

Differential Diagnosis for Renal Insufficiency

Renal Failure or Decreased Urine Output	Liano	Labus and Kowalak	Eisenberg	Kasper	Gomella	Total	Collected
PRERENAL							
Decreased cardiac output ¹		x	x	x	x	4	1
Hypovolemia ²		x	x	x	x	4	
Renovascular obstruction		x	x	x	x	4	
Peripheral vasodilatation ³		x	x			2	
INTRARENAL							
Acute tubular necrosis AKA acute kidney injury (AKI)	x	x	x	x	x	5	
Glomerulonephritis	x	x	x	x	x	5	
Renal vascular obstruction	x	x	x		x	4	
Cortical necrosis		x			x	2	
DIC			x		x	2	
Drugs: NSAIDS, cyclosporine, amphotericin B				x	x	2	
Papillary necrosis	x	x				2	
Pyelonephritis				x	x	2	
Chronic renal disease (atrophy)							2
POSTRENAL							
Ureteral obstruction		x	x	x	x	4	
Bladder obstruction		x	x	x		3	9
Prostate conditions			x	x	x	3	1
Calculi			x	x		2	1
Retroperitoneal fibrosis			x	x		2	
Urethral obstruction		x		x		2	

¹ Congestive heart failure, myocardial infarction, cardiac tamponade

² Diarrhea, vomiting, hemorrhage, overdiuresis, pancreatitis, peritonitis

³ Sepsis, drugs, anaphylaxis

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Cause	US findings	CT findings
Renovascular obstruction	Narrowed or occluded renal artery; elevated PSV at or near stenosis; increased RI in kidneys	Narrowed or occluded renal artery
Acute tubular necrosis AKA acute kidney injury	Elevated RI	Persistent nephrograms
Acute cortical necrosis	Wedge shaped area of abnormal echogenicity and decreased flow on color Doppler imaging	Wedge shaped area of abnormal enhancement
Acute papillary necrosis	Echogenic renal papillae +/- surrounding fluid; dilatation above level of obstruction caused by sloughed papilla	Blunted calyx; filling defect and dilatation above the level of a sloughed papilla
Acute pyelonephritis	Swelling; blurred corticomedullary junction	Swollen kidneys; patchy or striated nephrogram; delayed irregular enhancement
Vasculitis	Swelling; hyperemia on color Doppler	Irregular enhancement; abnormal vascular tree
Ureteral obstruction	Dilatation above level of obstruction; visualization of stone or mass in ureter causing the obstruction	Dilatation above level of obstruction; visualization of stone or mass in ureter causing the obstruction
Bladder obstruction	Dilatation above the level of the obstruction; visualization of prostate enlargement or other cause of the obstruction	Dilatation above the level of the obstruction; visualization of prostate enlargement or other cause of the obstruction
Prostate conditions	Enlarged prostate; dilated bladder (see bladder obstruction)	Enlarged prostate; dilated bladder (see bladder obstruction)
Calculi	Echogenic focus in the kidney, ureter, or bladder	Hyperdense lesion in the kidney, ureter, or bladder
Retroperitoneal fibrosis	Dilatation above the fibrosis; mass at the level of the fibrosis	Dilatation above the fibrosis; mass at the level of the fibrosis
Urethral obstruction	Dilatation above the obstruction; detection of a stone or mass at the level of obstruction	Dilatation above the obstruction; detection of a stone or mass at the level of obstruction
Neurogenic bladder	Dilated bladder and upper system	Dilated bladder and upper system
Acute Renal Failure with Very Subtle, Very Infrequent, or No US and CT Findings		
Decreased cardiac output; hypovolemia; peripheral vasodilatation; severe vasoconstriction; acute glomerulonephritis; disseminated intravascular coagulopathy; drug response (NSAIDs, cyclosporine, amphotericin B); acute interstitial nephritis; acute allergic nephritis; transfusion reaction;		

NOTE: While CT findings are included for completeness, many of the findings are best appreciated on a contrast-enhanced study, but such a study would be virtually never be performed because of the indication for the examination.

REFERENCES

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