



# Ordine Provinciale dei Medici Chirurghi e degli Odontoiatri di Vicenza

Ente sussidiario dello Stato

**CORSO DI AVVIAMENTO ALLE BASI TEORICO-PRATICHE  
DELL'ECOSCOPIA NEL SETTING DELLA MEDICINA GENERALE**

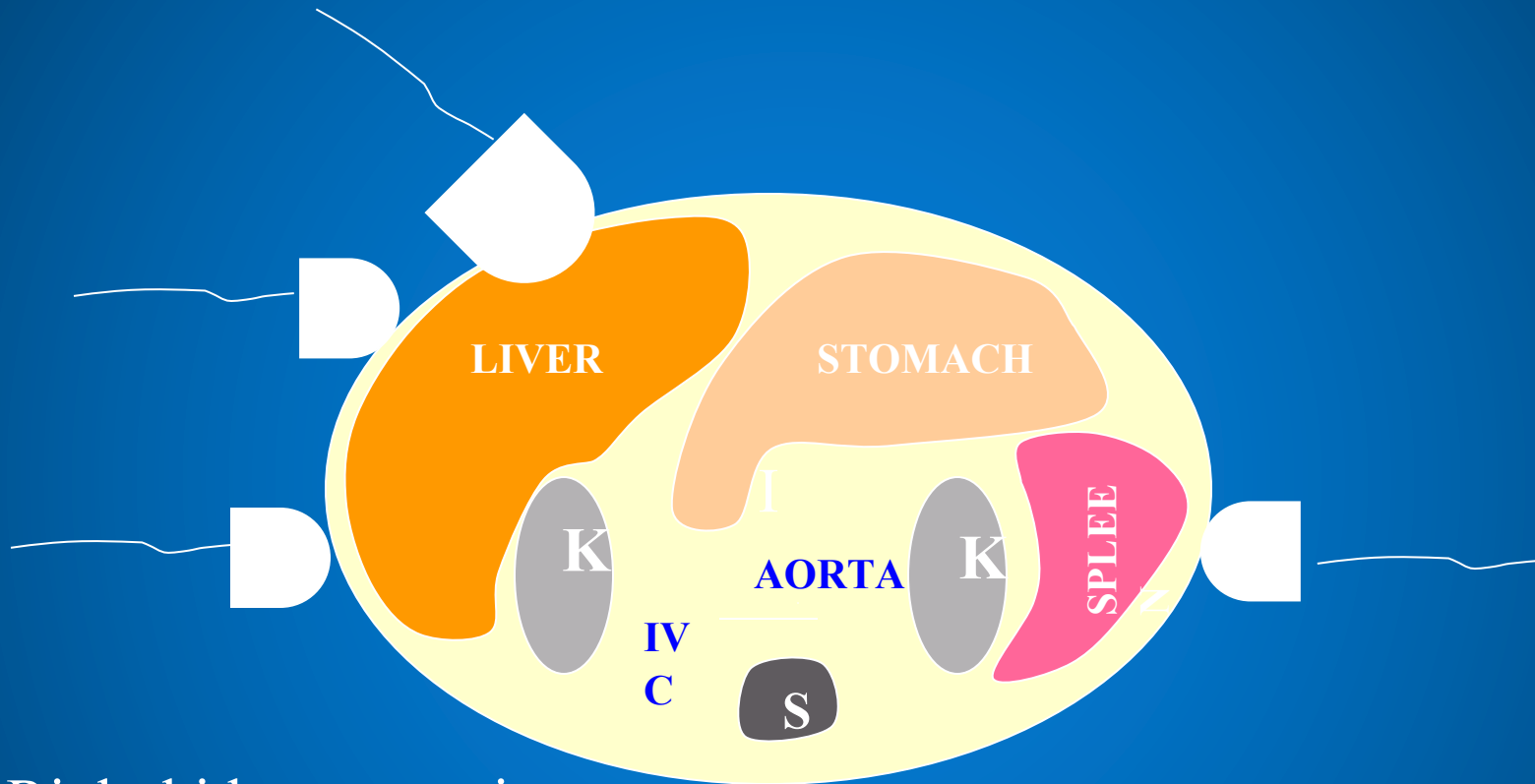
## **Approccio alla patologia renale litiasi, idronefrosi e globo vescicale**

**Vicenza 27-28 Settembre 2024**

# RENI E VIE URINARIE

- MORFO-VOLUMETRIA RENALE
- LESIONI RENALI OCCASIONALI
  - CISTICHE
  - SOLIDE
- VIE ESCRETRICI, ANATOMIA ECOGRAFICA E FINESTRE
- CALCOLOSI RENALE E DELLE VIE ESCRETRICI / IDROURETERONEFROSI
- VESCICA
  - FORMAZIONI SOLIDE VESCICALI
- ALTRE PATOLOGIE FREQUENTI
  - PIELONEFRITI
  - CISTITI
  - STENOSI DEL GIUNTO
  - RITENZIONE URINARIA

# Approach to Scanning

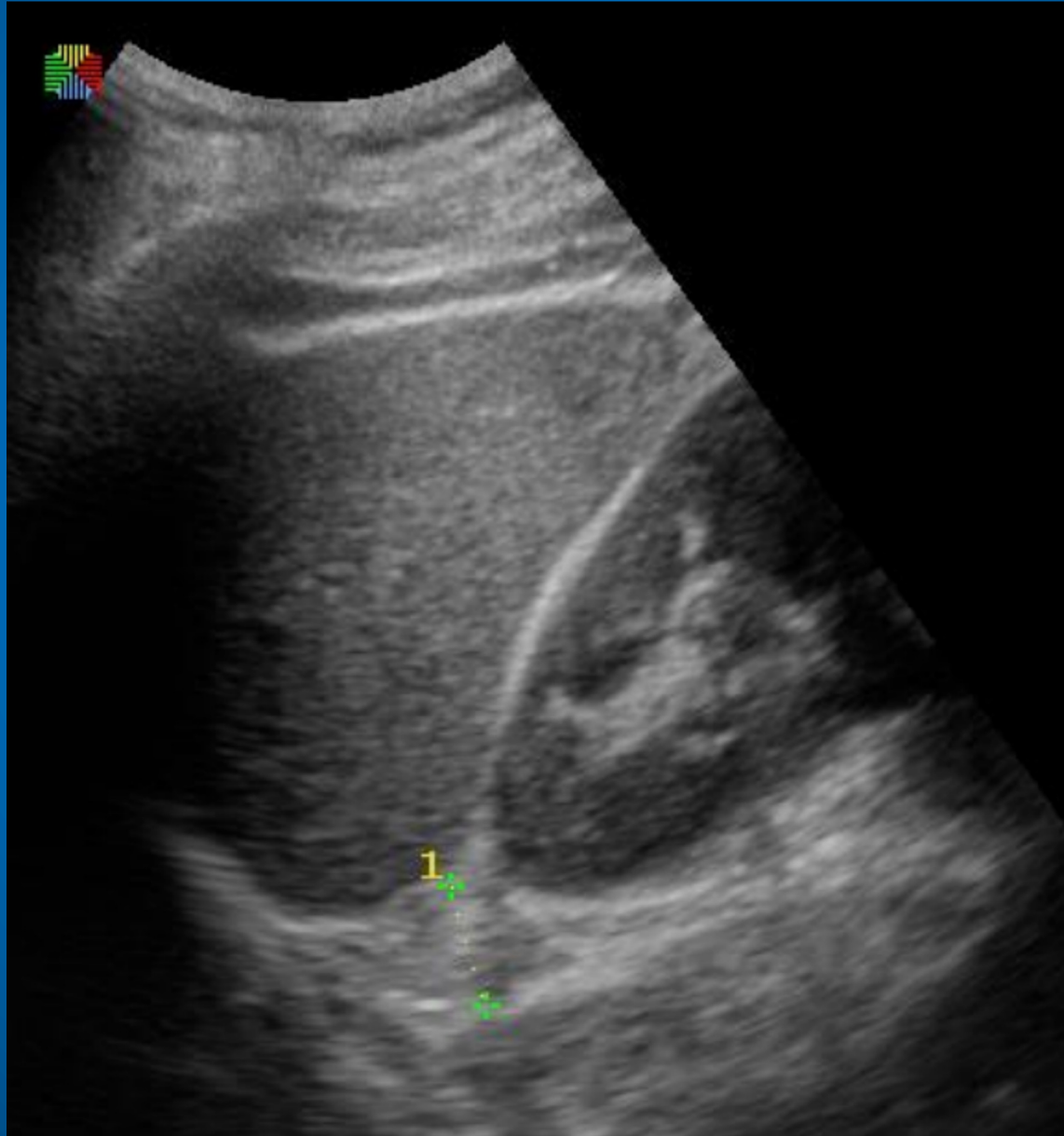


- Right kidney scanning approach: anterior, lateral, posterior
- Liver is the acoustic window
- Left kidney: requires a posterior approach, through the spleen
- Air-filled bowel impedes anterior scanning

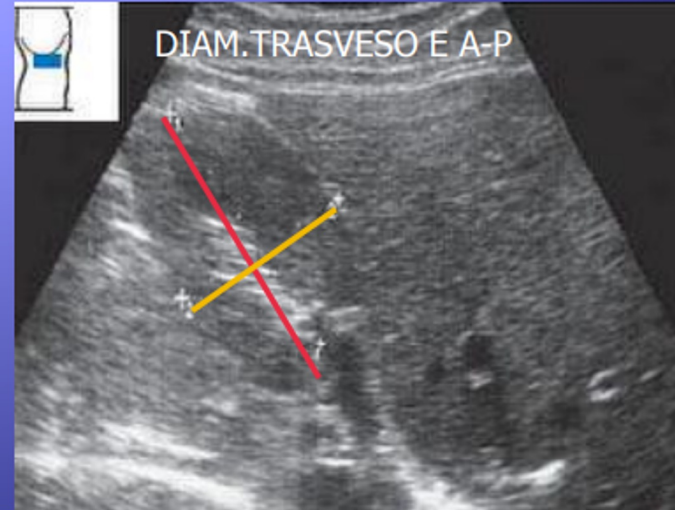
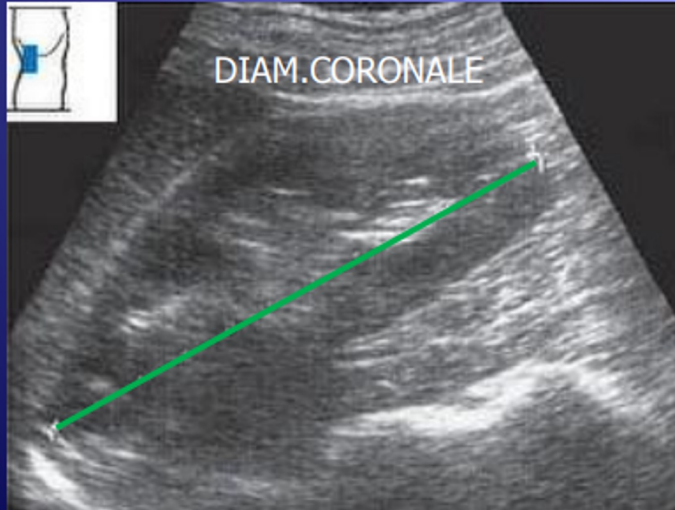
DX



SN

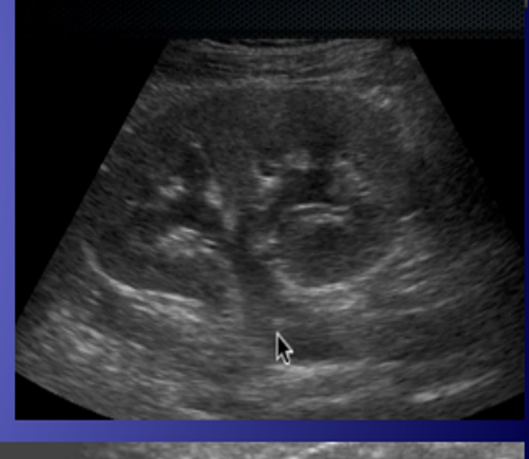
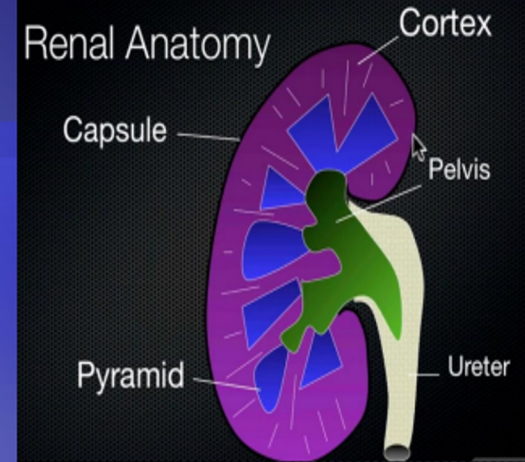


Il **diametro coronale** del rene varia da 9 a 12 cm.  
Nelle scansioni trasversali, sull'ilo renale, **il diametro trasv. 5-6 cm.**, mentre il **diametro antero-posteriore è di 4-5 cm.** Un rene con diametro < a 8 cm. è sicuramente di dimensioni ridotte



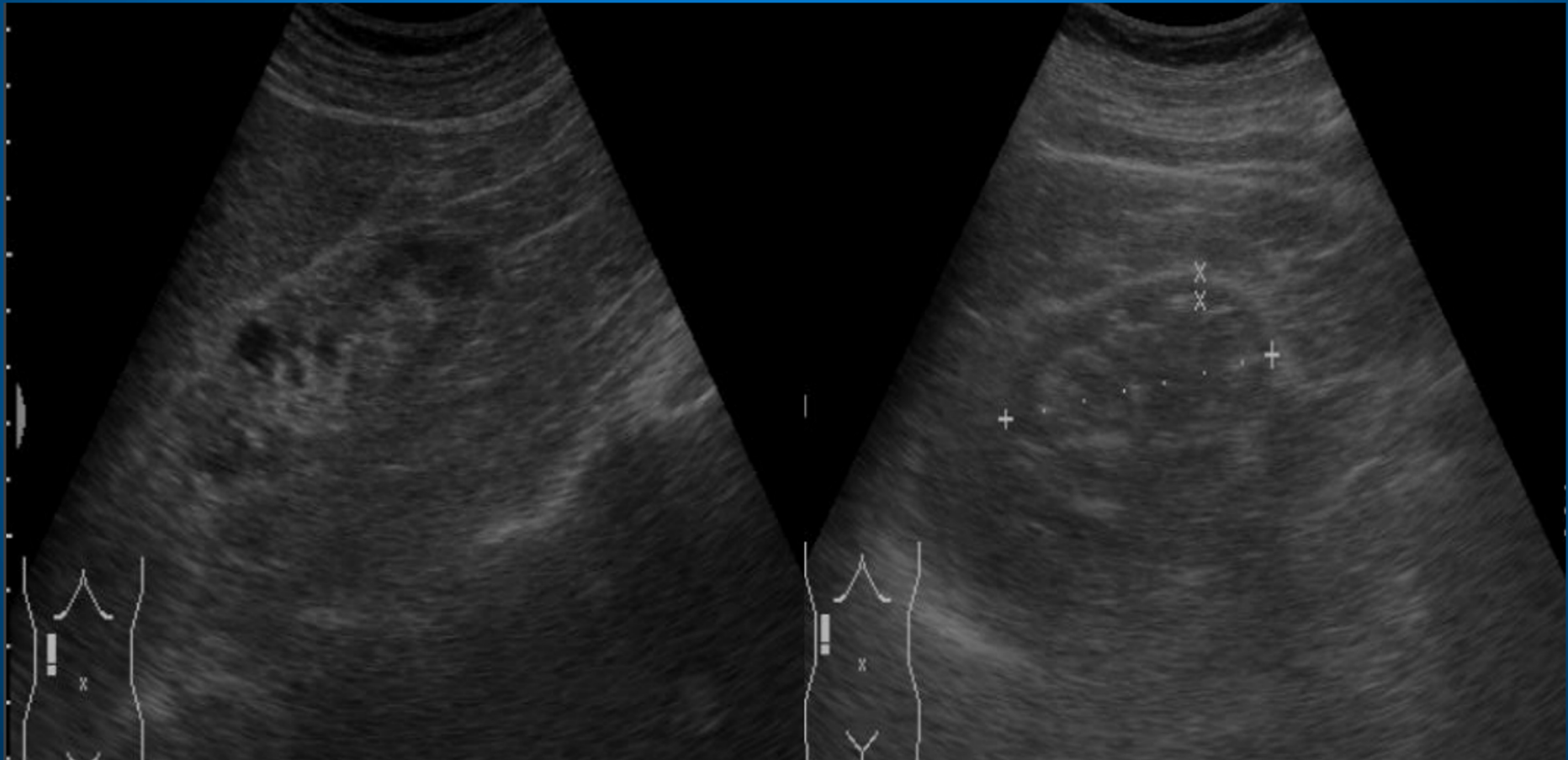
# ECOGENICITA'

- ◆ CONOSCERE LE COMPONENTI ANATOMICHE:
  - ◆ capsula esterna iperecogena
  - ◆ parenchima iso-ipoecogeno (rispetto a fegato e milza) compreso tra capsula e pelvi e a sua volta costituito da
    - ◆ Corticale più esterna ed ecogena (porzione funzionale renale)
    - ◆ Midollare, più interna ed ipoecogena, corrispondente alle piramidi midollari, a struttura triangolare con la base verso l'esterno
    - ◆ Seno renale, iperecogeno per le molte interfacce date dal grasso e dalle diverse struttura intrasinusali
- ◆ Lo spessore parenchimale verrà misurato vicino ai calici del polo inferiore o superiore



# RENI IPOTROFICI

Riduzione dimensionale  
Riduzione dello spessore corticale  
Riduzione della differenziazione cortico-midollare

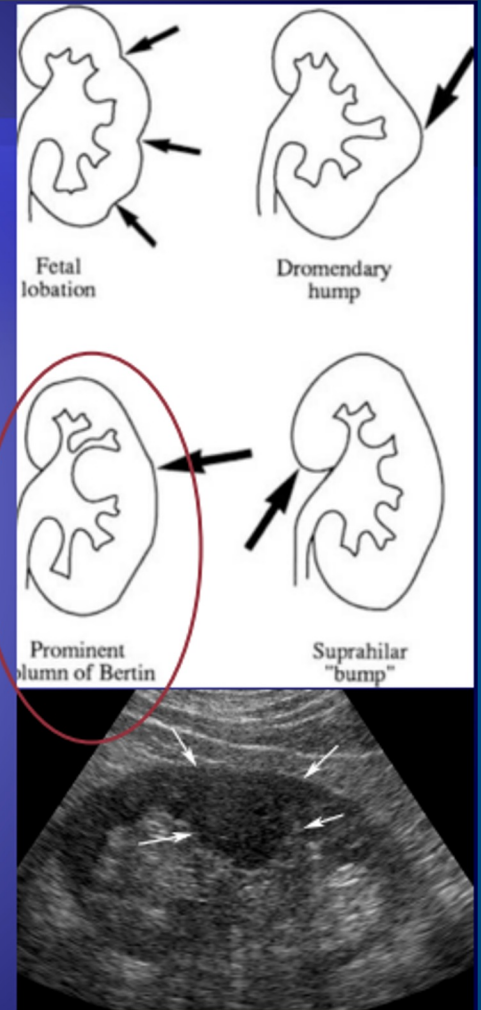


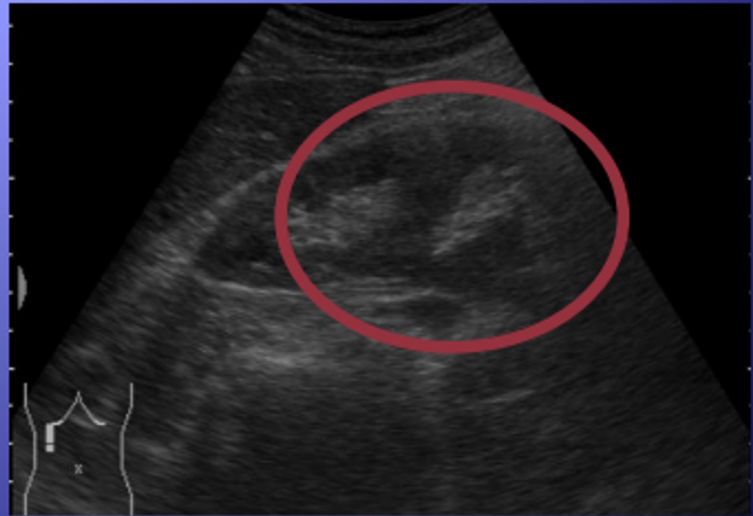
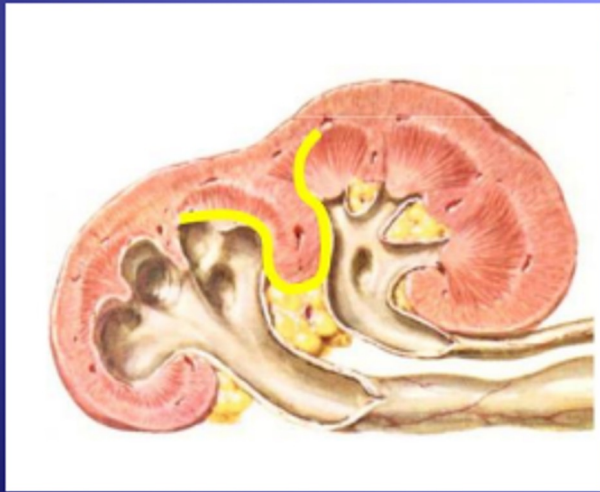
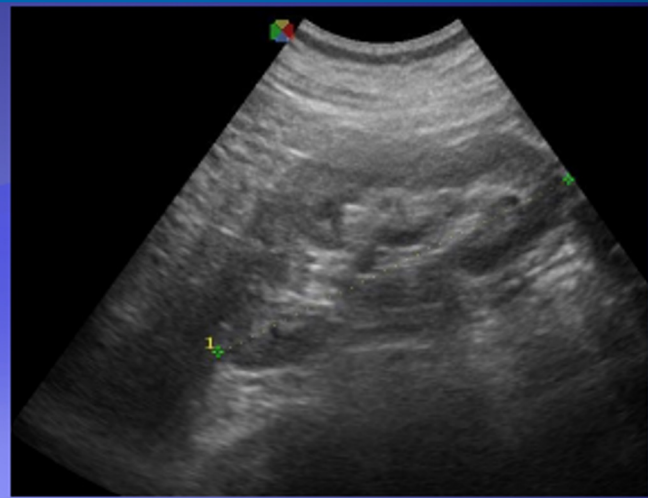
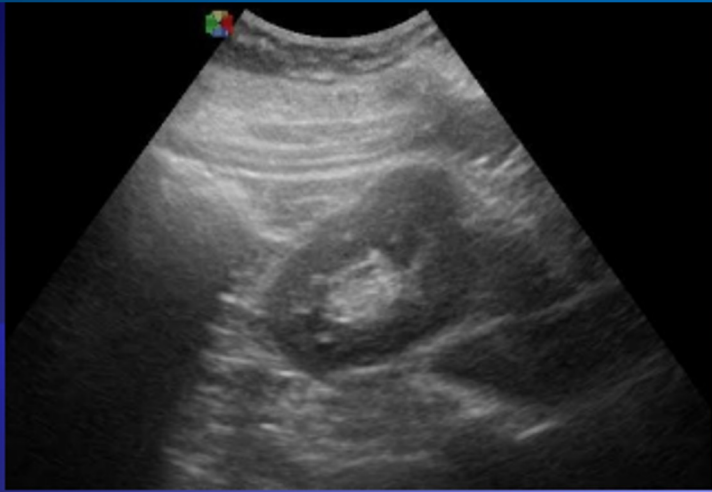
## INCISURE CORTICALI (esiti)

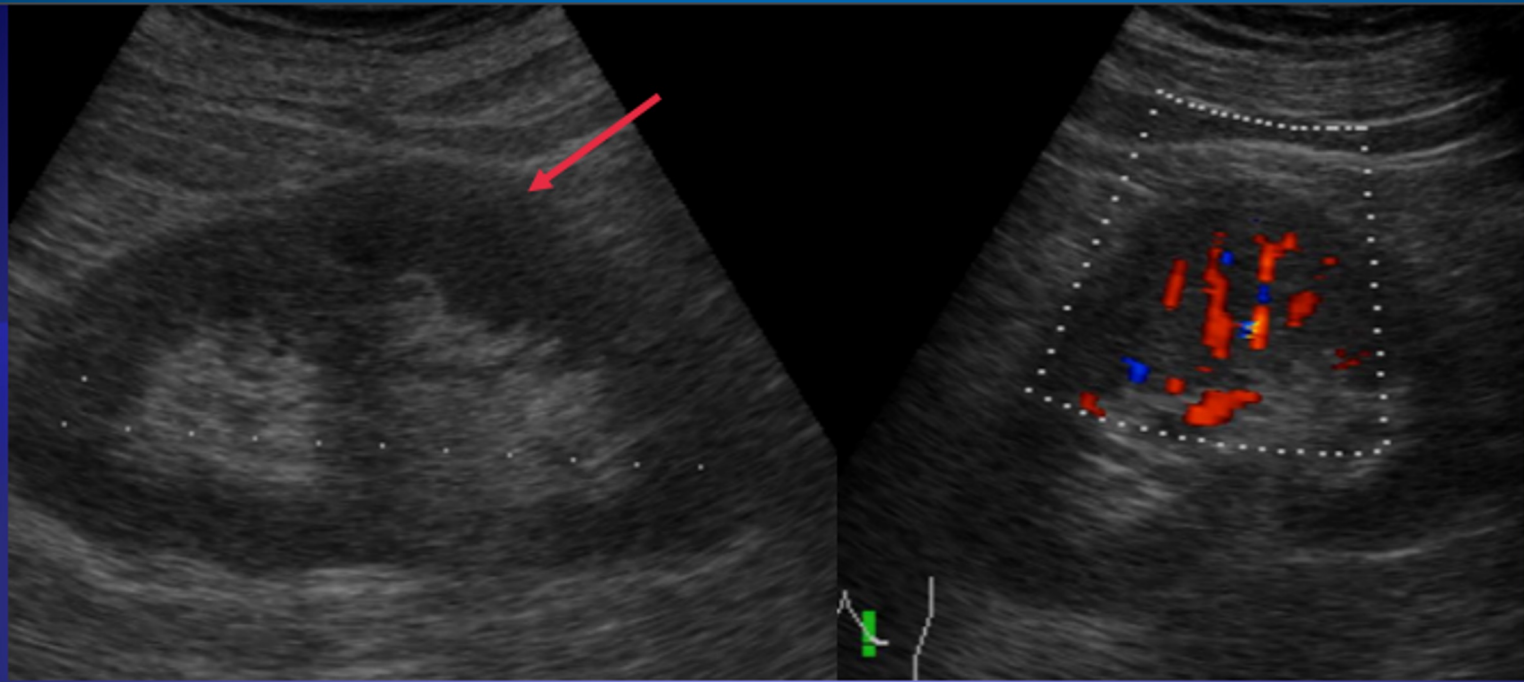


# Alterazioni profilo

- ◆ Vi sono varianti anatomiche che possono creare un aspetto di pseudo-nodulo:
  - ◆ Ipertrofia della colonna mesorenale di Bertin
  - ◆ Rene «a dromedario»
  - ◆ Lobulazioni fetali

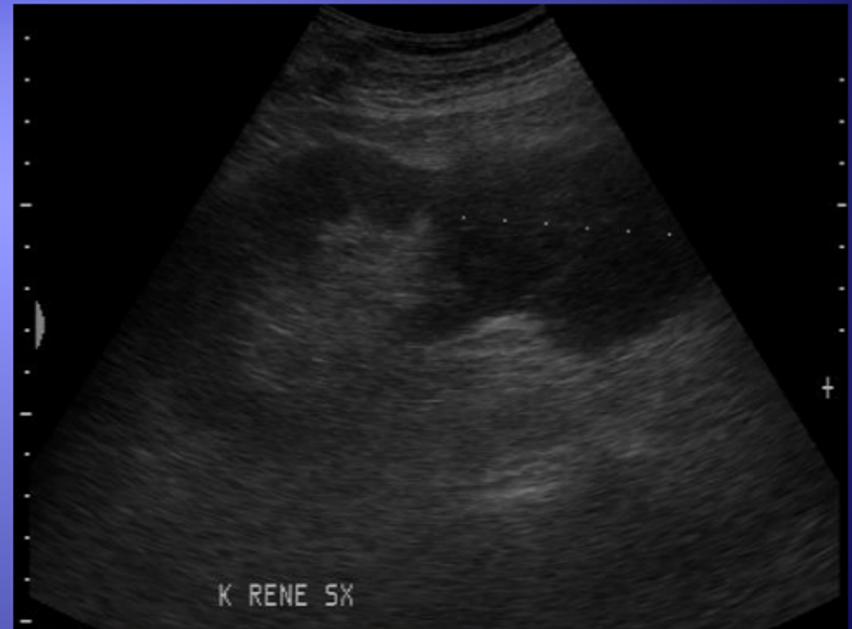
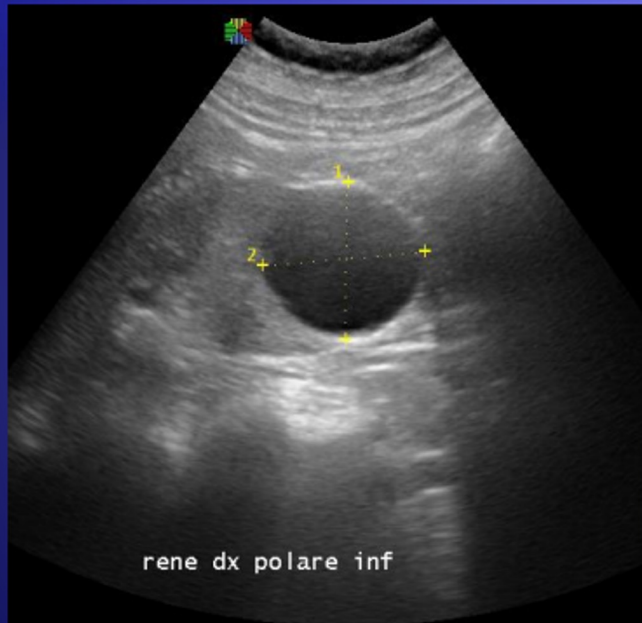






Nella «gobba» la struttura parenchimale è omogenea e il circolo intrarenale presenta una disposizione raggiata, centrifuga, regolare

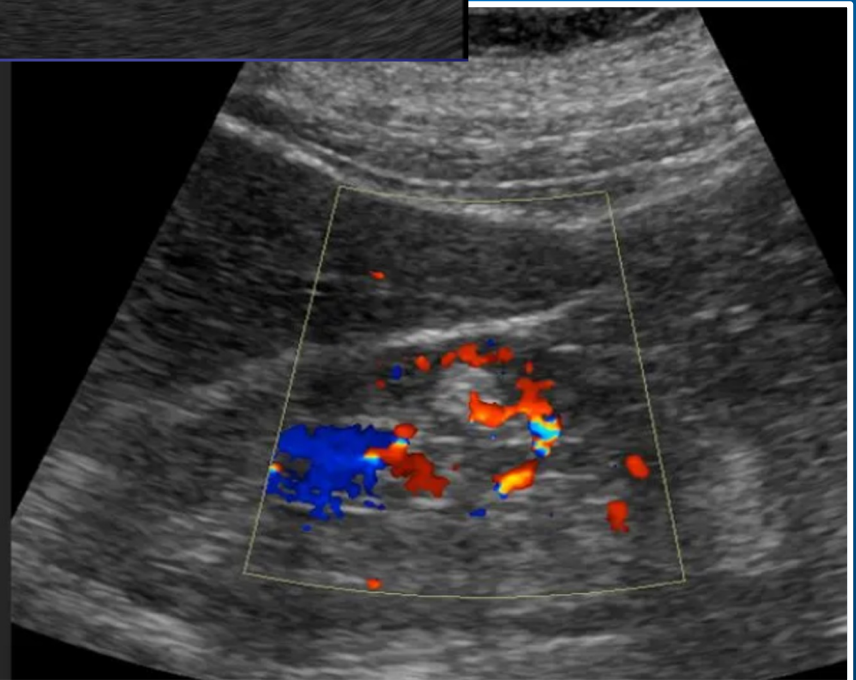
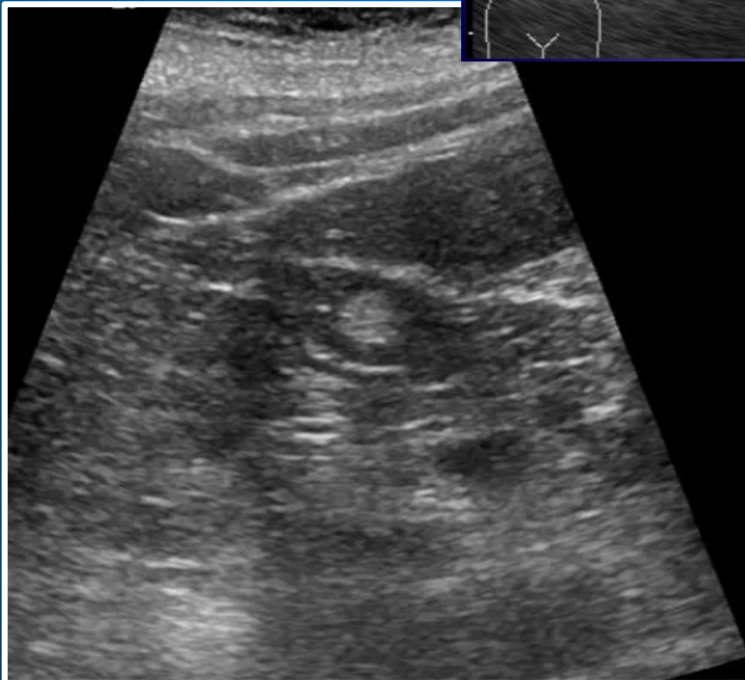
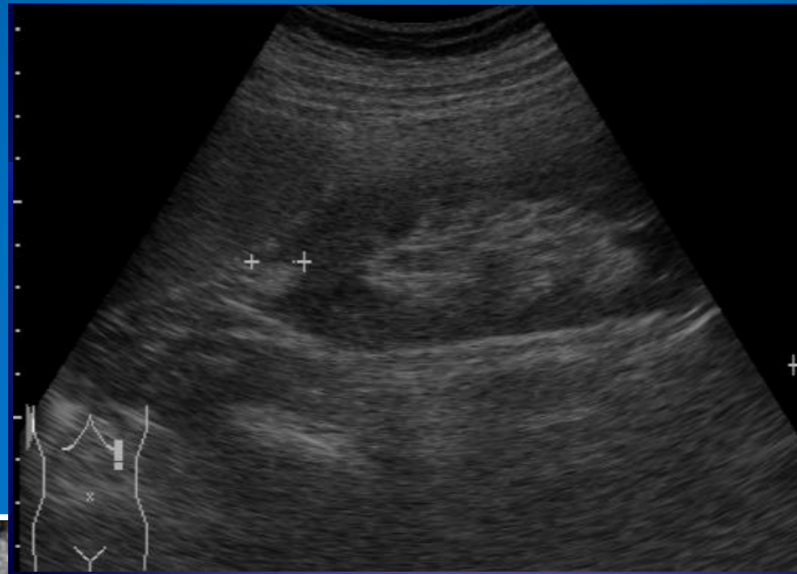
# Presenza di lesioni occupanti spazio e differenziazione tra lesioni solide e liquide



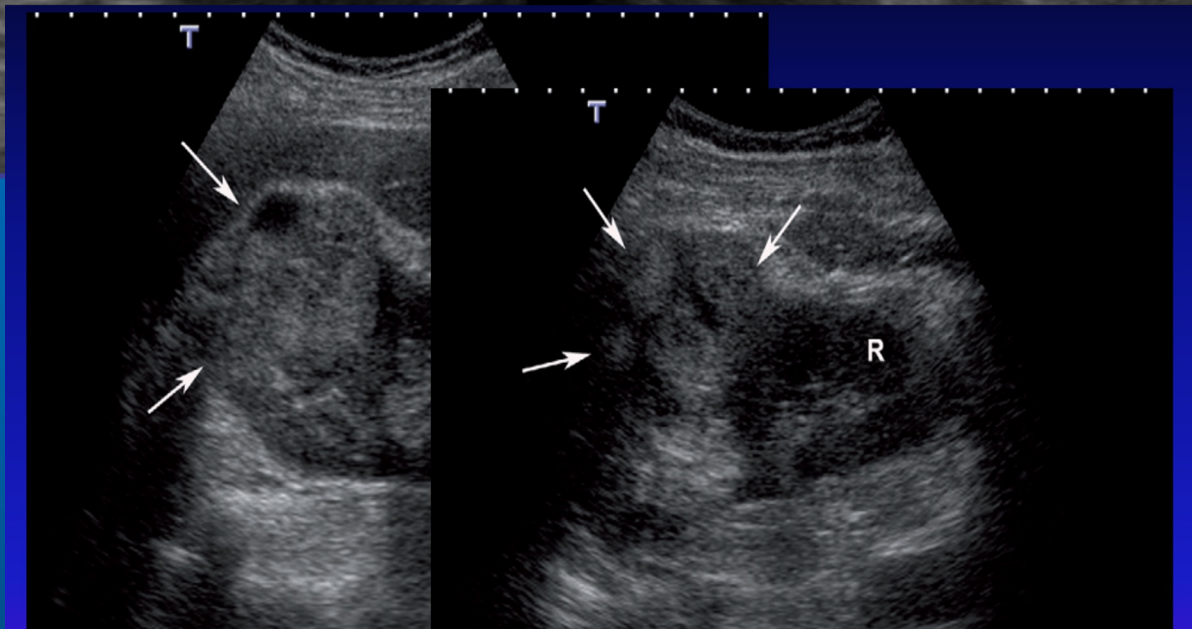
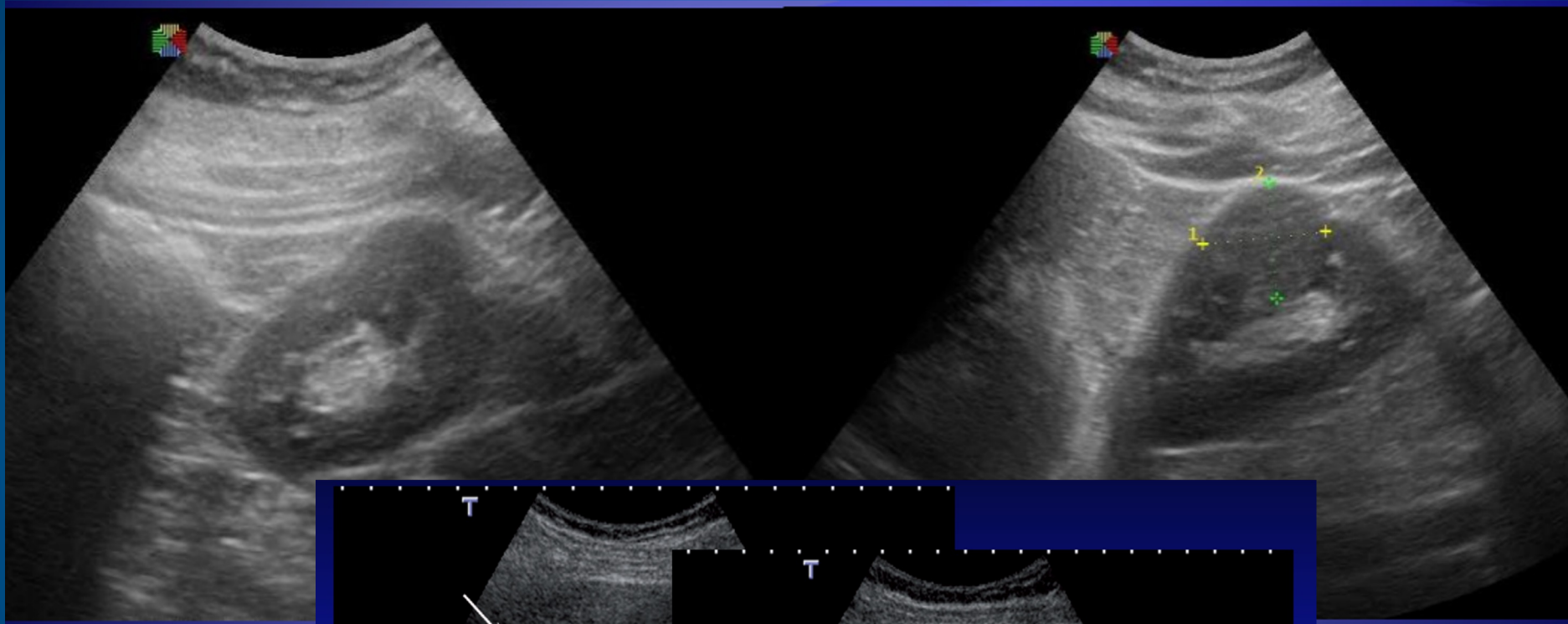
# ANALISI LESIONE FOCALE

- ◆ Ecogenicità
- ◆ Forma
- ◆ Ecostruttura
- ◆ Vascolarizzazione
- ◆ Dislocazione vasi renali (effetto massa)

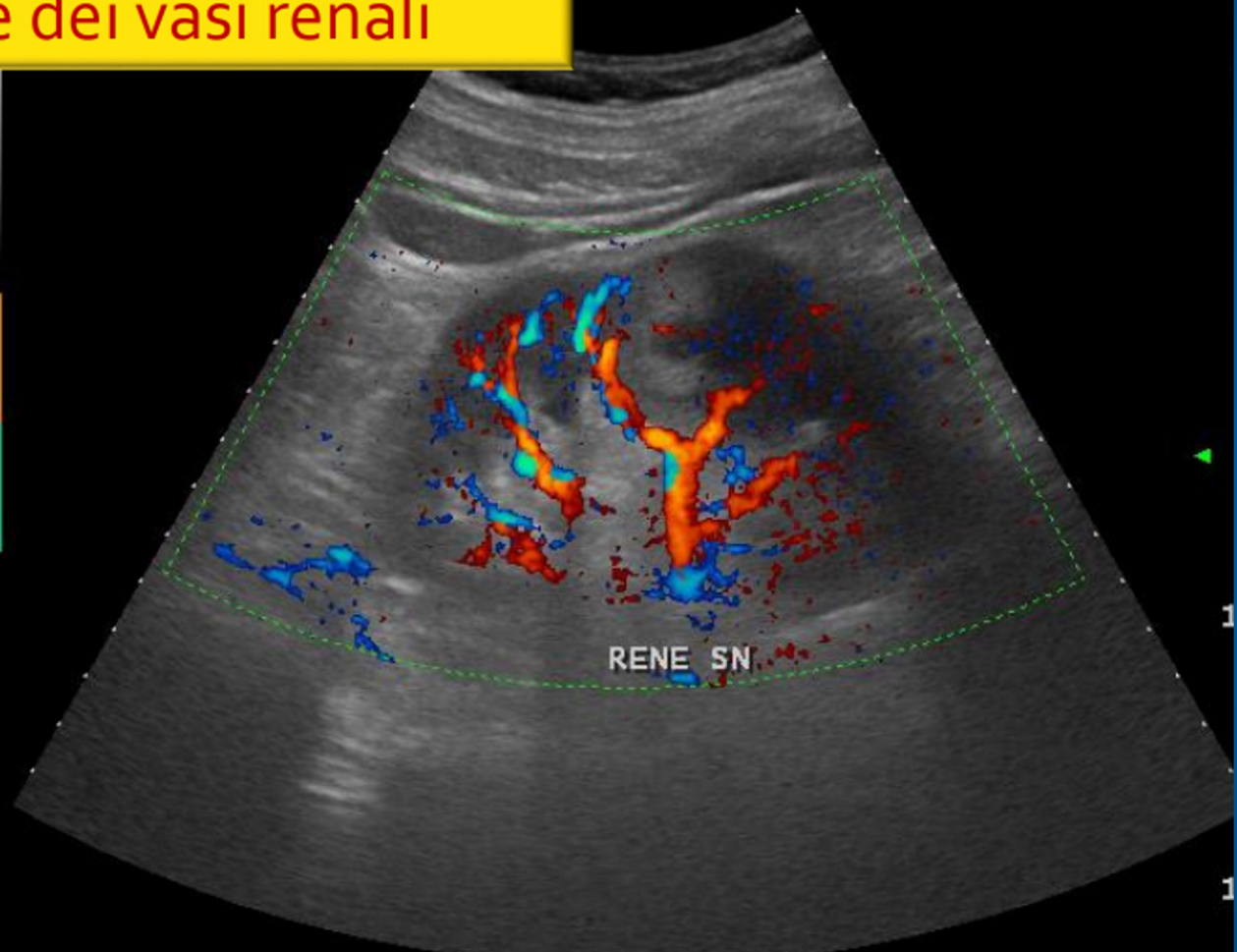
# ANGIOMIOLIPOMA



# LESIONI SOLIDE



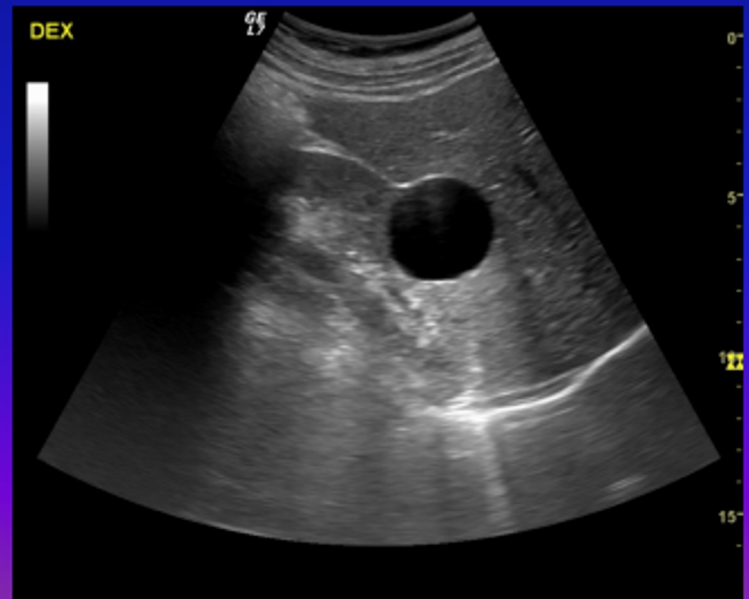
Effetto massa con  
dislocazione dei vasi renali



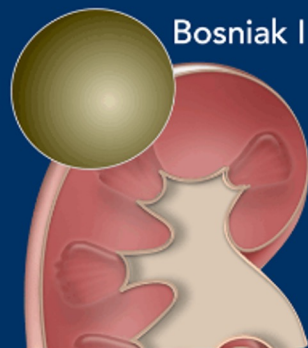
# Patologia Cistica

Il **quadro tipico** è caratterizzato da:

- ❖ Lesione anecogena, liquida, priva di echi interni
- ❖ Margini netti e regolari
- ❖ Rinforzo acustico posteriore

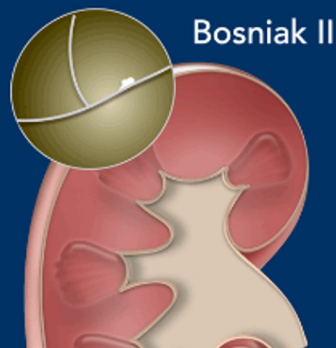


# CLASSIFICAZIONE DI BOSNIAK CISTI RENALI



Bosniak I

Smooth wall  $\leq 2\text{mm}$   
Wall may enhance  
No septa or calcification



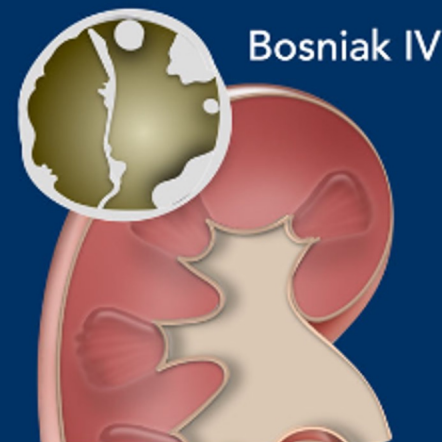
Bosniak II

1-3 septa ( $\leq 2\text{mm}$ )  
Septa and wall may enhance  
May have calcification



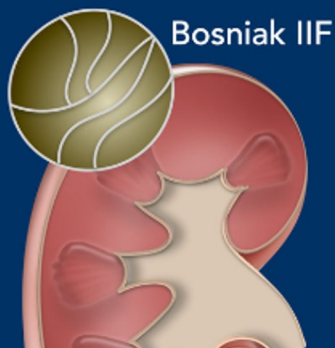
Bosniak III

One or more enhancing thick ( $\geq 4\text{ mm}$  width) or enhancing irregular walls or septa (displaying  $\leq 3\text{-mm}$  obtusely margined convex protrusions)



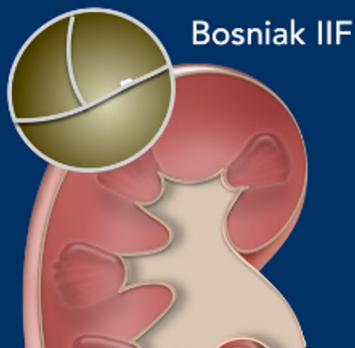
Bosniak IV

One or more enhancing nodules ( $\geq 4\text{-mm}$  convex protrusion with obtuse margins, or a convex protrusion of any size that has acute margins)



Bosniak IIF

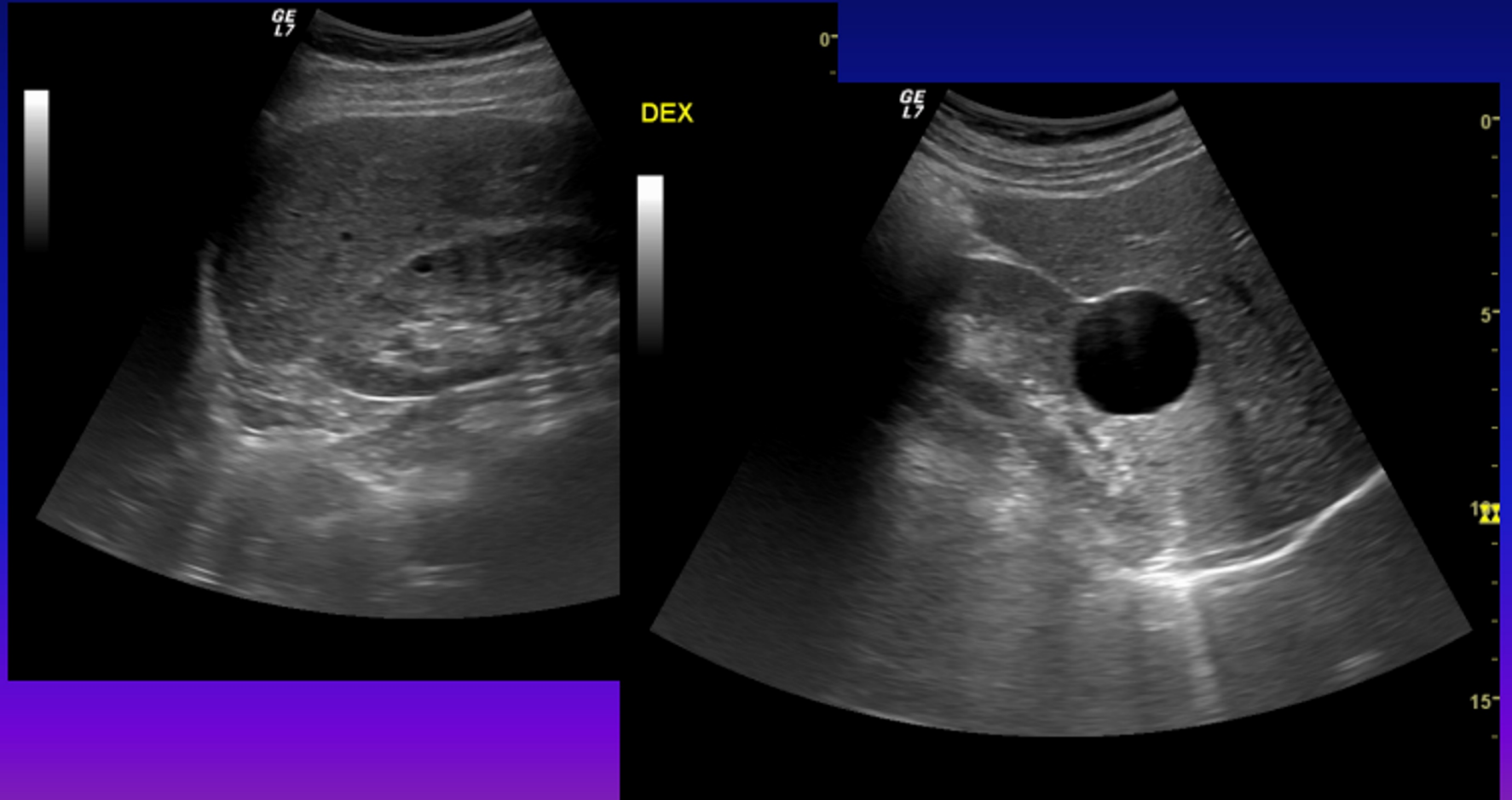
Many ( $\geq 4$ ) smooth and thin  $\leq 2\text{mm}$  septa



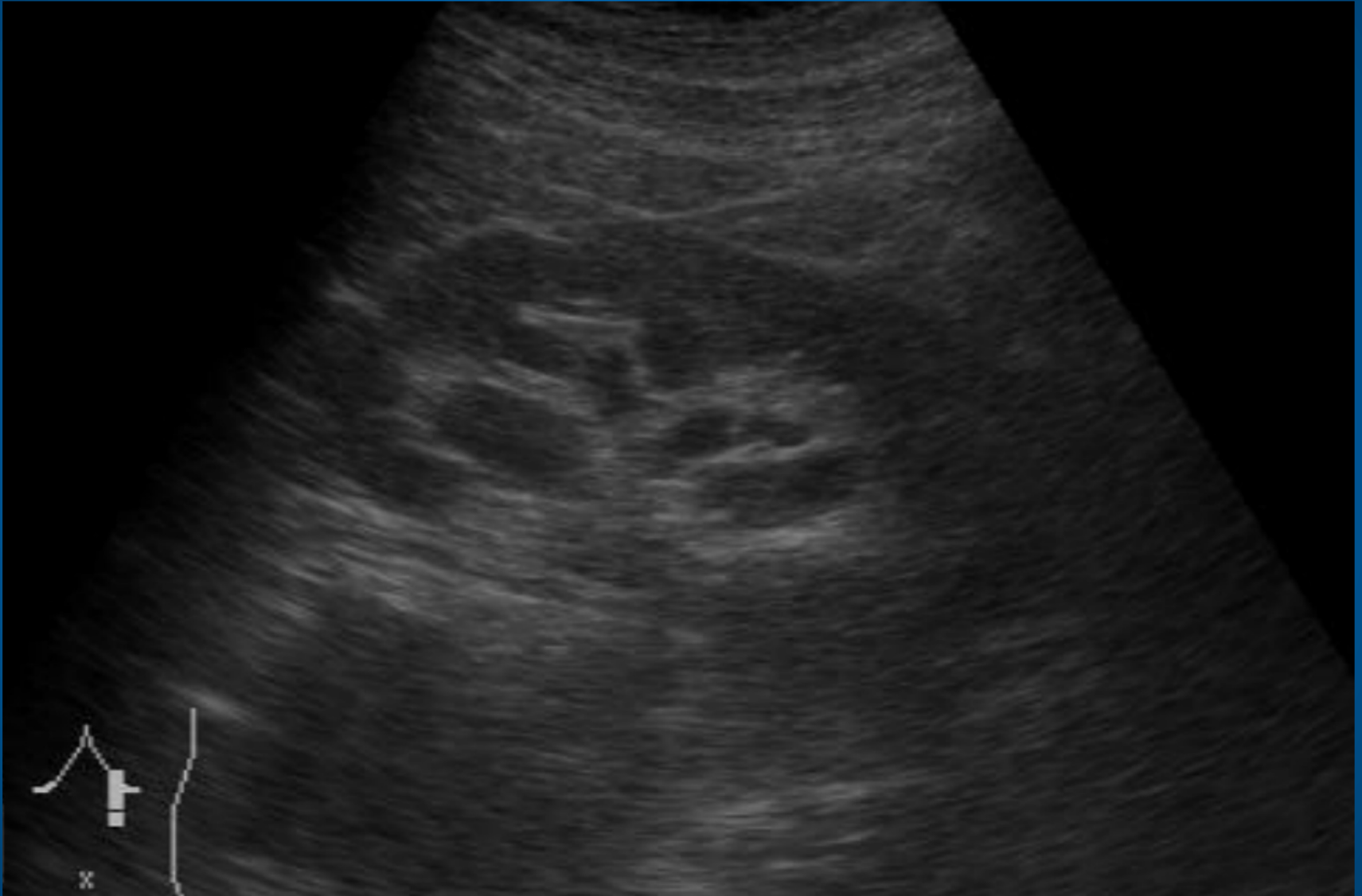
Bosniak IIF

Smooth minimally thickened  $3\text{mm}$  enhancing wall  
 $3\text{mm}$  septa may enhance

**Cisti tipo I:** cisti semplici, perfettamente anecogene e profili netti.

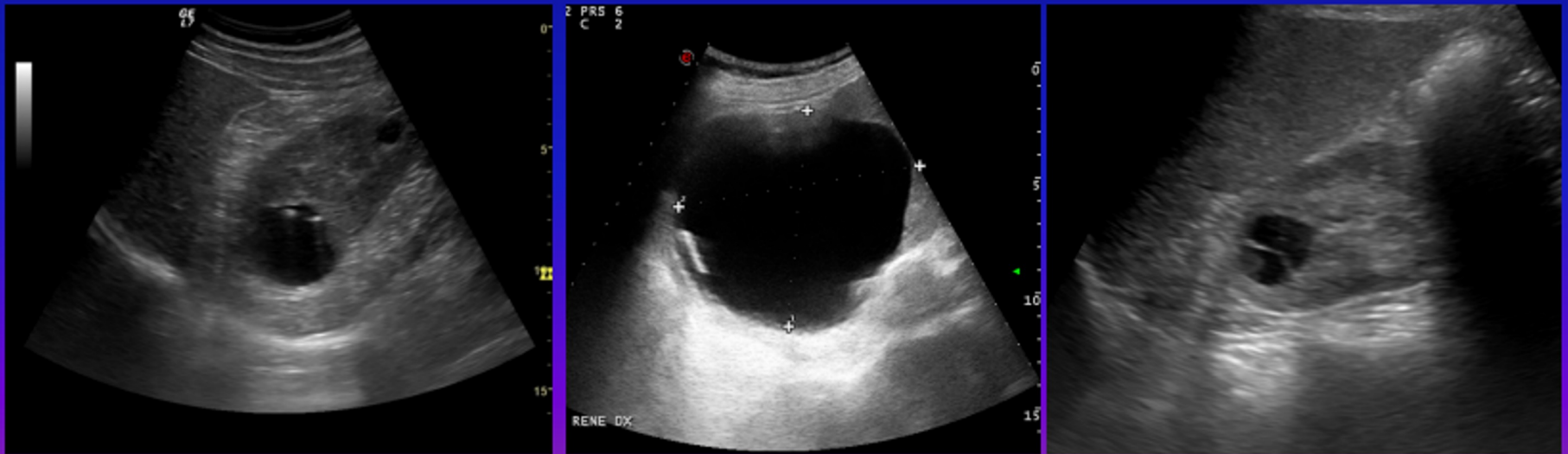


# CISTI SEMPLICI PARAPIELICHE



**Cisti tipo II:** cisti complesse con pochi e sottili sepimenti ( $< 1$  mm), profili regolari, con calcificazioni marginali sottili e tipo lamellare; meritano attento follow-up.

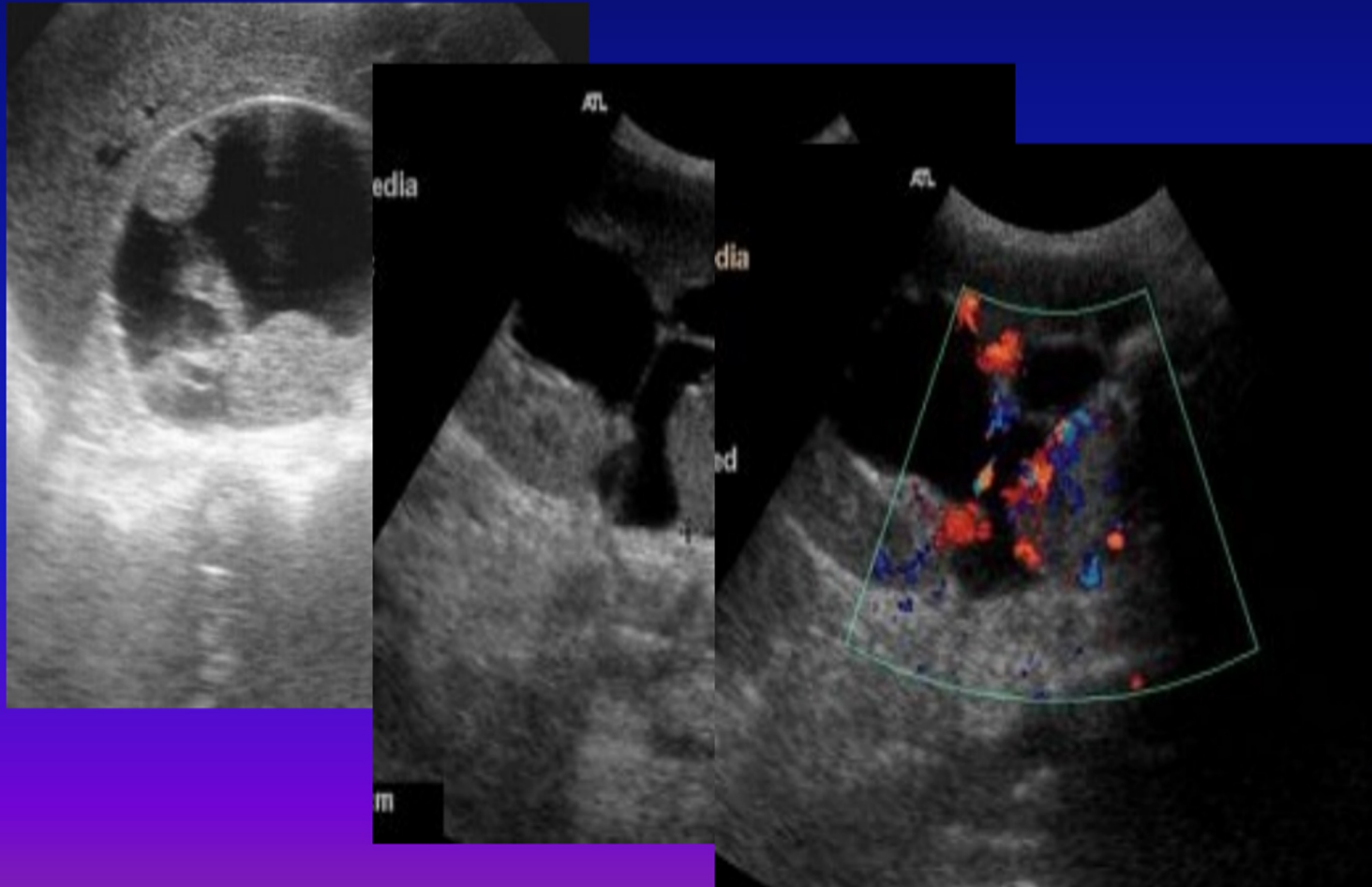
**Cisti tipo IIF:** presentano parete ispessita, sepimenti numerosi e spessi ( $> 3$  mm), calcificazioni grossolane e voluminose; richiedono sempre ulteriori accertamenti diagnostici con mdc (TC e CEUS) per la possibilità di essere carcinomi iniziali.



**Cisti tipo III:** sono presenti setti numerosi e spessi, parete ispessita, calcificazioni grossolane multiple ed irregolari; possibilità di nefroma cistico benigno o nefrocarcinoma cistico

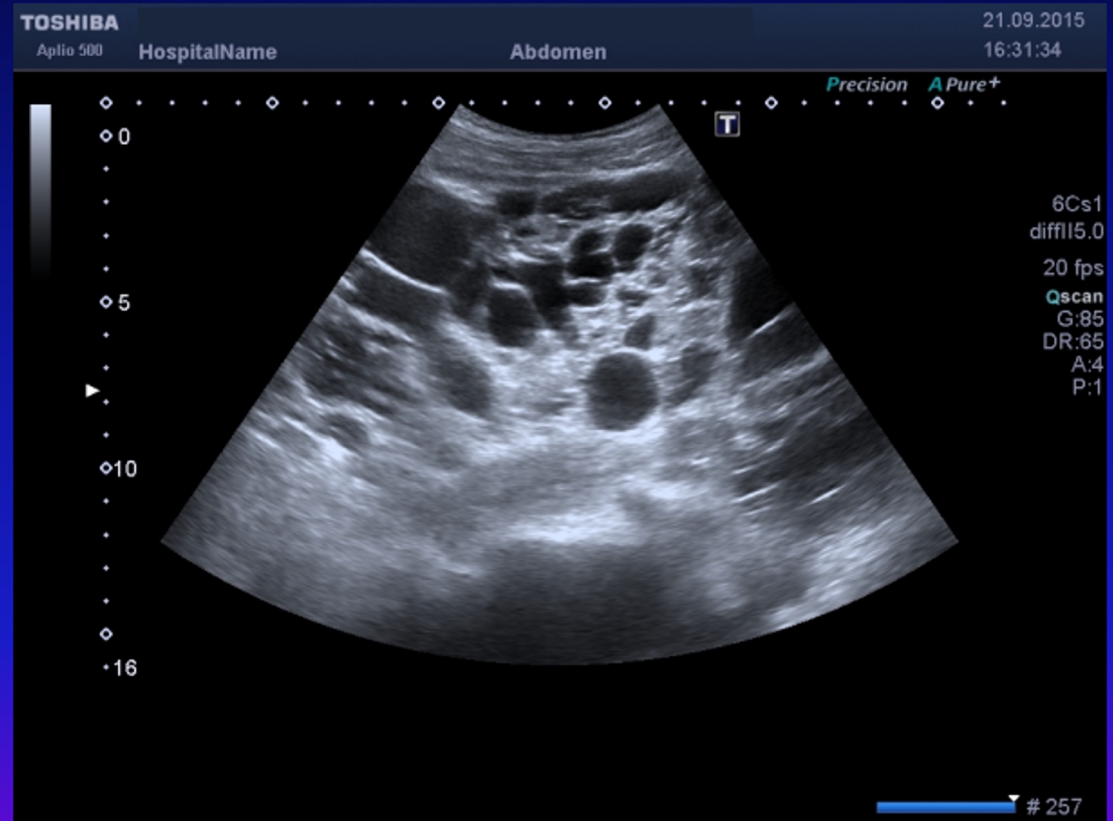
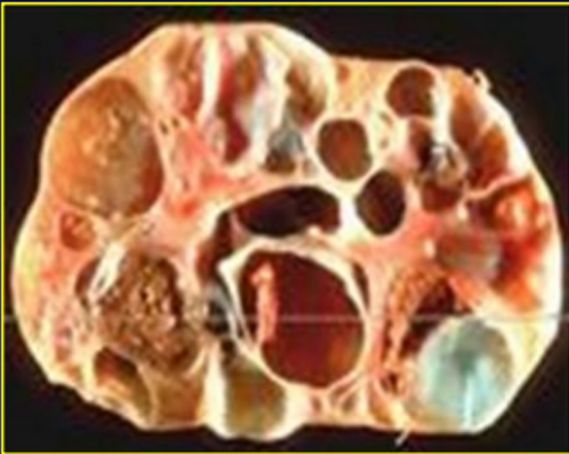


**Cisti tipo IV:** parete spessa con vegetazioni parietali irregolari e diffuse; si tratta in genere di carcinomi di tipo cistico.



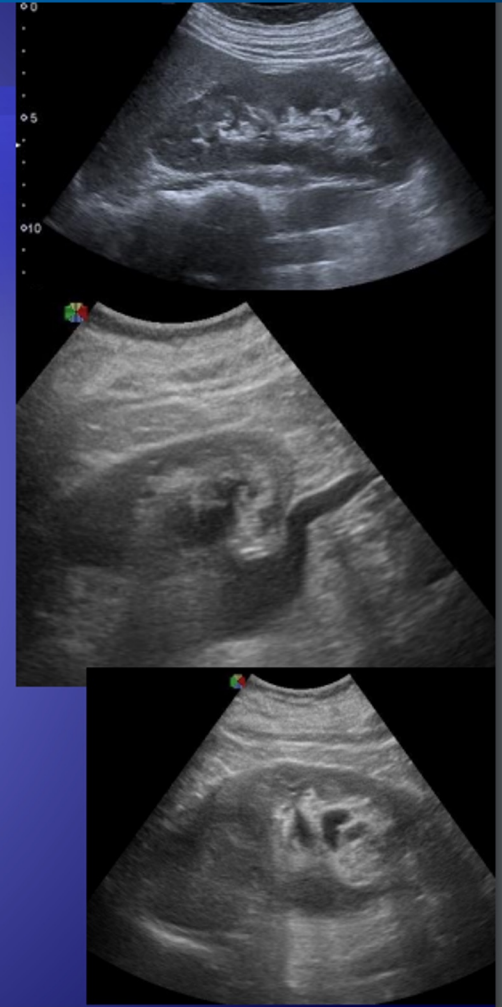
# Rene policistico

**ADPKD**



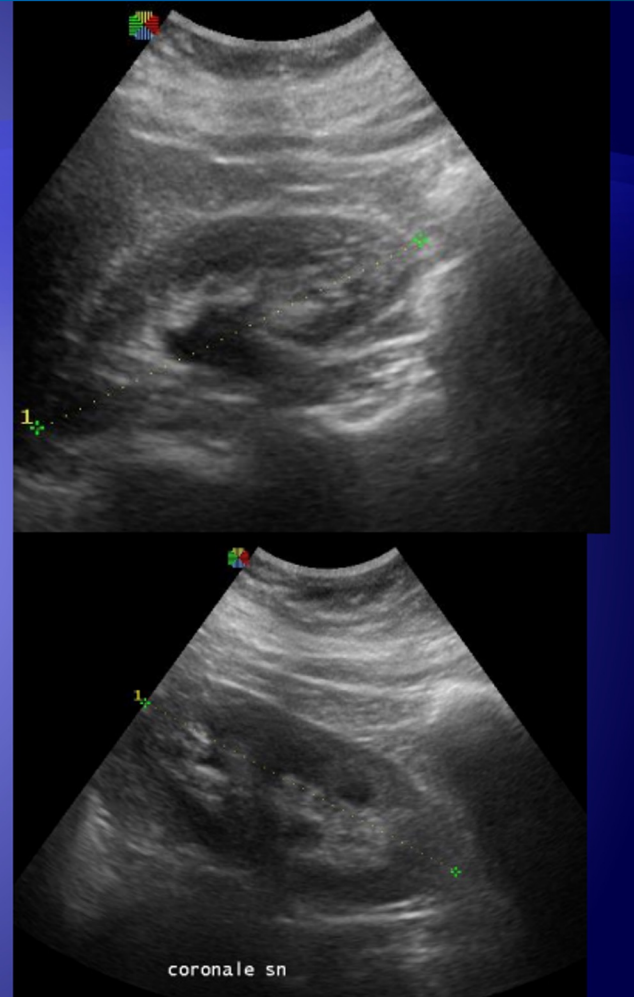
# ESAME DELLA PELVI

- ◆ Le variazioni di ecogenicità della pelvi sono legate alla **quantità di tessuto adiposo e connettivo**
- ◆ Normalmente l'esame ecografico della pelvi non mostra la presenza di liquido
- ◆ Può esservi, a vescica distesa, la presenza di fluido nel bacinetto renale
- ◆ L'origine dell'uretere può essere visibile, ma, in genere, esso non è visualizzabile, se non dilatato
- ◆ Una pelvi extrarenale può simulare una dilatazione o un'anomalia del giunto pielo ureterale



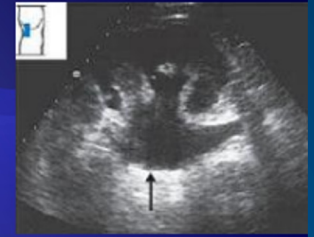
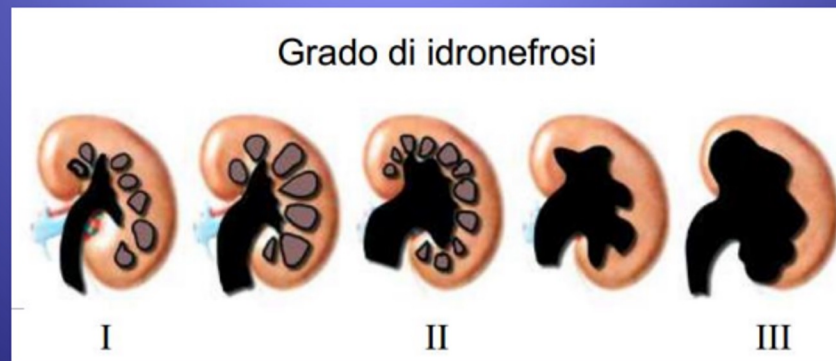
# ESAME DELLA PELVI

- ◆ Il diametro antero-posteriore normale arriva fino a 30 mm.
- ◆ Uretere, se visualizzabile all'origine, 5 mm.
- ◆ In caso di dilatazione, in particolare se bilaterale, vuotare la vescica e ripetere l'esame dopo 20 minuti circa

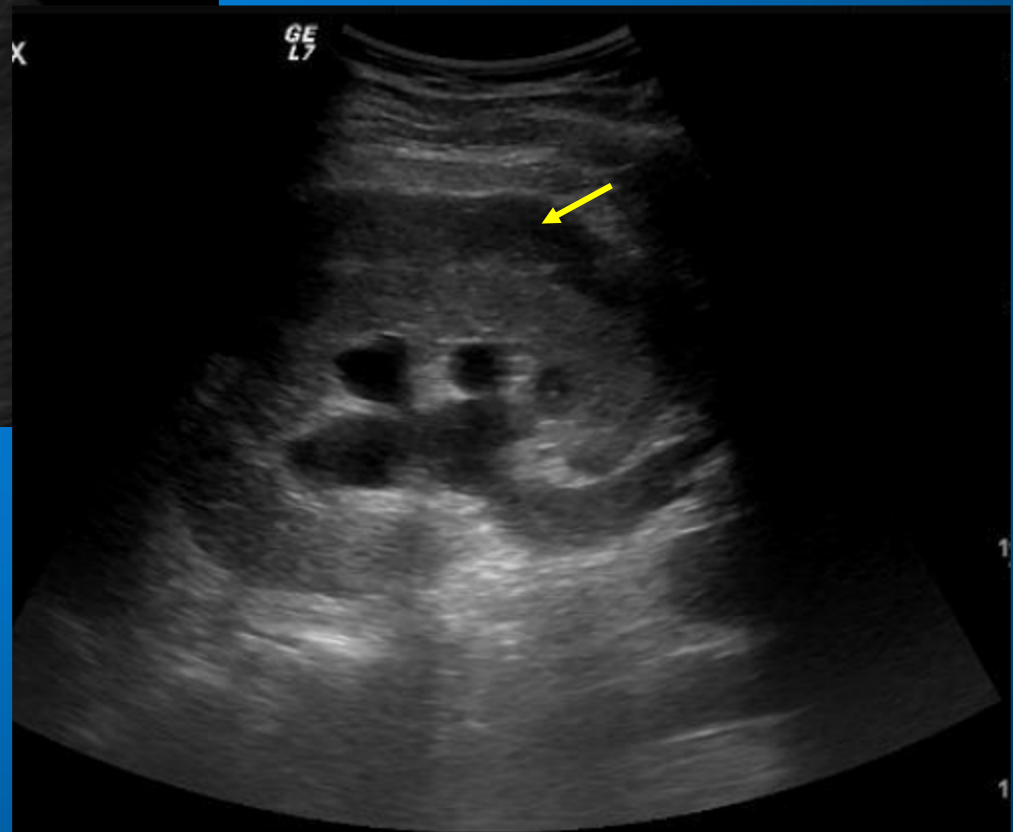
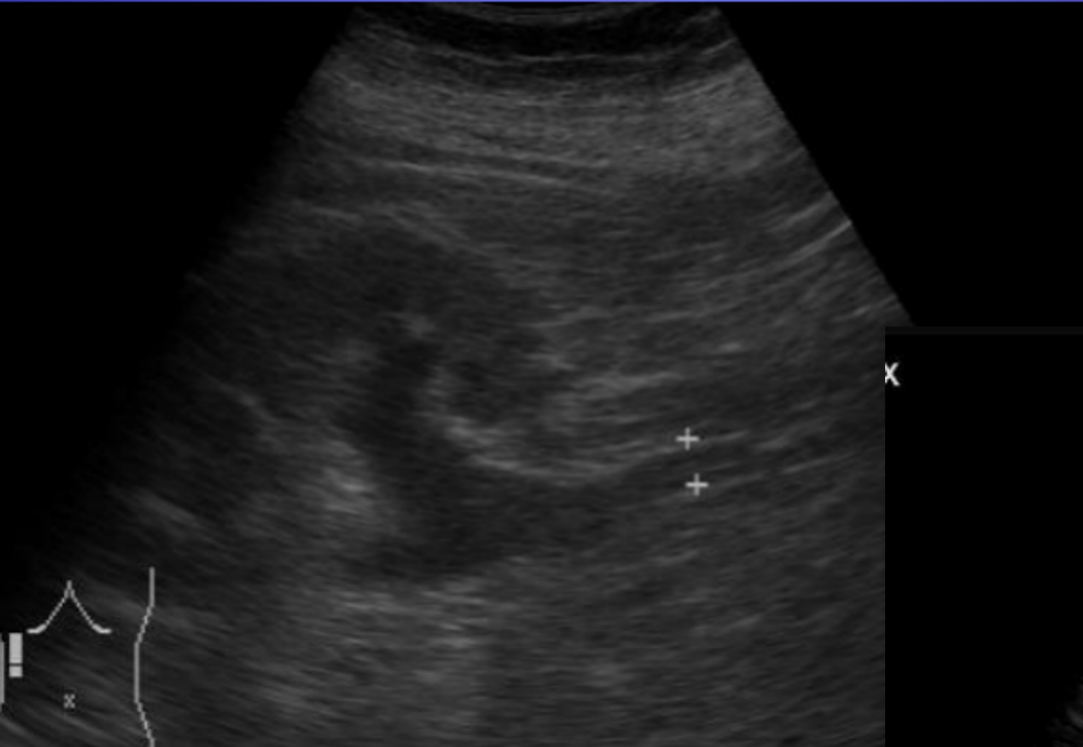


# ESAME DELLA PELVI: IDRONEFROSI

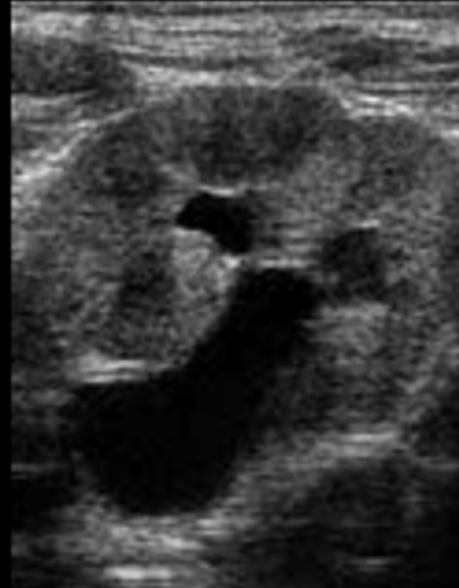
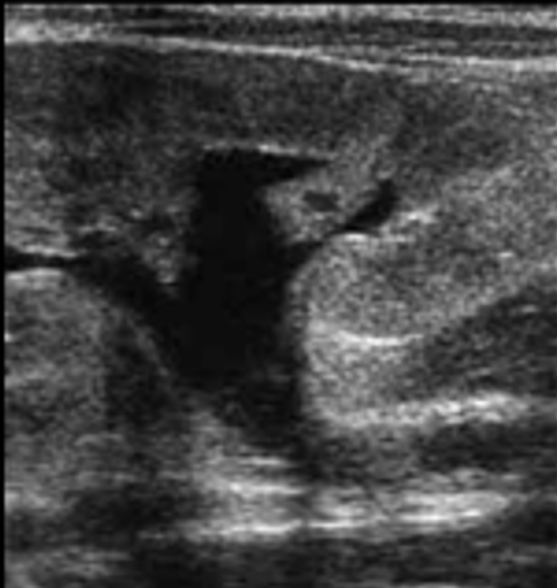
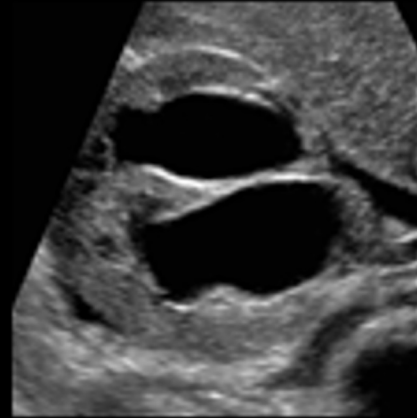
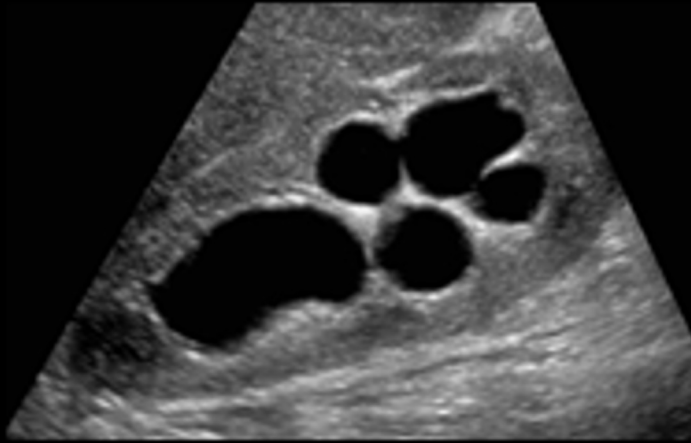
- ♦ GRADO 1: immagine anecogena corrispondente a pelvi e calici liev.dilatati
- ♦ GRADO 2: calici notevolmente dilatati, con visione delle comunicazioni tra calici e pelvi, ma parenchima conservato
- ♦ GRADO 3: riduzione dello spessore parenchimale a causa della dilatazione calicopielica
- ♦ GRADO 4: parenchima praticamente assente



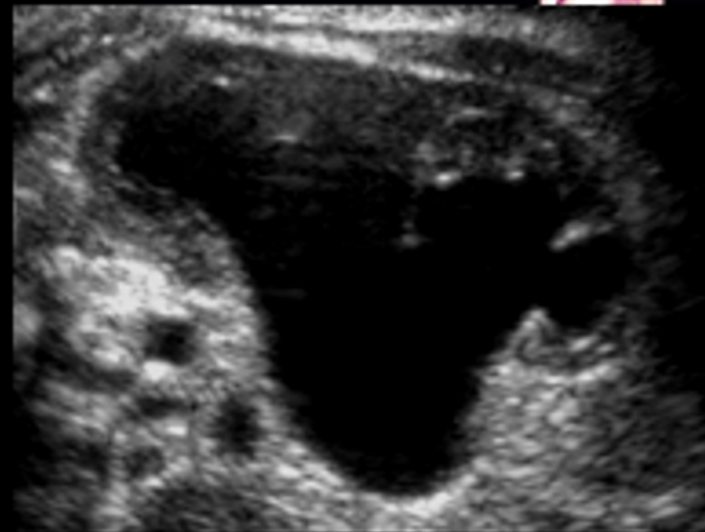
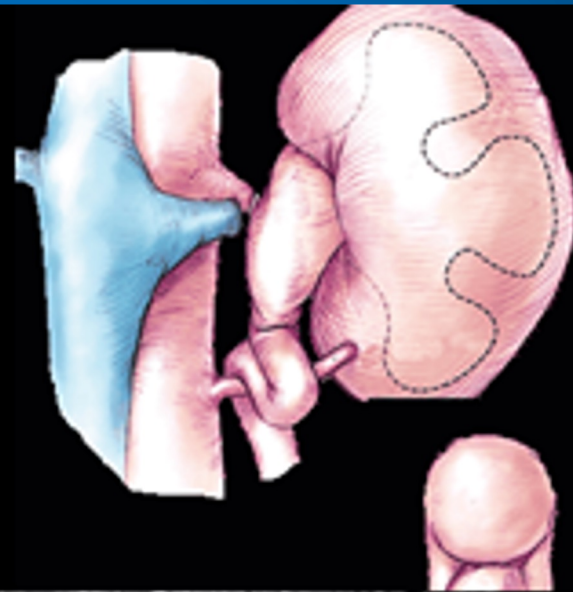
# PRIMO-SECONDO GRADO



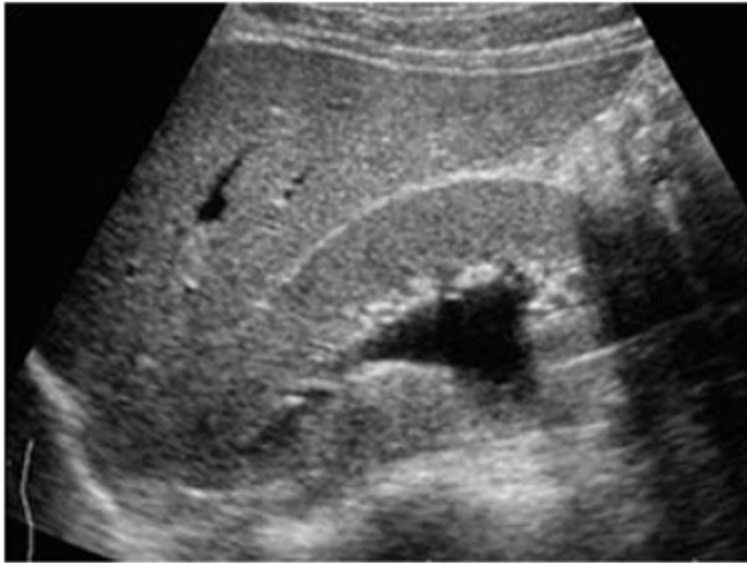
# SECONDO - TERZO GRADO



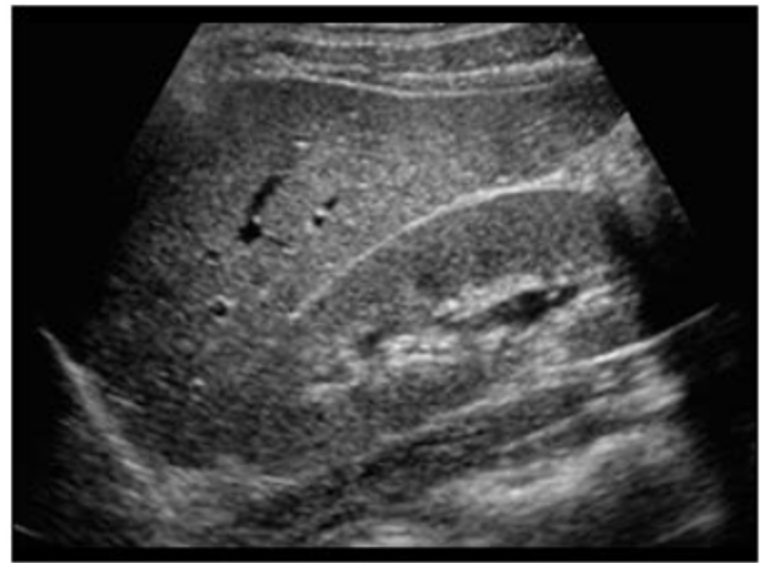
# QUARTO GRADO



# DILATAZIONE DA DISTENSIONE VESCICALE



Dilatated renal pelvis longitudinal



After voiding longitudinal



Full bladder

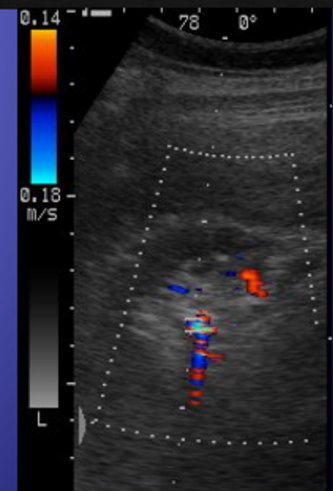
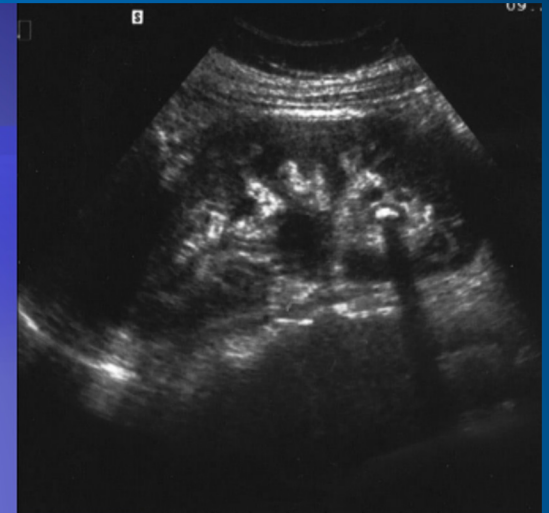


Bladder after voiding

# LITIASI RENALE

## PRESENZA DI LITIASI

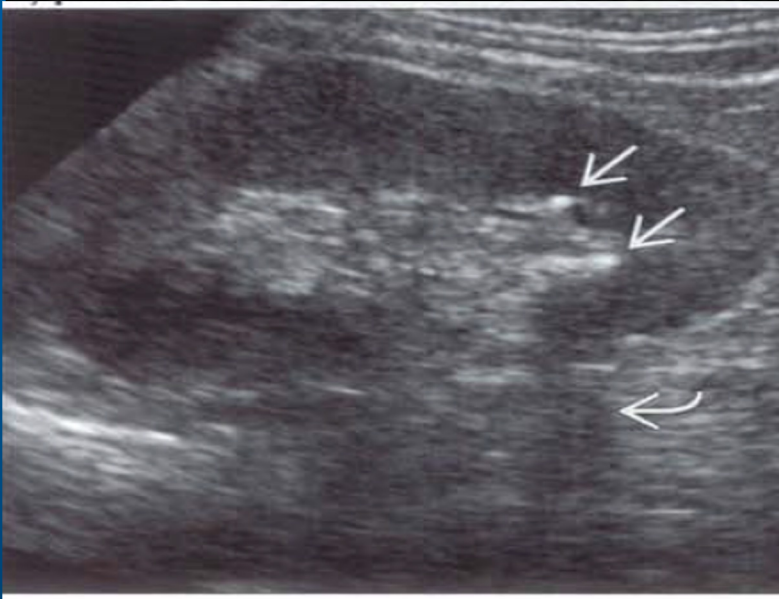
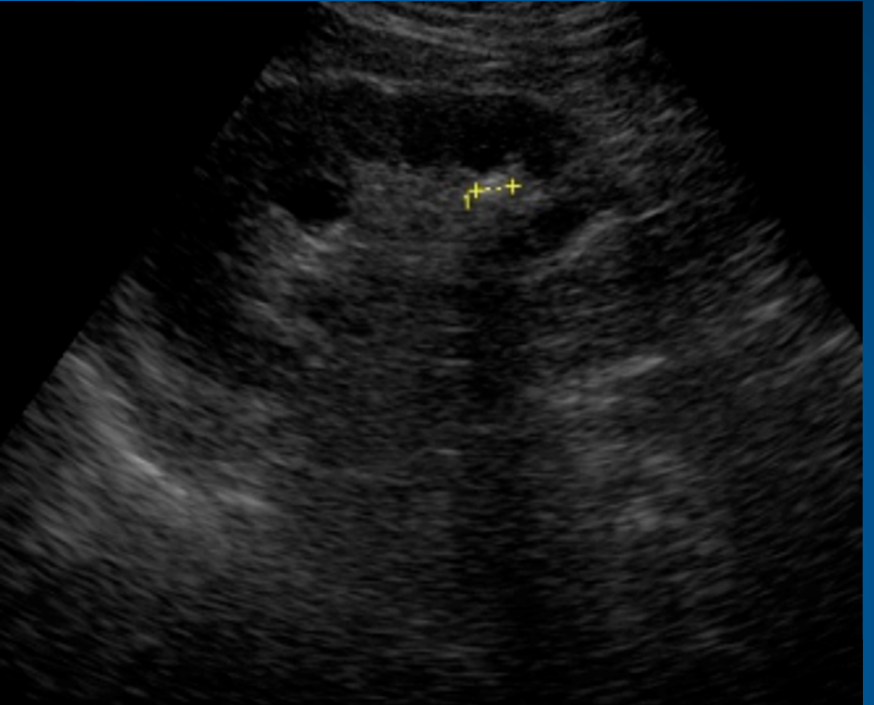
- ◆ Un calcolo renale appare come un'immagine intensamente iperecogena, luminosa, ben delimitata, con cono d'ombra posteriore
- ◆ Può essere difficile identificare un piccolo calcolo nell'iperecogenicità della pelvi renale. In questo caso, in genere, la ricerca del cono d'ombra e la presenza dell'artefatto «a scintillio» possono essere di aiuto



## LITIASI RENALE

L'ecografia riconosce sia i calcoli radiopachi che radiotrasparenti perché la loro visualizzazione dipende esclusivamente dalla riflessione del fascio ultrasonoro. La diagnosi di calcolo renale si basa sulla dimostrazione dell'immagine iperecogena nel contesto del seno renale o a livello della giunzione parenchimo-ilare. Dimostrazione dell'ombra acustica posteriore a partenza dalla formazione iperecogena.

= considerare che alcuni grossi calcoli a stampo o a matrice proteينية hanno un cono d'ombra posteriore sporco o assente (immagine a menisco) = considerare che calcoli inferiori a 3-4 mm possono non presentare cono d'ombra posteriore.



# IDENTIFICAZIONE DEI CALCOLI

AGGIUSTARE IL GUADAGNO:

RIDURRE GRADUALMENTE PER DIFFERENZIARE I  
VERI CALCOLI DA ALTRE FORMAZIONI  
RIFLETTENTI

CERCARE DI ESSERE PERPENDICOLARI AL  
SOSPETTO CALCOLO PER PRODURRE IL CONO  
D'OMBRA

CAMBIARE ANGOLO DI VISUALIZZAZIONE E  
POSIZIONE DEL PAZIENTE

## RENAL STONE SIZE CLASSIFICATION

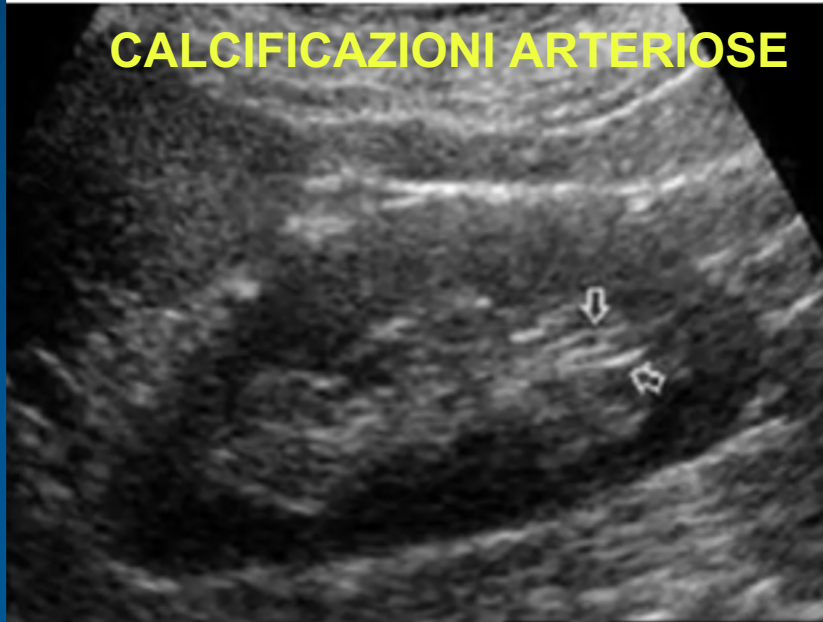
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graph TD; A[RENAL STONE SIZE CLASSIFICATION] --> B[Stone 5 plus  
(sizeable more than 5 mm)]; A --> C[Stone less than 5 mm  
microcaliculi (less than 5 mm)  
renal gravel (less than 3 mm)  
renal echoconcretion];
```

Stone 5 plus  
(sizeable more than 5 mm)

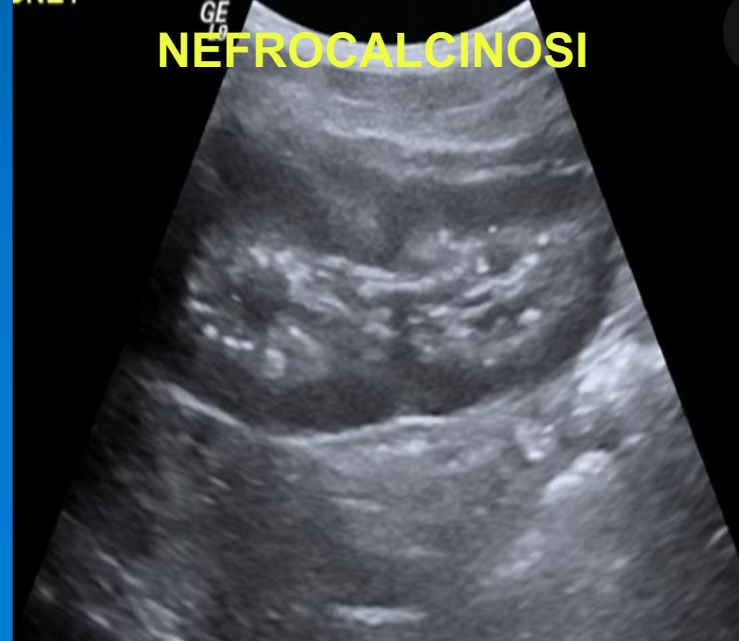
Stone less than 5 mm  
microcaliculi (less than 5 mm)  
renal gravel (less than 3 mm)  
renal echoconcretion

# PITFALLS

**CALCIFICAZIONI ARTERIOSE**



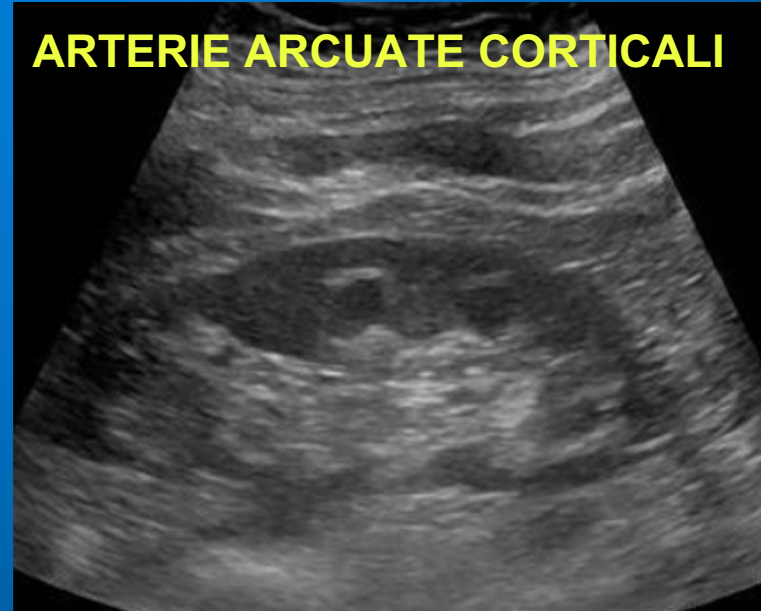
**NEFROCALCINOSI**



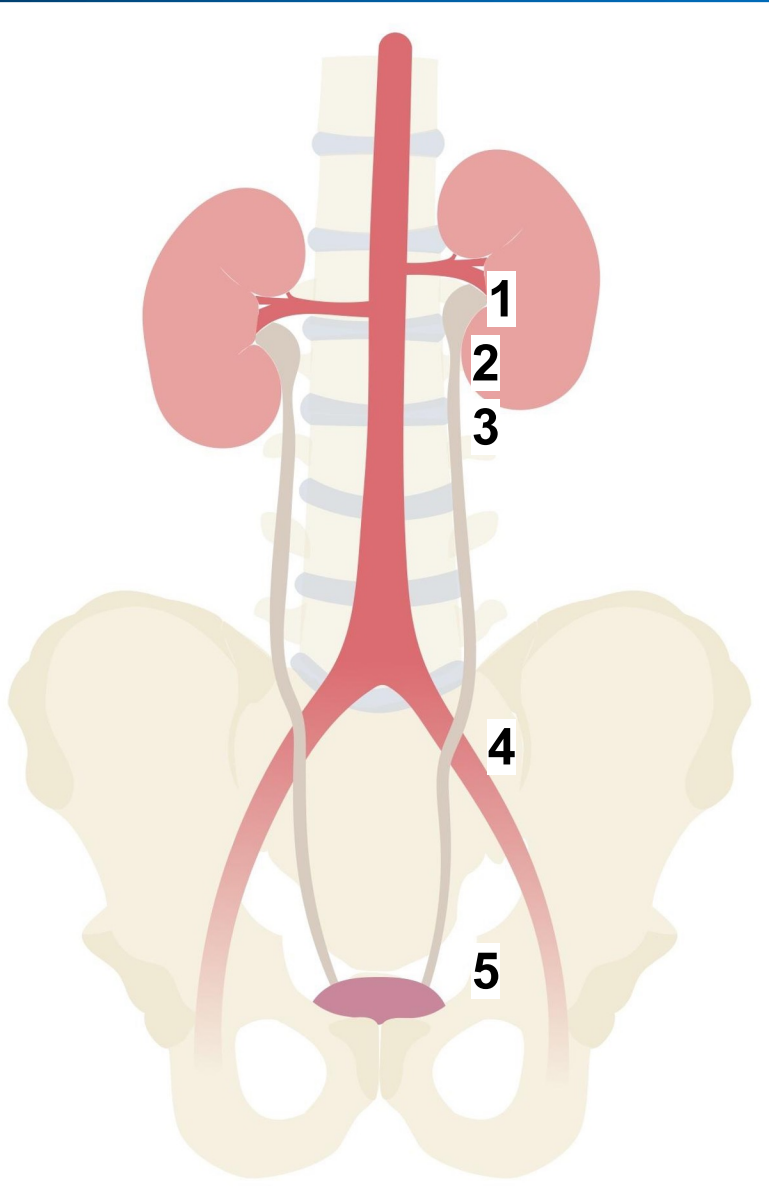
**LATTE DI CALCIO NELLE CISTI**



**ARTERIE ARCUATE CORTICALI**



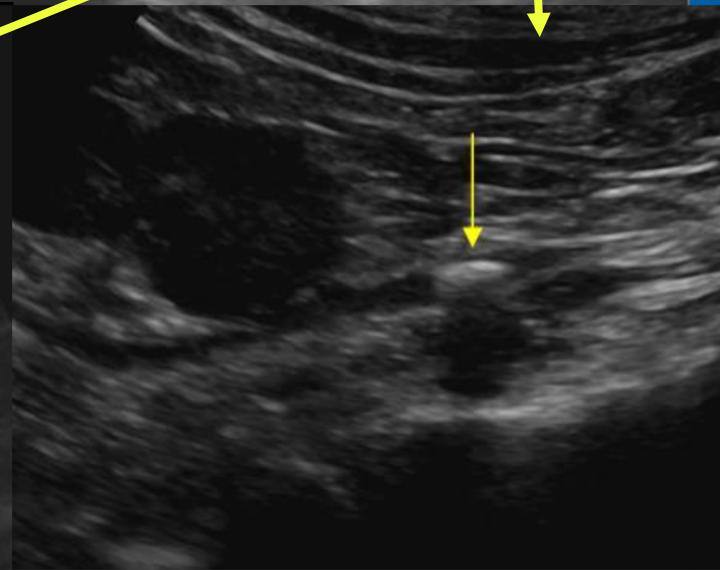
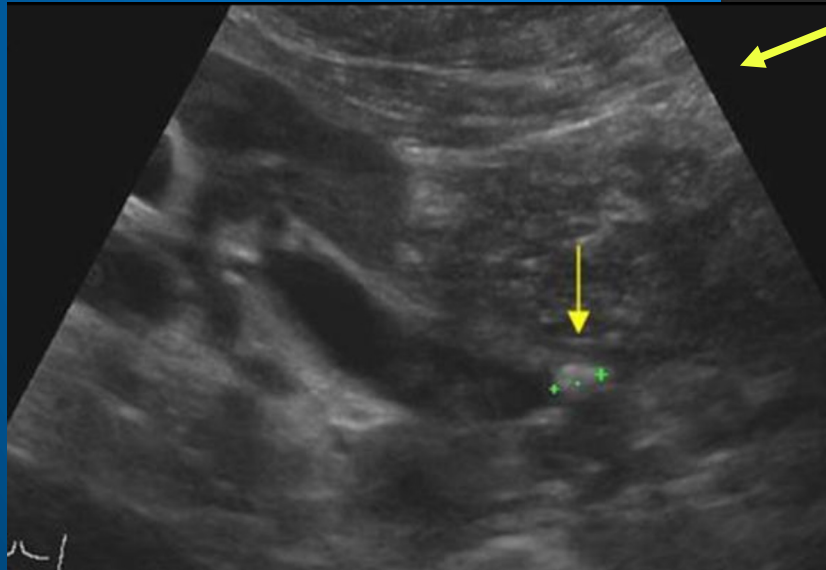
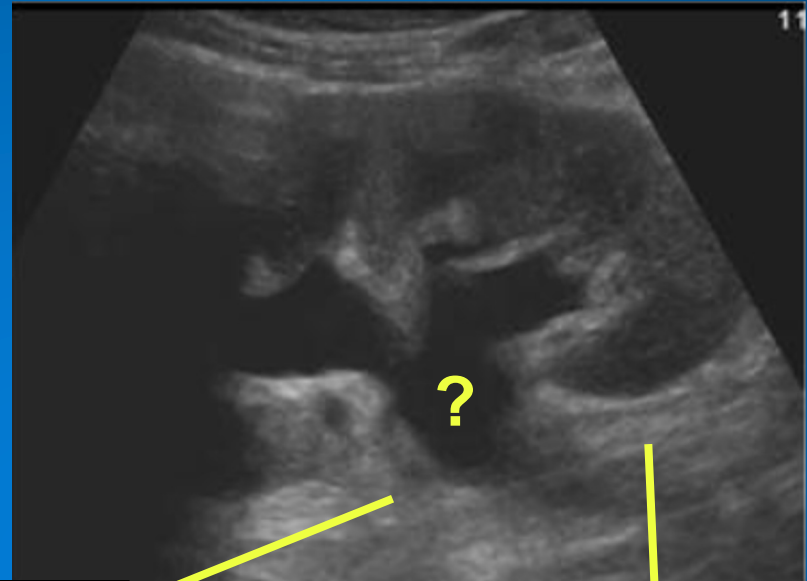
# FINESTRE ACUSTICHE PER LA RICERCA DEI CALCOLI INCUNEATI



1. PELVI
2. GIUNTO
3. URETERE PROSSIMALE
4. INCROCIO CON I VASI ILIACI
5. URETERE DISTALE

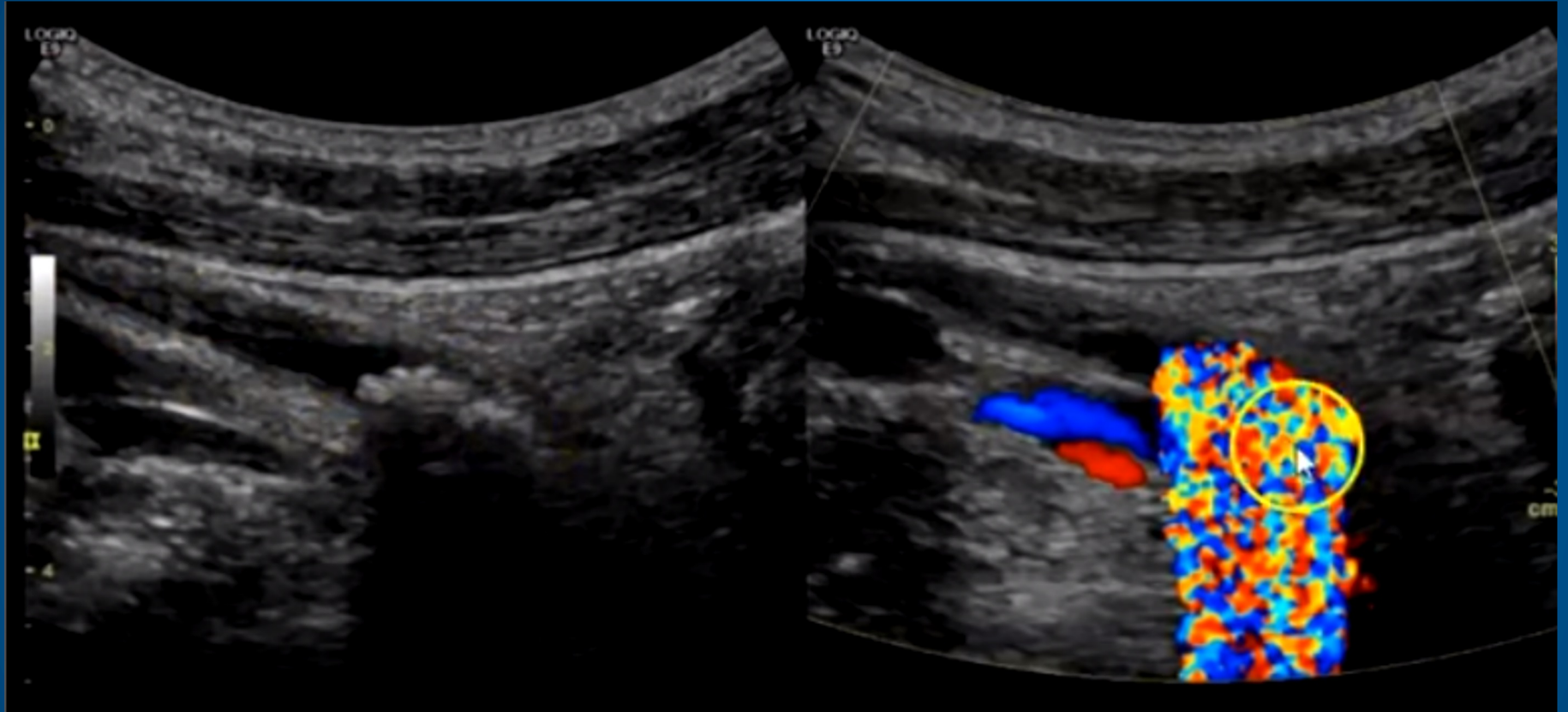
**NB: MAGARI NON VEDETE IL CALCOLO MA CAPITE LA POSIZIONE PRESUNTA A SECONDA DEI TRATTI DILATATI**

# CALCOLO IN PELVI O GIUNTO/URETERE PROSSIMALE

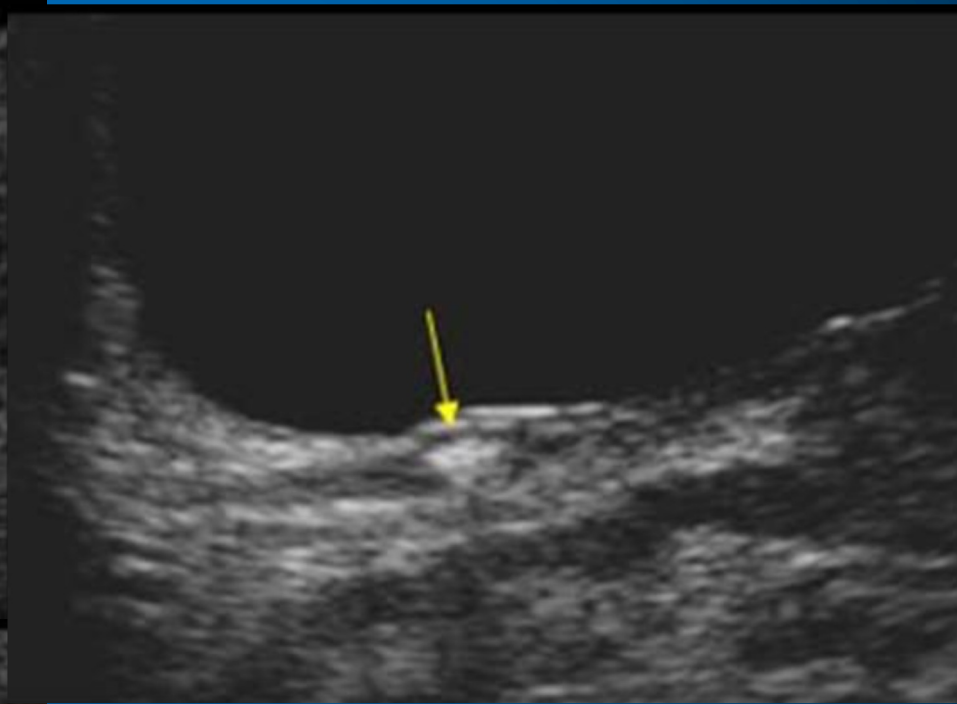
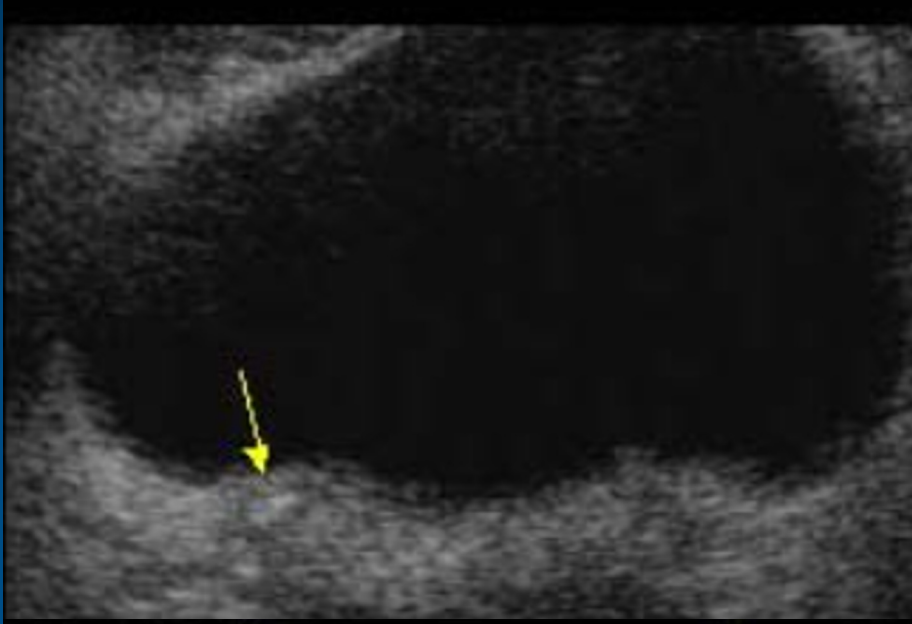


**DD CON STENOSI DEL GIUNTO**

# INCROCIO CON I VASI ILIACI

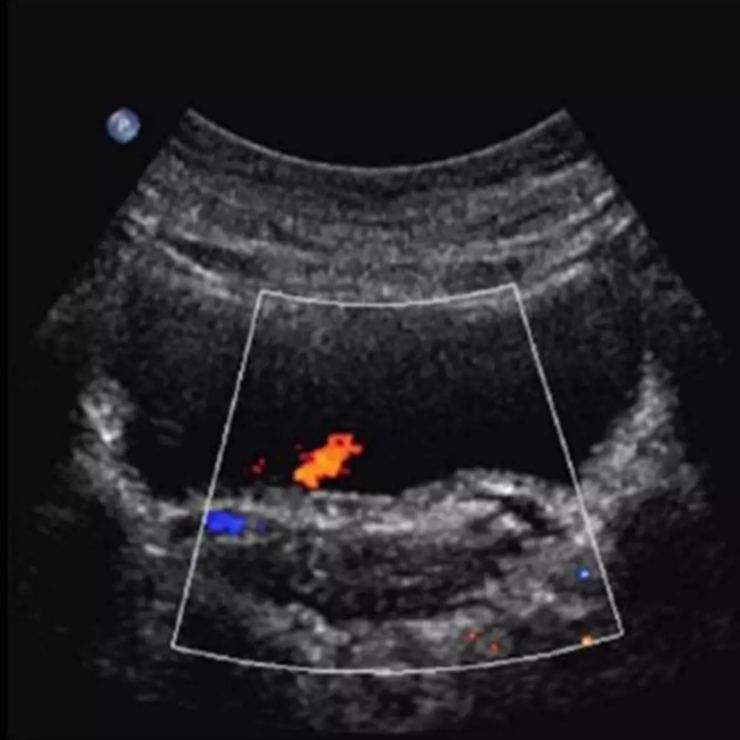


# URETERE DISTALE / SBOCCO



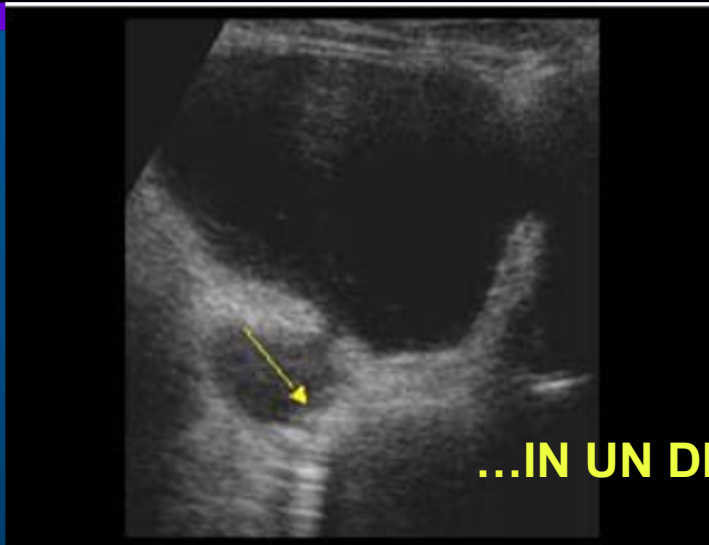
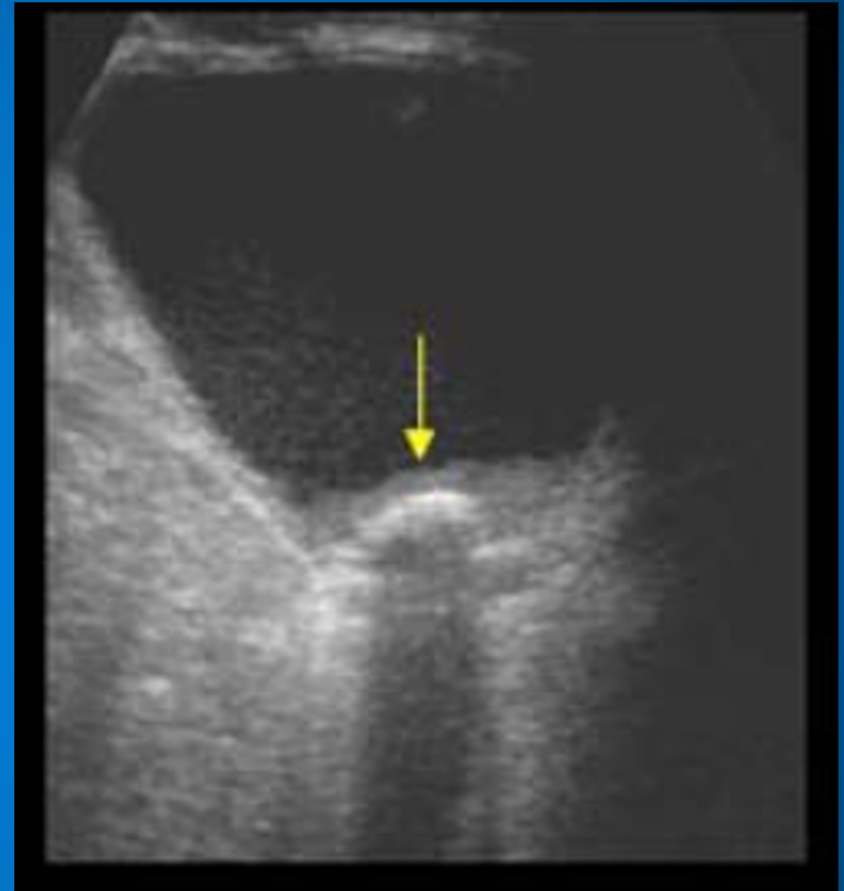
**VESCICA PIENA!  
(MA NON CHE ESPLODE!)**

## JET URETERALE



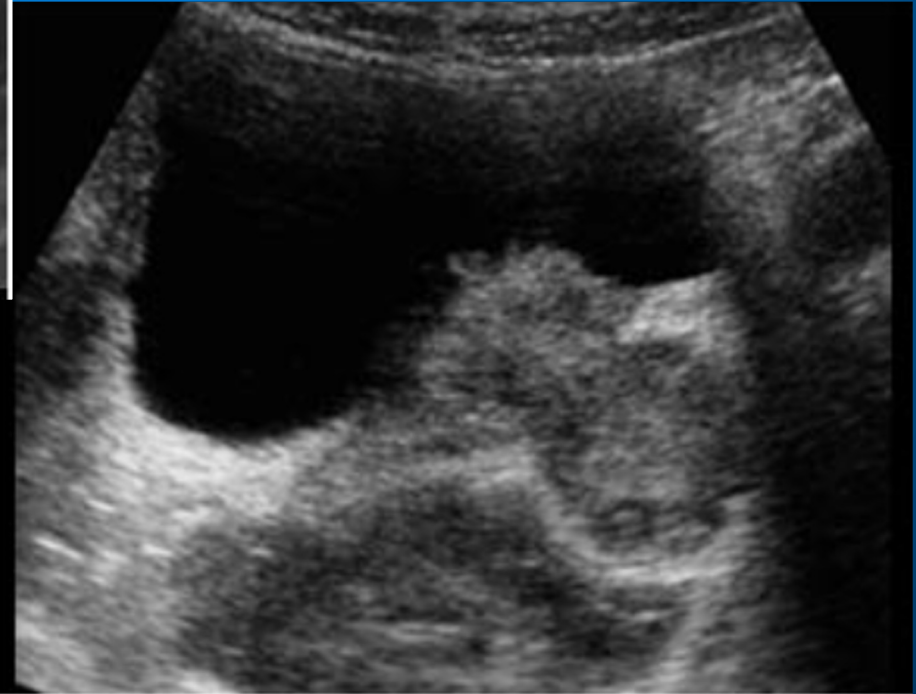
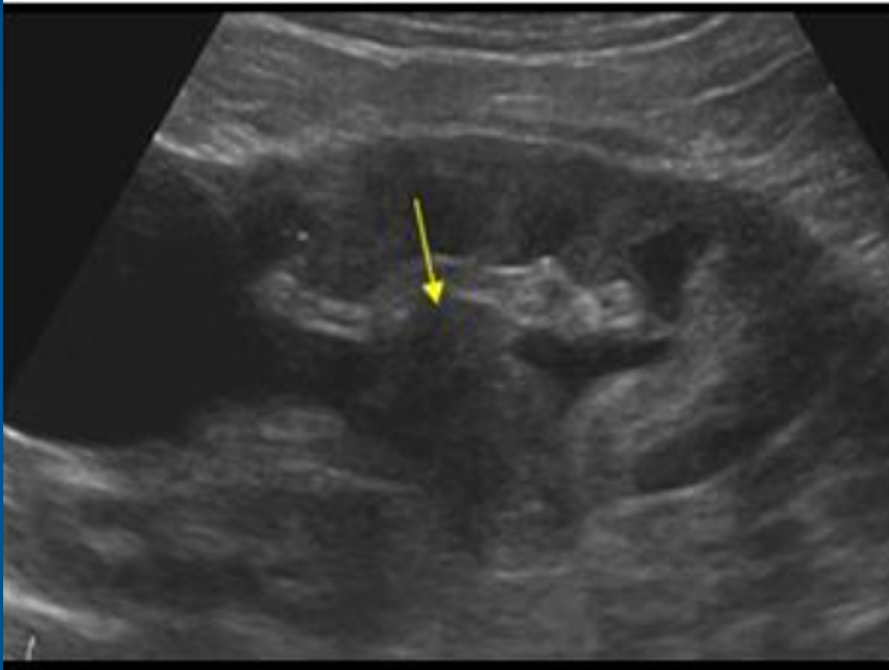
- Absence of a unilateral ureteral jet within the bladder can support the presence of obstruction however the patient needs to be well hydrated
- Jet can still be present with partial obstruction

# CALCOLI ENDOVESICALI



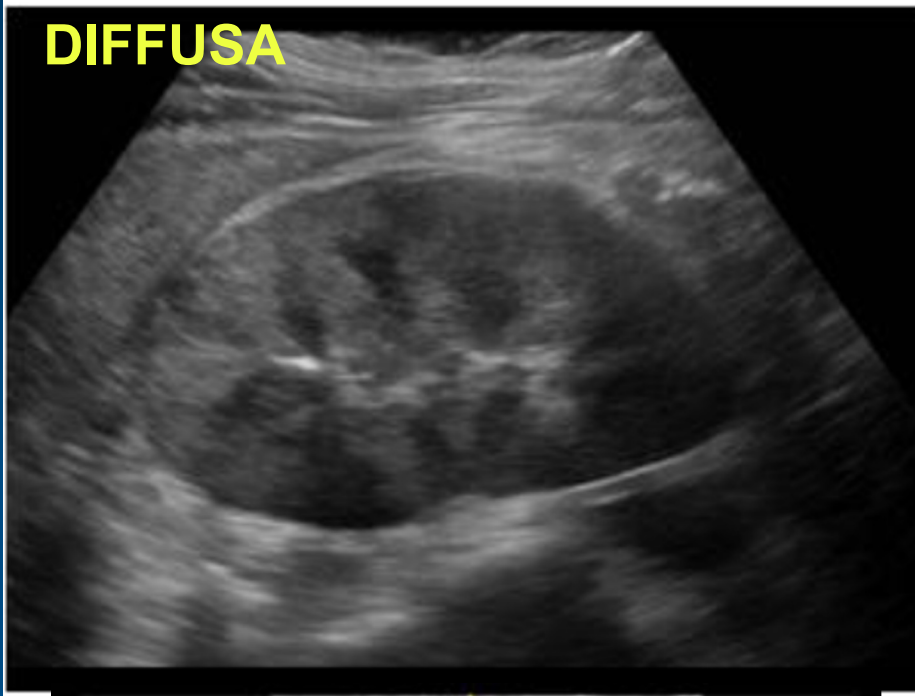
...IN UN DIVERTICOLO

# IDRONEFROSI ALTRE CAUSE CARCINOMA TRANSIZIONALE

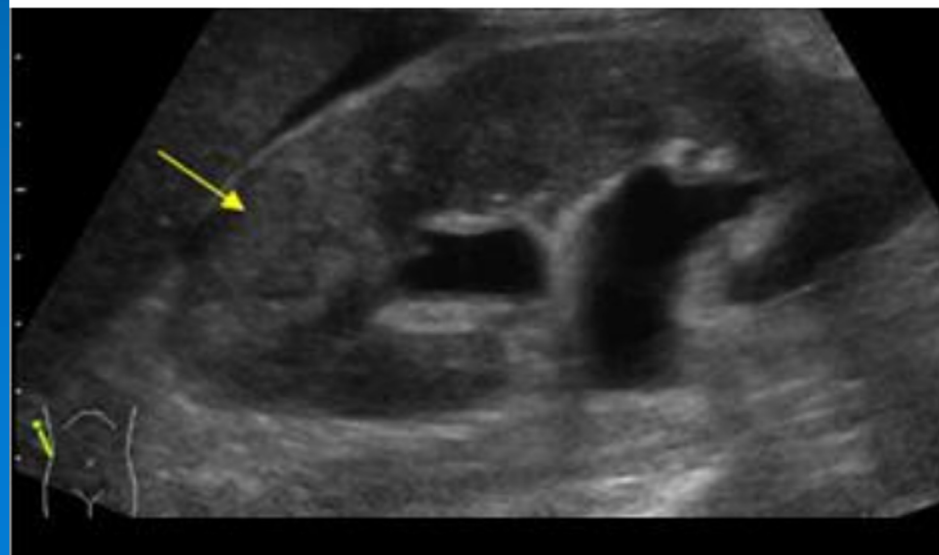


# PIELONEFRITI

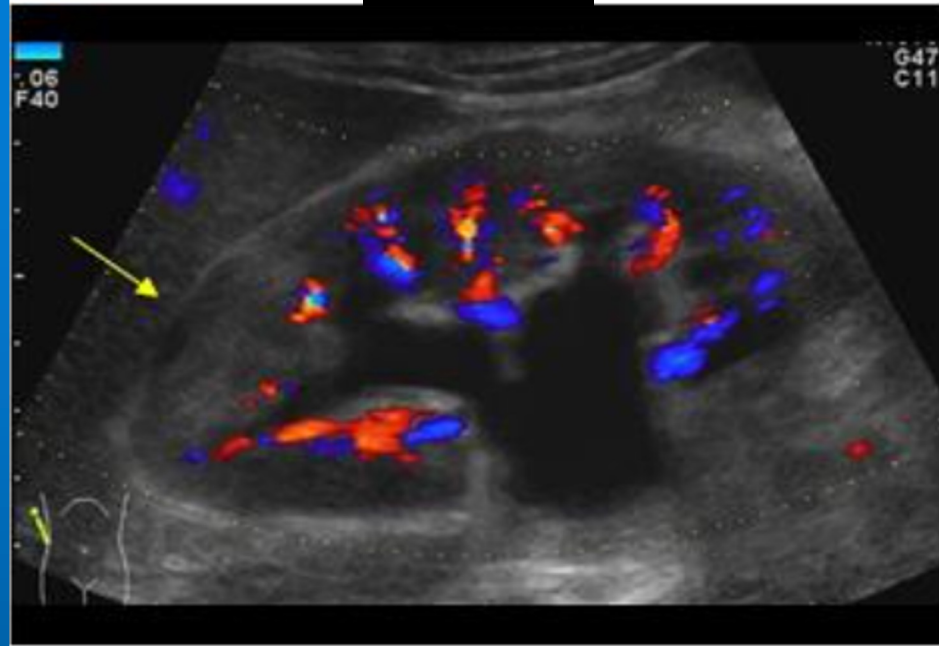
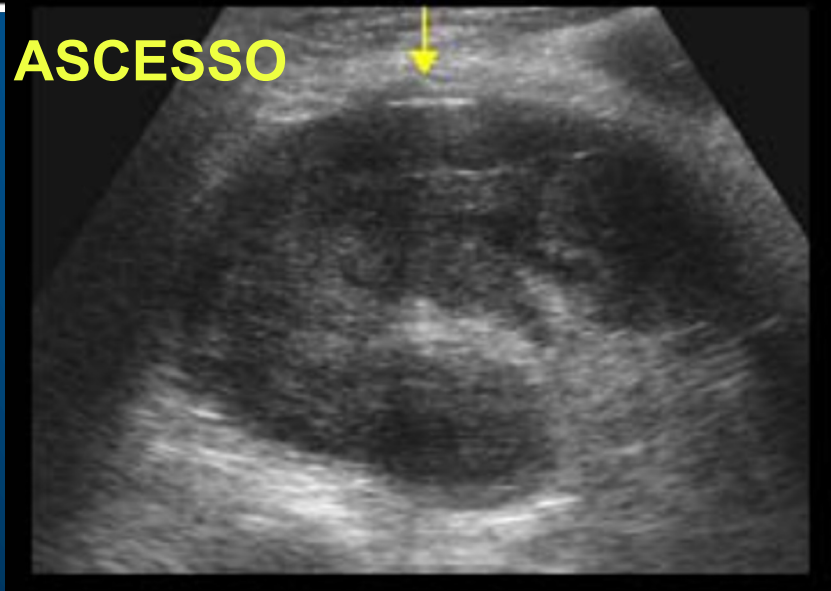
**DIFFUSA**



**FOCALE**

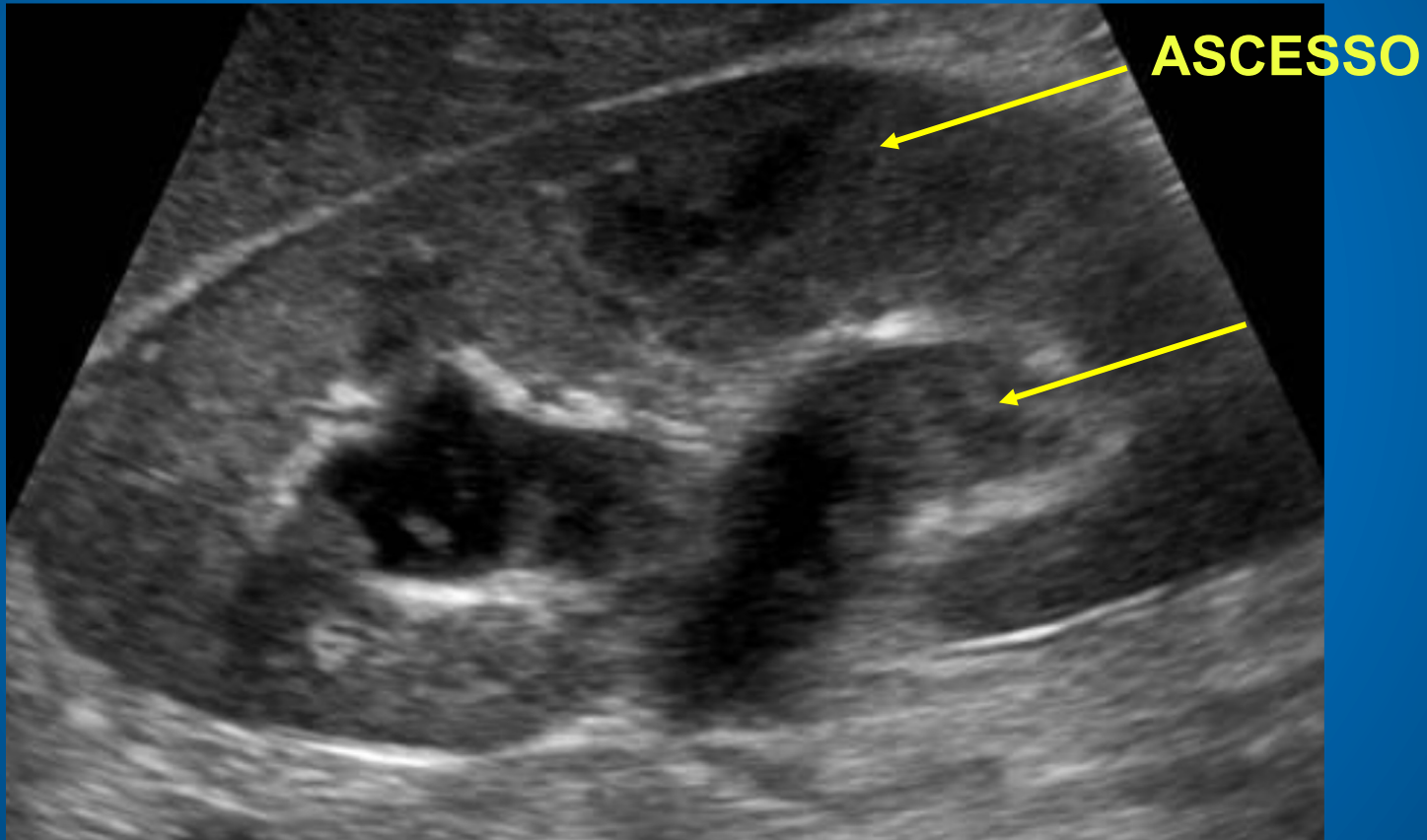


**ASCESSO**



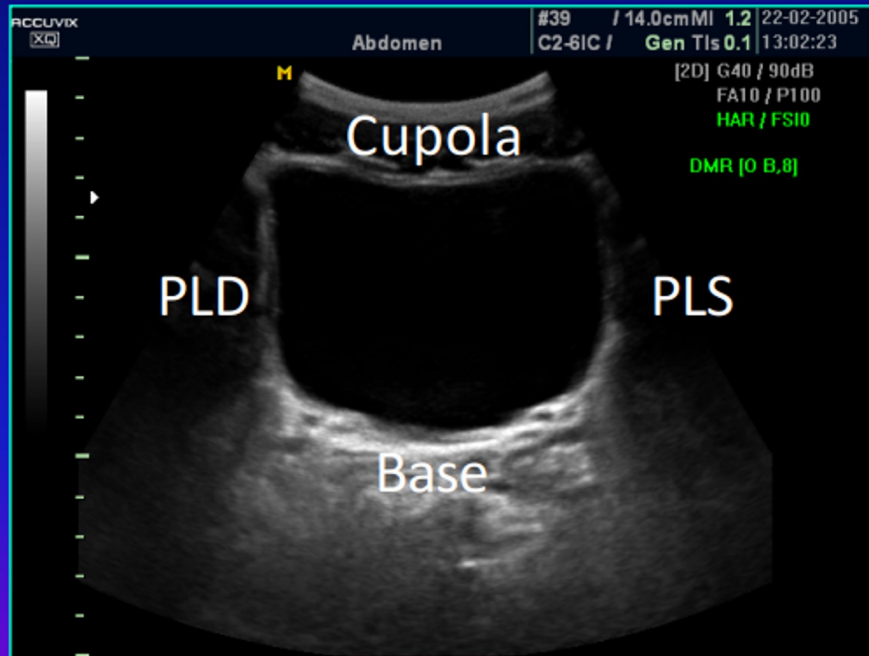
# PIELONEFRITE

CON MATERIALE DENSO CALICEALE (SANGUE/PUS) DD CON UROTELIOMA?

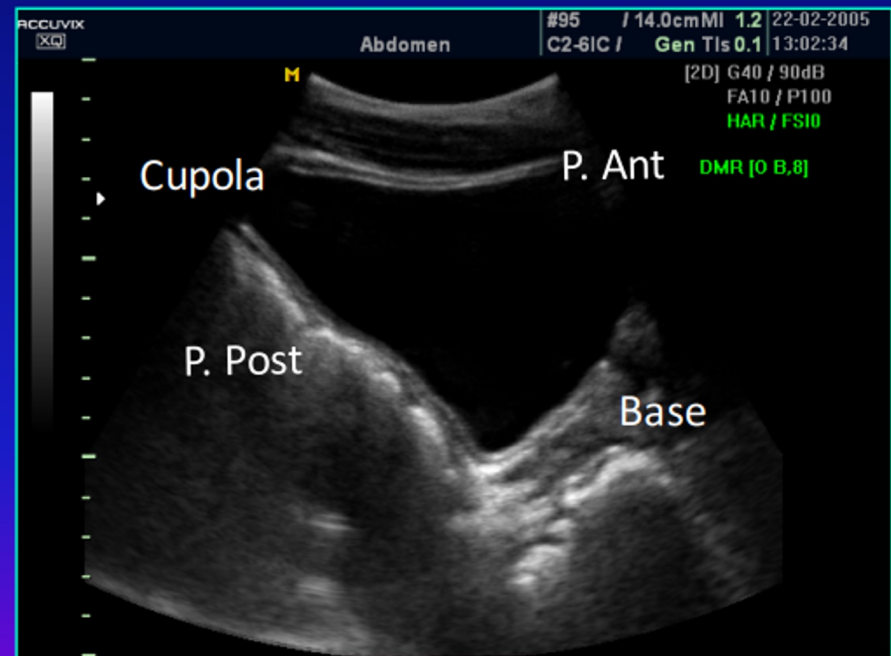


# Eco-Anatomia Normale della Vescica: *Morfologia*

SCANSIONI TRASV. (QUADRANGOLARE)

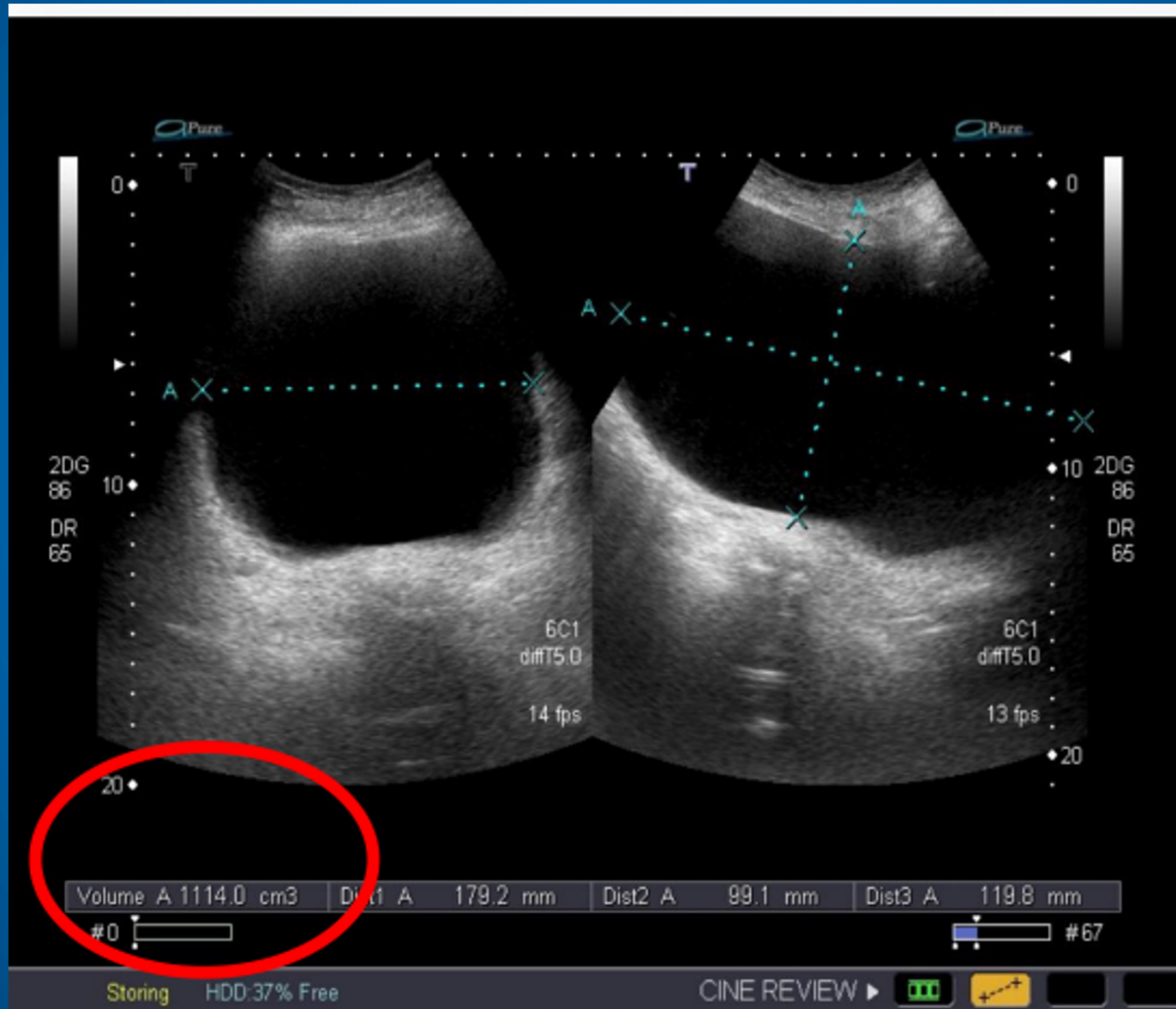


SCANSIONI LONG. (TRIANGOLARE)



**SPESSORE:  $\leq 3$  MM VESCICA VUOTA;  $\leq 5$  MM VESCICA PIENA**

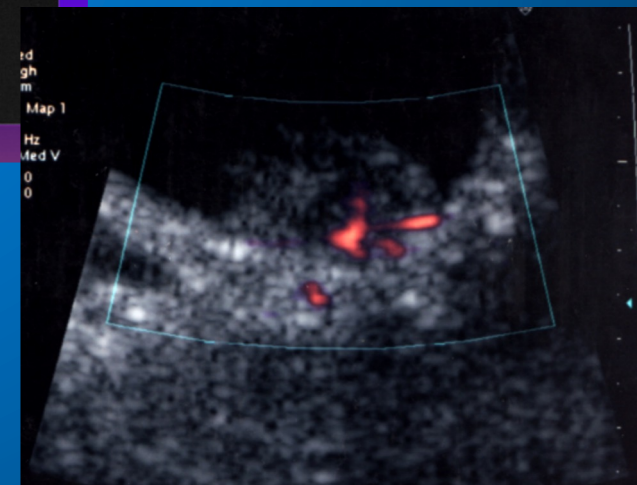
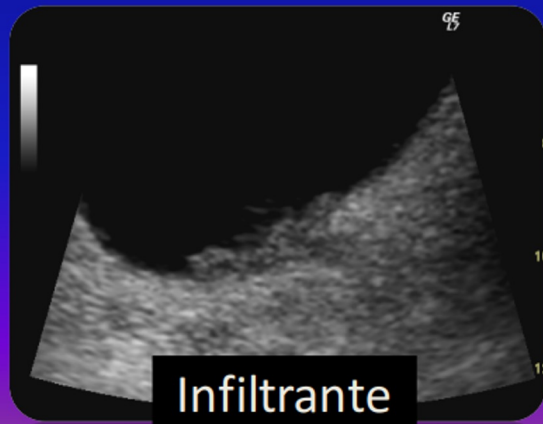
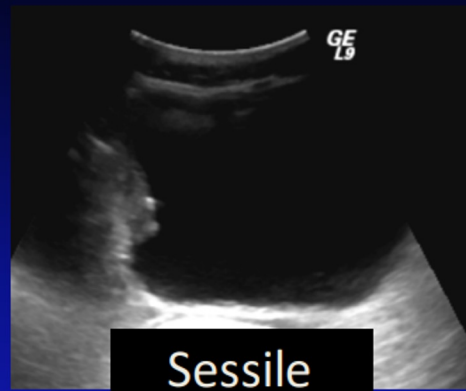
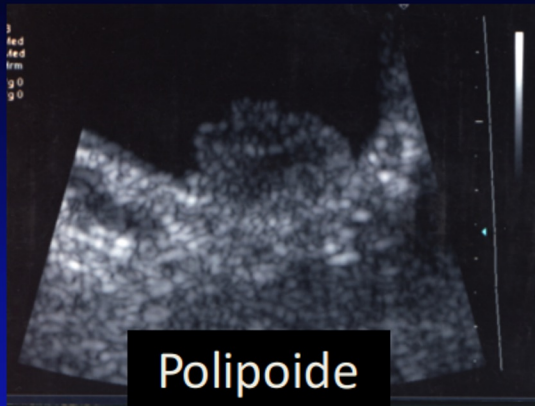
# CALCOLO VOLUME



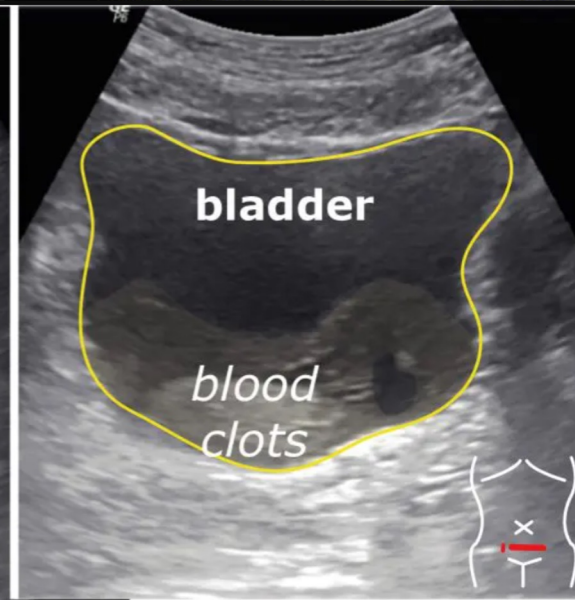
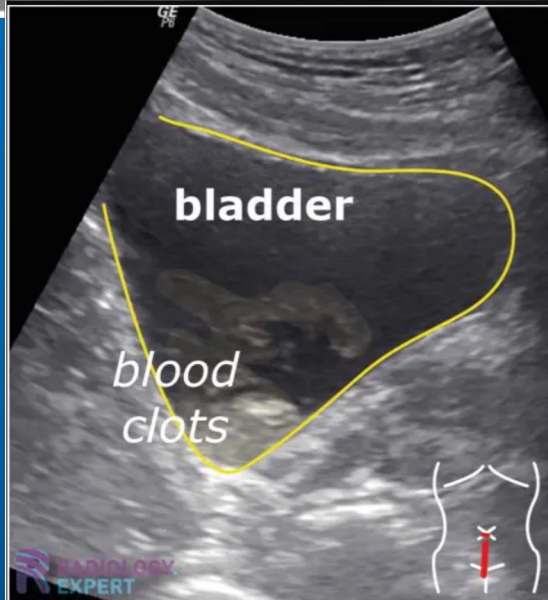
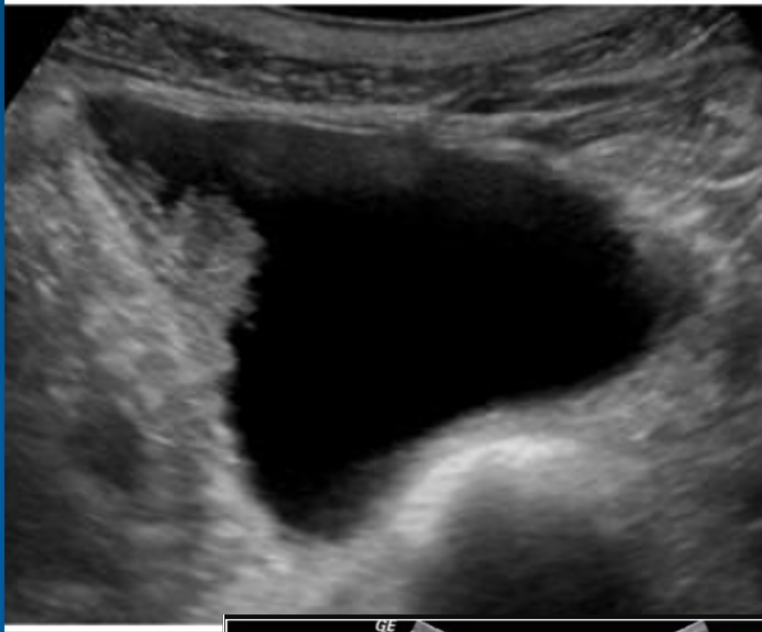
# Urine Corpuscolate



# Vegetazioni Solide



# COAGULI (VARIARE IL DECUBITO!)



# CISTITE

## Etiology

Cystitis has a variety of causes <sup>1</sup>:

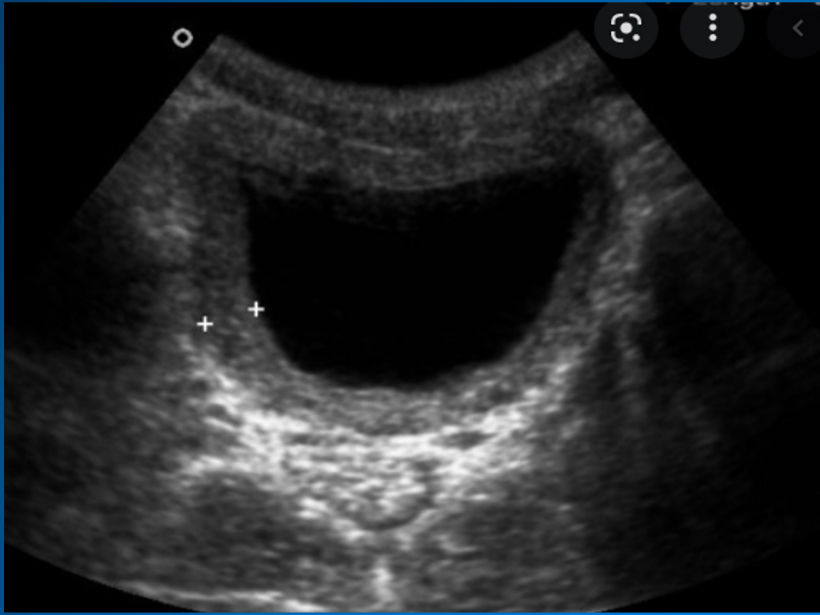
- ascending urinary tract infection (most common cause): bacterial (typically *Escherichia coli*, tuberculosis), parasite (schistosomiasis), or fungal (mycosis)
- medication: typically from chemotherapy e.g. cyclophosphamide
- radiotherapy
- bone marrow transplant: may cause hemorrhagic cystitis <sup>2</sup>
- neoplasm: e.g. bladder transitional cell carcinoma
- foreign body: including indwelling catheters
- fistula: from adjacent colon, rectum, or vagina (typically seen as a complication of diverticulitis, Crohn's disease, or malignancy)
- idiopathic: e.g. interstitial cystitis, eosinophilic cystitis

## Radiographic features

Typical imaging features include <sup>1</sup>:

- bladder mural hypertrophy: may be diffuse, or less commonly focal; defined as >3 mm when distended or >5 mm when non-distended
- urothelial mucosal irregularity
- layering intraluminal debris
- periserosal edema: fat stranding and free fluid
- mural calcification may be present: typically in schistosomiasis

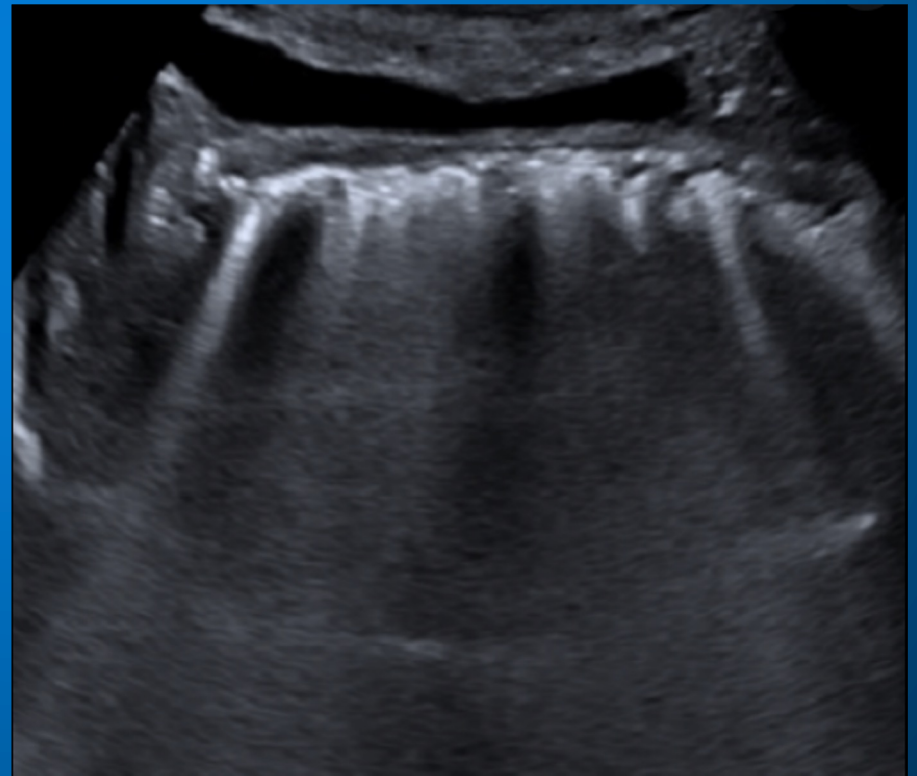
# CISTITE



# EMORRAGICA



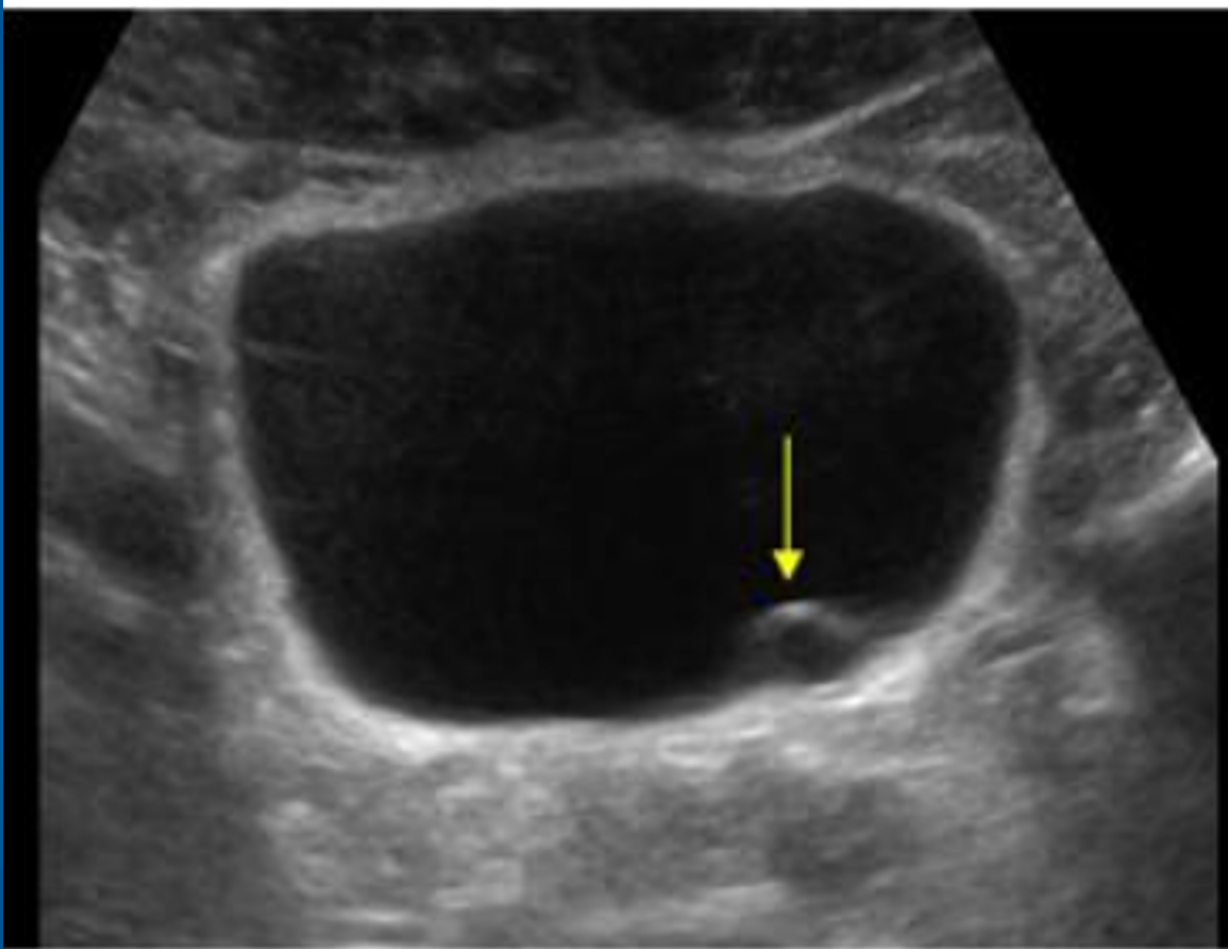
# ENFISEMATOSA



# DIVERTICOLI



# URETEROCELE



# ARIA (CATETERE?)



# Verifica posizionamento catetere

