

Oncology

Melanotic Xp11 Translocation Renal Cancer Managed With Radical Nephrectomy and IVC Tumor Thrombectomy



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ABSTRACT

Melanotic Xp11 translocation renal cancer is a rarely observed neoplasm primarily affecting adolescents and young adults. Given the paucity of data describing this malignancy, its natural history and subsequent long-term management are not well understood. We report a case of melanotic Xp11 translocation with tumor thrombus extension managed with radical nephrectomy and inferior vena cava (IVC) tumor thrombectomy. To our knowledge, this is the first case report to describe use of conventional tumor thrombectomy techniques in a patient with melanotic Xp11 translocation renal cancer.

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Introduction

Melanotic Xp11 translocation renal cancer is a rare neoplasm predominantly affecting young patients. The cancer was initially described in 2009 presenting in two children with metastatic disease.¹ This malignancy has various histologic and immunophenotypic features that overlap with melanoma, renal cell carcinoma, and perivascular epithelioid cell neoplasm (PEComa).¹ It can present with flank pain, abdominal pain, constitutional symptoms, or metastasis.¹ We report our experience with this disease in an 18-year old female presenting with abdominal discomfort secondary to a large palpable mass ultimately leading to immediate surgical resection.

Case presentation

An 18-year old female with no significant past medical, surgical or urologic history presented to our outpatient clinic with a history of progressively worsening abdominal discomfort over a two-month period. The patient denied any constitutional symptoms including fevers, night sweats or weight loss.

The patient had no family history of genitourinary malignancy. Physical examination demonstrated a visible and palpable non-tender right-sided abdominal mass. No lymphadenopathy or lower extremity venous congestion was appreciated. Computed Tomography (CT) scan revealed a 9.5 × 18.5 × 21.5 cm right renal mass with tumor extension to the level of the hepatic IVC associated with perihilar lymphadenopathy (Fig. 1A). No pulmonary metastasis was identified. MRI of the abdomen and pelvis confirmed no local invasion (Fig. 1B). After elaborating with Pediatric Oncology, the mass was deemed to represent renal cell carcinoma (RCC) rather than a Wilms' tumor. Thus, the mass was not biopsied and the patient was promptly boarded for surgical resection.

The patient underwent an open right radical nephrectomy, level III IVC tumor thrombectomy and retroperitoneal lymph node dissection performed with our hepatobiliary surgeons to aid in liver mobilization. The renal hilum was characterized by severe desmoplasia. Grossly, the renal tumor demonstrated marked neovascularity without evidence of invasion into adjacent structures. Tumor thrombectomy did not require cardiopulmonary bypass. The intrahepatic IVC above the tumor thrombus, infrarenal IVC and left renal vein were clamped in the usual standard fashion. The right kidney, adrenal gland and tumor thrombus were removed en bloc proceeded by IVC repair with a bovine pericardial patch and aortocaval lymphadenectomy. The patient tolerated the procedure well and was transferred postoperatively to the surgical intensive care

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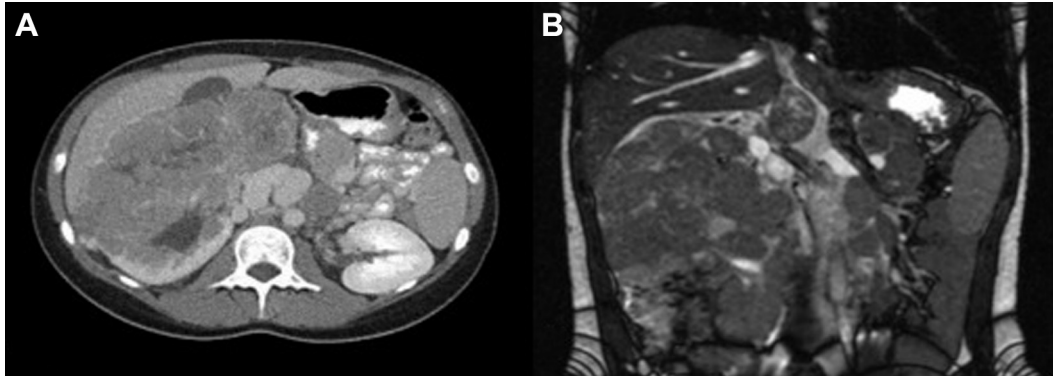


Figure 1. (A) CT of the abdomen with IV contrast demonstrating large right renal mass extending into the IVC. (B) MRI of abdomen with IV contrast demonstrating a multilobulated, encapsulated 9.5 × 18.5 × 21.5 cm heterogeneously enhancing right renal mass extending into the IVC as well as a contralateral 2.9 cm para-aortic lymph node.

unit. She was ultimately discharged home on postoperative day five.

Histologically (Fig. 2), the mass was composed of solid nests of epithelioid cells (Fig. 2A) containing clear and eosinophilic cytoplasm (Fig. 2B). There were also foci of cytoplasmic melanin granules (Fig. 2C) highlighted by Fontana-Masson staining (Fig. 2D). On immunohistochemical staining, the neoplastic cells were positive for TFE3, cathepsin k, HMB45, P504s, and CD10. Stains were found to be negative for cytokeratins, EMA, PAX-8, vimentin, desmin, smooth muscle actin, MiTF, and S-100. Three out of six aorto-caval lymph nodes were involved by cancer. FISH analysis was positive for TFE3 gene rearrangement. Final pathologic diagnosis was

confirmed after expert consultation at Johns Hopkins Hospital. Using RCC pathologic staging criteria, the tumor was considered stage T3bN1Mx.

Discussion

Renal malignancies account for approximately 6% of all childhood cancers with approximately 93% of such cancers encompassing Wilms' tumors and the remaining portion representing RCC.² While RCC is rare in children, chromosomal translocation of the Xp11 locus is identified in 40–50% of pediatric RCC neoplasms.^{2–5} In contrast, while adult Xp11 translocations RCCs may

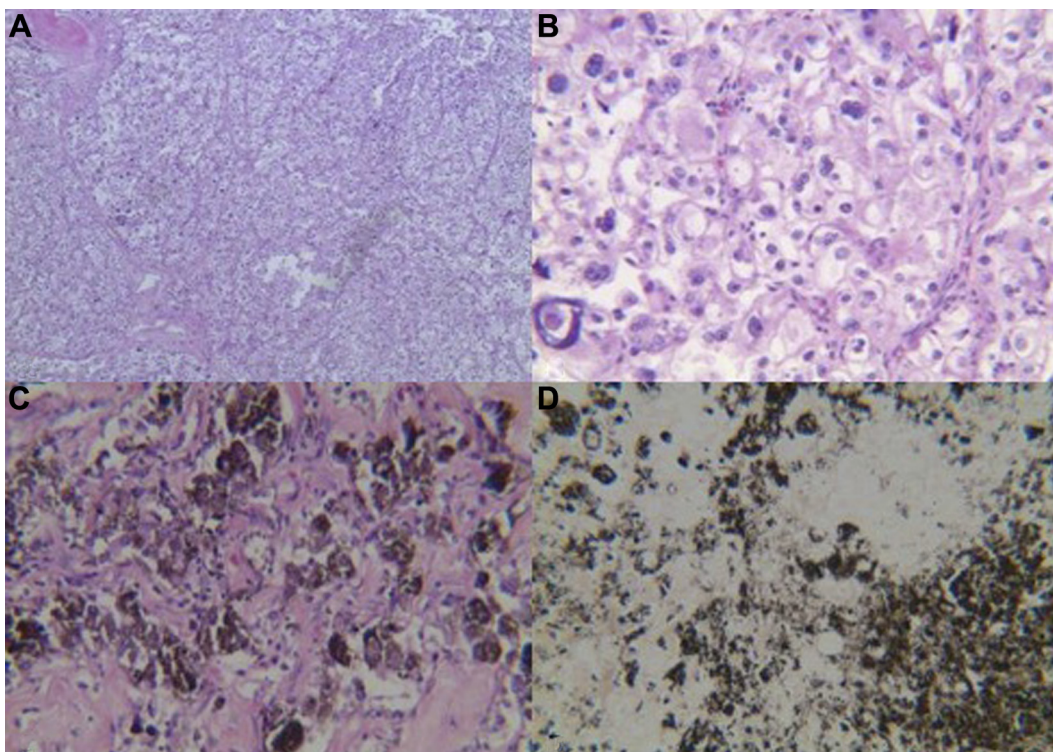


Figure 2. Histopathology from surgical specimen. (A) Sheets of neoplastic cells with solid to nested architecture and branching capillary vasculature. (B) Cells with clear to finely granular eosinophilic cytoplasm with occasional markedly atypical cells. (C) Areas of the tumor exhibit cytoplasmic fine brown pigment consistent with melanin. (D) Fontana-Masson stain highlights melanin pigment within tumor cells (Not pictured: Melanin pigment was removed by bleaching).

outnumber pediatric cases due to the sheer volume of RCC presenting in the adult population, the incidence of Xp11 translocation in adults with RCC is estimated to be a mere 1.6%.³ Occurring with even more rarity, a variant of Xp11 translocation tumors is melanotic Xp11 translocation renal cancer harboring a similar Xp11 locus translocation but with no expression of renal tubular markers on immunohistochemistry.³ Overall, there have been fewer than 10 cases reported of this disease.³ Gene fusion involving transcription factor TFE3 has been identified in melanotic Xp11 translocation renal cancers.¹ Histologic examination of melanotic Xp11 translocation renal cancers reveals a solid nested architecture of epithelioid neoplastic cells with finely granular eosinophilic cytoplasm and nonrefractile brown melanin pigments.^{1,3–5}

Melanotic Xp11 translocation renal cancer has rarely been reported in the literature with the majority of cases being reported cases in the pediatric age group. Etiologies for this particular malignancy are not known though cytotoxic chemotherapy was thought to predispose to the development of renal translocation carcinomas.³ Specifically, DNA topoisomerase II inhibitors and/or alkylating agents have been the two reported culprits leading to the subsequent development of Xp11 translocation RCCs after chemotherapy.³ Furthermore, case reports of melanotic Xp11 renal cancer have described variable presentations ranging from localized disease to widespread metastasis.⁴

This is the first case report to describe use of conventional tumor thrombectomy techniques in a patient with melanotic Xp11 translocation renal cancer. No standard treatment algorithm exists for patients with melanotic Xp11 translocation renal cancers beyond what is established for renal cell carcinoma. Patients reported to have this rare malignancy have primarily undergone surgical resection with some receiving adjuvant chemotherapy.⁴ Reliable data regarding long-term survival of patients with this cancer is scarce. One case report described a patient to be disease free after two years status-post partial nephrectomy of a 4.6 cm renal mass.⁴ Another case of melanotic Xp11 translocation renal cancer reported by Zhan et al described a patient with a 3 cm mass to be disease free 50 months after radical nephrectomy.⁵ Overall, conclusions regarding treatment, management and long-term survival cannot definitively be determined secondary to the lack

of follow-up data regarding this malignancy. The patient described in this report did not receive adjuvant therapy. She has had no evidence of disease recurrence or metastasis two months after surgical resection.

Conclusion

Melanotic Xp11 translocation renal cancer is a rare neoplasm with little known about its etiology, management and prognosis. Local tumors can likely be effectively managed with surgical resection; however, long-term data supporting this is lacking. To our knowledge, this is the first case report to describe use of conventional tumor thrombectomy techniques in a patient with melanotic Xp11 translocation renal cancer. Continued description of this entity will allow for better understanding regarding optimal treatment management.

Conflict of interest

The authors have no conflicts of interest.

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