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A Rare Case of Krukenberg Tumor in a Young Female Initially Misdiagnosed as Ovarian Tuberculosis

Noman Salih^{1*}, Numan Ghani², Izhar Ullah¹, Hidayat Ullah¹, Khwaja Talha Aziz¹, Muhammad Ihtisham³

¹Department of Internal Medicine, Hayatabad Medical Complex Peshawar, Peshawar, Pakistan

²Department of Internal Medicine, Lady Reading Hospital MTI Peshawar, Peshawar, Pakistan

³Department of Internal Medicine, Khyber Medical Center, Peshawar, Pakistan

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***Corresponding author:** Noman Salih, Department of Internal Medicine, Hayatabad Medical Complex Peshawar, Peshawar, Pakistan. Email: nomansalih22@gmail.com

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ABSTRACT

Krukenberg tumour is a metastatic ovarian tumour made up of mucin-rich signet-ring cells. The stomach is the most typical initial location for this tumour. The lymphatic system is most likely how these tumours spread. We describe a remarkably unusual case of a 28-year-old woman who presented with a Krukenberg tumour with an unknown primary focus. This case is an exceptional incidence of a young person developing metastatic carcinoma with an unknown primary focus presenting as a Krukenberg tumour. The patient's initial complaints were abdominal pain and nausea. The initial workup of the patient revealed bilateral ovarian tumours, which were incorrectly treated as ovarian tuberculosis. A CT scan and further studies revealed deposits in the peritoneum and omentum, which were suggestive of metastatic illness. Laparotomy was performed and biopsies from the ovarian tumors were taken to investigate other diagnoses. Signet-ring cells were discovered through immunohistochemical and histopathological analyses, supporting the diagnosis of a metastatic Krukenberg tumour with an unknown primary focus.

Keywords: Krukenberg tumour; Peritoneum; Omentum

Introduction

Adult tumours that spread to the ovaries commonly do so; in fact, 5-30% of ovarian cancer cases are metastatic diseases¹. Adenocarcinoma with pleomorphic mucin-filled signet-ring cells, initially described by Krukenberg in 1896, accounts for approximately 5% of all carcinomas that have spread to the ovaries². This tumour is also known as the Krukenberg tumour. The stomach (which accounts for 70% of cases) is the most typical location of the primary tumour in this patient group, followed by the large bowel, appendix, and occasionally several other sites^{1,3}. However, the primary tumour can go undetected in 25% of the cases because it is very small. The involvement of the ovary, which is typically bilateral and can take on enormous proportions, is assumed to be the result of the selective retrograde lymphatic spread of the initial tumour along the stomach-ovarian axis⁴. With a median life span of 14

months, individuals with Krukenberg tumours typically die, as there is currently no viable treatment available⁵. Due to their vague clinical manifestations and similarities to benign illnesses, such as ovarian TB, Krukenberg tumours are renowned for being diagnostic dilemmas. To highlight the need for accurate differential diagnosis in treating unusual neoplastic disorders, we provide an example of a 28-year-old female patient with a Krukenberg tumour who was initially misdiagnosed as having ovarian tuberculosis.

Case Presentation

A 28-year-old female patient presented with abdominal pain, bloating, decreased appetite and irregular menstrual cycles to a physician who suspected her to be a case of ovarian tuberculosis (TB) based on her symptoms and Computed Tomography (CT) findings which initially showed suspicion of tuberculosis and

put her on Anti-Tuberculous Therapy (ATT). Three months later, she presented to our emergency department with worsening symptoms and ascites. Based on her CT findings, we suspected ovarian TB but her unresponsiveness to ATT forced us to consider an alternate diagnosis. To be safe, we started a workup to rule out any malignancy. The patient presented with complaints including nausea, abdominal pain, and decreased appetite. The patient experienced severe discomfort due to abdominal pain. On examination, she was cachexic, her abdomen was mildly tender, and there were ascites with dullness to percussion. The rest of the examinations were unremarkable. Except for lower blood pressure, the other vital signs were stable. Large heterogeneous cystic mass lesions with irregular margins and ascites were observed on abdominal ultrasonography (US). Computed Tomography (CT) showed a large well-defined heterogeneous cystic mass lesion with irregular lobulated margins, measuring approximately 10 x 11 cm, which is noted in the left adnexa. The lesion appears to arise from the left ovary. It had a small solid peripheral enhancing component and a large internal non-enhancing necrotic area. It had thin enhancing walls with few septations. The lesions have a distinct interface with the surrounding structures and do not invade the gut loops or pelvic walls. Posteriorly, the lesion did not extend to the pelvic sidewall or rectum. Superiorly, the lesion extended into the lower abdomen with the displacement of the bowel in the region. There was no evidence of calcification or haemorrhage within or adjacent to the lesion. Another large heterogeneous enhancing lesion was seen in the right adnexa measuring 5.3 x 3 cm. The right ovary was visualized separately from the lesion shown in (Figure 1).

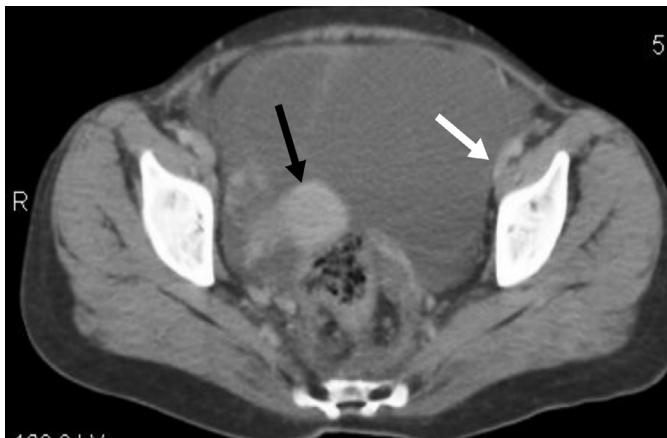


Figure 1. Black arrow shows right ovarian lesion. White arrow shows peritoneal involvement.

The uterus was normal in both size and shape. Focal lesions were not observed. Multiple enlarged, rounded, and enhancing lymph nodes are seen in the pelvis. Gross abdominopelvic ascites were observed. No scalloping of the abdominal viscera was observed, and multiple large soft tissue density-enhancing deposits of variable sizes were seen in the omentum, predominantly on the left side of the abdomen measuring 2.8 x 1.5 cm as shown in (Figure 2).

All of these findings were suggestive of ovarian malignancy with metastasis. Except for slightly high serum levels of CA 19-9 equals 41.9 U/ml (normal values 0 - 37), CA 125 equals 73.26 U/ml (normal values 0 - 37), and chromogranin A 37.0 U/L (normal values 2 - 18), the findings of the laboratory work-up were within normal ranges. The impression given by the imaging of a large tumour potentially harming the ovarian tissue was confirmed by laparotomy. Due to the lack of adhesions between the masses and the nearby organs and

tissues, the excision of both masses together with bilateral salpingectomy was completed after obtaining informed consent on the basis that ovarian function had been lost. Exploration of the abdominal cavity revealed tumour deposits and ascites in multiple areas. Masses and metastatic lesions were removed and sent for histopathological analysis. Histopathology gave the following reports on gross examination of a skin-covered tissue piece separately present in containers along with bilateral fallopian tubes. The uterus measured 40 mm x 33 mm x 24 mm. On serial slicing, the endometrial cavity measured 20 mm x 2 mm. The maximum thickness of the endometrium was 1 mm, and that of the myometrium was 14 mm. A fibroid (separately present in the container) measured 20 mm x 19 mm x 15 mm. Serial slicing revealed a tan-white whorled cut surface. The skin-covered tissue piece measured 21 mm x 19 mm. The skin was grossly unremarkable. The soft tissue fragments measured 135 x 65 x 30 mm. The first fallopian tube measured 45 mm x 9 mm. The second fallopian tube measured 51 mm x 9 mm. The cut surfaces of both fallopian tubes were unremarkable. Microscopic examination revealed a malignant tumour made up of sheets of signet-ringed cells diffusely invading multiple tissue fragments. Immunohistochemical findings are shown in (Table 1).

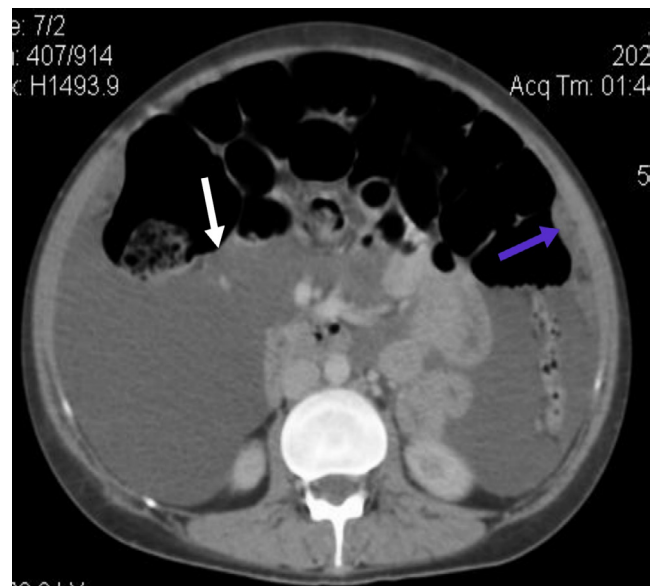


Figure 2. White arrow showing ascities. Blue arrow showing omental deposits.

Table 1. Immuno/Histochemical Stain(S)

STAIN (S)	Results
CK7	Patchy Positive
CK20	Positive
CDX2	Positive
Mucin	Positive
PAX8	Negative

CK - Cytokeratin; CDX - Caudal-related homeobox transcription factor; PAX - Paired-box gene

The bilateral fallopian tubes were tumour-free. Skin tissue showed fibrosis. Endometrial leiomyoma is a signet-ring cell adenocarcinoma. A metastatic diagnosis of signet ring cell cancer was made. A suspected primary tumour was investigated after an uneventful postoperative course, which included breast and thyroid ultrasound, oesophageal gastroduodenal and ileum colorectal endoscopy and hysteroscopy; however, no primary focus could be found despite immunohistochemical staining

pointing towards colon cancer. Following the laparotomy, her clinical condition continued to deteriorate, and she was moved to a high-density unit (HDU) and a subsequent intensive care unit (ICU). Before starting chemotherapy and discussing her with the oncologist, she deteriorated and died a month after the exploratory laparotomy.

Discussion

1-2% of ovarian tumours are Krukenberg tumours, which are uncommon^{1,4}. Patients with this tumour range in age from 13 to 84 years, with a lower median age (41-45 years vs. 55-65 years) than those with other ovarian neoplasms^{5,6}. Four (3%) of the 120 cases in the largest series of Krukenberg tumours reported by Kiyokawa et al. in 2006 were diagnosed in the second decade of life, one of which was a 13-year-old adolescent. In these four cases, the main site was “nongastric” in the fourth patient and “unknown” in the other three⁶. The investigators discovered two other cases that had been previously reported in the literature and involved adolescents with primary tumours in the sigmoid colon and stomach, respectively⁷. Finally, although her fate is not known⁸, a 13-year-old patient with a primary sigmoid colon was recently described. To date, the youngest case of Krukenberg tumour has been documented in 11 patients at the time of diagnosis. Resection might have a role in the management of Krukenberg’s tumours if it could render patients free of gross residual disease⁹. Krukenberg tumours are uncommon in young females, making this case particularly noteworthy. The initial misdiagnosis of Ovarian Tuberculosis highlights the challenges in differentiating between benign and neoplastic ovarian masses, particularly in regions with a high prevalence of tuberculosis. Our patient, who presented with abdominal pain and decreased appetite initially mismanaged as ovarian TB, was later diagnosed with a Krukenberg tumour with unknown primary focus. Imaging tests showed that the tumour involved both ovaries, and the presence of serum tumour markers confirmed that the lesions were carcinomatous. It has long been known that the ovary can occasionally serve as the site of origin for a variety of epithelial tumours, even in adolescents. However, the extensive involvement of both ovaries tended to support the metastatic character of the lesion, a condition that is rarely encountered in oncology. Although there are few reports of Krukenberg tumours, the possibility was considered, but it was evident that histological confirmation was necessary. The postoperative workup missed the main tumour, as in 25% of Krukenberg tumours. Resection of the main tumour, which is frequently found in the gastrointestinal tract, as well as any metastases, is part of Krukenberg tumour treatment. However, the primary frequently goes undetected, as in our case⁶. Chemotherapy is consequently the primary form of treatment, although its efficacy is not well documented. However, our patient did not survive long enough to receive chemotherapy with platinum compounds, which are the first-line therapy for upper gastrointestinal tract tumours. Furthermore, taxanes, which are active in undifferentiated neoplasms, are suggested for the treatment of advanced thyroid and breast malignancies, and metastatic tumours of uncertain origin, the use of a combination of medications with a broad spectrum of activity seems to be the best course of action¹⁰. The tumour rapidly progressed fatally, leaving us helpless. An additional noteworthy aspect of this report was the spectacular clinical trajectory of a young patient. We have not looked into whether the patient’s young age may harm the clinical course of Krukenberg tumours. However, a twenty-year-old patient with advanced disease and fulminant

course was documented by Gupta et al. in 1986. They proposed that young people may experience an unusually aggressive course of Krukenberg tumours¹¹. Accurate differential diagnosis of Krukenberg tumours and Ovarian Tuberculosis is crucial because the treatment approaches for these conditions are vastly different. Delayed diagnosis of Krukenberg tumours can lead to disease progression and poor outcomes.

Conclusion

This example highlights the importance of thorough examination and accurate differential diagnosis when dealing with young females with ovarian tumours, especially in areas where tuberculosis is prevalent. For the prompt implementation of effective management and better patient outcomes, prompt detection of Krukenberg tumours is crucial. To prevent misdiagnosis and subsequent treatment delays, doctors should maintain a high index of suspicion for atypical neoplastic diseases.

Conflicts of Interest

This study does not have any conflict of interest.

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