Case Report:
Tubular Krukenberg Tumor with an Occult Primary

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Abstract:
Tubular Krukenberg tumor with an occult primary can cause problems in histopathologic diagnosis, by mimicking primary ovarian tumors. We present one such occurrence in a 32-year-old female who underwent surgery for bilateral malignant ovarian tumor. Gross examination of both ovarian tumors revealed bosselated, smooth outer surface with a few cysts on the surface. Cut surface was grey-white to yellowish in colour with cysts filled with serous fluid at the periphery. Microscopic examination of both ovaries revealed mucin laden signet ring cells, predominantly showing tubular architecture within a cellular ovarian stroma. The cytoplasm of these cells varied from granular eosinophilic to pale vacuolated appearance and showed PAS and mucicarmine positive mucin. Differential diagnosis with other primary ovarian tumors is discussed.

Key Words: Krukenberg tumors; Tubular variant; Ovary

Introduction:
Krukenberg tumors (KT) are rare among ovarian metastases, but responsible for the most frequent diagnostic confusions with primary ovarian cancers. Especially those with an occult primary can cause diagnostic confusion with the primary ovarian tumors. Distinction from the latter is of great importance as misclassification of Krukenberg tumor as a primary ovarian tumor may lead to suboptimal treatment of the patient. We report a case of tubular Krukenberg tumor in a 32-year-old female with an occult primary tumor and discuss the diagnostic difficulties that arise with such an occurrence.

Case Report:
A 32 year old female presented with fullness of lower abdomen, polymenorrhagia and decreased appetite since 2 months. CT scan revealed a large well defined soft tissue density mass lesion with heterogenous solid and cystic components in both uterine adnexa measuring 16x11.5cm (right side) and 12x8cm (left side) respectively. In addition there were gross ascites and significant retroperitoneal lymphadenopathy. Possibility of bilateral malignant sex cord stromal tumor was suggested. Serum levels of CA-125 was also raised (1410u/ml). Patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy.

On gross examination, ovarian tumors were measuring 17x11x9cm and 12x8x5cm respectively. Both ovarian tumors showed bosselated, smooth outer surface with a few cysts on the surface. Cut surface showed lobulated, grey white to yellowish colour with cysts filled with serous fluid at the periphery.

Microscopic examination of the sections from both ovaries showed mucin laden signet ring cells, predominantly showing tubular architecture within a cellular ovarian stroma (Figure 2). The cytoplasm of these cells varied from granular eosinophilic to pale vacuolated appearance and showed PAS and mucicarmine positive mucin. The diagnosis of bilateral Tubular Krukenberg was given. Detailed radiographic and endoscopic exploration of the digestive system of the patient did not reveal any primary tumor.
primary ovarian tumor may lead to suboptimal treatment of the primary ovarian tumors. Distinction from the latter is of great ever, Krukenberg tumors may mimic other metastatic or metastatic carcinoma, usually a Sertoli-Leydig cell tumor. Presence of signet ring cells within the tubules is inconsistent with Sertoli-Leydig cell tumor. In contrast to Krukenberg tumor, Sertoli-Leydig cell tumor stains positive to inhibin but negative to cytokeratins or epithelial membrane antigen. Other ovarian tumors with a tubular pattern that can enter the differential diagnosis in this group include well-differentiated endometrioid carcinoma (metastatic or primary), clear cell carcinoma and tumors of Wolffian origin. Differentiation can be made on the basis of their characteristic histologic features. Bullon A et al reviewed a series of 70 Krukenberg tumors and found 13 cases with a predominant tubular pattern. Eleven of them had been diagnosed by the referring pathologist as a tumor in the sex cord-stromal category, usually a Sertoli-Leydig cell tumor and no diagnosis was given in the other two cases. Three factors contributed to the erroneous diagnoses in their cases which included: a prominent tubular pattern, luteinization of the stroma of the tumor in five cases, and associated virilization in two cases. Each tumor, however, contained typical signet-ring cells that were readily demonstrable with mucicarmine stains. With their experience, they concluded that the diagnosis of Krukenberg tumor must always be considered in the differential diagnosis of an ovarian tumor with a tubular pattern even though endocrine manifestations are present. Rarely, primary mucinous carcinomas of the ovary may contain signet ring cells, but not in great number. However, careful consideration of the clinical background, distribution of disease, gross characteristics and spectrum of routine microscopic findings, will lead to the correct diagnosis in the majority of cases and at the very least lead to formulation of a considered differential diagnosis such that use of special techniques may be judicious and those results placed in context of the time-honored clinical and pathologic features. Preoperative serum CA 125 levels in patients with Krukenberg tumors can be elevated, though they subsequently decrease after tumor resection. On the basis of this observation, serum CA 125 level can be used for (1) postoperative follow-up of patients for evaluation of complete resection of the tumor, and (2) follow-up of patients with a history of primary adenocarcinomas (gastrointestinal, in particular) for early detection of ovarian metastasis. Serum CA 125 level also can help predict the prognosis. References:

