Case Report
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Tubular Variant of Krukenberg Tumour with an Occult Primary

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Abstract

Krukenberg tumor is a rare tumour and accounts for 1% to 2% of all ovarian neoplasms. It is an uncommon metastatic signet ring cell adenocarcinoma of the ovary, originating in the stomach in the vast majority of cases. On occasions, the gastric cancer may be small and remains undetected for several years after oophorectomy. Much less frequently, the primary tumor is in the large intestine, breast, gallbladder, uterine cervix, appendix, or urinary bladder. Tubular variant of Krukenberg tumour with an occult primary can cause diagnostic dilemma on histopathological examination by mimicking primary ovarian tumours like Sertoli-Leydig cell tumour, endometrioid carcinoma (primary or metastatic) or clear cell carcinoma. Distinction from primary ovarian tumours is very important as misdiagnosis of Krukenberg tumour as primary ovarian tumour can lead to suboptimal treatment of the patient. We report a case of tubular variant of Krukenberg tumour with occult primary in a 42 year old female and discuss the diagnostic dilemma that arise in such situation. Gross examination of the specimen revealed asymmetricallly enlarged bilateral ovaries having bosselated outer surface with few cysts. Histopathological examination of both the ovaries revealed mucin laden cells in tubular configuration as well as diffusely scattered signet ring cells in a cellular ovarian stroma.The primary site of tumour could not be identified even after through radiographic and endoscopic examination of the patient. The prognoses for patients with this type of metastatic tumor are poor, most die within the first year of evolution. There are rare cases in which patients survive several years.

Keywords: Krukenberg Tumour; Tubular Variant; Ovary.

Introduction

Krukenberg tumor is an ovarian tumor first described in 1896 by the German physician Friedrich Krukenberg. It is a rare tumour and accounts for 1% to 2% of all ovarian neoplasms [1]. It is an uncommon metastatic signet ring cell adenocarcinoma of the ovary, originates in the stomach in the vast majority of cases [3]. On occasions, the gastric cancer may be small and remains undetected for several years after oophorectomy [2, 3]. Much less frequently, the primary tumor is in the large intestine, breast, gallbladder, uterine cervix, appendix, or urinary bladder [3]. Because of the marked proliferation of the ovarian stroma, in some cases the tumors may resemble fibrothecomas on gross examination [4]. In 1981, Bouillon described in great detail what he called a tubular Krukenbergtumor [11-13]. Tubular variant of Krukenberg tumour with an occult primary can cause diagnostic dilemma on histopathological examination by mimicking primary ovarian tumours like Sertoli-Leydig cell tumour, endometrioid carcinoma (primary or metastatic) or clear cell carcinoma. Distinction from primary ovarian tumours is very important as misdiagnosis of Krukenberg tumour as primary ovarian tumour canlead to suboptimal treatment of the patient. We report a case of tubular variant of Krukenberg tumour with occult primary in a 42 year old female and discuss the diagnostic dilemma that arise in such situation.

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Case Report

A 42 year old female presented with complaints of polymenorrhagia, fullness and swelling of lower abdomen since 3 months. Ultrasound revealed bilateral ovarian masses with heterogenous solid and cystic components. Further investigations revealed no other relevant findings except for raised levels of serum CA 125 (158IU/ ml). Total hysterectomy with bilateral salphingo-oophrectomy was done. Gross examination of the specimen revealed asymmetricallly enlarged bilateral ovaries (Right ovary measuring 10 x 8.5 x 7.8 cm ; left ovary 8.4 x 7.7 x 6.1 cm) having bosselated outer surface with few cysts (Figure 1.A) . Cut surface of both the ovaries was predominantly solid, uniform with cystic structures at periphery (Figure 1.B). Histopathological examination of both the ovaries revealed mucin laden cells in tubular configuration as well as diffusely scattered signet ring cells in a cellular ovarian stroma (Figure 2.B). Both hypercellular and hypocellular areas having fibroblastic proliferation could be identified in the ovarian srtoma. Fibroblasts being arranged in fascicles, whorls with interspersed vessels and oedematous areas (Figure 2.A). Presence of diffusely scattered signet ring cells and mucin in cells arranged in tubules clinched the diagnosis in favour of Krukenberg tumour, excluding the other causes of primary ovarian tumour like sertoli-leydig cell tumour. The primary site of tumour could not be identified even after through radiographic and endoscopic examination of the patient.

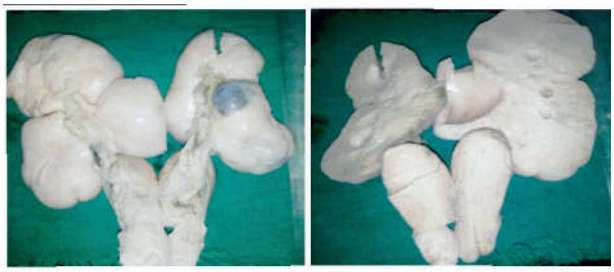

Fig. 1: Gross photograph of the specimen showing bilateral tumour of ovaries with bosselated external surface (A). Cut surface of both ovarian tumours (B)

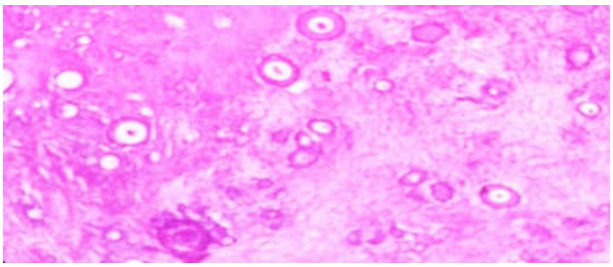

Fig. 2: A. Photomicrograph showing tumour cells forming in tubules in a hypercellular&hypocellular (edematous) ovarian stroma (H & E 10X)

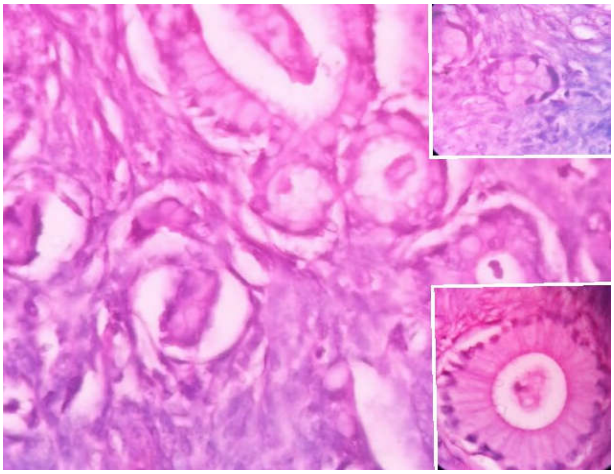

Fig. 2 B: Photomicrograph showing mucin laden signet ring cells (upper & lower inset) arranged in tubular configuration in ovarian stroma (H&E 100X)

Discussion

Krukenberg tumor is an ovarian neoplasm, usually bilateral and nearly always of metastatic origin as was in our case. It is characterized grossly by moderate, solid, multinodular enlargement of the ovaries and microscopically by a diffuse infiltration of signet ring cells containing abundant mucin [5].

In 1896, it was first reported by a German gynaecologist Frederick as a new type of primary malignant ovarian tumor, but, six years later R.H Major revealed the true metastatic nature of the tumor. Krukenbergtumor is a rare tumor accounting for 1-2% of all ovarian tumors [1]. Krukenberg tumour originates in the stomach in the vast majority of cases [3]. On occasions, the gastric cancer may be small and remains undetected for several years after oophorectomy [2, 3]. Much less frequently, the primary tumor is in the large intestine, breast, gallbladder, uterine cervix, appendix, or urinary bladder [3]. The primary tumor cannot be found in at least 10% of cases [6]. Krukenberg tumors are more common in premenopausal women than in postmenopausal women and average age is to 40-50 years [7]. In our case the age of the patient was 42 years. Clinically, it presents with abdominal or pelvic pain and menstrual irregularity. Some patients may exhibit nonspecific gastrointestinal symptoms or remain asymptomatic. In only 20% to 30% of the cases, a history of a prior carcinoma of the stomach or any other organ can be obtained [6]. In many cases, the primary tumor is very small and can escape detection. In such cases, a meticulous radiographic and endoscopic exploration of patients digestive tract should be carried out to detect the primary lesion. In our study we could not locate any primary even after thorough workup of the

patient.

Novak and Woodruff have defined the criteria to qualify a Krukenberg tumour as primary ovarian tumour [8]. These includes

1. Complete post-mortem examination if the patient is dead at the time of case report, absence of primary tumour in any organ except ovary should be proved.
2. If the patient was living at the time of case report, and a surgical resection of the tumour was done, then patients should have survived for 5 years or longer.

While the entity of primary Krukenberg cannot be unequivocally denied, all women with typical Krukenberg tumours should be considered as having metastatic carcinoma, usually from the stomach, until proven otherwise [6].

The diagnosis of Krukenberg tumours largely depends on the recognition of its characteristic light microscopic features with hematoxylin-eosin stained sections. However, Krukenberg tumours may mimic other metastatic or primary ovarian tumours. Distinction from the latter is of great importance as misclassiûcation of Krukenberg tumour as a primary ovarian tumour may lead to suboptimal treatment of the patient.Tubular variant of Krukenberg tumour can be distinguished from other ovarian tumours revealing annular or tubular pattern for e.g., sertoli-leydig cell tumour, particularly if intracellular mucin is not evident on routine staining. Presence of signet ring cells within the tubules excludes the diagnosis of sertoli-leydig cell tumour [3]. Other tumours which can be considered in the differential diagnosis are well-differentiated endometrioid carcinoma (primary or metastatic), clear cell carcinoma and tumours of Wolffian origin. Differentiation can be made on the basis of their typical histological features [3]. Rarely primary mucinous carcinoma of ovary may contain signet- ring cells but not in large numbers. Preoperative serum CA 125 levels in patients with Krukenberg tumour can be elevated, though it subsequently declines after tumour resection [9]. CA 125 levels can be used for screening for early detection of ovarian metastasis as well as for monitoring the course of disease.

Therefore, a detailed evaluation of history, clinical & radiological findings, gross & histopathological features can lead to a correct diagnosis in majority of the cases. The prognosis for patients with this type of metastatic tumor is poor and most of them die within the first year of evolution. There are rare cases in which patients have survived for several years [10].

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