PATHOLOGICA 2017;109:375-378

Case report

Primary well differentiated neuroendocrine tumor of ovary collides with Mucinous borderline tumor in a postmenopausal female: a report of case and review of literature

M. SHAHID, A. SIDDIQI
Department of Pathology University of Florida College of Medicine, Jacksonville, USA

Key words

Collision tumor • Neuroendocrine tumor • Borderline mucinous tumor • Ovarian tumor

Summary

Collision tumors represent a coexistence of two adjacent but histologically distinct tumors without histologic admixture in an organ. Primary well differentiated neuroendocrine tumor of ovary is rare and coexistent borderline mucinous tumor makes this association extremely rare. Although these tumors have been reported in other organs, its occurrence in ovary is rare. Collision tumor comprising primary neuroendocrine tumor of ovary and mucinous borderline tumor is an extremely rare occurrence. Here we report a case of this collision tumor in a postmenopausal female. H&E and immunohistochemical stains for chromogranin, synaptophysin, CDX-2, CK20, CK7 and Ki-67 were performed to confirm the diagnosis of collision tumor. Extensive search of literature revealed only a couple of cases report so far with this association. Our case is unique for a reason that we have reported trabecular variant of neuroendocrine tumor while the previously reported cases were insular variant. Management depends on patient's age, desire for fertility and disease distribution.

Introduction

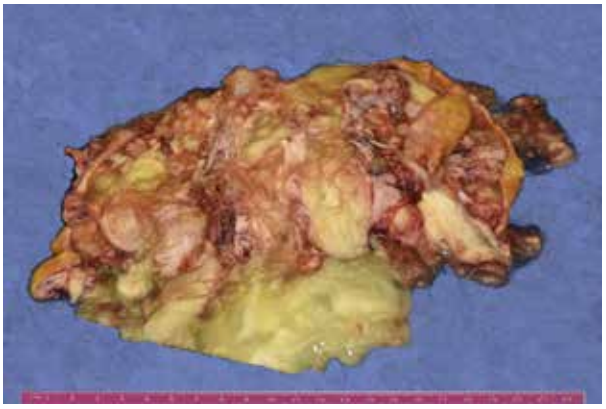
Collision tumor represents a coexistence of two adjacent but histologically different neoplasms occurring in the same organ without histological admixture with both tumors displaying a different histogenesis and different tumorogenesis pathway [1]. Primary well differentiated neuroendocrine tumor of ovary is in itself rare and coexisting Mucinous borderline tumor, intestinal type makes this association even rarer. Primary neuroendocrine tumor of ovary constitute less than 0.5-1.7% of all neuroendocrine tumor and less than 0.1% of all ovarian cancer [2 3]. Four histologic subtypes include insular, trabecular, strumal and mucinous and these types resemble their counterpart in gastrointestinal tract [3 4]. Insular type is most common followed by strumal, trabecular, and mucinous and may occur in pure form or within a dermoid cyst, a mucinous cystic tumour or a Brenner tumor [3]. Insular type is midgut derived and commonly observed in western countries and presents with classical carcinoid syndrome caused by serotonin and its precursors. In contrast, trabecular and strumal types are foregut or hindguts derived and are primarily reported in Japan and presents with constipation induced by the production of peptide YY, an inhibitor of intestinal mobility [7]. Ovarian neuroendocrine tumors are derived from germ cells, and other teratomatous elements may be present in up to 90% of tumors [5].

Case report

A 55-year-old G1P0 woman presented with abdominal distension for 8 months. Her past medical history was unremarkable. Physical examination revealed was a large mass in pelvis measuring 25 cm, and extending above umbilicus and displacing cervix posteriorly. Large volume ascites was also noted. A chest radiograph showed no metastatic disease. She had an elevated CEA 259 ng/ml and normal CA 125 U/ml. Computerized tomography of the abdomen and pelvis confirmed 20.2 cm x 16.4 cm x 16.2 cm ovarian mass with internal cystic change

Correspondence
Mohammad Shahid, University of Florida College of Medicine, Jacksonville1st Floor, Clinical Center, 655 West 8th Street, C504, Jacksonville, FL 32209, USA - E-mail: mohammad.shahid@jax.ufl.edu

Fig. 1. Gross image of ovarian tumor with irregular outer surface and cut section showing cystic areas filled with mucoid material.



with massive ascites with soft tissue nodularity in anterior peritoneum. A paracentesis was performed and cytological findings were reactive mesothelial cells without evidence of malignancy. She underwent exploratory laparotomy with unilateral salpingoophorectomy. Per operative findings were large ovarian mass, large volume mucinous ascites, and yellow necrotic material within peritoneal cavity with extensive adhesive disease of small bowel, large bowel and peritoneum. The liver, stomach, bowel, gallbladder and appendix were normal. There was no evidence of intraluminal gastric or intestinal tumors. Grossly tumor measured 20 cm in greatest dimension with irregular outer surface. Cut surface was partially solid and cystic with mucoid material and papillary projections. (Fig. 1) Microscopically the tumor consists of well differentiated neuroendocrine tumor with coexisting borderline mucinous tumor, intestinal type. Neuroendocrine tumor is composed of monomorphic cells with round nucleus, stippled chromatin, arranged in a wavy and anastomosing ribbons and cords depicting trabecular pattern. Borderline mucinous tumor is composed of the cysts lined by stratified mucinous epithelial cells which resemble dysplastic intestinal epithelial cell and contains goblet cells, neuroendocrine cells and paneth cells. (Figs. 2-3). The neuroendocrine cells are diffusely positive for synaptophysin and chromogranin with a low Ki-67 labeling index supporting the diagnosis of well differentiated neuroendocrine tumor. (Figs. 4-5-6). The intestinal epithelial cells are positive for CDX-2 and CK20 immunostains.

Discussion

Primary well differentiated neuroendocrine tumors of ovary are very rare and a co-existing borderline mucinous tumor is even rarer and only few cases has been reported. Robboy has described two cases of insular carcinoid with mucinous borderline tumor and mucinous cystadenocarcinoma respectively [6], our case is unique in a respect that we encountered trabecular variant of neuroendocrine tumor. Review of literature reveals cases of large cell neuroendocrine carcinomas of ovary and associated serous carcinoma [8] and mucinous borderline tumor of the ovary [9]. Primary and metastatic neuroendocrine tumor of ovary is difficult to differentiate specially in absence of teratomatous component. Appendix is the most common primary site for metastatic ovarian neuroendocrine tumor [4]. Appendix, stomach, large and small intestine was normal in our case. Primary neuroendocrine tumor of ovary constitute less than 0.5-1.7% of all neuroendocrie tumor and less than 0.1% of all ovarian cancer [2 3]. The median age of diagnosis is 53 years of age (range 14-79 years) [3]. Primary neuroendocrine tumor may occur as a pure form or within a dermaoid cyst, mu-

Fig. 2. Low power magnification showing intestinal epithelium with stratification and low grade dysplasia lining the cyst and underline neuroendocrine tumor with monomorphic round cell arranged in trabecular pattern (H & E, 4x).

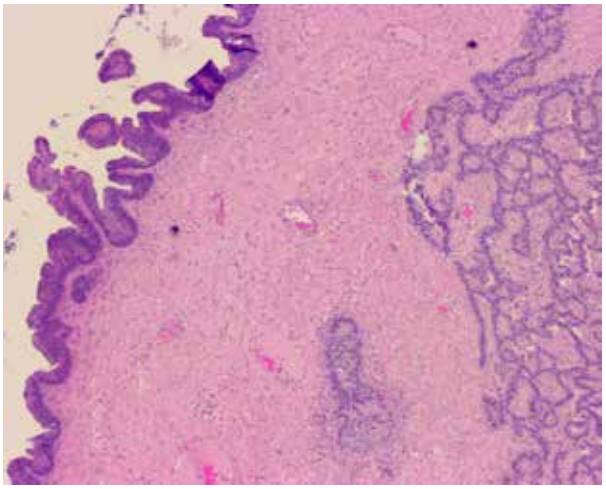


Fig. 3. Medium power magnification showing neuroendocrine tumor with monomorphic round cell with stippled chromatin and arranged in ribbon and cords displaying a trabecular pattern (H & E, 10x).

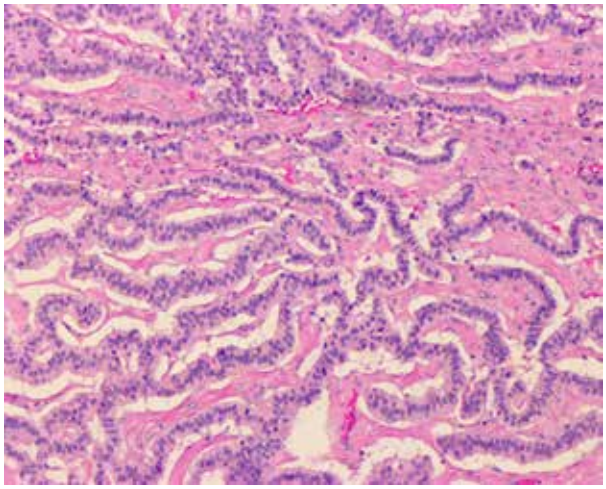
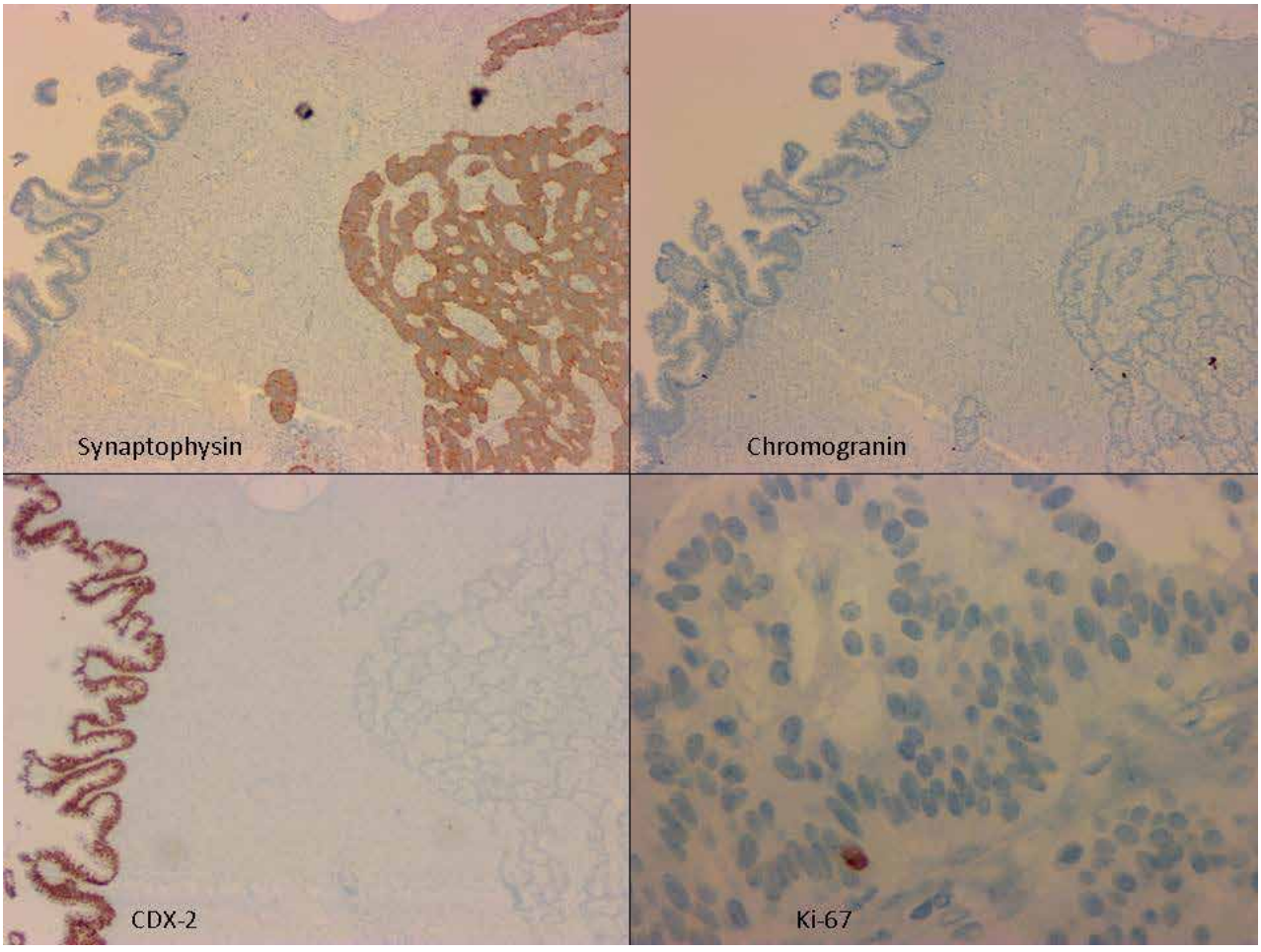


Fig. 4. Tumor with Positive staining for Synaptophysin (IHC, 4x), Negative staining for Chromogranin (IHC, 4x), low Ki-67 index (IHC, 4x). Overlying mucinous epithelium with positive staining with CDX-2 (IHC, 4x).



cinous cystic neoplasm or Brenner tumor [3]. Clinical sign of carcinoid syndrome can be present in 30% of insular carcinoid, rare in trabecular (13%) and strumal carcinoid (3.2%) [3]. Trabecular carcinoid may causes severe constipation and pain in defecation in about 15% of cases due to peptide YY production [3]. Functioning thyroid symptoms can be found in 8% of the strumal carcinoid [3]. Our case didn't present with any carcinoid syndrome. Primary neuroendocrine tumor of ovary are found incidentally on cross section or ultrasound imaging and rarely presents with abdominal pain, constipation, hirsutism and a pelvic mass [10]. This tumors is considered to originate from germ cell, and other teratomatous elements, usually a dermoid cyst, are present in up to 90% of tumors [5]. Grossly the tumor presents as a tan yellow solid nodule adjacent to or protruding from a cyst, while in others as a mural thickening. Neuroendocrine tumor whether pure or associated with a teratoma usually presents as a solid mass while infrequently cut section is cystic [5]. The most common variant of primary ovarian neuroendocrine tumor is insular, followed by strumal trabecular and mucinous [3]. Histologically insular variants are characterized by nests and islands of round cells with monomorphic nuclei with abundant eosinophilic cytoplasm surrounded by an abundant fibromatous stroma. Strumal variants are characterized by variable admixture of neoplastic thyroid tissue with neuroendocrine component which in most cases is trabecular or mixed trabecular and insular. Trabecular variants are characterized by growth of the tumor cells in wavy ribbons and anastomosing cord with oblong nuclei with prominent nucleoli. Mucinous variant consists of columnar or cuboidal cells forming small glands with occasional intracytoplasmic mucin or with a goblet cell appearance [3 11]. Management of ovarian neuroendocrine tumor depends on the age of patient, disease distribution and fertility. In younger patient fertility sparing surgery is usually recommended as in most case these tumors are unilateral and associated with a good prognosis. Radical debulking is done when tumor has spread to adjacent organ. Metastasis is common in regional lymph nodes, liver, bones and lungs. Neuroendocrine tumor has a strong affinity for liver metastasis and unresected tumor should be considered for cryotherapy, radiofrequency ablation or regional embolization [9].

Our patient was managed by unilateral salpingooophorectomy with lysis of adhesion and remains disease free after surgery.

In summary primary neuroendocrine tumor of ovary is rare and a coexistent mucinous borderline tumor makes this association an interesting case to report. Clinical awareness and recognition of such tumors are important as they will dictate appropriate treatment strategies depending on the individual biological aggressiveness of each of the tumor components.

References

[1] Brahmania M, Kanthan CS, Rani Kanthan K. *Collision tumor of the colon – colonic adenocarcinoma and ovarian granulosa cell tumor*. World J Surg Oncol 2007;5:118.

[2] Talerman A. *Germ cell tumors of the ovary*. Curr Opin Obstet Gynecol 1997;9:44-7.

[3] Tavassoli FA, Devilee P. *Pathology and genetics of tumours of the breast and female genital organs*. Lyon: IARC Press 2003, pp. 172-173.

[4] Huang Y, Kumarapeli A, Chen F, et al. *Primary mucinous carcinoid of the ovary arising in a mature cystic teratoma: a case report with review of the literature*. NAJMS 2012;5:239-42.

[5] Eichhorn JH, Young RH. *Neuroendocrine tumors of the genital tract*. Am J Clin Pathol 2001;115:S94-S112.

[6] Robboy SJ. *Insular carcinoid of ovary associated with malignant mucinous tumors*. Cancer 1984;54:2273-6.

[7] Yamaguchi M, Tashiro H, Motohara K, et al. *Primary strumal carcinoid tumor of the ovary: a pregnant patient exhibiting severe constipation and CEA elevation*. Gynecol Oncol Case Rep 2012;4:9-12.

[8] Draganova-Tacheva RA, Khurana JS, Huang Y, et al. *Large cell neuroendocrine carcinoma of the ovary associated with serous carcinoma with mucin production: a case report and literature review*. Int J Clin Exp Pathol 2009;2:304-9.

[9] Kim JM, Shin HC, Kim MJ. *Ovarian large cell neuroendocrine carcinoma associated with endocervical-like mucinous borderline tumor: a case report and literature review*. Korean J Pathol 2011;45:523-528.

[10] Gardner GJ, Reidy-Lagunes D, Gehrig PA, *Neuroendocrine tumors of the gynecologic tract: a Society of Gynecologic Oncology (SGO) clinical document*. Gynecol Oncol 2011;122:190-8.

[11] Baker PM, Oliva E, Young RH, et al. *Ovarian mucinous carcinoids including some with a carcinomatous component a report of 17 cases*. Am J Surg Pathol 2001;25:557-8.