Incidentally Diagnosed Krukenberg Tumor in a Young Pregnant Woman

Dear Editor,

Malignancy is a rare finding during pregnancy. The most common cancers seen during pregnancy are carcinoma breast (incidence 1: 3000),^[1] followed by cervical cancer, Hodgkin's lymphoma, and ovarian cancer. The Krukenberg tumor accounts for 1%–2% of all ovarian tumors.^[2] Moreover, these tumors during pregnancy are even rarer, as the incidence of gastric cancer in the women of reproductive age group is only 0.4%–0.5%.^[3] The rarity of this condition is reflected in the lack of information in the literature, regarding the appropriate treatment and management. The pregnancy also masks the presence of the disease. Late diagnosis does not only affect the outcome of the patient's health but also offers psychological and social implications involving the mother and future child.

A 22-year-old pregnant woman, gravida 2 para 1 presented in the department of obstetrics and gynecology for a prenatal check-up. She had complaints of abdominal bloating with mild abdominal pain and decreased appetite for the last 3 weeks. General physical and systemic examination was within normal limits. Abdominal examination was done, the height of uterus was 26-28 weeks, cephalic presentation, liquor adequate, and fetal heart sound cannot be localized. Vagina and cervix were normal with os closed on per-speculum and per-vaginum examination. During the course of her investigations for preeclampsia, she was noted to have a large pelvic echogenic mass more toward right adnexa measuring $13.7 \text{ cm} \times 13.5 \text{ cm}$ along with intrauterine viable pregnancy. These findings prompted measurements of her tumor markers which demonstrated cancer antigen (CA) 125-1594.9 U/ml, alpha-fetoprotein - 100 ng/ ml, human chorionic gonadotrophin - 15,007 mIU/ml, and lactate dehydrogenase - 165 U/L. The carcinoembryonic antigen (CEA) level was not done. Magnetic resonance imaging was suggestive of intrauterine developing fetus with cephalic presentation along with a large lobulated altered signal intensity mass in the abdomen, which was arising from the pelvis (17 cm \times 14 cm \times 19 cm) with extent up to subhepatic region with small pedunculous communication with the lateral wall of the uterus [Figure 1]. The possibility of the malignant ovarian tumor was kept. The patient was discussed in tumor board, and it was decided to continue pregnancy up to 35 weeks. At 35 weeks of gestation, the patient underwent exploratory laparotomy proceed elective lower segment cesarean section with right

salpingo-oophorectomy with omentectomy. The baby was safely delivered. This procedure allowed visual inspection of this pelvis which demonstrated that by this stage, the right mass had progressed into a large 25 cm cystic lesion attached to the broad ligament and posterior wall of the uterus, with a 3-cm irregular ovarian mass on the left. There was no free fluid in the abdomen and pelvis. The inspection of the stomach and colon during surgery was unremarkable. Histological analysis of the peritoneum and omentum samples showed infiltration by adenocarcinoma with areas of signet ring cell differentiation. The presence of signet cells indicates that the primary malignancy is most likely of gastrointestinal origin and hence that the ovarian masses detected are metastatic, most likely a Krukenberg tumor. This was further supported by the immunochemistry results as tumors that are immunoreactive to CK20, CDX2, CK-19, CK-7, and CEA suggest a gastropancreatobiliary origin.[4] Postoperative serum markers, including CA 125-38.2 U/ml, serum CEA - 42.19 ng/ml, inhibin-A and inhibin-B, α FP, and β -HcG – were within normal ranges. Postoperative contrast-enhanced computed tomography abdomen was suggestive of circumferential thickening involving the sigmoid colon with surrounding stranding and abdominal lymphadenopathy [Figure 1]. Colonoscopy and colonic biopsy were done suggestive of adenocarcinoma sigmoid colon [Figure 2] which was diagnosed as colon cancer stage IV B and planned for palliative chemotherapy. The palliative capecitabine and oxaliplatin-based chemotherapy was commenced. The patient developed disseminated disease and succumbed to disease (8 months postpartum). The prognosis of a patient with Krukenberg tumor is extremely poor with average survival time between 3 and 10 months.^[5] Some studies had shown the importance of early detection and resection of ovarian metastases might prolong survival.

The inference we draw from this case is that there is a vital need for earlier detection and diagnosis given the unfavorable outcome. Many studies reflected that life-changing advantages of earlier detection can give higher survival rate of 50%–60%.^[6] Furthermore, if the disease is detected before 22 weeks' gestation, it allows the mothers a wider choice of management options including the termination of the pregnancy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her



Figure 1: (a) Magnetic resonance imaging showing intrauterine developing fetus with large lobulated altered signal intensity lesion measuring 17 cm \times 14 cm \times 19 cm seen in the right side of abdomen appearing to arise from the pelvis with extent up to subhepatic region with small pediculous communication with lateral wall of uterus. (b and c) Contrast-enhanced computed tomography showing multiple lymph nodes seen in the prepara-aortic, mesentery, pelvis, and along bilateral iliac vessels largest 12 mm in the para-aortic region. Heterogeneously enhancing circumferential thickening seen involving the sigmoid colon for length of 6 cm with maximum thickness of 13 mm with surrounding stranding



Figure 2: Hematoxylin and eosin staining $(\times 100)$ of sigmoid colon biopsy suggestive of diffuse infiltrative poorly differentiated (G3) signet ring cell adenocarcinoma

consent for her images and other clinical information to be reported in the journal. The patient understands that name and initial will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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