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KIDNEY (RENAL) CYSTS

•Renal cysts are fluid-filled sacs that develop in the kidneys.
•Simple renal cysts are found in approximately 25-33% of adults over the age of 50.
•Up to 50% of people over 50 may have at least one renal cyst.
•The exact cause of why cysts form is unclear --- one theory suggests that the cell wall of tubule inside the kidney may weaken, form a pouch that become filled with fluid, and the fluid becomes stuck within the pouch thus creating a cyst.
•Most simple renal cysts are asymptomatic and are often discovered incidentally during imaging tests, such as ultrasounds or CT scans, performed for other reasons.
•They can vary in size, number, and type.
•Usually *do not* cause symptoms (aches/pain, infection/UTI, bleeding).
•A classification system using roman numerals called the "Bosniak Classification System" is used.

SIMPLE RENAL CYSTS (BOSNIAK I)

• Benign (non-cancerous) and are the most common type of cyst with almost no malignant potential.
• Filled with clear or straw-colored fluid that is similar to plasma and contains water, salts, and other dissolved substances.
• Thin, smooth walls.
• No septations (internal walls), calcifications, or solid components.
• Appear as round or oval shapes with well-defined borders on imaging.
• They don't enhance after contrast administration.
• Do not harm the function of the kidney.
• The size of the cyst, or if it changes in size, is not typically relevant or needing to be tracked.
• If asymptomatic and discovered incidentally, it typically does not require treatment.
• Periodic imaging is usually not required but may be recommended if there's any uncertainty. If there's any doubt about the benign nature of the cyst, a follow-up ultrasound (or CT or MRI) may be performed after 6-12 months to ensure stability.
• Treatment (if necessary):
    • Percutaneous Aspiration: A radiologist inserts a small needle through the back to drain the cyst fluid.
    • Sclerotherapy: A chemical agent is injected into the cyst after drainage to reduce the chance of recurrence.
    • Surgery: In rare cases where the cyst is large or symptomatic, laparoscopic removal might be recommended.

COMPLEX RENAL CYSTS (BOSNIAK II, IIF, III, IV)

• Has features that make them more suspicious for malignancy (cancer).
• May contain fluid that is more dense/thicker and contain more proteins or other debris or may have blood (hemorrhagic cysts), making the contents appear darker.
• Thicker walls or irregular borders, septations (internal walls or septations), calcifications (hard, mineralized deposits) or solid components.
• Potential for enhancement after intravenous contrast on imaging.

BOSNIAK CLASSIFICATION SYSTEM - categorizes kidney cysts using roman numerals

• **BOSNIAK I**: Simple cysts with thin, smooth outer walls, containing clear fluid, and no internal, calcifications, or solid components. Benign, close to zero chance of being cancer.

• **BOSNIAK II**: Minimally complex cysts, few thin septations, possibly thin calcifications. Very low malignant potential and generally benign, no follow-up needed but may be monitored.

• **BOSNIAK IIF**: More complex cysts, more thin septations, minimal thickening of the walls or septations or calcifications, but no solid components. There is a low to mild (non-negligible) risk of malignancy. The "**F**" stands for "**F**ollow-up" and imaging is recommended at 6-12 months, then annually.

• **BOSNIAK III**: Indeterminate cysts with thickened, irregular walls or septations, solid components that enhance with contrast. There is a moderate risk of malignancy (about 30-50%), and surgical evaluation is often recommended.

• **BOSNIAK IV**: Cystic masses with clearly solid enhancing components, with high likelihood of malignancy (greater than 50%) and surgical removal is typically recommended (partial or complete removal of the cyst or the affected portion of the kidney).