

# RADY 403 Case Presentation

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# Focused Patient History and Workup

## Presentation:

- 8 yo male presented to OSH with ongoing abdominal pain and left sided abdominal fullness after being struck by a soccer ball in his left abdomen 3 days ago.

## Focused history:

- Reports some dizziness and headaches, decreased appetite, and decreased activity with low-grade fevers for the last 3 days. Tachycardic and hypertensive at presentation.
- He reported "extreme" pain this morning when twisting his trunk.
- About one month ago he had a similar experience with minor abdominal trauma to his left abdomen causing lingering pain for multiple days.

## Workup:

- Labs most concerning for hemoglobin of 8.4.
- ED ordered CT Chest Abdomen Pelvis W Contrast.
- After imaging patient was admitted at OSH and subsequently transferred to UNC for management.

# List of Imaging Studies

- CT Chest Abdomen Pelvis W Contrast
- XR Chest Portable
  
- No comparison studies

# CT Chest Abdomen Pelvis W Contrast – Transverse views

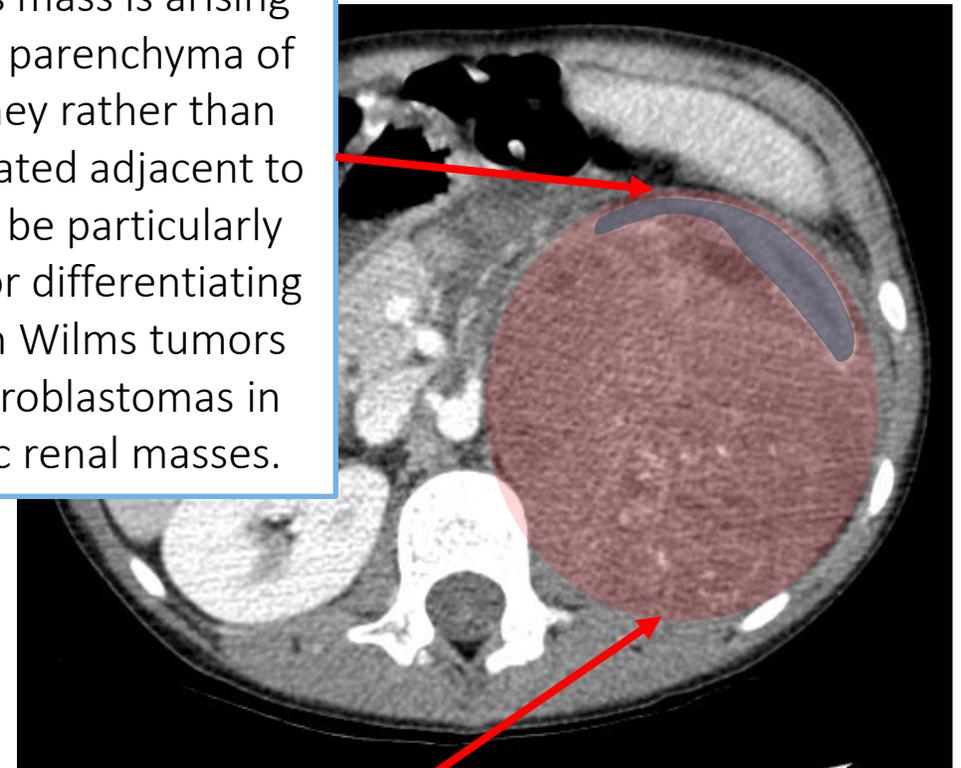
Large heterogeneous enhancing left renal mass with perinephric fluid most consistent with Wilms tumor



Transverse CT

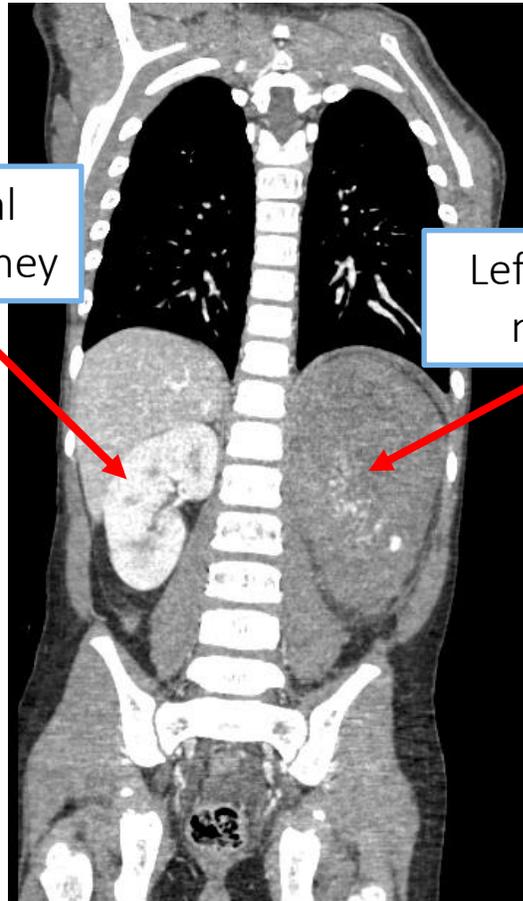
## Claw Sign

Indicates mass is arising from the parenchyma of the kidney rather than being located adjacent to it. It can be particularly helpful for differentiating between Wilms tumors and neuroblastomas in pediatric renal masses.



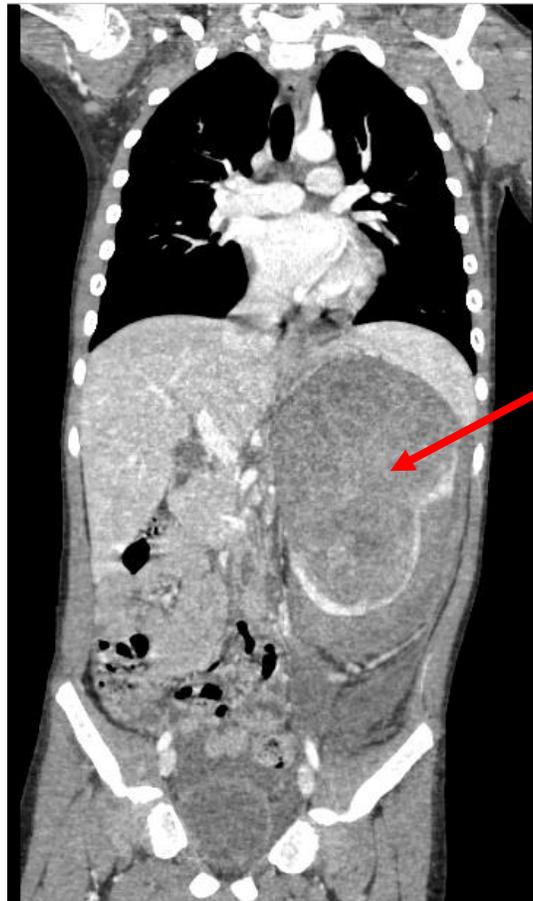
15.3 x 9.8 x 9.3 cm mass

# CT Chest Abdomen Pelvis W Contrast – Coronal views



Left renal mass

Normal right kidney

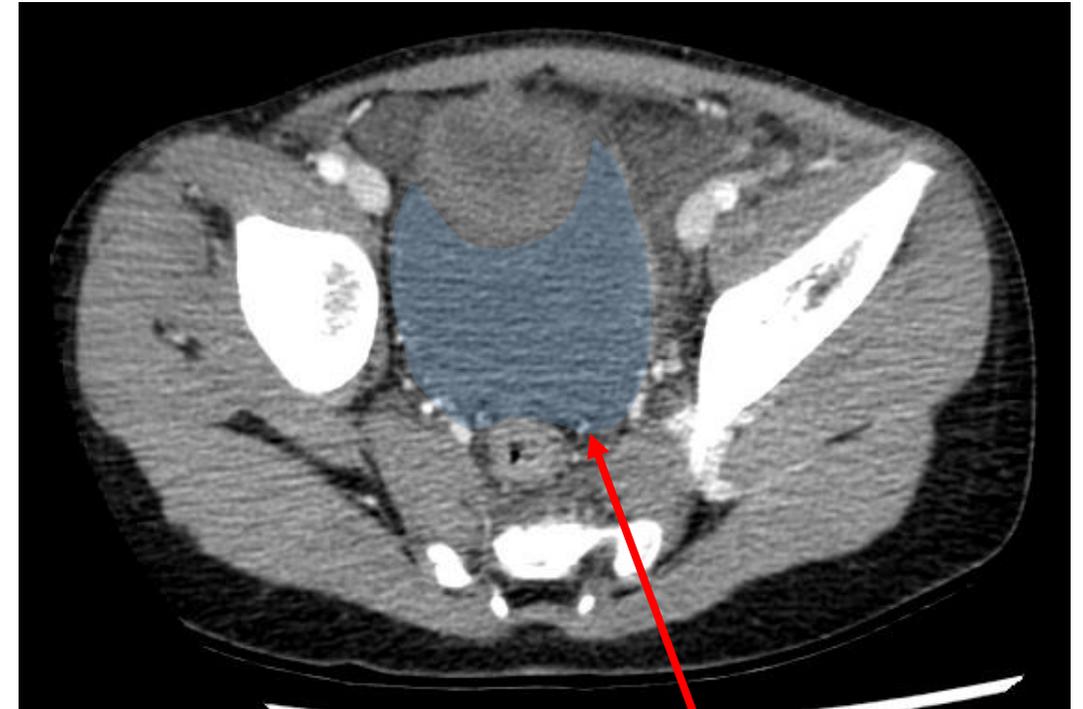


Posterior



Anterior

# CT Chest Abdomen Pelvis W Contrast – Transverse views

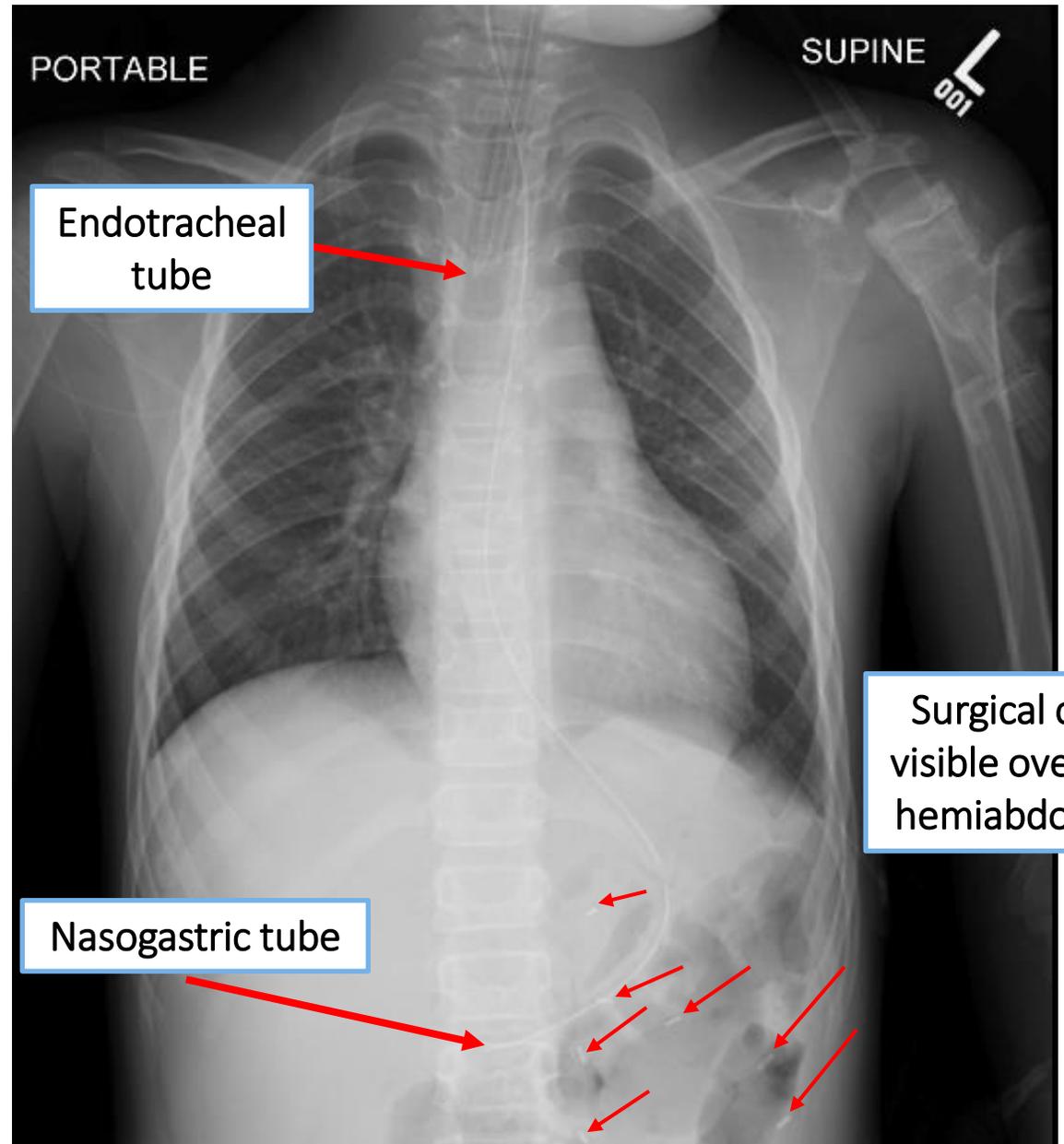


Free fluid

- Moderate volume free fluid in the pelvis concerning for rupture of the mass
- No metastases identified in lungs or elsewhere
- Surgical resection expedited due to concern for rupture

## Patient Treatment or Outcome

- Pediatric surgery performed left nephrectomy
  - Determined there was no rupture of mass—there was yellow ascites in abdomen
  - Mass measured 8 x 20 x 13 cm
  - Left ureter, gonadal vein, and renal vasculature densely adhered to the mass
  - No gross metastatic disease
- Surgical pathology results confirmed Wilms tumor and narrow negative margins
  - Stage III given a separately removed tumor thrombus in the renal vein
  - Concern for residual tumor
- Port placed for chemotherapy
- Discharged with plan for radiation therapy



# Differential Diagnosis

- Wilms tumor
- Neuroblastoma
- Clear cell sarcoma
- Cystic partially differentiated nephroblastoma
- Pediatric cystic nephroma
- Renal rhabdoid tumor
- Renal abscess
- Angiomyolipoma
- Renal cell carcinoma
- Renal medullary carcinoma

# Wilms Tumors – Epidemiology and Presentation

- Wilms tumor = nephroblastoma
- Most common pediatric renal mass
  - Over 85% of renal masses<sup>1</sup>
  - 6% of all childhood cancers<sup>2</sup>
  - Approximately 80% present by age 5<sup>3</sup>
  - When associated with a syndrome (Beckwith-Wiedeman, WAGR, Denys-Drash, etc.) the tumor usually presents earlier, before 2 years.<sup>1</sup>
  - 5-10% are bilateral
- Presentation<sup>5</sup>
  - Most often with abdominal swelling and no other symptoms
  - Abdominal pain (30-40%)
  - Hematuria (12-25%)
  - Hypertension (25%)
  - Fever

# Wilms Tumors – Radiographic Features and Staging

- Usually large solid masses
- Appear heterogenous
- Displace adjacent structures
- Claw sign is helpful in determining if mass is arising from renal parenchyma or adjacent to it
- Metastases are most commonly to the lung (85%), liver and local lymph nodes<sup>1</sup>

## Wilms Tumor Staging<sup>4</sup>

- **stage I**
  - confined to kidney
  - complete resection possible
- **stage II**
  - local spread beyond kidney including renal vein involvement
  - complete resection possible
- **stage III**
  - lymph-node involvement or
  - disease confined to the abdomen: e.g peritoneal spread, residual tumor
  - complete resection NOT possible
- **stage IV**
  - haematogenous metastases (typically lungs, liver, distant nodes)
- **stage V**
  - bilateral renal involvement
  - each kidney should be staged individually

# Wilms Tumors – Treatment and Prognosis

## Treatment<sup>5</sup>

- Surgical excision for all resectable tumors
- Chemotherapy for most patients
- Radiation therapy sometimes
- Some strategies use chemotherapy before tumor resection

## Prognosis<sup>5</sup>

- Overall five-year survival rate = 90%
- Recurrence
  - 15% with favorable histology
  - 50% with anaplastic features

# Estimated Cost, Radiation Exposure, Imaging Appropriateness

## CT Abdomen Pelvis W Contrast

- Estimated average cost: \$1,378<sup>7</sup>
- Estimated average radiation exposure (pediatric): 0.3-3 mSv<sup>8</sup>

## Imaging Appropriateness

- Evaluation of an abdominal mass without other presenting symptoms would usually begin with ultrasound, particularly in a child. However, due to this patient's chief complaint being caused by low-grade trauma, along with abdominal fullness and tenderness, CT was appropriate based on ACR appropriateness criteria.<sup>8-9</sup>

## Wrap Up

- Wilms tumors (nephroblastomas) are the most common pediatric renal mass
- Most often present with abdominal swelling and no other symptoms
- Radiographically most often appear as a large heterogenous mass arising from within the renal parenchyma
- Are most often treated with resection followed by chemotherapy

# References

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3. Gaillard F. Wilms Tumor. Radiopaedia. Accessed June 17, 2020. <https://radiopaedia.org/articles/wilms-tumour?lang=us>
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