic with a solid mural nodule. Microscopically, the cyst wall revealed features of mature teratoma while the nodule showed features of a low-grade insular carcinoid. Synaptophysin and CD56 were positive. Ki67 index was low. No evidence of primary gastrointestinal or respiratory malignancy was found. The histologic and immunohistochemical characteristics of this tumor, its intimate association with a mature cystic teratoma and the absence of primary malignancy elsewhere were compatible with the diagnosis of a primary ovarian insular carcinoid tumor. This case is reported to raise the awareness of a rare tumor entity among the pathology and gynecologic communities.

Key words: ovary, mature cystic teratoma, primary carcinoid

Streszczenie

Pierwotny rakowiak jajnika w obrębie dojrzałego potworniaka torbielowatego to bardzo rzadki nowotwór. Rozpoznanie takiej zmiany w ramach diagnostyki przedoperacyjnej jest trudne, szczególnie wobec braku objawów zespołu rakowiaka. W pracy przedstawiono przypadek pacjentki w wieku przedmenopauzalnym leczonej operacyjnie z powodu zmiany w obrębie jajnika. Zaobserwowano torbielowato zmieniony jajnik z litym przyściennym guzkiem. Obraz mikroskopowy wykazał cechy dojrzałego potworniaka z guzkiem odpowiadającym rakowiakowi wyspowemu o niskim stopniu złośliwości. Uzyskano dodatni wynik dla synaptofizyny i CD56; wskaźnik Ki67 był niski. Nie potwierdzono obecności pierwotnego nowotworu w przewodzie pokarmowym ani układzie oddechowym. Charakterystyka histopatologiczna i immunohistochemiczna zmiany, jej ścisły związek z dojrzałym potworniakiem torbielowatym oraz brak pierwotnej zmiany złośliwej w innej lokalizacji sugerowały rozpoznanie pierwotnego rakowiaka wyspowego jajnika. Celem prezentacji przypadku jest podniesienie świadomości patologów i ginekologów w zakresie rzadkich nowotworów.

Słowa kluczowe: jajnik, dojrzały potworniak torbielowaty, pierwotny rakowiak

INTRODUCTION

Primary ovarian carcinoids are rare, accounting for 0.3% of all carcinoid tumors[1]. In 1939, Stewart *et al.* reported the first case of carcinoid tumor arising in an ovarian teratoma[2]. The occasion of a carcinoid tumor arising from mature cystic teratoma (MCT) is very rare with a very small number of published cases[3]. Therefore, the coexistence of a carcinoid tumor inside a mature ovarian cystic teratoma is of high clinical interest and poses a diagnostic challenge. We report a case of a 42-year-old woman diagnosed with primary carcinoid tumor of the ovary arising in mature cystic teratoma.

CASE HISTORY

A 42-year-old woman presented with intermittent right sided abdominal pain. On examination, there was a right lower abdominal mass. Ultrasound (US) revealed a hypoechoic space-occupying lesion (SOL) in the right pelvic region measuring 8.1 × 5.8 cm, suggesting ovarian endometriosis. Hysterectomy with right salpingo-oophorectomy was done. Size: the ovary was cystic measuring 8.5 × 8 × 7 cm. The outer surface was smooth with congested blood vessels. Cyst content was pultaceous, with hair shaft and bony tissue. There was a well-circumscribed solid nodule measuring 1.6 × 1.4 × 1 cm in the cyst wall (Fig. 1).

Light microscopy: The cyst wall revealed different components of mature cystic teratoma, such as keratinized stratified squamous epithelium, dermal appendages, intestinal epithelium, thyroid follicles, muscle and bony tissue. The solid nodule in the cyst wall showed a well-circumscribed tumor that seems to be originating from the intestinal epithelium (Fig. 2). Cells were arranged mostly in solid nests and in an acinar pattern with a thick calcified intraluminal secretion. The tumor cells had homogenous round to oval nuclei with stippled chromatin and abundant granular eosinophilic cytoplasm (Fig. 3). Mitosis and necrosis were not identified. Focal extracellular mucin was noted.

On the basis of the nuclear feature, a neuroendocrine tumor was suggested. Immunohistochemistry: Chromogranin (Fig. 4) was negative, synaptophysin (Fig. 5) and CD56 (Fig. 6) were strongly positive. Ki67 index was low (<2%) (Fig. 7).

A diagnosis of mature cystic teratoma with (low-grade) primary carcinoid of the ovary was given. The uterus, cervix and fallopian tube were within normal limits. The appendix, colon, rectum and other parts of the intestinal tract did not reveal any significant pathology. The patient did not have clinical symptoms of carcinoid syndrome.

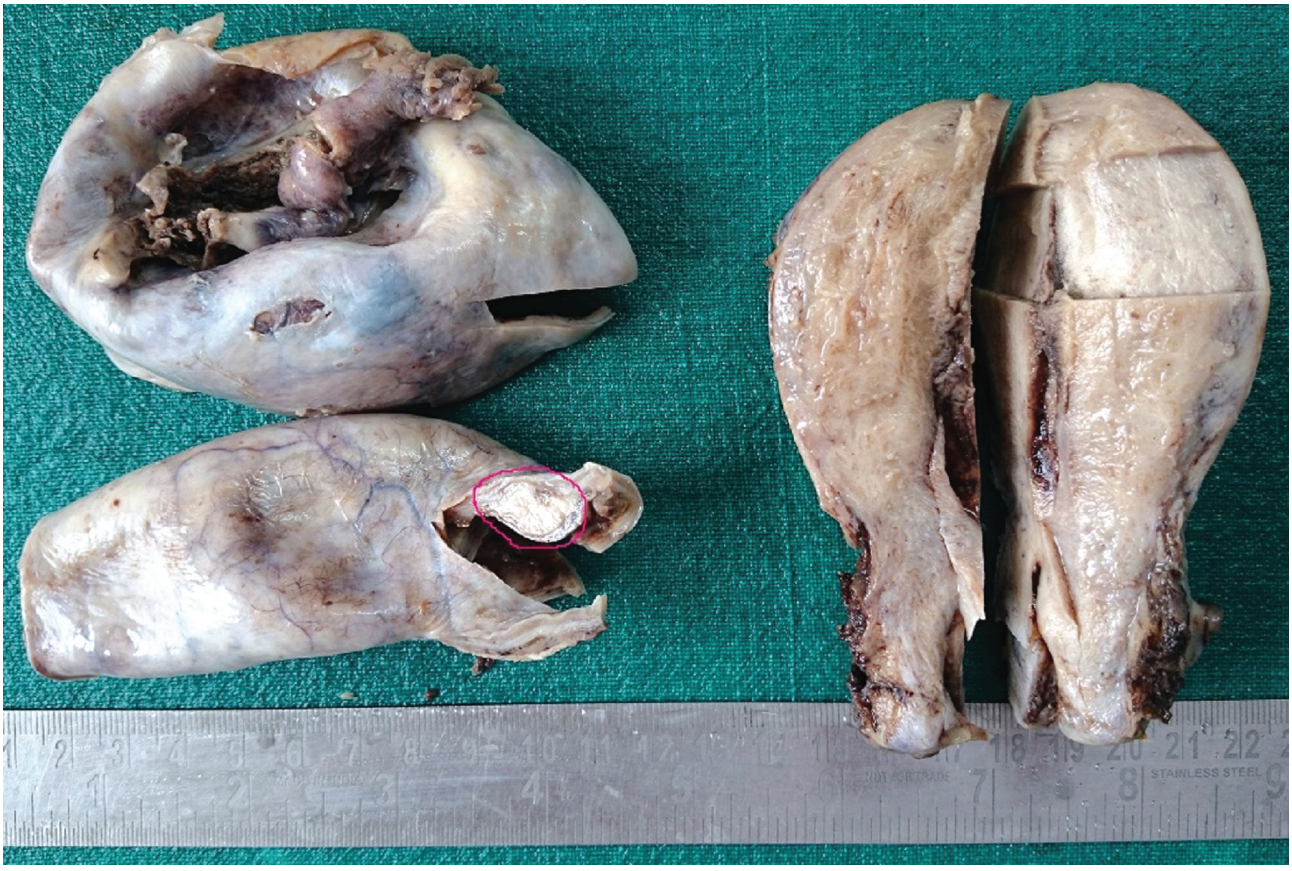

Fig. 1. Gross – cyst wall with nodule (circle)

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DISCUSSION

Mature cystic teratomas (MCT) represent 10–20% of all ovarian neoplasms. They are characterized by benign histologic features. The co-existence of a malignancy within a mature teratoma, as in the present case, is often reported as "teratoma with malignant transformation" (TMT). TMT is an extremely rare phenomenon, being reported only in 1–3% of teratomas[3]. The most common malignant change in a dermoid cyst is squamous cell carcinoma. Other malignancies arising in MCT are adenocarcinoma, thyroid carcinoma, sebaceous carcinoma, malignant melanoma, and sarcoma. The occasion of a carcinoid tumor arising from MCT is very rare with a very small number

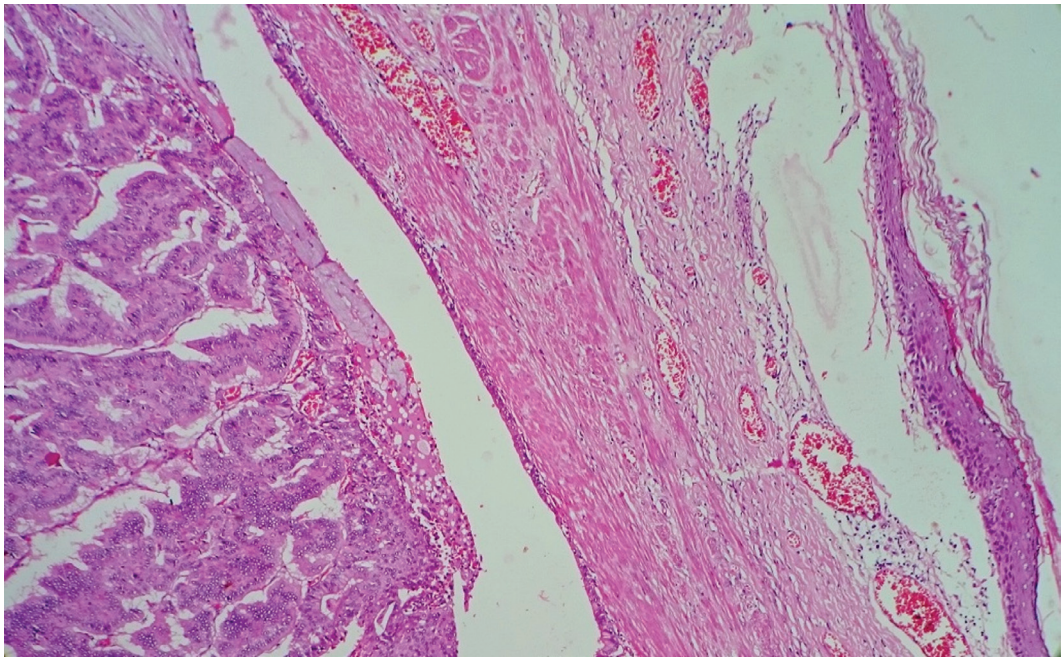

Fig. 2. H&E, 100× – squamous lining of cyst wall with underlying tumor

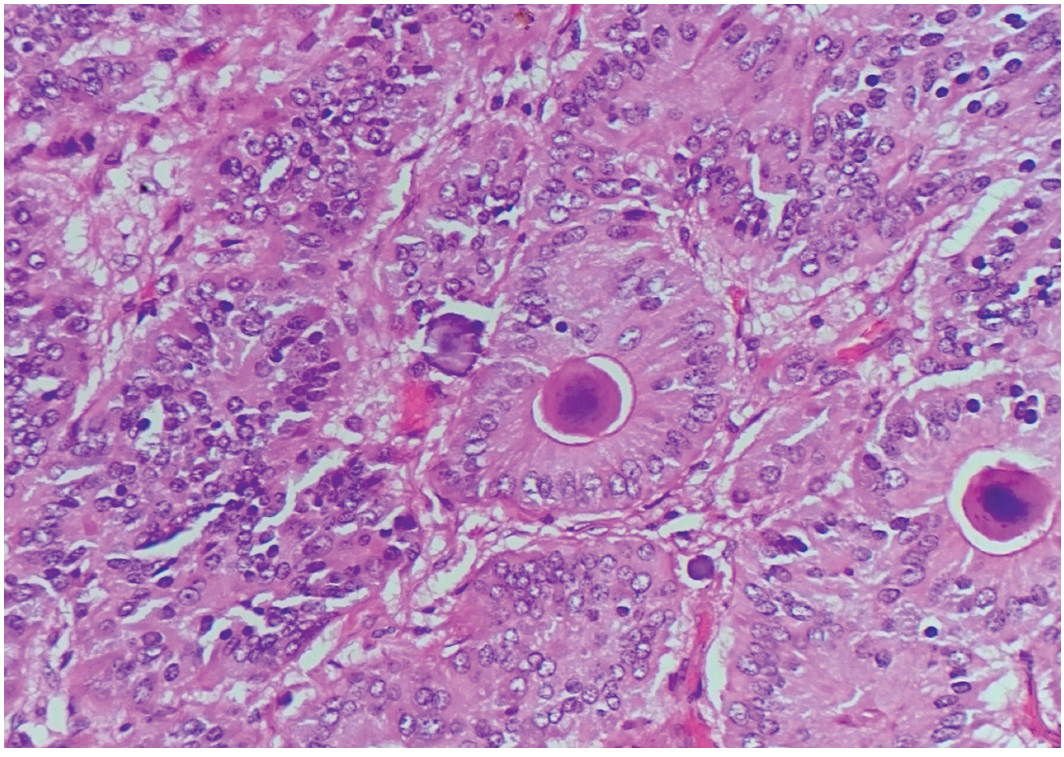

Fig. 3. H&E, 400× – acinar & nesting pattern with calcified secretion and stippled chromatin

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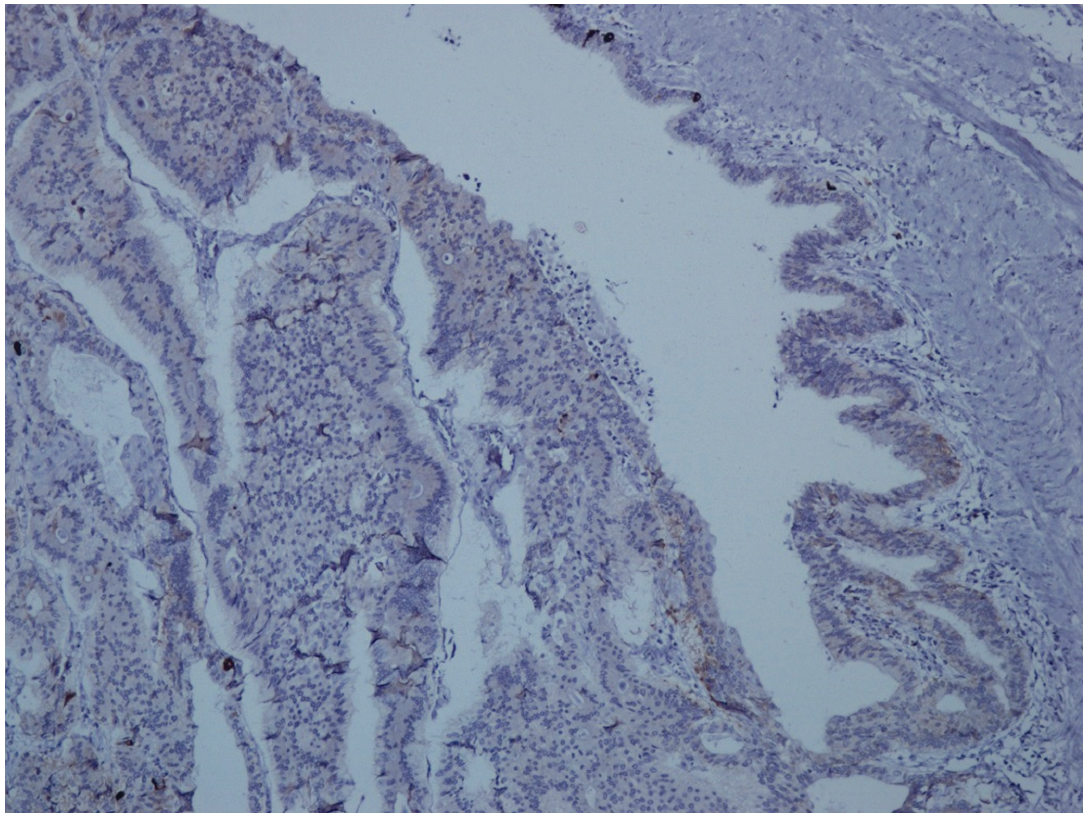

Fig. 4. Chromogranin-negative

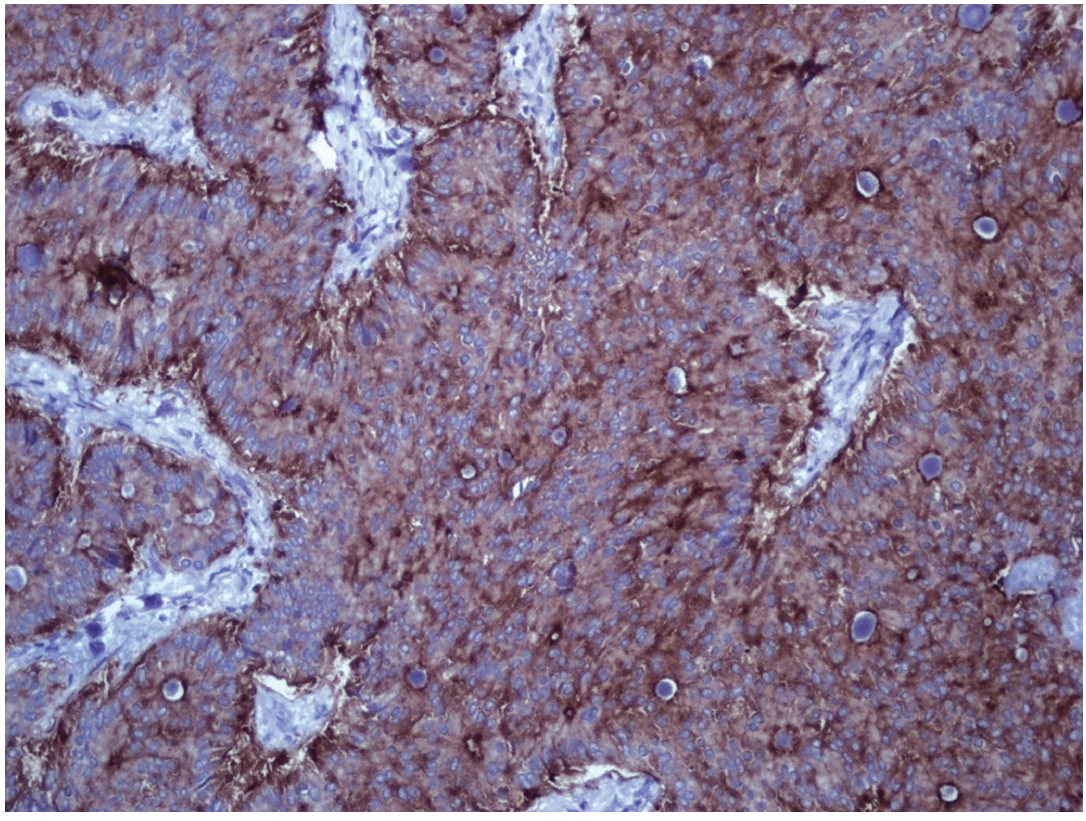

Fig. 5. Synaptophysin-positive

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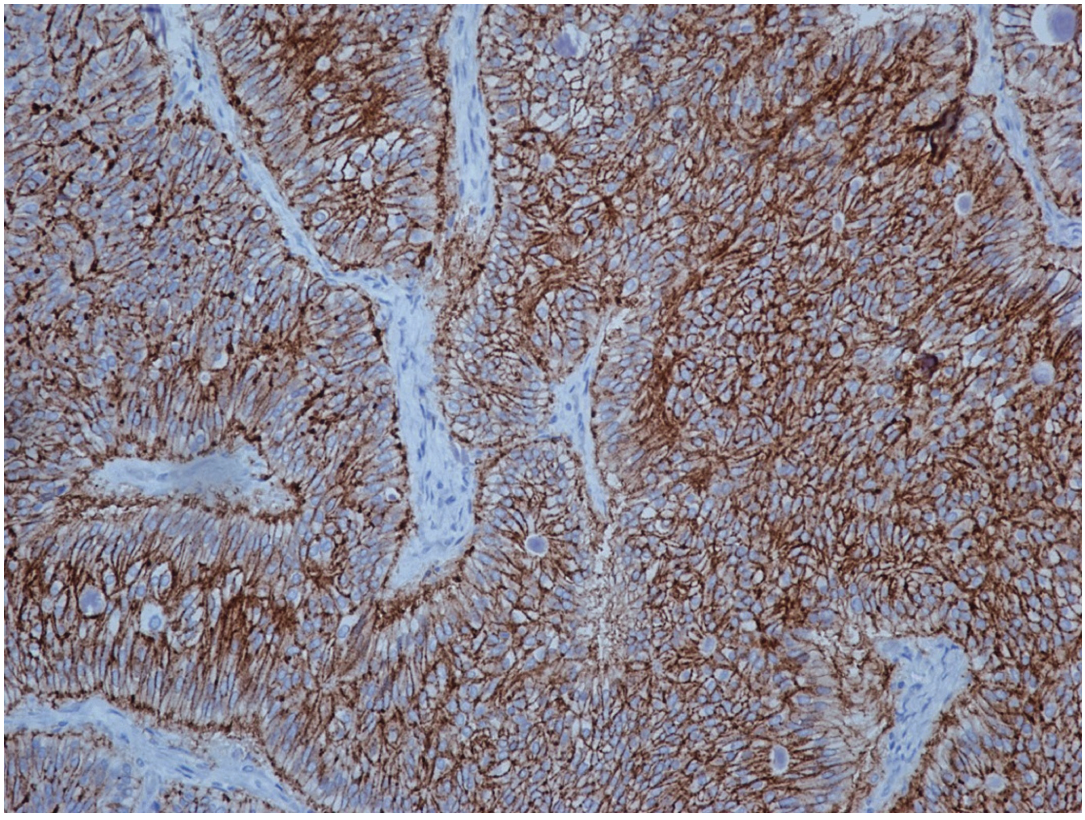

Fig. 6. CD56-positive

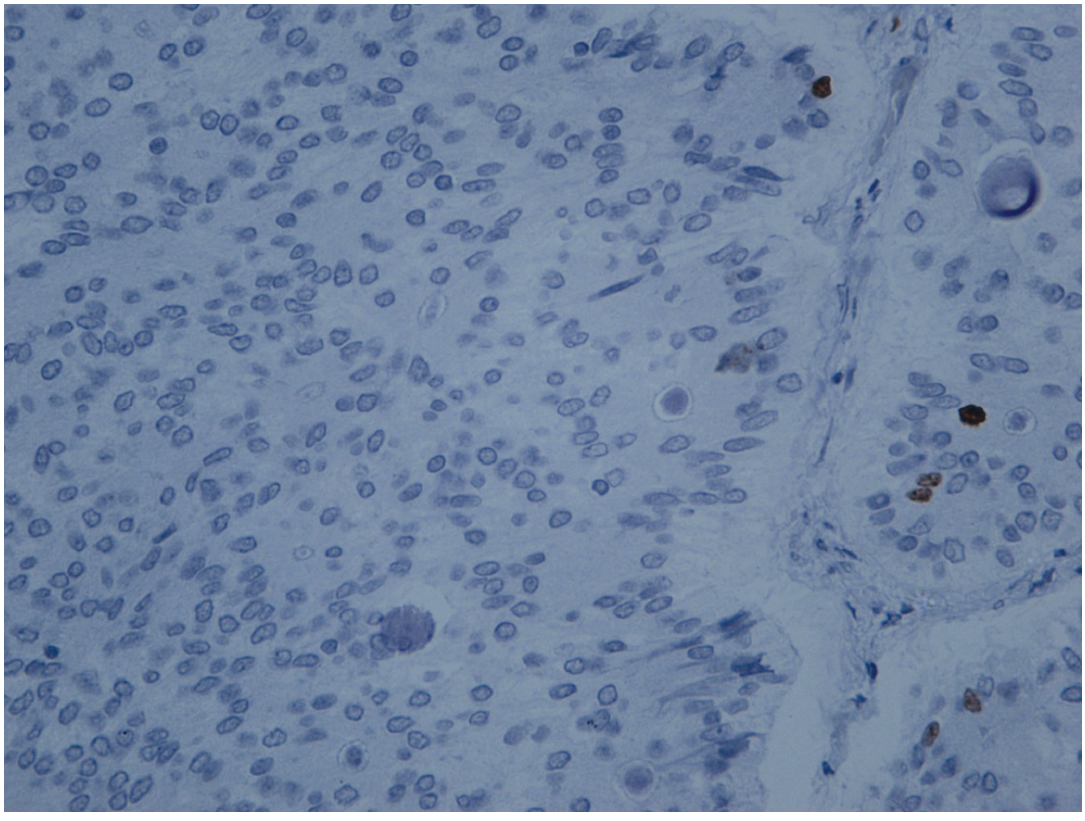

Fig. 7. Ki67 index <2%

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of published cases[3]. Carcinoid tumors constitute only 0.3% of all ovarian neoplasms; thus they may remain undiagnosed until the time of surgery[1]. Primary ovarian carcinoid is probably more frequent than it has been reported[4].

Carcinoid tumor can be seen in the ovary as a metastasis of a primary tumor located in the gastrointestinal tract or elsewhere, as a component of mature cystic teratoma or as a primary pure neoplasm of this organ[1]. The large majority of primary ovarian carcinoids are unilateral, but in 16% of cases the contralateral ovary is involved by a cystic teratoma or a mucinous neoplasm[5]. In contrast, metastatic carcinoids are nearly always bilateral and scattered tumor deposits are present throughout both ovaries[6]. In the present case, the contralateral ovary and peritoneal surface appeared normal on US and during surgery. The established criteria used for differentiating metastatic tumors of the ovary from primary ovarian tumors are still helpful: tumor bilaterality, presence of multiple ovarian nodules and the finding of a primary tumor in the gastrointestinal tract, all favor metastasis to the ovary[7]. The additional presence of teratoma or other surface epithelial tumors, an absence of blood vessels or lymphatic invasion, and confinement to single ovary, as seen in our case, strongly supports a primary ovarian origin[8]. The prognosis in primary carcinoid (whether pure or a component of mature cystic teratoma) is very good, whereas metastatic carcinoids have poor outcome[1].

Talerman divided primary ovarian carcinoid tumors into four types: the insular type, trabecular type, strumal carcinoid and mucinous type[9]. Insular carcinoid tumors are the most widely recognized and the most common type of ovarian carcinoid. Primary insular carcinoid tumors of the ovary are usually found in association with or as a part of mature cystic teratoma, but may also originate within solid teratoma or mucinous tumors. Our case, mostly showing solid nests and acinar pattern with secretion, belongs to the insular type.

Neuroendocrine tumors are graded according to World Health Organization (2010) as low-grade, intermediate-grade or high-grade depending on the proliferative index measured by mitotic rate and Ki67 index[10]. The present case showed well-organized architecture, with minimal cytologic atypia, no mitosis, no necrosis and low Ki67 (<2%) index, which can be best classified as "well-differentiated (low-grade)."

Carcinoid tumors secrete a wide variety of neurohumoral substances, such as serotonin, histamine, tachykinin, bradykinin, kallikrein, corticotrophin, substance-P, motilin, and prostaglandins. Persistent systemic exposure to large quantities of these hormones and biogenic amines can result in carcinoid syndrome, the classical triad of flushing of upper extremities and face, wheezing, and diarrhea. Usually, systemic exposure does not occur with an intestinal carcinoid until it has metastasized, because of efficient hepatic metabolism of secreted substances[1]. However, primary ovarian carcinoid tumors can cause these symptoms directly, because their venous drainage bypasses the portal venous system. In our case, the patient did not present with any features of carcinoid syndrome.

CONCLUSION

This case adds to the rare reports in the literature of a carcinoid tumor occurring in a mature cystic teratoma. It is difficult to make a diagnosis of malignant transformation in MCT of the ovary preoperatively. Extensive histological sampling is crucial to make the diagnosis. The clinician and pathologist should be aware of the malignant transformation when faced with an ovarian dermoid cyst for early and appropriate treatment.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organization, which might negatively affect the content of this publication or claim authorship right to this publication..

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