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# Ovarian Dysgerminoma with Renal Metastasis: An Uncommon Phenomenon

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**ABSTRACT**

Dysgerminomas are the most common malignant germ-cell tumor of the ovary, which are usually locally invasive and metastasize to regional lymph nodes. Metastases to the kidney are quite rare, occur in disseminated disease, and there are only a few reports in literature. We report a case of ovarian dysgerminoma metastasizing to the ipsilateral kidney in a 24-year-old female.

## INTRODUCTION

Dysgerminomas are the most common malignant germ-cell tumor of the ovary [1] and are found mostly in adolescents and young adults [2]. These are mostly locally invasive and metastasize to regional lymph nodes. Distant metastases are rare and are mainly through lymphatics to the para-aortic lymph nodes, lungs, liver, or brain. Metastases affecting other abdominal viscera are rare and usually occur in disseminated disease [3]. A renal metastasis of dysgerminoma is quite rare, and it prompted us to report this case.

## CASE REPORT

A 24-year-old para 1 female presented with chief complaints of continuous and dull aching pain, and gradual swelling in the left flank for three months. The patient had a history of a left ovarian mass for which she underwent bilateral salpingo-oopherectomy 1 year prior to presentment. The histopathology was suggestive of dysgerminoma of the left ovary, and the patient subsequently received 4 cycles of paclitaxel and carboplatin and 1 cycle of paclitaxel and cisplatin. On examination, there was a hard, non-tender 12 cm x 10 cm lump occupying almost the whole left lumbar region extending into the left hypochondrial region, which was ballotable and slightly moving with respiration.

The patient was anemic but other biochemical parameters were normal. However, her serum lactate dehydrogenase (LDH) was elevated (LDH = 240 U/L) while other tumor markers were negative (alpha-fetoprotein = 0.65 ng/mL; beta human chorionic gonadotropin= 0.925 U/mL; cancer antigen 125 = 24.4 U/mL). Contrast-enhanced computed tomography of the abdomen was suggestive of a large, heterogenous soft tissue-enhancing mass at the mid and lower pole of the left kidney, with nonenhancing hypodense areas within. This pushed the aorta medially and anteriorly and closely adhered to it (Figure 1). The left renal pelvis was grossly dilated, with poor contrast excretion. Chest and liver function X-rays were normal.

Exploration was done with the intent of performing radical nephrectomy but this was impossible as great vessels were engulfed within the mass. Representative biopsies were taken from the mass, and a histopathology suggested a tumor comprised predominantly of sheets of malignant round-to-oval cells, with scanty cytoplasm, some areas of mesodermal differentiation, and areas of necrosis (Figure 2). Immunohistochemistry suggested a positive expression of the WT1 gene, MIC-2, tyrosine-protein kinase kit (CD117), and vimentin while the cytokeratin 7 and the Bcl-2 gene were negative, which was consistent with dysgerminoma. The case was diagnosed as metastatic dysgerminoma and the patient is presently undergoing chemotherapy.

**KEYWORDS**: Dysgerminoma, metastasis, kidney, ovary

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Figure 1. Computed tomography showing a mass arising from the left kidney.

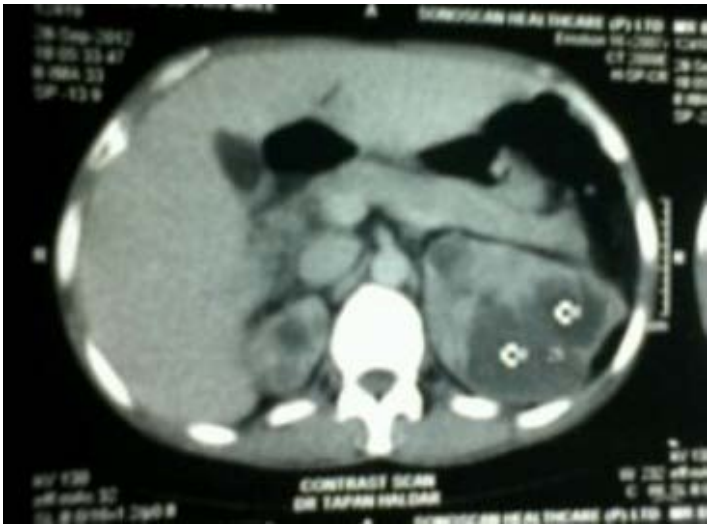


Figure 2. Contrast-enhanced computed tomography (ABD) suggestive of large heterogenous soft tissue.

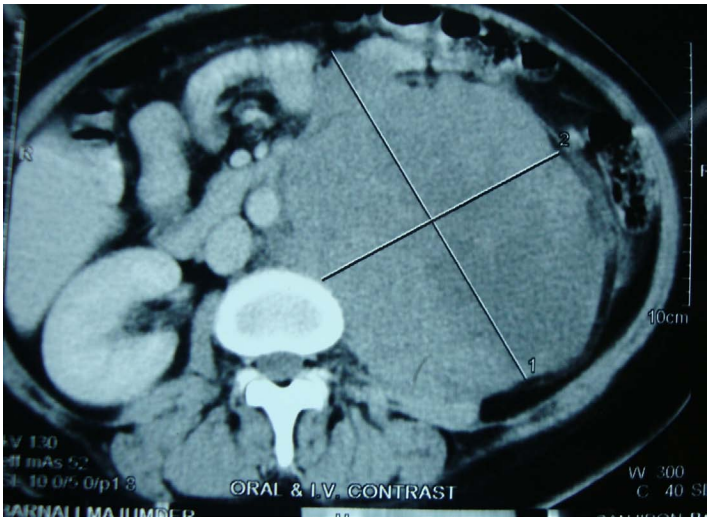



Figure 3. HPE sugesstive of polygonal cells admixed with mature cells.

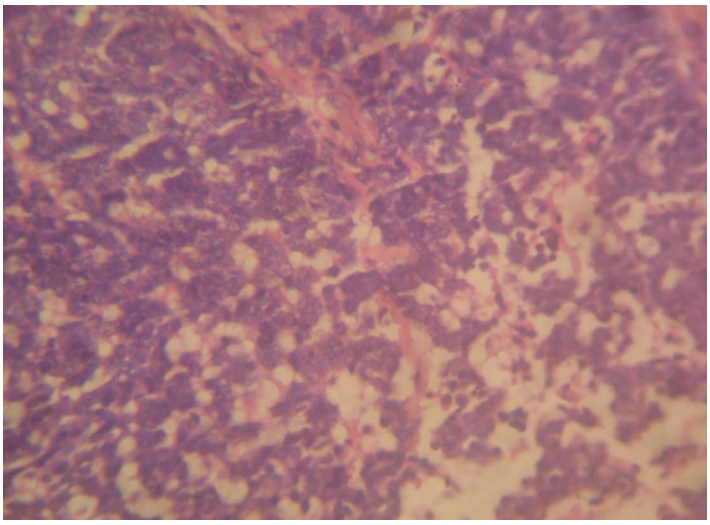
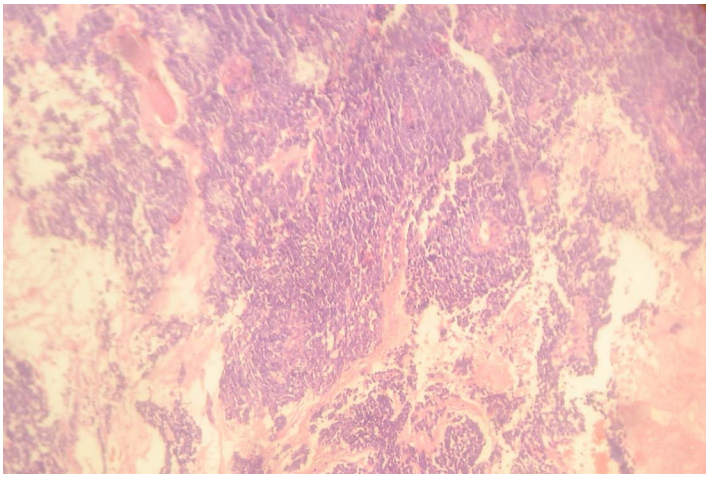


Figure 4. HPE (10 x 10, H & E stain).



## DISCUSSION

Dysgerminomas are the most common malignant germ-cell tumors of the ovary [1], though they account for only about 3 to 5% of all ovarian malignancies [2]. Presently, 75% of dysgerminomas occur between the age of 10 and 30 [2] and 75% of these remain confined to the ovary at the time of diagnosis [2]. Extraovarian tumor spread is mainly through lymphatics and often involve the retroperitoneal and pelvic lymph nodes [3]. In addition, hematogenous spread may occur; common sites of involvement are the lungs, liver, and bones [1,3]. Metastasis to the kidney is rare, and few reports are available that suggest renal metastasis. Seegar reviewed 89 cases of dysgerminoma and found such metastasis in only 3 cases [4]. Mandeville reported metastasis in the left kidney upon autopsy of a 4-year-old girl who had bilateral dysgerminoma along with liver, adrenal, pancreas, lymph node, and bone marrow involvement [5].

These tumors arise from primordial germ cells [2] and contain giant syncytiotrophoblastic cells that produce placental alkaline phosphatase (PLAP) and LDH [1,2]. Additionally, elevated levels of neuron-specific enolase, calcium, WT1, and prolactin have been reported in serum and tumor tissue [6]. However, if LDH is frequently elevated, it is a non-specific tumor marker and its raised level only signifies a rapid-cell turnover rate and large tumor burden. Increased levels of other germ-cell tumor markers such as serum alpha-fetoprotein (AFP) or beta human chorionic gonadotropin (beta HCG) are generally not detected. If increased, they suggest that other germ-cell elements are present in the tumor. However, about 3% of patients with a pure dysgerminoma have increased amounts of beta HCG in the blood, secreted by syncytiotrophoblastic cells within the tumor [7].

Dysgerminomas are characterized by their solid nature and rapid growth. The presence of a cystic area is either due to local necrosis or hemorrhage or due to the presence of other neoplastic elements. Classic histopathology of dysgerminomas features a proliferation of epithelioid cells mixed with mature lymphocytes arranged in sheets or small clusters separated by thin, fibrous septae resembling alveoli. The neoplastic cells are large and have moderate to high nucleus-to-cytoplasm ratios. Lymphoid follicles containing germinal centers, giant syncytiotrophoblastic cells, and non-caseating granulomas are also frequently seen [1,2,7].

Immunohistochemistry (IHC) plays an important role in characterizing dysgerminomas. These are immunoreactive for PLAP, CD117, Oct-3/4, and vimentin while possibly focally positive for cytokeratin and HCG. They usually do not express epithelial membrane antigen (EMA), S100 protein, CD45 antigen, or AFP [2,7]. Positive neuron-specific enolase expression is closely related with advanced tumors while WT1 expression correlates with poorer differentiation of dysgerminoma [6].

Dysgerminomas can also be associated with a wide array of gonadal dysgenesis. With pure gonadal dysgenesis (46,XY; phenotypic female) or Swyer syndrome—which is a disorder of sexual differentiation that is characterized by mutations of the SRY gene, the propensity of development of dysgerminoma, and its in situ counterpart—gonadoblastoma has been reported as high as 20 to 50% [8]. Even in the absence of the influence of the Y chromosome, gonadal dysgenesis may develop. In such conditions, factors like WT1, and hormones such as inhibin and mullerian inhibiting substance, might be implicated in tumorigenesis [9]. In the present case, the patient was a karyotypic female (46,XX) but the tumor cells from the retroperitoneal and renal mass were positive for WT1, which suggest a poorly differentiating dysgerminoma.

The treatment of a patient with early dysgerminoma is primarily surgical, including resection of the primary lesion and proper surgical staging [1]. These tumors are markedly sensitive to radiotherapy. But at the same time, they are also exquisitely sensitive to cisplatin-based chemotherapy. As the disease principally affects young females, special consideration is given to the preservation of fertility whenever possible, and chemotherapy is preferred over radiotherapy [1,7]. Patients with stage 1A disease (i.e., disease that is limited to 1 ovary) may be treated by unilateral oophorectomy alone, especially when fertility is to be maintained. The relapse rate ranges from 10 to 20%; the overall survival rate is 90 to 100% [10]. Bilateral oophorectomy may be justified since dysgerminoma is more often a bilateral disease than other ovarian tumors, and a hysterectomy may be performed if the patient is no longer interested in bearing children. Radiotherapy and 3 to 4 cycles of adjuvant chemotherapy with cisplatin, etoposide/vinblastine, and bleomycin (PVB or BEP) are often reserved for patients with at least stage 1B disease (i.e., disease that is limited to both ovaries) or as an adjuvant therapy for those patients who suffer recurrences and relapses [1,7,10].

## CONCLUSION

Dysgerminoma of the ovary is a rare but possible source of renal metastasis, and further studies are required to fix the nature of the disease and its management.

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