

BILATERAL WILMS TUMOUR IN A MALE CHILD WITH ACUTE URINARY RETENTION AND URETHRAL MEATAL MASS

BY

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ABSTRACT

Wilms Tumour is a childhood renal tumour that develops from embryonic renal tissue. It is often discovered inadvertently by parents in the home environment either when bathing or dressing up a child. The index case presented at the hospital on account of acute urinary retention with a urethral mass at the penile meatus. The study is a case of incidental finding of bilateral Wilms Tumor in a 2 year old male child who was brought by the parents to the children's emergency room on account of urethral meatus mass and acute urinary retention with discomfort and irritable excessive cry. Abdominal Ultrasound and CT scan was requested by the managing team. The clinical presentation, imaging findings and management are hereby discussed.

Keywords: Wilms Tumour, Renal mass, Acute urinary retention, Urethral meatal mass

Introduction

Wilms tumour or Nephroblastoma is a common childhood tumour that is intimately linked to early kidney development and is often associated with persistent embryonal renal tissue and other kidney abnormalities and syndromes (Liu & Suson, 2020)

Multiple genetic foci have been linked to wilms tumourigenesis(Liu & Suson, 2020), WT1 is the first gene found to be inactivated in wilms tumour; it encodes a transcription factor that functions as both a tumour and a critical regulator of renal organogenesis,while the risk of wilms tumour varies in different WT1 associated conditions(Welter et al., 2023).

The majority are sporadic and occur in otherwise normal children, and about 9 out of 10 kidney cancers in children are wilms tumour. Most cases are unilateral while about 5% of cases are bilateral(Pater et al., 2021), unilateral form present at an earlier age in males(mean age 42 months) than in females(mean age 47 months) while the mean age of presentation of bilateral wilms tumour

is lower, seen at 30 months and 33 months respectively.

The incidence of wilms tumour is 1:10,000(Bernardo et al., 2019), while the frequency is slightly higher in blacks than in whites but is considerably lower in Asians than in whites; children of African descent may have slightly higher rates of wilms tumour, peak age is 3 to 4 years, while most cases occur before 10 years. There is no recognized gender predilection, however presentation is a little later in females

Clinically affected children present with a painless, palpable abdominal mass, abdominal pain, nausea and vomiting, loss of appetite, fever and high blood pressure especially if synchronous or metachronous bilateral kidney involvement(Asfour et al., 2025).

Diagnosis is by physical examination of a painless abdominal mass and also via imaging modalities like ultrasound, computed tomography or magnetic resonance imaging(Ikhuoriah et al., 2023). Most often diagnosis is made before metastasis to other organs

CASE REPORT

F.A is a 2 year old male, fifth child of the parents, referred from a health facility on account of inability to pass urine 6hours duration, and protrusion of solid substance from the urethra meatus.

The child was managed by the urology unit on account of the presenting complaint above.

The urethra meatus solid tissue was extracted and sent for histopathological analysis, sections of which reveal fragments of necrotic tissue, epithelial cells and glandular structures and diagnosis of necrotic tissue was made. Child also had ultrasound done, which shows bilateral solid renal masses involving two-thirds and one-third of both left and right kidneys respectively with moderate hydronephrosis. A formal diagnosis of bilateral Wilms tumour, to exclude Rhabdoid tumour of kidney and Nephroblastomatosis was made.

The patient was transferred to the pediatric surgical unit from the urology unit based on the ultrasound findings after relieving the acute urinary retention.

On examination the patient was ill looking, pale (pcv 20%), dyspneic, anicteric, febrile, acyanosed, abdomen was distended and moved with respiration. The child was transfused with 280mls of packed red blood cells.

Several other investigations were requested and done; these include abdominopelvic

computed tomography, chest radiograph, echocardiography, liver function test, urine m/c/s, E/U/Cr.

Abdominal ultrasound showed hypoechoic soft tissue masses in both renal parenchyma with associated hydronephrosis (Figures 1a and 1b). CT scan show bilateral hypodense renal masses with right moderate hydrocalicosis (Figures 2a and 2b), chest radiograph was normal, Echocardiography revealed left ventricular hypertrophy(LVH) with ejection fraction of 70% and good ventricular function, Liver function test shows mildly elevated ALP(449iu/L) otherwise normal, Urine m/c/s show leucocytosis, klebsiella oxytoca was cultured and sensitivity to colistin, Tieceycline, resistant to cephalosporin, E/U/Cr were essentially normal.

Initial working diagnosis was bilateral wilms tumour with acute urinary retention secondary to necroturia from sloughed tumour tissue (Figures 3 and 4). Definitive diagnosis of stage v wilms tumour was based on histopathological analysis of renal mass biopsy.

The child was transfused severally based on clinical findings and prior to chemotherapy. Chemotherapy started with 2 courses and then a single course a week later. SIOP regimen was given (Vincristine, actinomycin, doxorubicin). The patient took a total of four courses of chemotherapy and absconded from the ward till date. Parents have not responded to calls by the doctors.

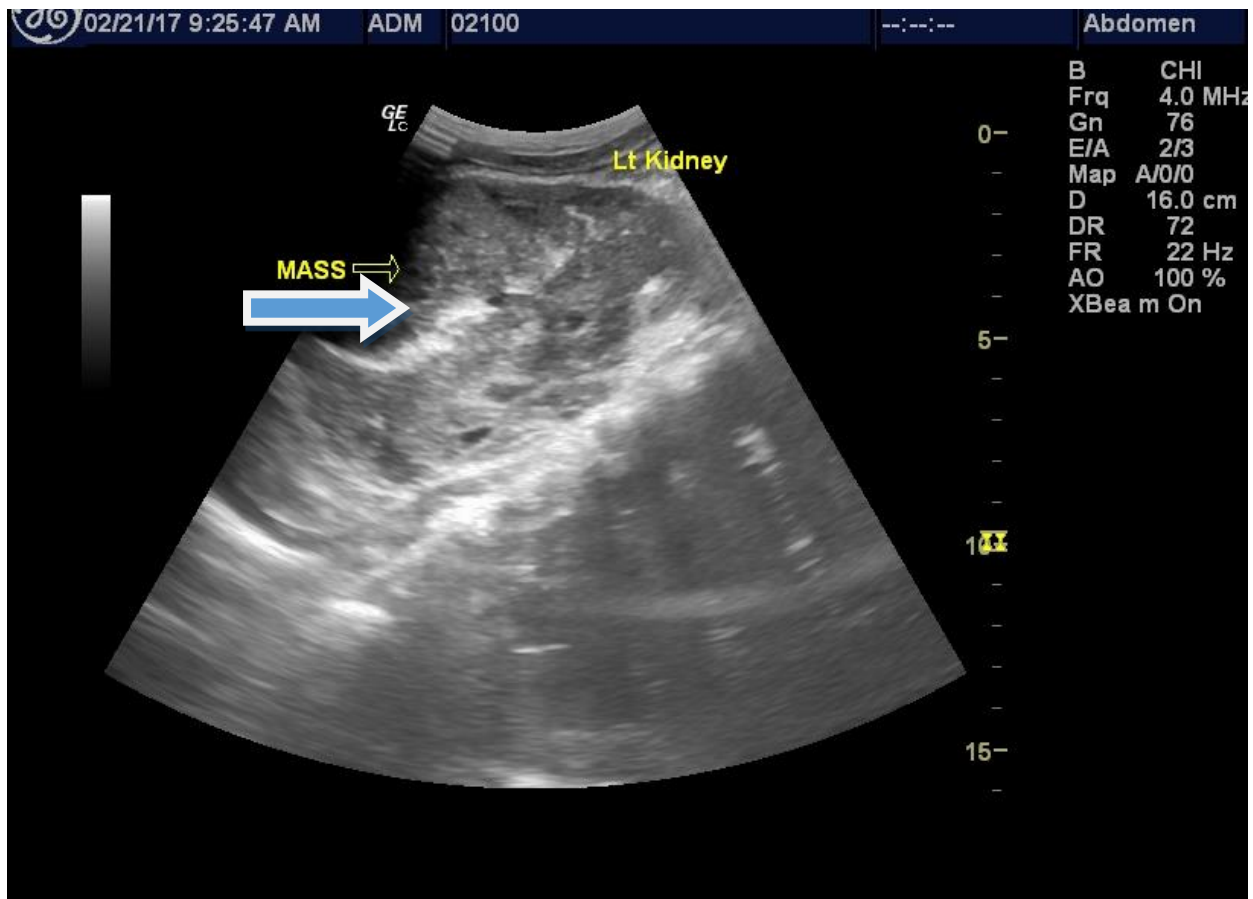


Figure 1a: Abdominal ultrasound longitudinal image shows a left renal mass(blue arrow)

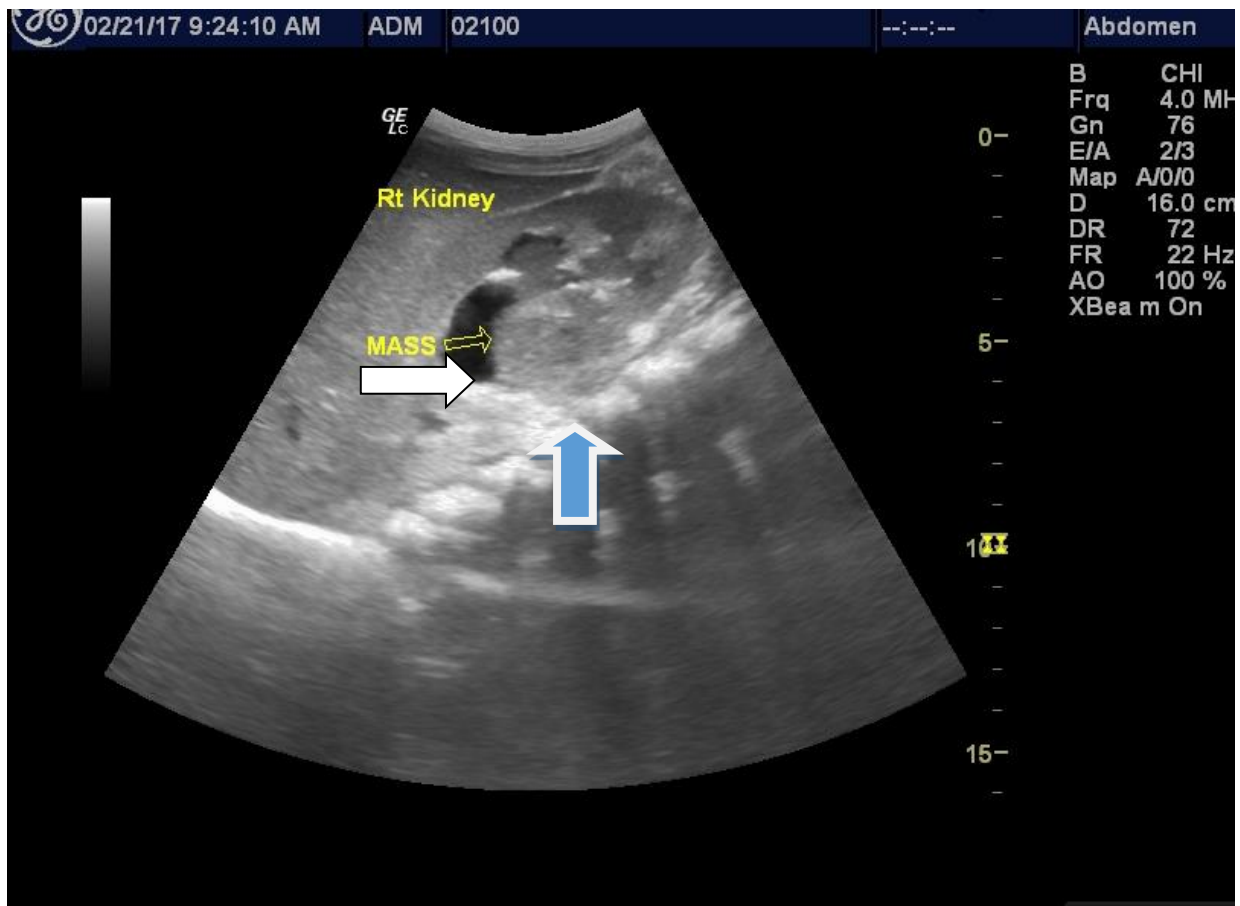


Figure 1b: Abdominal ultrasound (longitudinal view) shows an hypoechoic mass (blue arrow) in the right kidney with hydrocalycosis(white arrow)

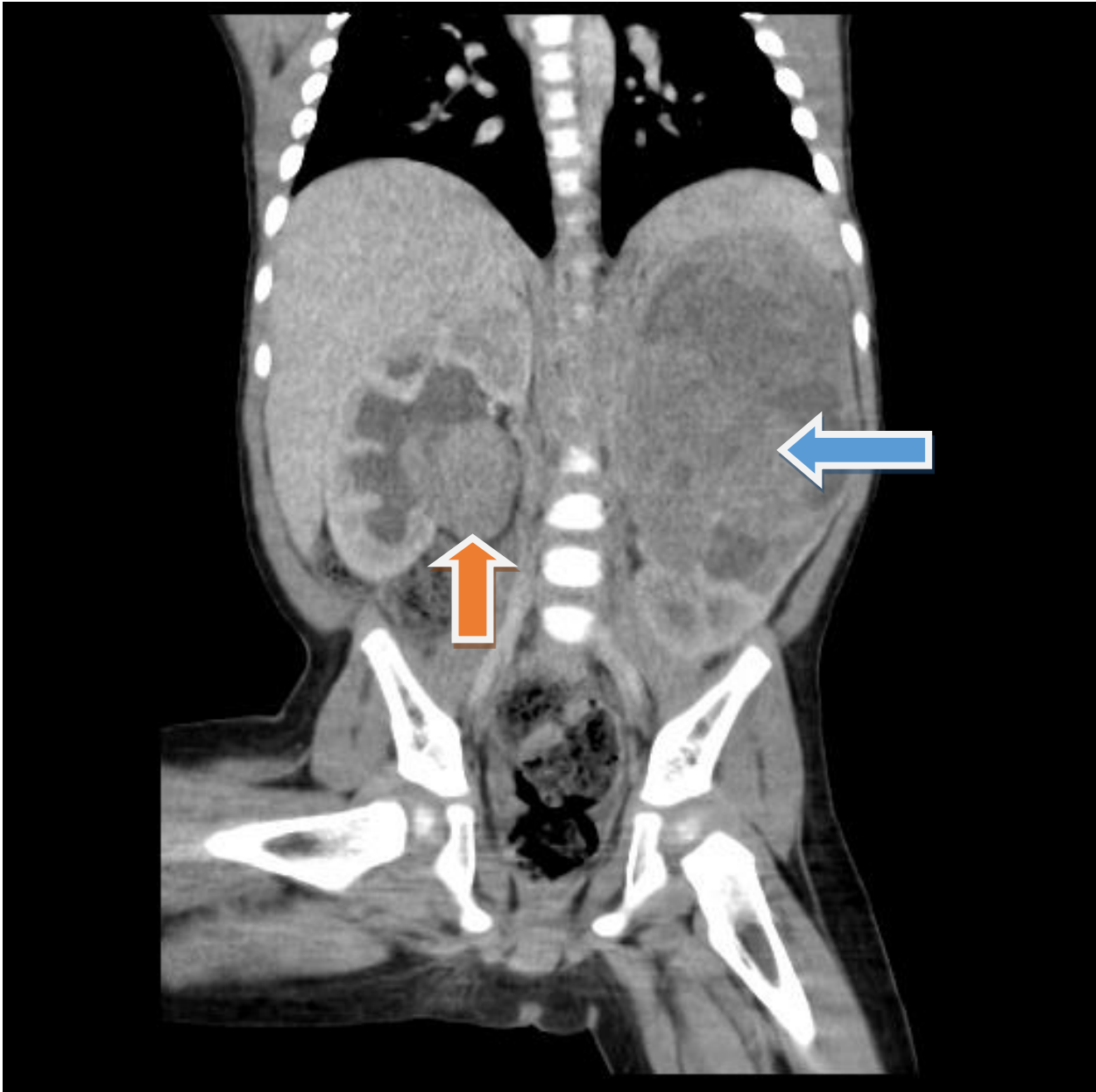


Figure 2a: Contrast enhanced computed tomography of the abdominopelvic coronal reformat shows hypodense mass involving both kidneys (left (blue arrow) and right (orange arrow)).



Figure 2b: Axial non contrast computed tomography of abdomen showing hypodense mass in both kidneys (white arrows)



Figure 3: Urethral mass at the tip of the penile meatus. This was later confirmed to be necrotic tissue debris from sloughing of the wilms tumor



Figure 4: Urethral meatal mass extracted for histopathological analysis which reveal necrotic tissue.

DISCUSSION

Wilms tumour can arise anywhere within the renal medulla or cortex and can protrude into the calyces and ureter and in 6% of patients the tumour extends into the renal vein or inferior vena cava(Qureshi et al., 2021).

The incidence of end stage renal disease is significantly higher in children with bilateral wilms tumour and the risk of renal failure increases with the loss of more than 50% of renal mass, however the prognosis is relatively

good as curative therapy is achievable in the majority of cases (90%)(Spreafico et al., 2021). The preservation of maximum amount of renal parenchymal is needed to prevent renal failure but complete resection is required to optimize the chances for cure of the malignancy(Martos Rodriguez et al., 2026)

The major challenge in bilateral renal tumour is to achieve cure rate and at the same time

to preserve sufficient renal tissue for normal growth and development(Alhashim et al., 2024; Wahyudi et al., 2020)

Staging according to the National Wilms Tumour Study(NWTS) comprises stage i: tumour limited to the kidney and completely resectable; stage ii: tumour extending beyond the kidney but still completely resectable; stage iii: residual tumour confined to the abdomen without distant metastasis; stage iv: haematogenous metastasis to lung, liver, bone, brain and stage v: bilateral renal involvement appearing initially or manifesting during treatment(Bhutani et al., 2021).

Bilateral Wilms tumour are all considered stage v disease and generally both kidneys are asymmetrically involved, one kidney being more severely affected than the other. The index patient had left kidney more severely affected than the right.

Synchronous bilateral wilms tumour represent 4%-7% of all wilms tumour and most patients present with synchronous disease(Asfour et al., 2025). The index patient had synchronous involvement.

Wilms tumour most commonly metastasises to lungs, followed by lymph nodes, and liver, rarely it metastasises to bone, bone marrow or brain. The chest radiograph of the index patient was essentially normal on admission. Imaging findings are solid, often heterogenous, intrarenal masses with internal hemorrhage, fat, necrosis or calcification.

On ultrasound wilms tumour appear heterogenous in echogenicity due to the presence of hemorrhage, fat, necrosis or calcification(Bălănescu et al., 2022)The index patient had heterogenous pattern, however the presence of calcifications could not be ascertained.

On computed tomography(CT) the mass may also appear heterogenous in density, while on contrast enhanced computed tomography it demonstrate tumour extension into the renal vein, inferior vena cava(IVC), hepatic vein and nodal metastasis(de Carvalho et al., 2021). In the index case the mass is hypodense on both views of the contrast enhanced images; no tumour extension into the renal vein seen.

Magnetic resonance imaging(MRI) will show wilms tumour as low signal intensity on T1weighted and high signal on T2weighted images, MRI is the most sensitive modality for determination of IVC patency, however the long sedation period has limited its use

in young children(de Carvalho et al., 2021). The index patient did not have an MRI scan done due to its non suitability.

Positron emission tomography CT allows accelerated metabolic activity to be accurately anatomically localised for proper staging, assessment of treatment response, surgical and radiotherapy planning.

The current recommendation for treatment of synchronous bilateral wilms tumour are biopsy, followed by neoadjuvant chemotherapy (Duncan et al., 2024) and then renal salvage procedures such as partial nephrectomy or tumourectomy(Neagu et al., 2025).

Preoperative chemotherapy is important because each kidney is staged separately and complete resolution of the disease in one kidney may allow surgery on the other kidney to achieve definitive cure(Chintagumpala et al., 2022)

Nephron sparing surgery when combined with adjuvant radiation and or chemotherapy, provides an opportunity to preserve renal function while maintaining excellent long term oncological outcomes for patients with bilateral wilms tumour. Bilateral nephron sparing surgery should be considered for all patients who have bilateral wilms tumour with favourable histology(Martos Rodriguez et al., 2026).

Survival of patients with wilms tumour has improved due to advances in imaging, histological methods of diagnosis, development of risk adapted therapy and improved staging(Bhutani et al., 2021). Although prognosis is dependent on individual staging and treatment, other factors that may contribute to poor outcome are under staging and or under treatment(Theilen et al., 2022).

SUMMARY

This is a case of a two year old boy with bilateral wilms tumour who presented with acute urinary retention from a necrotic urethral meatal mass which most probably resulted from dislodged necrotic tissue from the renal tumour into the urinary system. Unfortunately the child was not given the opportunity to complete the management of the tumour by the parents.

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