



COMPUTED TOMOGRAPHY

Cross Sectional imaging modality

Mobile X-ray tube that rotates around a patient.

Data displayed in multiple window settings (lungs parenchyma, bone, etc.)

Density measurements/Hounsfield Units analyze chemical component of tissue

Image key = shades (Densities)

White ----- bone and calcification

Black ----- air

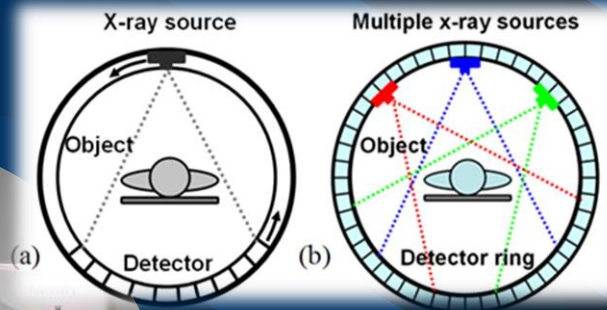
Dark Grey ----- Fat

HU:

-150-0 = fat, 45-75 = blood,

0 = water, 100-1000 = bone/calcium

0-20 = serous fluid,





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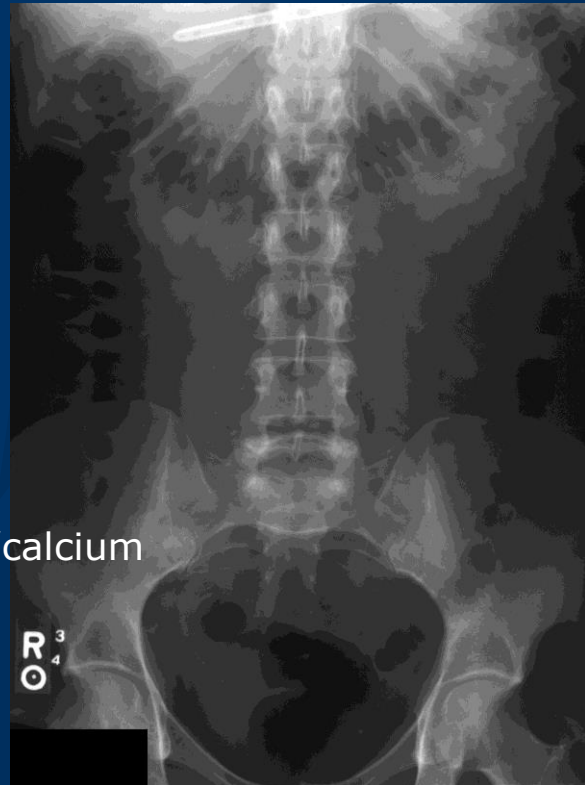
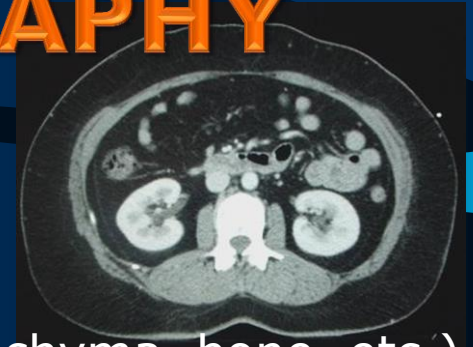
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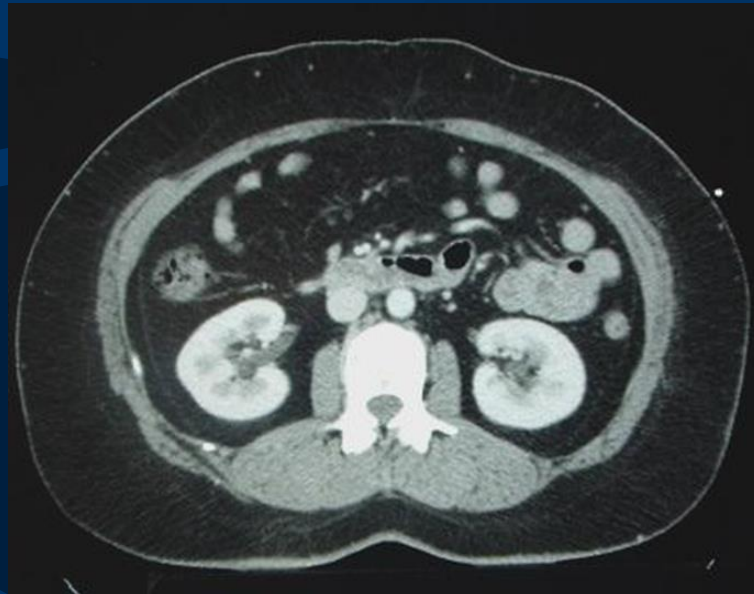


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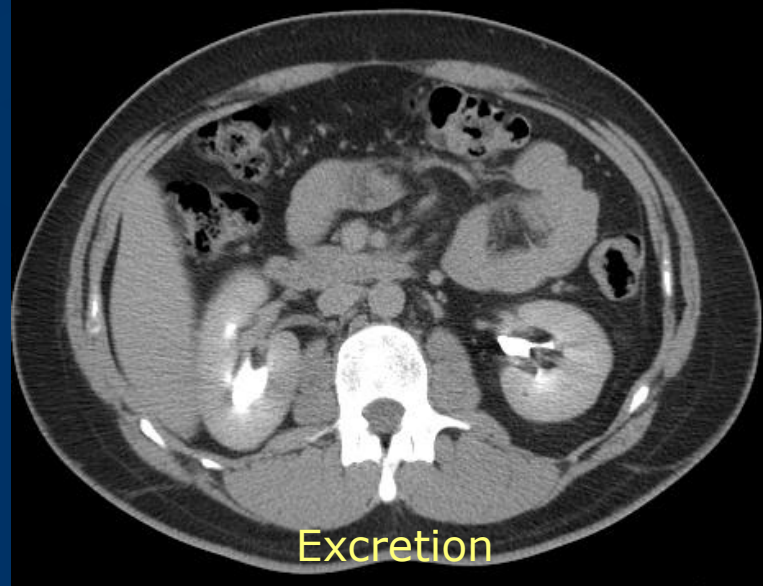
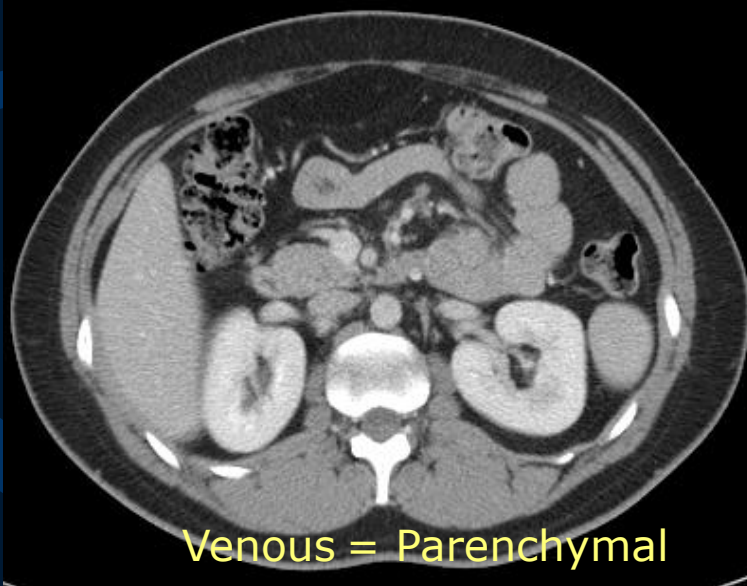
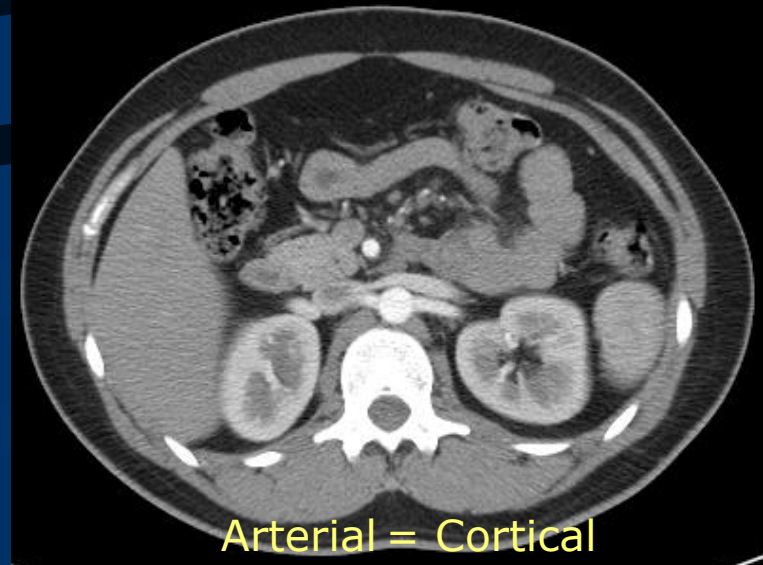
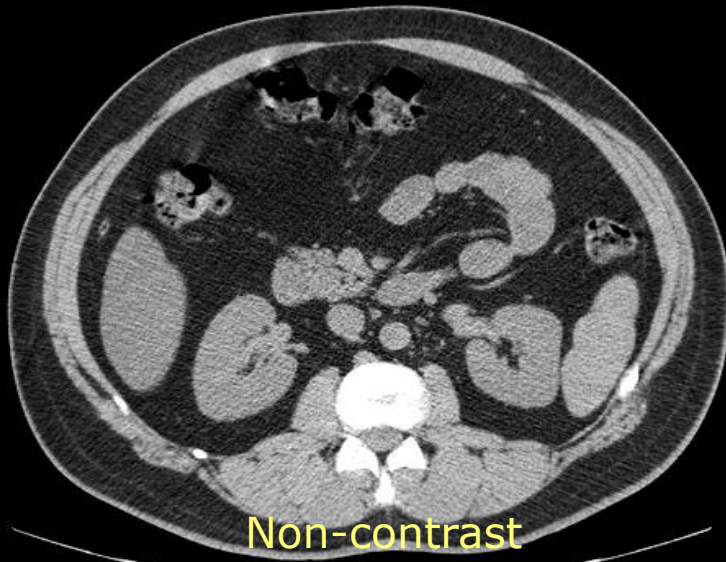
Better evaluation of soft tissue.

Image contrast determined by tissue density +/- contrast.

Useful for trauma, stone, tumor, infection.



COMPUTED TOMOGRAPHY ANATOMY





MAGNETIC RESONANCE IMAGING

Best for soft tissue imaging

There is no ionization

It can be done for pregnant women with caution

Images can be directly taken in any plane

Useful for soft tissue pathology (Tumor, infection)

Expensive

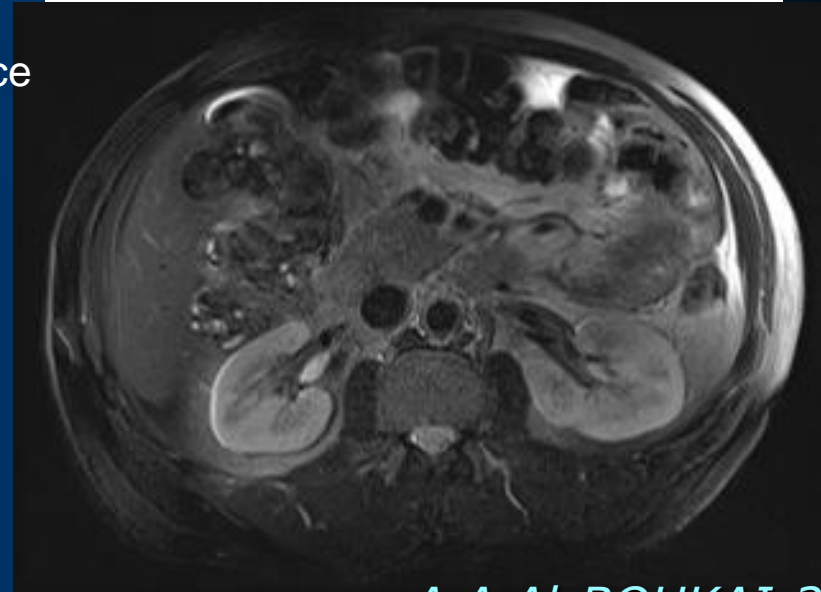
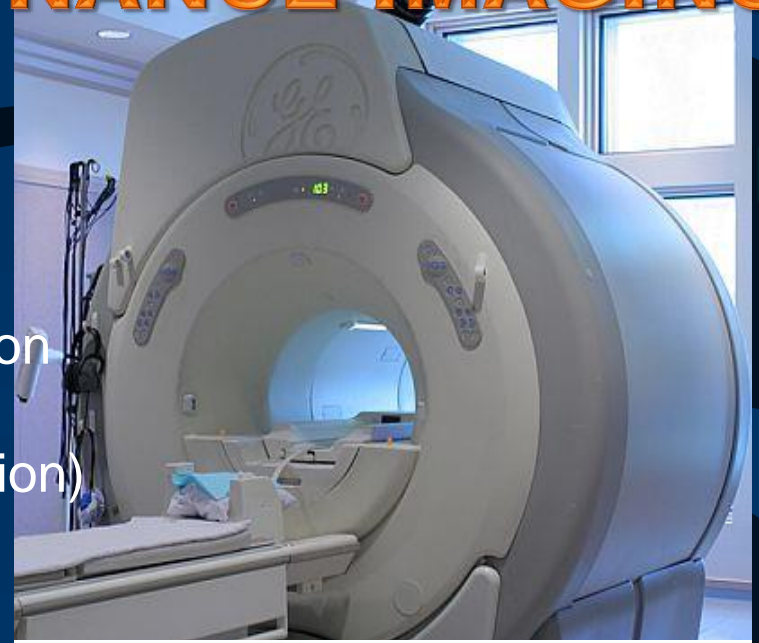
Time consuming

Patients fear it and dislike it because it is a narrow space

Since it is magnetic no metals can be allowed

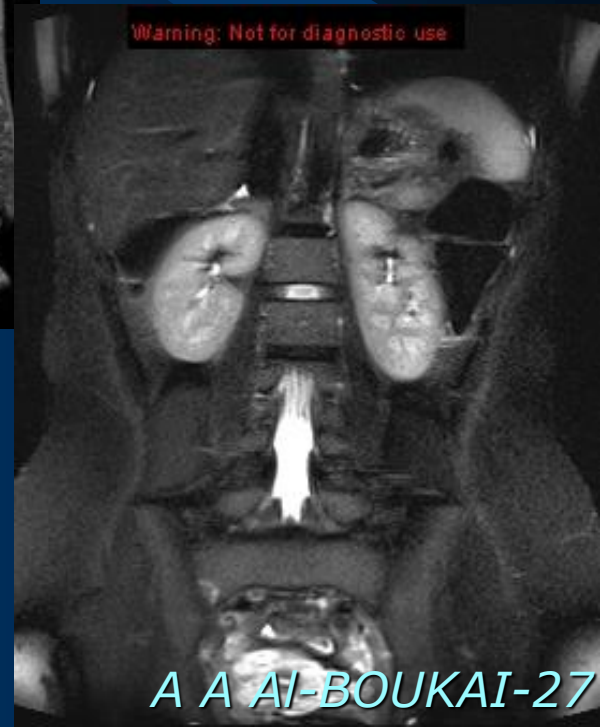
Patient has to keep still during scanning procedure

Image key = shades (Intensities)





MAGNATIC RESONANCE IMAGING





NUCLEAR MEDICINE IMAGING

RENAL CORTICAL STUDY.
RENAL DYNAMIC STUDY.

Gama camera.

Radioactive isotopes.

Functional / Structural test.

Useful for evaluation of function, obstruction
and scaring.



Image key = shades (Isotope count)

NUCLEAR MEDICINE IMAGING

RENAL CORTICAL STUDY.

- Contrast determine by tissue uptake
- Used for split function and cortical scaring as a result of previous infections



Image key = shades (Isotope count)

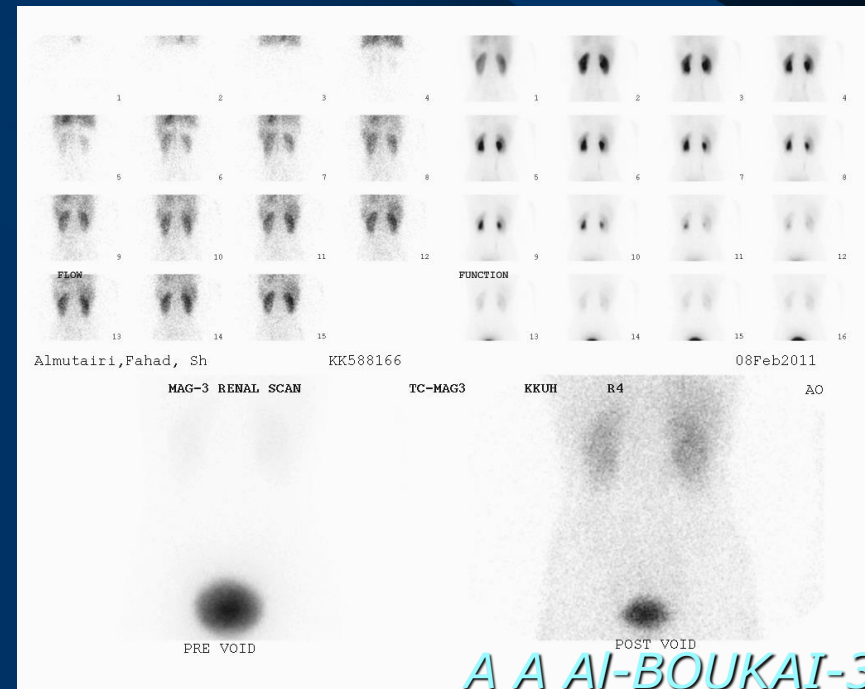


NUCLEAR MEDICINE IMAGING

RENAL DYNAMIC STUDY.

- Image contrast determine by organ blood perfusion, tissue uptake and clearance.
- Used for renal perfusion, function and obstruction.

Image key = shades (Isotope count)





EXAMPLES

CASE NO. 1

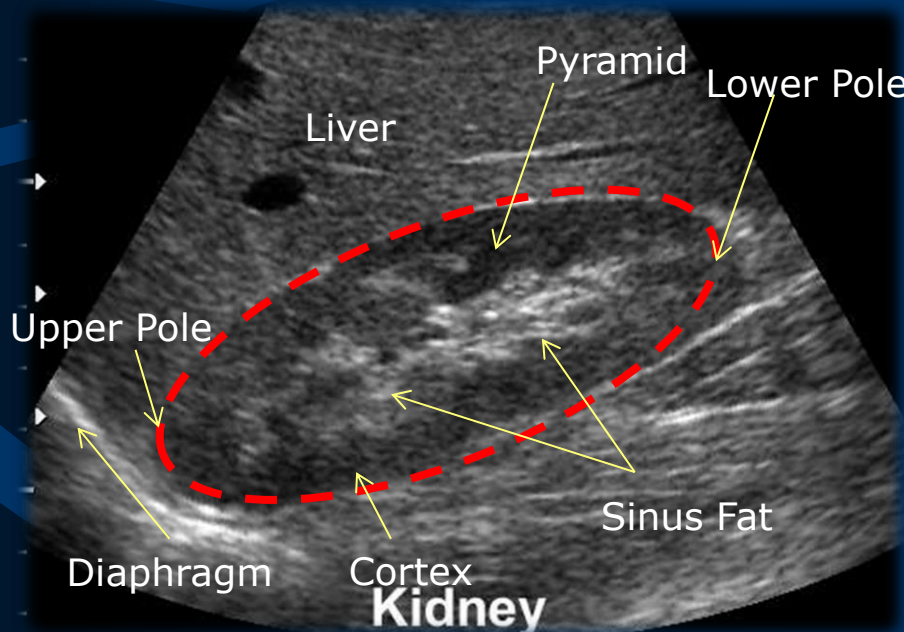
Young Adult presented with right loin pain and hematuria. Ultrasound Exam was performed. Which of the following is the likely finding?



- a- Hydronephrosis
- b- Normal.**
- c- Renal mass.
- d- Upper pole renal stone.

CASE NO. 1

Young Adult presented with right loin pain and hematuria. Ultrasound Exam was performed.
Which of the following is the likely finding?



- a- Hydronephrosis
- b- Normal.**
- c- Renal mass.
- d- Upper pole renal stone.

CASE NO. 2

Adult patient presents with hematuria. An intravenous urogram examination was performed.

Which of the following is the likely cause of his presentation?



- a- Non-functioning kidneys
- b- Renal stones.
- c- Renal mass.
- d- Uretric stricture.

CASE NO. 2



CASE NO. 2

Adult patient presents with hematuria. An intravenous urogram examination was performed.

Which of the following is the likely cause of his presentation?

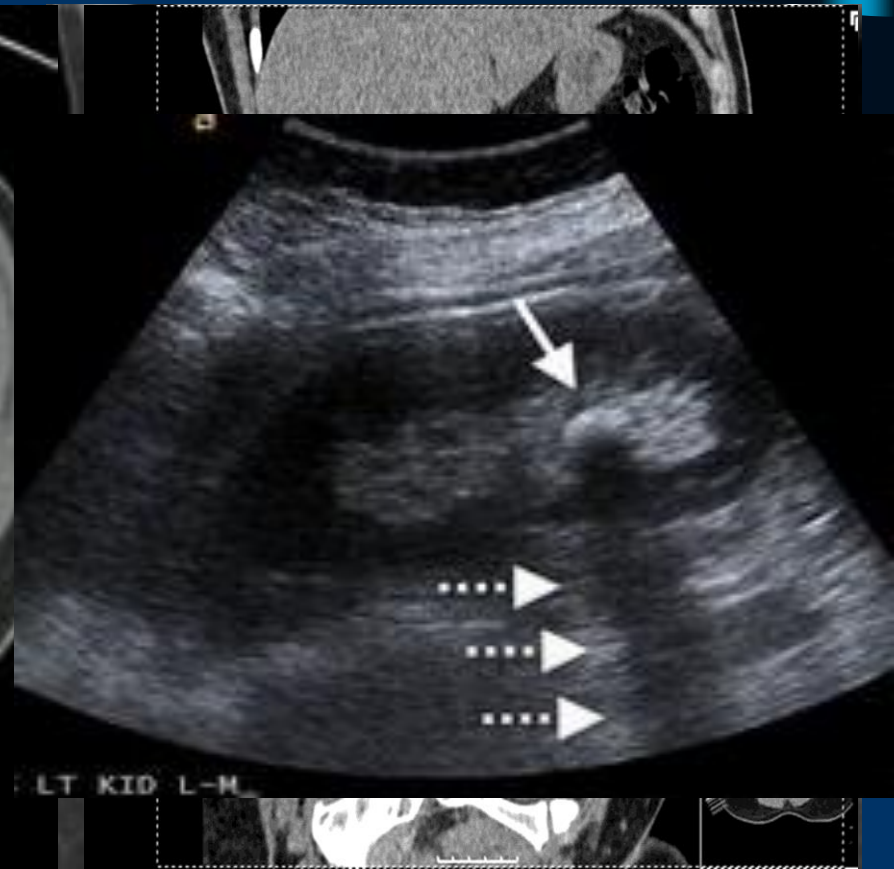


- a- Hydronephrosis
- b- Renal stones.**
- c- Renal mass.
- d- Uretric stricture.

URINARY TRACT STONE

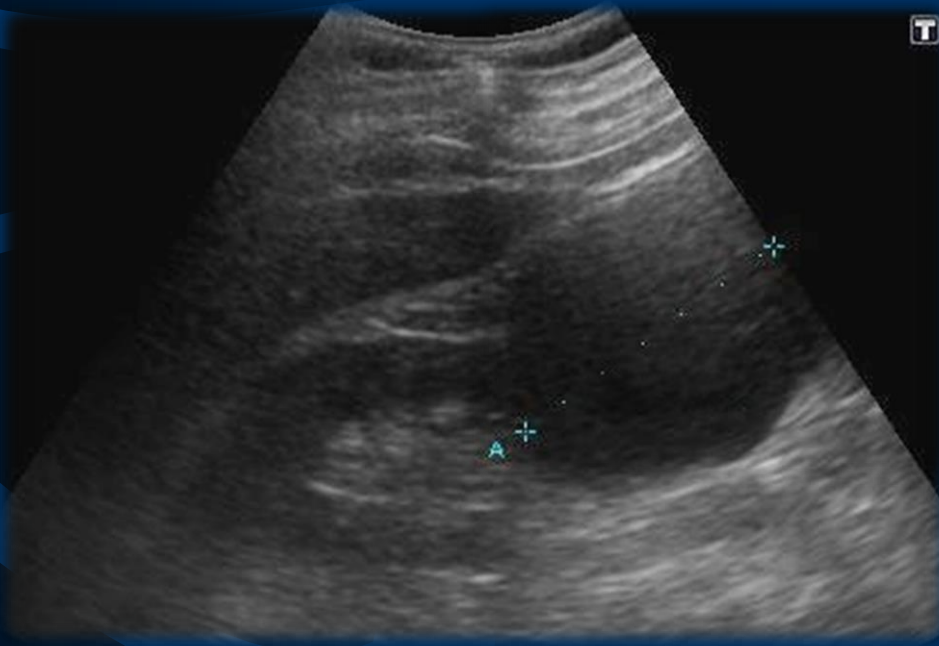


URINARY TRACT STONE



CASE NO. 3

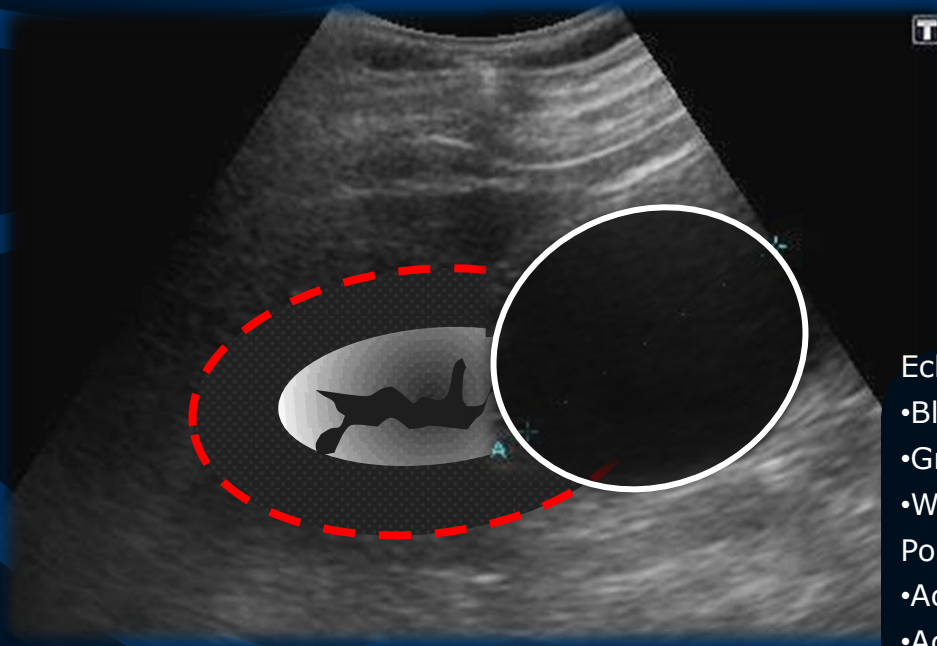
Young Adult presented with right loin pain and hematuria. Ultrasound Exam was performed. Which of the following is the likely finding?



- a- Normal.
- b- Hydronephrosis.
- c- Renal cyst.
- d- Lower pole renal stone.

CASE NO. 3

Young Adult presented with right loin pain and hematuria. Ultrasound Exam was performed. Which of the following is the likely finding?



Information needed

Echo texture:

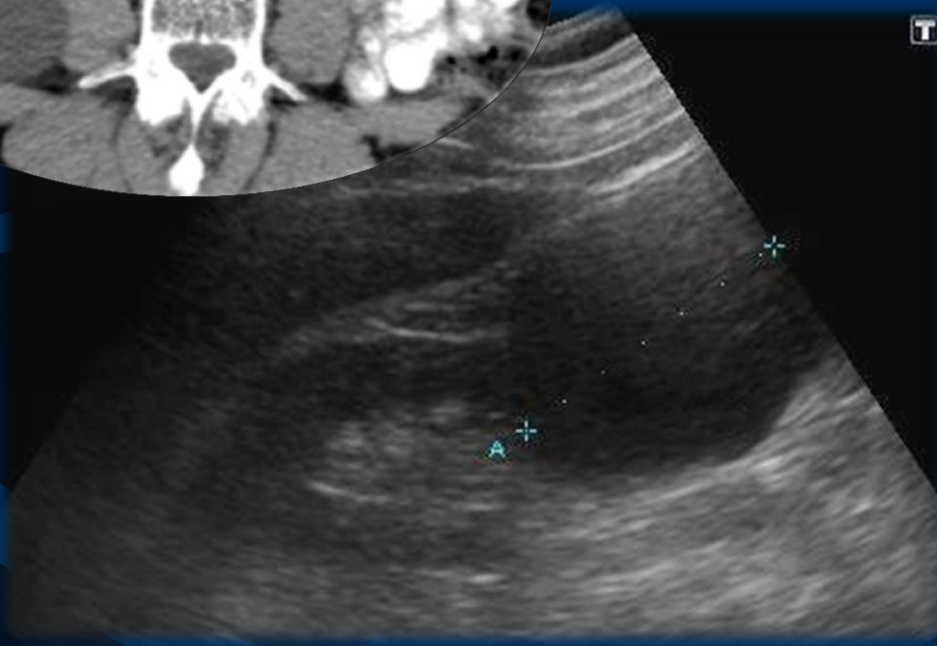
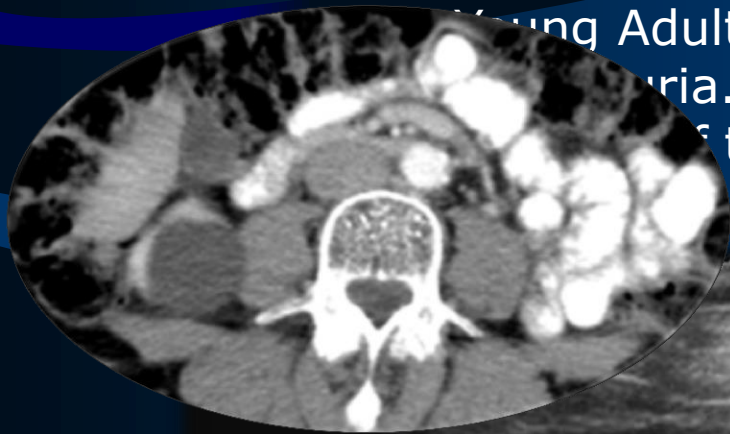
- Black => Sonolucent, echo void= Fluid.
- Grey => Hypoechoic = ST lesion
- White => Hyperechoic = Stone...

Posterior shadow:

- Acoustic enhancement. White-> Fluid
- Acoustic shadowing. Black-> Stone...

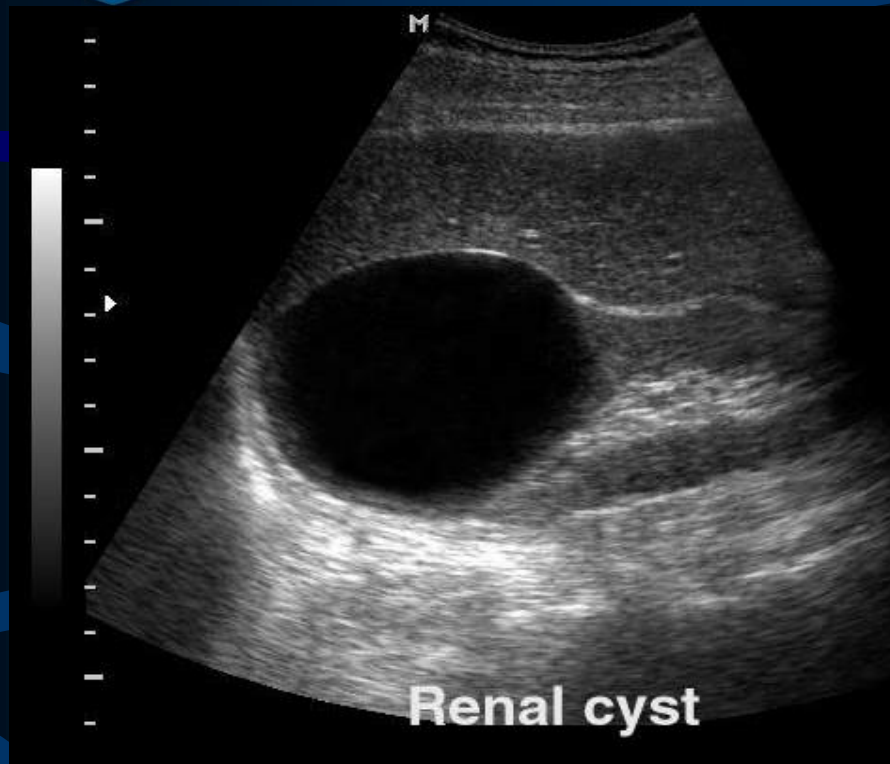
CASE NO. 3

A 45-year-old young Adult presented with right loin pain and hematuria. Ultrasound Exam was performed. Which of the following is the likely finding?



- a- Normal.
- b- Hydronephrosis.
- c- **Renal cyst.**
- d- Lower pole renal stone.

RENAL CYST

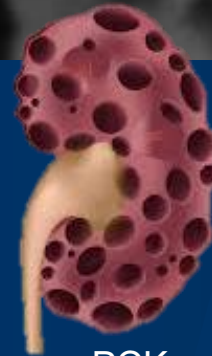


RENAL CYST

POLYCYSTIC KIDNEY DISEASE



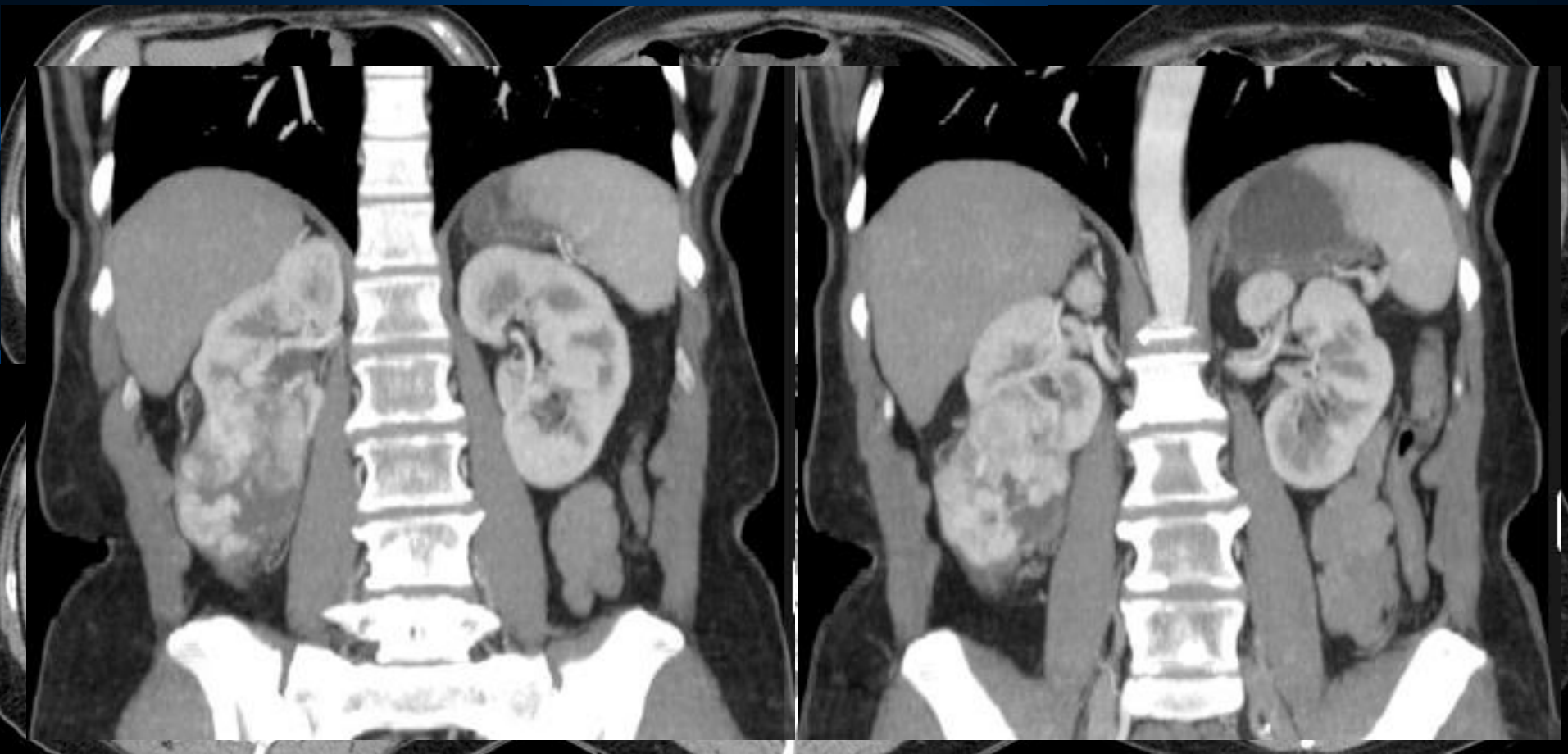
N



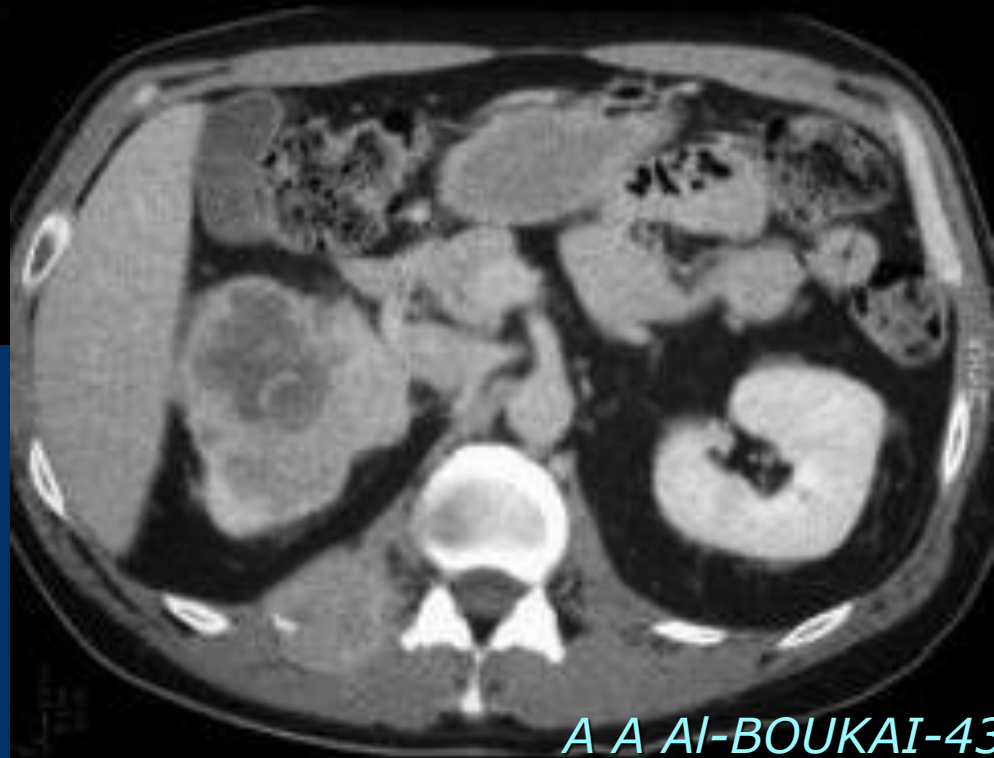
PCK

CASE NO. 4

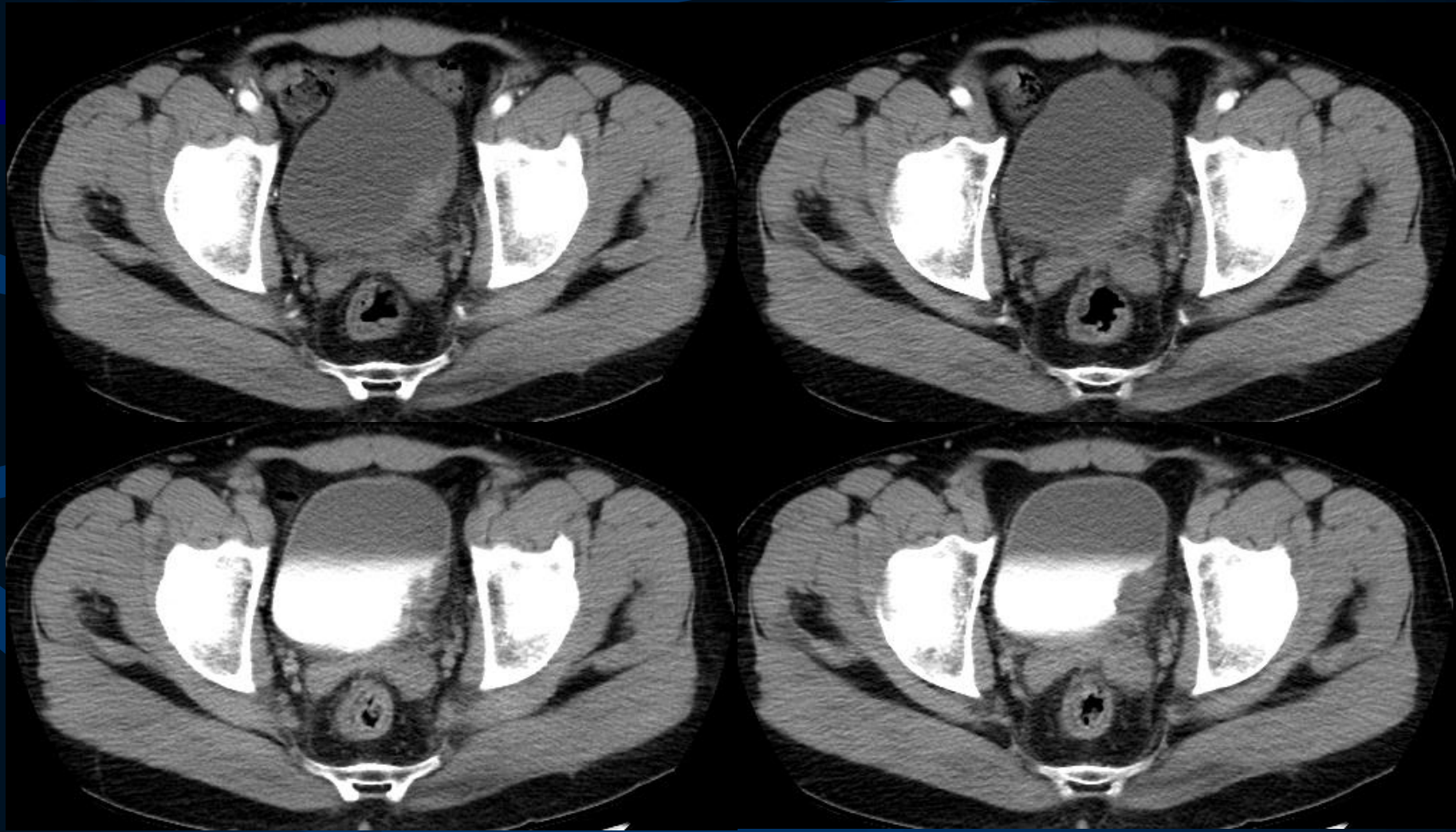
49 Adult patient smoker for 30 years presented to
PHC with hematuria and weight loss



RENAL CELL CARCINOMA



TRANSITIONAL CELL CARCINOMA



CASE NO. 5

54 YO presented with aggravating left flank pain and gross hematuria after ESWL.

Which of the following is the likely cause of his presentation?

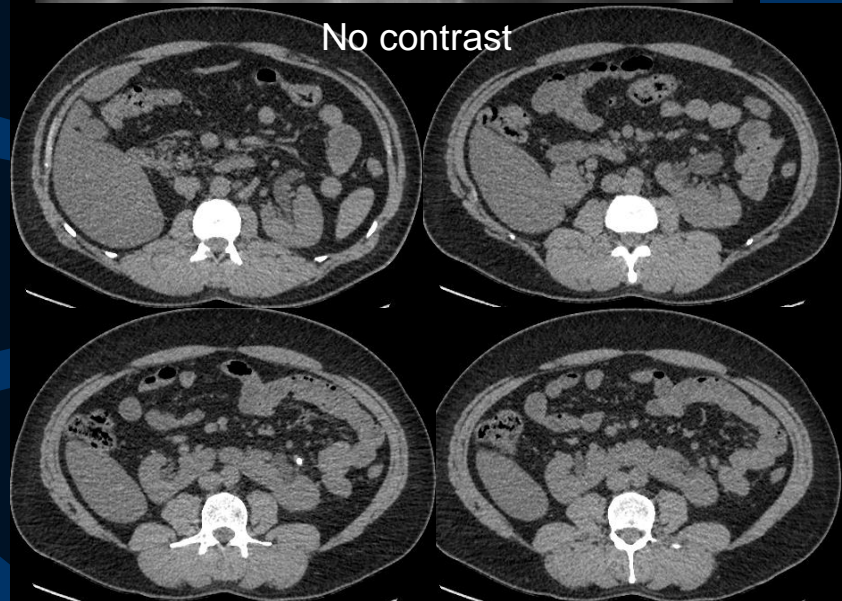


- a- Hydronephrosis
- b- Renal cyst.
- c- Renal mass.
- d- Renal hematoma.**

CONGENITAL HORSESHOE KIDNEY



CONGENITAL HORSESHOE KIDNEY





FURTHER READING

- Diagnostic Imaging (Armstrong, Diagnostic Imaging) by Peter Armstrong, Martin Wastie and Andrea G. Rockall (May 12, 2009)
- Lecture Notes: Radiology by P. R. Patel (Sep 14, 2010).
- A Guide to Radiological Procedures, by Frances Anne Aitchison MB ChB FRCP FRCR (Jun 11, 2009).
- Imaging Atlas of Human Anatomy, by Jamie Weir, Peter H. Abrahams, Jonathan D. Spratt and Lonie R Salkowski (Mar 9, 2010).



THANKS