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CASE REPORT

Krukenberg tumor in pregnancy. The lethal outcome

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Krukenberg tumor refers to gastrointestinal cancer metastatic to the ovaries and its prognosis is uniformly poor. This case report concerns a 38-year-old pregnant woman suffering from abdominal pain and iterative vomiting episodes. She presented with a large abdominopelvic tumor. Because of suspected ovarian torsion, we performed urgent surgery. At laparotomy, bilateral ovarian tumors, ascites and gastric cancer located at the cardia and the lesser curvature invading the serosa were identified. We performed right ovariectomy, resection of the left ovary, and gastric biopsy. Histological examination of the specimen yielded diagnosis of Krukenberg tumor. Ten days later the patient underwent an elective Cesarean section in the 25th gestational week because of fetal asphyxia and very poor maternal life prognosis. We performed Cesarean delivery and extracted a vital female newborn of 31 cm, 600 g, Ap score 3, with virilization. Few days later the baby died at the intensive care unit. Two weeks later the mother died because of pulmonary failure. (Pathology Oncology Research Vol 12, No 2, 108–110)

Key words: Krukenberg tumor, pregnancy, lethal outcome

Introduction

Krukenberg tumor refers to gastrointestinal cancer metastatic to the ovaries, and its prognosis is uniformly poor. Gastric cancer has been reported as the most frequent primary source of Krukenberg tumor. Despite the improved prognosis as a result of the early diagnosis, radical surgery, and the advances in adjuvant therapy, death from gastric cancer is almost always due to the recurrent disease. Even after a curative resection, a considerable number of patients experience recurrences that often preclude further treatment, especially surgery, and thus imply an inevitable poor prognosis. Ovarian metastasis of gastric cancer is not rare and is one of the most important causes of treatment failure in female patients. However, no optimal treatment strategy for Krukenberg tumors from gastric cancer has been clearly established. Most surgeons do not attempt to remove ovarian tumors when Krukenberg tumors are diagnosed preoperatively.[1,2] Many factors, including a delay in diagnosis which leads to a lower rate of resectability, poor patient tolerance for surgery, and relatively high operation-related morbidity as well as overall dismal prognosis, dissuade surgeons from resection when faced with Krukenberg tumors.[3] This case report concerns a 38-year-old pregnant woman suffering from abdominal pain and iterative vomiting episodes. She presented with a large abdominopelvic tumor that was subsequently diagnosed to be an ovarian metastasis (Krukenberg tumor) of a nonresectable primary gastric carcinoma.

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Case report

A 38-year-old pregnant woman, 0-para, 2-gravida, was admitted to our hospital with intensive abdominal pain and iterative vomiting episodes. The physical examination, radiological imaging and ultrasound examination showed cachexia, dyspnea, ascites, right sided hydrothorax and mobile tumors of nearly 10 cm in both ovaries. She also suffered from difficulty of defecation, possibly because of the masses. The level of tumor marker Ca 125 was highly elevated, 425 U/ml. Ultrasound imaging of pregnancy was normal except for Doppler velocimetry. Gestational age was 24 weeks, BPD 60 mm, AC 190 mm, Fl 40 mm, estimated fetal weight was 600 g. Doppler measurements showed fetal hypoxia: there was absence of late diastolic flow in the umbilical artery and

increased diastolic blood flow in the middle cerebral artery. Laboratory tests were normal except mild anemia (RBC 4.0x10e12/L, Hb 105 g/L, Hct 30%) and leukocytosis (14x10e12/L). Because of suspected ovarian torsion, we performed urgent surgery. At laparotomy, bilateral ovarian tumors, ascites and gastric cancer located at the cardia and the lesser curvature invading the serosal, were identified. No visceral metastases and no peritoneal involvement were noted. Cytological examination of peritoneal washing revealed no malignancy. The patient was non-operable, and we decided to do palliative surgery. We performed right ovariectomy, resection of the left ovary, and gastric biopsy. Histological examination of the specimen yielded diagnosis of poorly differentiated type signet-ring cell adenocarcinoma metastaticum partim mucinosum ovarii et peritonei-Krukenberg (G-3), with primary tumor located in the stomach. Malignant cells had discrete vacuoles pushing nuclei eccentrically. Mucicarmine stain demonstrated the cytoplasmic vacuoles to be mucin. Immunohistochemically positive reactions were seen for cytokeratin 7 (+) *(Figure 1.)*, cytokeratin 8 (+++), cytokeratin 18 (+/-), CEA (+++) *(Figure 2.)*. Repeated cytological examinations of the ascites and hydrothorax revealed no malignant cells. A right chest tube drainage relieved her dyspnea. Postoperative clinical (chest X-ray, CT scans) and pathological examination showed Krukenberg tumor with hepatic, pulmonary and ovarian metastases. The ethical committee of our Institute of Obstetrics and Gynecology and the patient's family decided to terminate the pregnancy because of fetal asphyxia and very poor maternal life prognosis. We performed Cesarean delivery and extracted a vital female newborn of 31 cm, 600 g, Ap score 3, with virilization. Few days later the baby died at the intensive care unit. Two weeks later the mother died because of pulmonary failure.

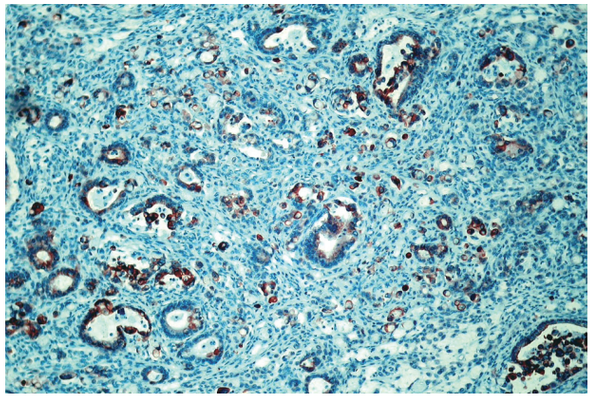

Figure 1. *Cytokeratin 7 positivity in Krukenberg tumor*

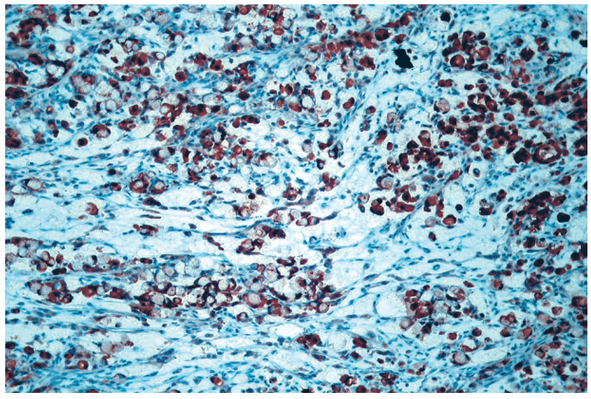

Figure 2. *CEA positivity in Krukenberg tumor*

Discussion

The persistent gastrointestinal symptoms mimicking the early nausea and vomiting of pregnancy mask the presentation of a tumor in the stomach. Growth of the fetus leading to abdominal distension masks the presence of the metastatic ovarian tumor in the pelvic cavity. Thus, early diagnosis of the tumor may be delayed.[4,5] We emphasize the importance of differentiation between physiological morning sickness and unusual persistent gastrointestinal symptoms in pregnant women. Persistent unusual gastrointestinal symptoms need careful evaluation by panendoscopic examination. A number of patients with Krukenberg tumors are discovered postpartum. Fetal asphyxia and fetal virilization may occur during pregnancy as the result of advanced malignant disease and ovarian Krukenberg tumor. Mechanism of the androgen overproduction in this exceptional condition is still poorly understood.[6]

It is sometimes very difficult to make diagnosis in Krukenberg tumor. In some cases a primary tumor is not found. The lesions are usually not discovered until the primary disease is advanced, therefore, most patients die of their disease within one year. Our patient died within one month.

Review of the literature has identified a number of diagnostic and management issues that appear to impact on survival. These include timing of definitive diagnosis of Krukenberg tumors, i.e. before, after, or at the same time as diagnosis of the gastrointestinal primary tumor, menopausal status, concurrent pregnancy, the role of debulking, and prophylactic oophorectomy. The prognosis worsens when the primary tumor is identified after the metastasis to the ovary is discovered.[7,8]

Since the clinical and pathologic details in the literature vary widely, it is extremely difficult to compare studies, particularly the treatment and survival of patients with Krukenberg tumor. Reports should include age, site of gastrointestinal primary, time from diagnosis of primary to ovarian metastasis, and overall survival as well as survival from the time of diagnosis and treatment of Krukenberg tumor. Persistent gastrointestinal symptoms always

warrant investigation. Pelvic inflammatory disease, pregnancy, and postpartum endometritis may mask the gastrointestinal symptoms. Delays in diagnosis should be avoided.[9,10] During surgery, the gynecologic surgeon must do a complete upper abdominal exploration, and the general surgeon must do a complete pelvic evaluation.

Resection of metastatic ovarian tumors and cytoreductive surgery as part of the treatment for Krukenberg tumor play a pivotal role in improving the survival time of the patients, provided that there is no distant metastasis. It was suggested that a combined modality involving complete cytoreductive surgery leaving no gross residual disease after a resection and intraperitoneal chemotherapy could improve the poor prognosis of advanced gastric cancers.[11,12] Unfortunately, our patient was in terminal stage of malignant disease and we did not perform radical surgery.

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