

A 3-year-old boy is brought to the physician for evaluation of an abdominal "swelling" discovered by his mother during bathing. He has no pain or changes in appetite. Review of systems is negative. He was recently treated with antibiotics for streptococcal pharyngitis but has no other medical problems. Weight and height have been tracking along the 75th percentile. Vital signs are normal. Examination shows a well-appearing, well-nourished boy. A firm, nontender mass is palpable in the left abdomen. Urinalysis results are as follows:

Color	Yellow
Blood	2+
Glucose	Negative
Protein	Negative
Nitrite	Negative
Leukocyte esterase	Negative
Bacteria	None
Red blood cells	34/hpf
White blood cells	1/hpf

What is the most likely diagnosis?

- ☐ A. Nephrolithiasis
- ☐ B. Neuroblastoma
- ☐ C. Posterior urethral valves
- ☐ D. Poststreptococcal glomerulonephritis
- ☐ E. Pyelonephritis
- ☐ F. Renal cell carcinoma
- ☐ G. Wilms tumor (nephroblastoma)

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What is the most likely diagnosis?

- ☐ A. Nephrolithiasis [1%]
- ☐ B. Neuroblastoma [5%]
- ☐ C. Posterior urethral valves [1%]
- ☐ D. Poststreptococcal glomerulonephritis [12%]
- ☐ E. Pyelonephritis [0%]
- ☐ F. Renal cell carcinoma [1%]
- ☒ G. Wilms tumor (nephroblastoma) [81%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Explanation:

User Id: [redacted]

Wilms tumor (nephroblastoma)	
Epidemiology	<ul style="list-style-type: none"> • Most common renal malignancy in childhood • Fourth most common childhood cancer • Peak age 2-5 years • Usually sporadic • Associated syndromes: <ul style="list-style-type: none"> • WAGR (Wilms tumor, Aniridia, Genitourinary anomalies, intellectual disability [mental Retardation]) • Beckwith-Wiedemann syndrome • Denys-Drash syndrome
Clinical presentation	<ul style="list-style-type: none"> • Asymptomatic, firm, smooth, abdominal mass that does not cross midline
Treatment	<ul style="list-style-type: none"> • Tumor excision or nephrectomy • Chemotherapy • +/- Radiation therapy
Prognosis	<ul style="list-style-type: none"> • 5-year survival rate with treatment: 90%

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Wilms tumor (nephroblastoma) is the **most common primary renal neoplasm of childhood**. It is usually diagnosed at **age 2-5 years** and affects a single kidney. The most common presentation is an **asymptomatic abdominal mass** that is found incidentally by a caretaker or physician. Some patients have abdominal pain, hypertension, hematuria, and fever. Less than 10% of patients have bilateral renal involvement (stage V disease). Although the lungs are the most common site of metastatic spread, children rarely present with pulmonary symptoms.

Abdominal ultrasonography should be the first step in imaging to differentiate Wilms tumor from other causes of abdominal masses. It should be followed by **contrast-enhanced computed tomography of the abdomen** to evaluate the nature and extent of the mass and of the chest to identify any **pulmonary metastases**. Treatment

Treatment	<ul style="list-style-type: none">• Chemotherapy• +/- Radiation therapy
Prognosis	<ul style="list-style-type: none">• 5-year survival rate with treatment: 90%

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Abdominal ultrasonography should be the first step in imaging to differentiate Wilms tumor from other causes of abdominal masses. It should be followed by **contrast-enhanced computed tomography of the abdomen** to evaluate the nature and extent of the mass and of the chest to identify any **pulmonary metastases**. Treatment includes surgery and chemotherapy with the addition of radiation therapy for high-stage disease. Survival rates are excellent especially if treated in the early stages.

(Choice A) Kidney stones can cause hematuria but are usually very painful. Even large staghorn calculi would present as urinary tract infection and pain rather than abdominal mass.

(Choice B) **Neuroblastoma** should be considered when examining a child with an abdominal mass. It is the third most common pediatric cancer after leukemia and brain tumors but the most common cancer in the **first year of life**. Neuroblastoma can arise anywhere in the sympathetic nervous system but typically involves the adrenal glands and presents as an abdominal mass that **crosses the midline** with systemic symptoms. This patient's age and asymptomatic abdominal mass are more characteristic of Wilms tumor than neuroblastoma.

(Choice C) Posterior urethral valves can cause bilateral obstructive uropathy and are usually diagnosed prenatally. Boys who present later in life typically have frequent urinary tract infections and signs of renal failure. The associated hydronephrosis is not palpable, making this diagnosis unlikely.

(Choice D) Glomerulonephritis can occur as a complication of streptococcal pharyngitis (even if treated). In addition to hematuria, patients typically have proteinuria, hypertension, and edema. Glomerulonephritis would not cause a firm abdominal mass.

(Choice E) Pyelonephritis typically presents with fever, chills, flank pain, pyuria (white blood cells >5-10/hpf), and bacteriuria. This patient has no symptoms, pyuria, or

tumor from other causes or abdominal masses. It should be followed by **contrast-enhanced computed tomography of the abdomen** to evaluate the nature and extent of the mass and of the chest to identify any **pulmonary metastases**. Treatment includes surgery and chemotherapy with the addition of radiation therapy for high-stage disease. Survival rates are excellent especially if treated in the early stages.

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(Choice F) Renal cell carcinoma is the most common primary renal neoplasm. However, it occurs predominantly in men age 50-80 years and is rare in children.

Educational objective:

Wilms tumor is the most common pediatric renal malignancy. It should be suspected in a toddler with a firm, smooth, unilateral abdominal mass and hematuria.

References:

1. **Management of Wilms' tumour: current practice and future goals.**

Media Exhibit

tumor



Media Exhibit

tumor

