CASE REPORT

A 6-year-old developmentally normal female child presented with a history of abdominal pain for a duration of 1 week. On examination, there was a hard irregular mass in the right lower abdomen (9 cm × 6 cm), occupying the right iliac fossa (RIF), hypogastrium, and umbilical regions. Her complete hemogram, renal function test, liver function test, alpha-feto protein (AFP), 24-h urinary vanillyl mandelic acid were within the normal limits. Ultrasonogram (USG) abdomen showed bilateral hydronephrosis and hypoechoic lesion in RIF. Contrast-enhanced computed tomography abdomen showed well-defined large heterogeneous retroperitoneal mass in the midline lower abdomen and intrapelvic region (more toward the right side) and bilateral hydronephrotic kidneys with normal parenchyma [Figure 1a and b]. Child underwent USG-guided tru-cut biopsy which showed small round blue cells [Figure 1c-e]. Immunohistochemistry showed neuron-specific enolase and WT1 negative, Vimentin positive, CD 99 focal membranous positive, and FLI1 weakly positive which were suggestive of Ewing’s sarcoma/primitive neuroectodermal tumor. Bone marrow aspiration and biopsy showed no metastasis. Positron emission tomography and CT (PETCT) abdomen showed metabolically active 9.2 cm × 8.2 cm × 5.2 cm mass in the midline and right lateral aspect of the lower abdomen and pelvis encircling bilateral iliac vessels. Few days after tru-cut biopsy child presented with acute renal failure with mild hypertension. She needed hemodialysis for 2 days and underwent cystoscopy and bilateral DJ stenting to relieve compression of ureters by tumor mass.

She received six cycles of neoadjuvant chemotherapy for nonmetastatic Ewing’s sarcoma based on Children’s oncology group protocol vincristine, doxorubicin, cyclophosphamide/ifosfamide, etoposide interval compressed chemotherapy. She responded well and repeat PETCT showed a significant reduction in the size of the lesion. Magnetic resonance imaging abdomen showed well-defined hypodense soft-tissue lesion of size.
19 mm × 10 mm × 27 mm in the midline and paramedian lower abdomen and pelvis. Complete excision of residual tumor was done through a lower abdominal midline incision. Tumor bed was marked with titanium clips and bilateral DJ stents were removed. Histopathology (HPE) of residual tumor showed portions of fibromuscular tissue with lobules of adipocytes, ganglion cells, mature glial cells, glomeruloid structure, scattered tubules, and focal sheets of atypical small round blastemal cells with hyperchromatic nuclei suggestive of extrarenal TWT [Figure 1f-h].

Detailed discussion in multidisciplinary tumor board was done. Since the child had already received adequate neoadjuvant chemotherapy followed by residual tumor excision, she received focal radiotherapy with 19.2 Gy in 12 fractions in view of the retroperitoneal site. The child remained stable for 2 months following radiotherapy, following which, she again presented with abdominal distension, decreased oral intake, and decreased urine output. USG abdomen showed ascites with malignant peritoneal deposits. Her blood cell counts were normal. Lactate dehydrogenase was 465 U/L and uric acid was 6.2 mg/dL. PETCT showed diffuse omental thickening with metabolic activity, nodular lesion, and paraaortic and supravacular lymph node activity suggestive of metastatic recurrence in the abdomen with retroperitoneal, internal mammary, and supraclavicular nodes. Relaparotomy and omental biopsy were done. HPE of the omental biopsy showed sheets and nests of densely packed cells with increased nuclear-cytoplasmic ratio, brisk mitosis, nonsignificant anaplastic features suggestive of metastatic WT.

At present, the child is on salvage chemotherapy with vincristine, orinotecan, and temozolomide.

**DISCUSSION**

WT is the most common primary malignant renal tumor of childhood and comprises 6% of all pediatric tumors. Classic WT consists of all the three components namely blastemal, stromal and epithelial derivatives. TWT is a histological variant of WT. It was first described by Variend *et al.* in 1984 and later Fernades *et al.* (1988) defined TWT as triphasic tumor with heterologous elements constituting more than 50% of tumor mass.[1] These heterologous elements can be epithelial or mesenchymal tissues. The epithelial elements can be squamous epithelium with keratinization, columnar epithelium with mucin production, glandular elements of the salivary gland, intestine, and respiratory tract or odontogenic epithelium. The mesenchymal elements may be skeletal muscle, smooth muscle, bone, cartilage, adipose tissue, or differentiated neural tissue.[1] In our
Table 1: Comparison of reported cases of extrarenal teratoid Wilms tumors

| Age at presentation | Clinical features | Ectopic region | Initial diagnosis | Investigations | Treatment | Hererologous elements | Response | Follow up |
|---------------------|-------------------|----------------|-------------------|---------------|-----------|-----------------------|----------|----------|
| Pawel et al. [2]    | 7 years           | Abdominal pain | Urteropelvic region near right kidney, opposite side duplication of ureteral system | Botryoid tumor | Complete excision | Squamous, mucinous, columnar elements | Good     | 18 months |
| Song et al. [3]     | 13 years          | Vaginal spotting | Vagina            | Sarcoma botryoides | Complete excision+VAC chemotherapy (vincristine, actinomycin D) | Tubular structures lined by pseudostratified columnar or cuboidal cells, fetal type glomeruli, islands of primitive cartilage, skeletal muscle and squamous and columnar mucinous epithelia | Good     | 97 months |
| Song et al. [3]     |                   |                |                   | AFP - Normal, MRI |           | Fetal type glomeruli, skeletal muscle and cartilage cells, adipocytes, ciliated mucinous and squamous epithelia | Good     | No follow up |
| Chowhan et al. [4]  | 1 year 5 months   |                 |                   | AFP, BHCG - Elevated, CT | Complete excision+chemotherapy (vincristine, actinomycin D) | Adipocytes, muscle cells, myxoid fibroblasts with spindle cells, blood vessels, and cystically dilated glands lined by flattened epithelial cells, attempted glomeruli, primitive tubules | Good     | 6 months |
| Baskaran et al. [5] | 3 years           |                 |                   |AFP - Normal, USG and CT | Complete excision+chemotherapy (vincristine, actinomycin D) | Glandular structure, adipocytes, neural and skeletal muscle tissues | Good     | 1 year |
| Unny et al          | 6 years           |                 |                   |AFP - Normal, USG, IVP, CT | Complete excision | Adipocytes, muscle cells, myxoid fibroblasts with spindle cells, blood vessels, and cystically dilated glands lined by flattened epithelial cells, attempted glomeruli, primitive tubules | Good     | 10 months |
|                     |                   |                 |                   |PETCT          | Neoadjuvant chemotherapy (VDC/IE) + residual tumor excision+radiotherapy+salvage chemotherapy | Fibromuscular tissue with lobules of adipocytes, ganglion cells, mature glial cells, glomeruloid structure, scattered tubules | Metastatic tumor |  

AFP: Alpha-feto protein, MRI: Magnetic resonance imaging, BHCG: Beta-human chorionic gonadotropin, CT: Computed tomography, USG: Ultrasonogram, PETCT: Positron emission tomography-CT, VDC/IE: Vincristine, doxorubicin, cyclophosphamide/ifosfamide, etoposide, VAC: Vincristine/Actinomycin D/Cyclophosphamide, IVP: Intravenous pyelogram
case, the tumor had blastemal cells with predominant epithelial elements such as adipocytes, ganglion cells, mature glial cells, and mesenchymal elements such as glomeruloid structures and tubules.

TWT can be intrarenal or extrarenal. There are only five reported cases of extrarenal TWT in the literature\textsuperscript{[1-5]} [Table 1]. The median age at presentation in the reported cases was 3 years, ranging from 1 day to 13 years. All of them had normal tumor markers initially except one child with sacrococcygeal mass who had elevated AFP and beta HCG. TWT was diagnosed in all cases, including ours, only after surgical excision. The primary HPE was not TWT in all cases. Complete surgical excision of tumor was possible in all except in our case.

Our initial diagnosis was Ewings sarcoma, based on which the child underwent six cycles of neoadjuvant chemotherapy. The prompt response was seen which was followed by a residual tumor excision. TWT usually does not respond to chemotherapy due to the high proportion of mature heterologous tissue.

Current imaging modalities are unable to accurately delineate the differences between extrarenal TWT and other tumors such as neuroblastoma, teratoma, and extrarenal WT. Histologically, teratomas and TWT have similar histology, but teratomas display unequivocal organogenesis.\textsuperscript{[3]} Lack of organogenesis can help in ruling out teratomas. Excisional biopsy is the only modality which can diagnose extrarenal TWT correctly.

Complete excision of tumor is considered the treatment of choice for TWT. It is easy in the case of renal TWT which can be done with nephrectomy. In all reported extrarenal TWT cases, initial complete excision of tumor was possible and all of them had a good response after excision. In our case, the huge retroperitoneal mass with vascular encasement warranted neoadjuvant chemotherapy, but complete excision of the residual tumor did not give a tumor clearance probably due to highly malignant WT elements.

Varying tumor components make the formulation of standardized criteria for diagnosis and treatment for TWT difficult. Procedures like tru-cut biopsy may not be sampling representative tissues for accurate diagnosis. Extrarenal locations of TWT are challenging for initial diagnosis and complete excision. High index of suspicion, knowledge of pathological findings in this rare variant of WT, and further studies on this tumor will help pediatric surgeons, oncologists, and pathologists to manage these children effectively.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initial s will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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