International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Khamkar PD et al. Int J Reprod Contracept Obstet Gynecol. 2026 Aug;15(8):3248-3251
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20262566

Case Report

A gastrointestinal malignancy presenting as an ovarian mass: a case report of Krukenberg tumours

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Received: 18 April 2026
Revised: 04 July 2026
Accepted: 08 July 2026

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ABSTRACT

Krukenberg tumour is a rare metastatic ovarian malignancy, most commonly arising from gastric signet-ring cell carcinoma. We report two cases of histopathologically confirmed Krukenberg tumours presenting with abdominal pain, menstrual irregularities, weight loss, and ovarian masses. Imaging studies revealed ovarian lesions associated with gastric wall thickening, while endoscopic biopsy confirmed gastric adenocarcinoma in both patients. Surgical management was performed, and histopathological examination established the diagnosis of metastatic ovarian involvement. These cases highlight the importance of considering a gastrointestinal primary in women presenting with ovarian masses and emphasize the role of early diagnosis and multidisciplinary management in improving patient outcomes.

Keywords: Krukenberg tumor, Ovarian metastasis, Signet ring cell carcinoma, Gastric adenocarcinoma, Immunohistochemistry, Bilateral ovarian masses

INTRODUCTION

Krukenberg tumour is an uncommon but highly aggressive form of metastatic ovarian malignancy characterized histologically by mucin-secreting signet-ring cells embedded within a cellular ovarian stroma.[1] It accounts for approximately 1-2% of all ovarian tumours and most commonly originates from primary gastric adenocarcinoma, although colorectal, pancreatic, biliary, and breast cancers have also been implicated.[2,3] Krukenberg tumours frequently affect women of reproductive age and are often bilateral, making differentiation from primary ovarian malignancies challenging. Despite advances in imaging, immunohistochemistry, and systemic therapy, prognosis remains poor because the majority of patients present with advanced metastatic disease.[4] We report two histopathologically confirmed cases of Krukenberg tumour associated with previously undiagnosed gastric carcinoma encountered at CAMA and ALBLESS hospital, Mumbai.

CASE REPORT

We present two cases of histopathologically confirmed Krukenberg tumours encountered at a tertiary care center, both associated with previously undiagnosed gastric malignancy.

The first case involved a 25-year-old nulliparous woman who presented with gradually progressive abdominal pain for approximately 20-25 days. Her symptoms were associated with menstrual irregularities, altered bowel habits, anorexia, and unintentional weight loss. On clinical examination, abdominal distension with a palpable adnexal mass was noted. Ultrasonography revealed a bulky heterogeneous right ovarian mass with both solid and cystic components. Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis demonstrated diffuse circumferential thickening of the gastric wall involving the cardia, fundus, and body, with surrounding fat stranding and regional lymphadenopathy. A large neovascular pelvic mass measuring approximately

9.5×10.5×12.6 cm was also identified, replacing the right ovary. PET-CT imaging showed metabolically active lesions in both the stomach and ovary. Upper gastrointestinal endoscopy revealed diffuse mucosal infiltration, and biopsy confirmed signet-ring cell adenocarcinoma of the stomach. The patient subsequently underwent exploratory laparotomy with total abdominal hysterectomy and bilateral salpingo-oophorectomy, followed by oncologic referral. Histopathological evaluation of the ovarian mass demonstrated signet-ring cell morphology consistent with metastatic Krukenberg tumour.

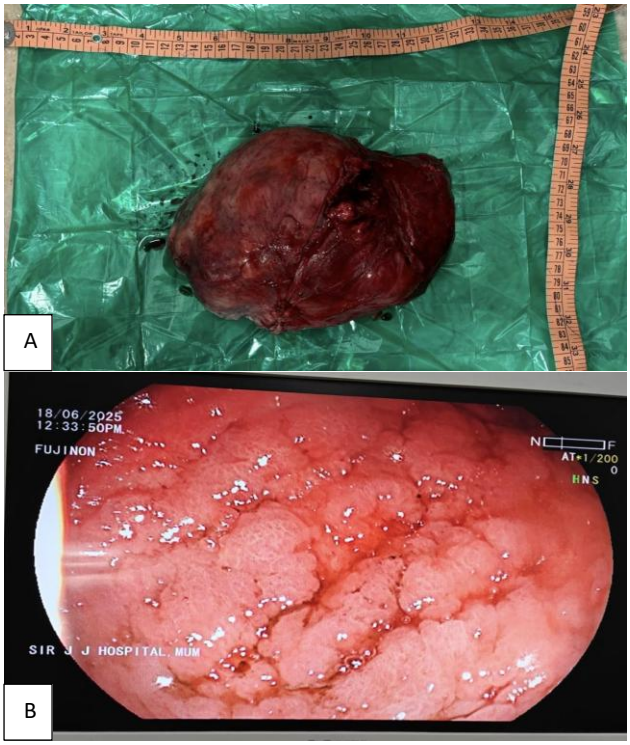

Figure 1 (A and B): (A) Right ovarian mass (9.5×10.5×12.6 cm); (B) Gastrointestinal endoscopy revealed diffuse mucosal infiltration.

The second case was a 37-year-old multiparous woman (P2L2) who presented with abdominal pain of 15 days duration accompanied by menstrual irregularity, weight loss, and altered bowel habits. Ultrasonography revealed bilateral ovarian masses with mixed solid and cystic characteristics. CECT imaging demonstrated long-segment irregular circumferential thickening of the gastric wall with associated nodal metastasis, along with bilateral ovarian masses measuring 9×10×12 cm on the right side and 8×6×2 cm on the left side. PET-CT confirmed metabolically active lesions involving the stomach and both ovaries. Endoscopic biopsy of the gastric lesion revealed poorly differentiated signet-ring cell adenocarcinoma. The patient underwent exploratory laparotomy with total abdominal hysterectomy, bilateral salpingo-oophorectomy, infracolic omentectomy, appendicectomy, and retroperitoneal lymph node dissection. Cystoscopy demonstrated a localized erythematous nodular lesion on the bladder mucosa. Histopathological examination confirmed high-grade adenocarcinoma with signet-ring morphology, consistent with Krukenberg tumour. Immunohistochemistry showed positivity for CDX2, CK7, and EMA, supporting a gastrointestinal origin. Tumor markers were elevated, including CA 19-9 (242 U/mL) and CEA (18 ng/mL). The patient received six cycles of paclitaxel and carboplatin chemotherapy and is currently on follow-up with stable clinical status.

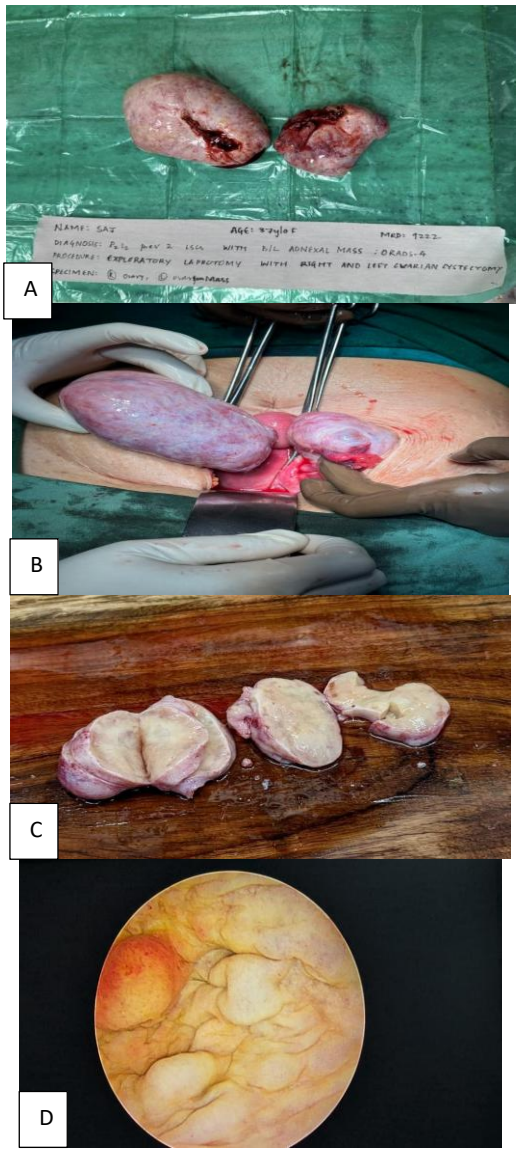

Figure 2 (A-D): (A) bilateral ovarian masses measuring 9×10×12 cm on the right side and 8×6×2 cm on the left side.

solid, enlarged, bosselated masses; (B) Intra operative picture; (C) Cut section of Ovarian Mass:- yellow-white, firm, homogeneous, and lobulated, with a characteristic whorled appearance; (D) Cystoscopy: S/o thickening of bladder mucosa with bladder nodule.

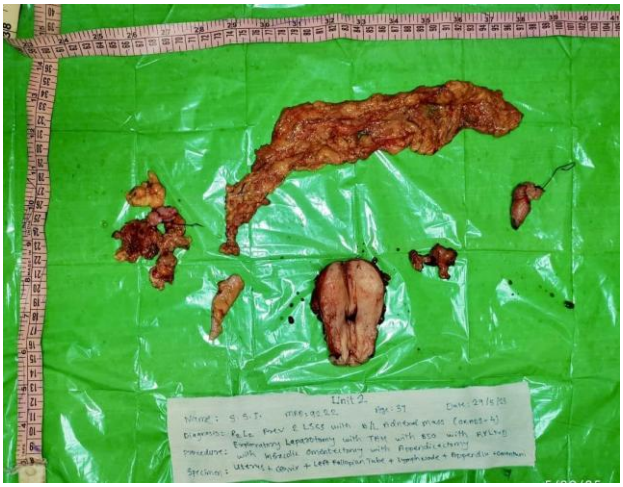

Figure 3: Cut open specimen of uterus + B/L fallopian tubes+omentum+appendix.

Both cases illustrate the diagnostic challenge in differentiating metastatic ovarian tumors from primary ovarian malignancies, particularly in younger women. The presence of bilateral solid ovarian masses accompanied by gastrointestinal symptoms and elevated CEA or CA 19-9 should raise suspicion of an underlying gastrointestinal primary tumour. Early multidisciplinary evaluation remains essential for timely diagnosis and optimal management.

DISCUSSION

Krukenberg tumours are more frequently seen in women of reproductive or premenopausal age, in contrast to primary epithelial ovarian cancers that usually occur after menopause.[5,6] Patients often present with nonspecific symptoms such as abdominal pain, distension, bloating, menstrual irregularities, or a palpable pelvic mass. Gastrointestinal complaints including early satiety, vomiting, weight loss, and altered bowel habits may also be present.[6,7] Advanced disease may manifest with ascites, pleural effusion, and cachexia. Bilateral ovarian involvement occurs in nearly 80% of cases, and the tumours are typically solid and enlarged.[5,8]

Diagnosis can be challenging as clinical and imaging findings often mimic primary ovarian malignancy.[7,8] Ultrasonography usually demonstrates bilateral solid ovarian masses, while CT or MRI helps assess metastatic spread and identify the primary tumour. PET-CT may aid in detecting occult primary lesions.[4,8] Although nonspecific, serum tumour markers such as CA-125, carcinoembryonic antigen (CEA), and CA 19-9 may provide supportive diagnostic clues. Elevated CEA and CA 19-9 levels often suggest a GI origin, whereas increased CA-125 may reflect peritoneal involvement.[9,10]

Definitive diagnosis relies on histopathological examination, with the characteristic finding of mucin-filled signet-ring cells infiltrating the ovarian stroma.[5,6] Immunohistochemistry further assists in determining the tumour origin. A marker panel including CK7, CK20, CDX2, SATB2, and E-cadherin helps differentiate metastatic gastrointestinal tumours from primary ovarian neoplasms. For instance, CDX2 and SATB2 positivity supports a gastrointestinal or colorectal origin, while patterns of CK7 and CK20 expression provide additional diagnostic clues.[7,8]

Management is individualized and depends on the primary tumour, disease extent, and patient condition. Treatment generally involves a multimodal approach combining cytoreductive surgery and systemic chemotherapy.[12] Aggressive debulking, including oophorectomy and resection of the primary tumour, may improve survival in selected patients with limited disease, particularly when complete cytoreduction (R0) is achieved.[12] Chemotherapy regimens are guided by the primary malignancy, such as FOLFOX or FOLFIRI for colorectal cancer and platinum-based therapy for gastric carcinoma. In selected cases with peritoneal metastasis, cytoreductive surgery with HIPEC has shown potential benefit.[13]

Despite advances in treatment, the prognosis of Krukenberg tumour remains poor, with median survival ranging from 6 to 24 months.[5,13] Better outcomes are associated with early diagnosis, isolated ovarian metastasis, complete surgical resection, and good response to systemic therapy. However, most patients present with advanced disease, resulting in limited therapeutic options and unfavorable survival.[12,13]

CONCLUSION

Given the rarity and aggressive clinical course of this condition, case reports and case series play an important role in expanding current clinical knowledge. Such reports help delineate patterns of presentation, highlight diagnostic challenges, and provide insights into treatment outcomes. The present case series describes the clinical characteristics, diagnostic approach, management, and outcomes of patients with Krukenberg tumours presenting to a tertiary care centre, underscoring the importance of early recognition and multidisciplinary management.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Khamkar PD, Palve T, Shetty A. A gastrointestinal malignancy presenting as an ovarian mass: a case report of Krukenberg tumours. Int J Reprod Contracept Obstet Gynecol 2026;15:3248-51.