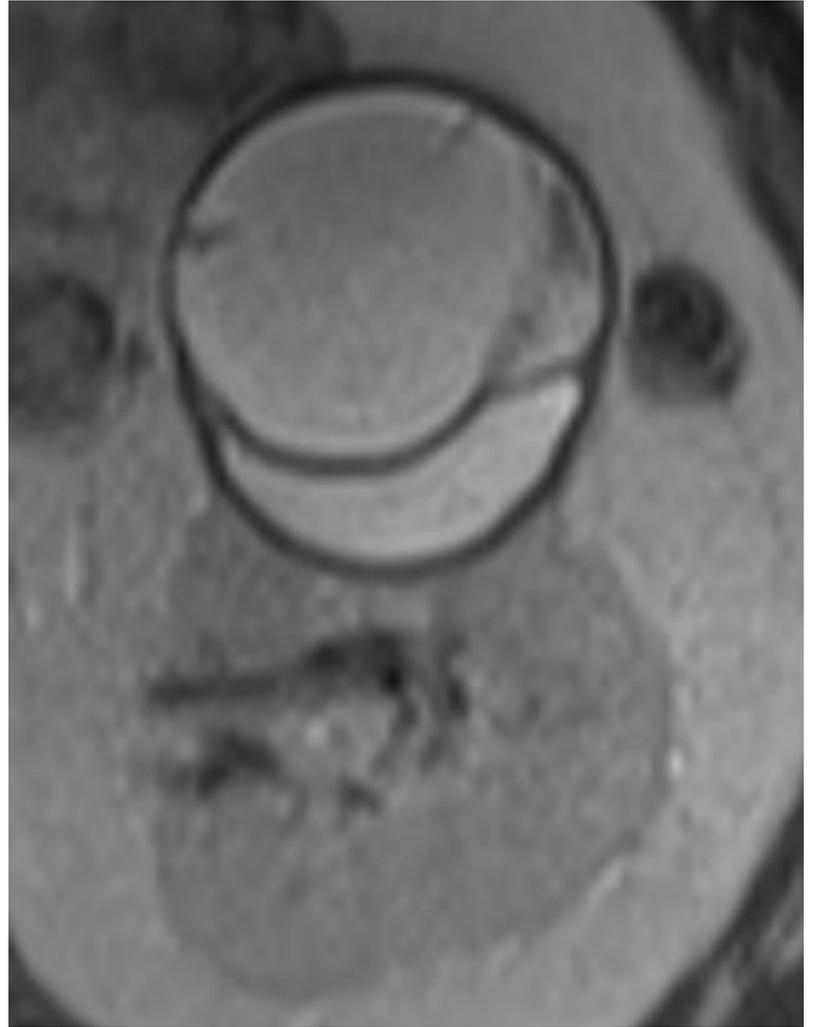




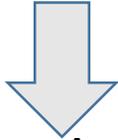
Classification Bosniak 2019

Van Nieuwenhove Sandy CUSL



Epidémiologie des lésions kystiques

Classification des lésions kystiques



La plupart des lésions sont découvertes fortuitement et bénignes

Les kystes simples sont fréquents > 50 ans

DD : ADPKD, maladie kystique acquise du rein (20% des hémodialysés), dystrophie kystique, maladie kystique de la médullaire, intoxication Li...

Update on MRI of Cystic Renal Masses Including Bosniak Version 2019

Satheesh Krishna, MD,^{1*}  Nicola Schieda, MD,² Ivan Pedrosa, MD, PhD,³
Nicole Hindman, MD,⁴ Ronaldo H. Baroni, MD,⁵ Stuart G. Silverman, MD,⁶ and
Matthew S. Davenport, MD⁷

J. MAGN. RESON. IMAGING 2020.

CME

Limitations de la version 2005

Pas de définition des termes : fins, épais – agrément interobservateur limité
Beaucoup de lésions Bosniak 3 selon la version 2005 sont des lésions bénignes
Caractérisation des lésions uniquement par CT urinaire (à blanc, injecté (60 s) et 3 min)
Lésions découvertes à l'US ou à l'IRM devaient être complétées par CT
Certaines lésions restent non caractérisables (trop petites pour être caractérisées)

MRI-based Bosniak Classification of Cystic Renal Masses, Version 2019: Interobserver Agreement, Impact of Readers' Experience, and Diagnostic Performance

 Xu Bai,  Song-Mei Sun,  Wei Xu,  Huan-Huan Kang,  Lin Li,  Ye-Qiang Jin,  Qing-Ge-Le Gong, 
Guo-Cheng Liang, Hong-Yan Liu,  Lin-Lin Liu,  Si-Lu Chen,  Qing-Rong Wang,  Peng Wu,  Ai-Tao
Guo,  Qing-Bo Huang,  Xiao-Jing Zhang,  Hui-Yi Ye,  Hai-Yi Wang 

Radiology

▼ **Author Affiliations**

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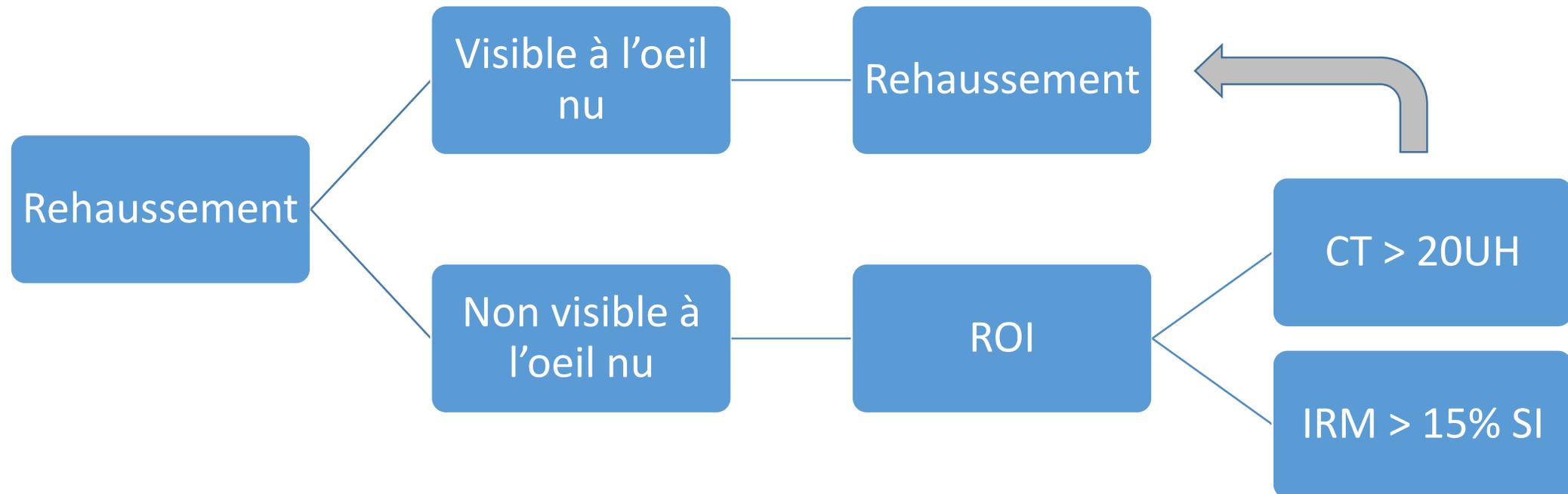
Amélioration de l'agrément interobservateur ($\kappa = 0.64$ vs 0.50 , $P < .001$)

Pas de modification de l'agrément interobservateur entre senior et junior de la version 2019 ($\kappa = 0.65$ vs 0.64 ; $P = 0.71$) et version 2005 ($\kappa = 0.54$ vs 0.46 ; $P < .001$)

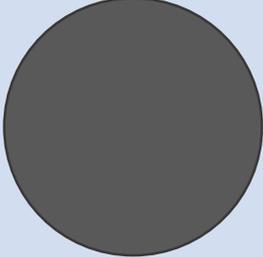
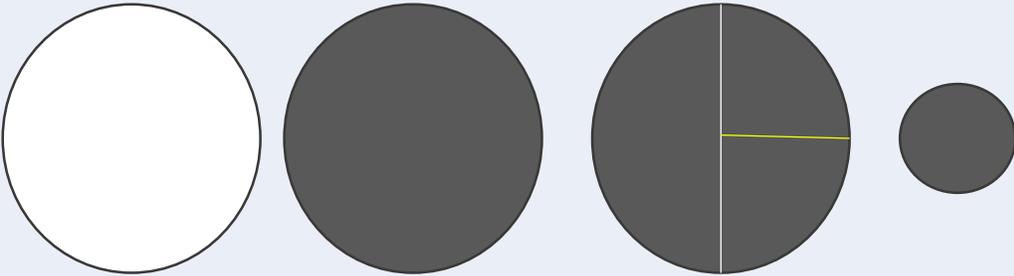
Meilleure spécificité diagnostique de la version 2019 que la version 2005 (83% vs 68% ; $P < .001$), sans modification de la sensibilité (89% vs 84% ; $P = 0.34$).

Classification de Bosniak 2019

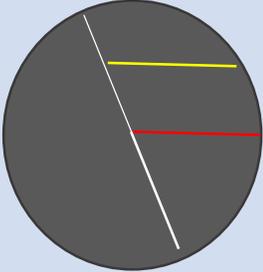
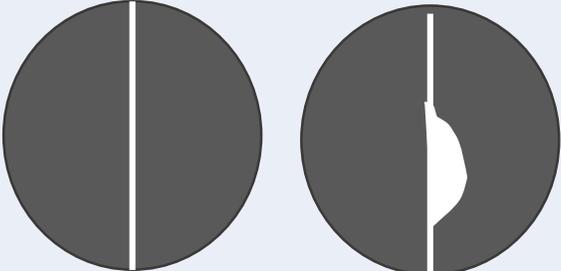
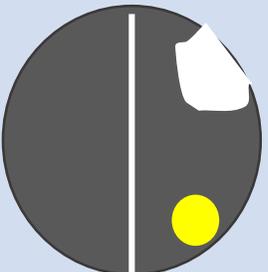
- Définition de la lésion kystique
- Définition du rehaussement



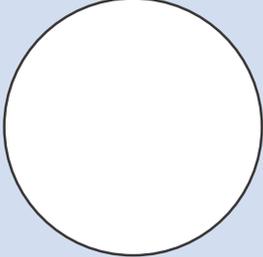
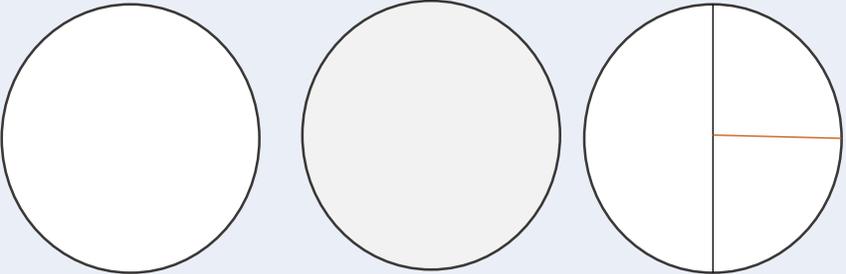
Classification Bosniak au CT

| TYPE | CT |
|--|---|
| <p>Type 1</p>  | <p>Bien défini paroi fine et lisse ($\leq 2\text{mm}$); pas de septa ni de Ca^{++}; densité homogène (-9 à 20UH)</p> <p>Pas de suivi</p> |
| <p>Type 2</p>  <p>+/- Ca^{++}</p> | <p>paroi fine et lisse ($\leq 2\text{mm}$)</p> <ul style="list-style-type: none"> - Masse kystique avec 1-3 septa fins ($\leq 2\text{mm}$); Ca^{++} - Masse homogène hyperdense à blanc $\geq 70\text{UH}$ - Masse homogène -9 à 20UH à blanc sur protocole CT urinaire. - Masse homogène non rehaussante $>21\text{-}30\text{UH}$ post IV contraste; Ca^{++} - Lésions homogènes et hypodenses trop petites <p>Pas de suivi</p> |

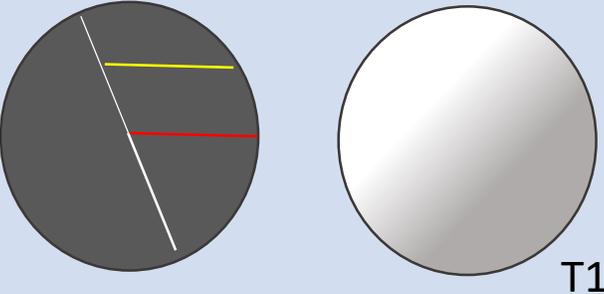
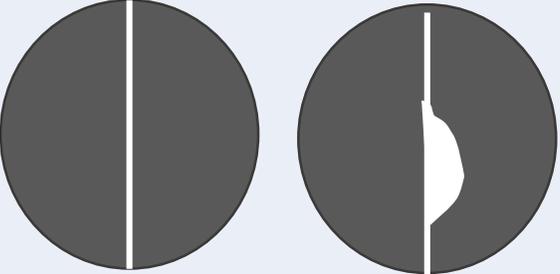
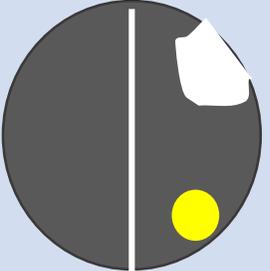
Classification Bosniak au CT

| TYPE | CT |
|--|---|
| <p>Type 2F</p>  | <p>Bien défini paroi rehaussante modérément épaissie (3 mm); Septa modérément épais et rehaussant (3 mm) ≥ 4 septa fins rehaussants</p> <p>Suivi 6-12 mois pdt 5 ans</p> |
| <p>Type 3</p>  | <p>≥ 1 septa épais rehaussant (≥ 4 mm) Paroi ou septa irrégulier rehaussant ≤ 3 mm avec une protrusion convexe obtue</p> <p>Consultation URO</p> |
| <p>Type 4</p>  | <p>≥ 1 nodule rehaussant (≥ 4 mm avec protrusion convexe avec des marges obtues ou toute protrusion qui a des marges aigues)</p> <p>Consultation URO</p> |

Classification Bosniak à l'IRM

| TYPE | IRM |
|--|---|
| <p>Type 1</p>  | <p>Bien défini paroi fine et lisse ($\leq 2\text{mm}$); pas de septa ni de Ca^{++}; intensité liquidienne similaire au LCR sur IRM injectée</p> |
| <p>Type 2</p>  <p>T2 T1 T2</p> <p>+/- Ca ++</p> | <p>paroi fine et lisse ($\leq 2\text{mm}$)</p> <ul style="list-style-type: none">- Masse kystique avec 1-3 septa fins ($\leq 2\text{mm}$) rehaussants ou non ; Ca^{++}- Lésion kystique homogène sur IRM <u>sans injection</u> hyperT2- Masse homogène hyperT1 (x2,5 intensité du parenchyme sur IRM <u>sans injection</u>) |

Classification Bosniak à l'IRM

| TYPE | IRM |
|--|--|
| <p>Type 2F</p>  | <p>Bien défini</p> <ul style="list-style-type: none">- paroi rehaussante modérément épaissie (3 mm);Septa modérément épais et rehaussant (3 mm)≥ 4 septa fins rehaussants- Masse kystiques hyperT1 hétérogène |
| <p>Type 3</p>  | <p>≥ 1 septa épais rehaussant (≥ 4 mm)</p> <p>Paroi ou septa irrégulier rehaussant ≤ 3 mm avec une protrusion convexe obtue</p> |
| <p>Type 4</p>  | <p>≥ 1 nodule rehaussant (≥ 4 mm avec protrusion convexe avec des marges obtues ou toute protrusion qui a des marges aigues)</p> |

Classification à l'écho de contraste

Table I. Bosniak categories based on the updated Bosniak classification version 2019, modified for CEUS [8]. The anatomical description for each Bosniak category carefully mirrored the description for CT.

| Bosniak category | Modified BC _{new} description for CEUS |
|------------------|---|
| I | Cystic lesions with well-defined, thin (≤ 2 mm) smooth wall, completely anechoic, no septa or calcifications; wall may enhance |
| II | Cystic lesions with thin (≤ 2 mm) and few (1-3) septa; septa and wall may enhance; may have calcification or any type Hypoechoic lesions but without internal enhancement (cyst with echoes) Cystic lesions that are too small for enhancement to be characterised |
| IIIF | Cystic lesions with smooth, minimally thickened (3 mm) enhancing wall or septa Cystic lesions with many (≥ 4), smooth thin (≤ 2 mm) enhancing septa |
| III | Cystic lesions with one or more enhancing thick (≥ 4 mm) wall or septa Cystic lesions with enhancing irregular (≤ 3 mm obtusely-margined convex protrusions) wall or septa |
| IV | Cystic lesions with one or more enhancing nodules (≥ 4 mm obtusely-margined convex protrusions or a convex protrusion of any size with acute margins) |

Limites de l'échographie de contraste

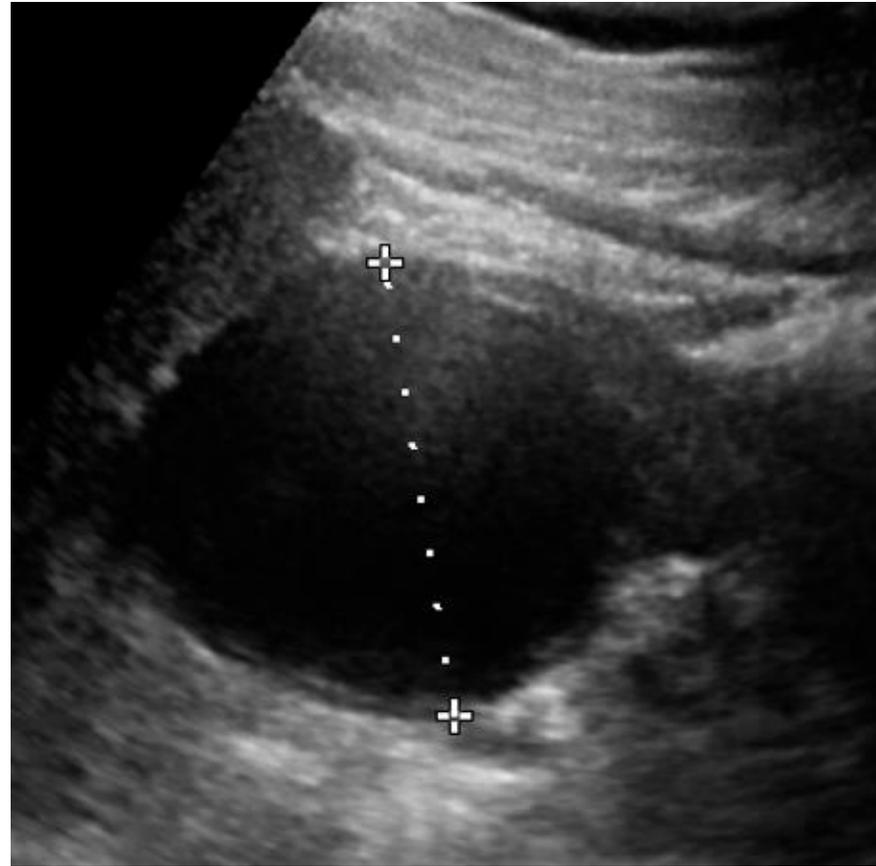
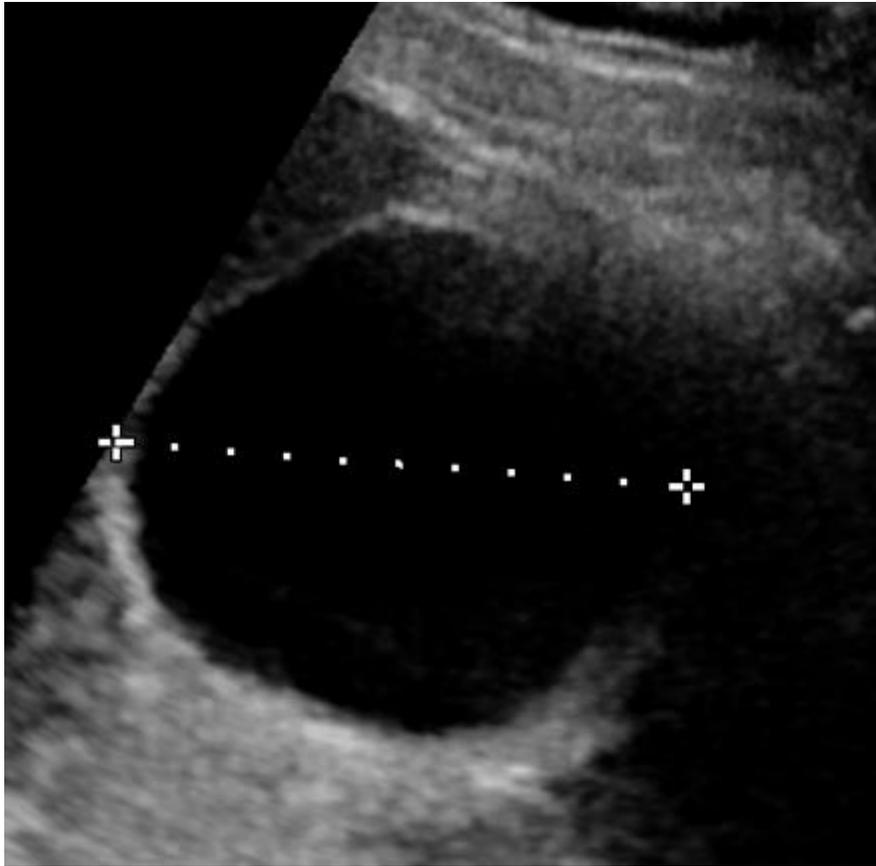
- Médium pariétal et profondeur de la lésion
- Présence de calcifications périphériques
- Agrément interobservateur (Bosniak 2, 2F et 3)

Rôle de l'US de contraste pas complètement établi.

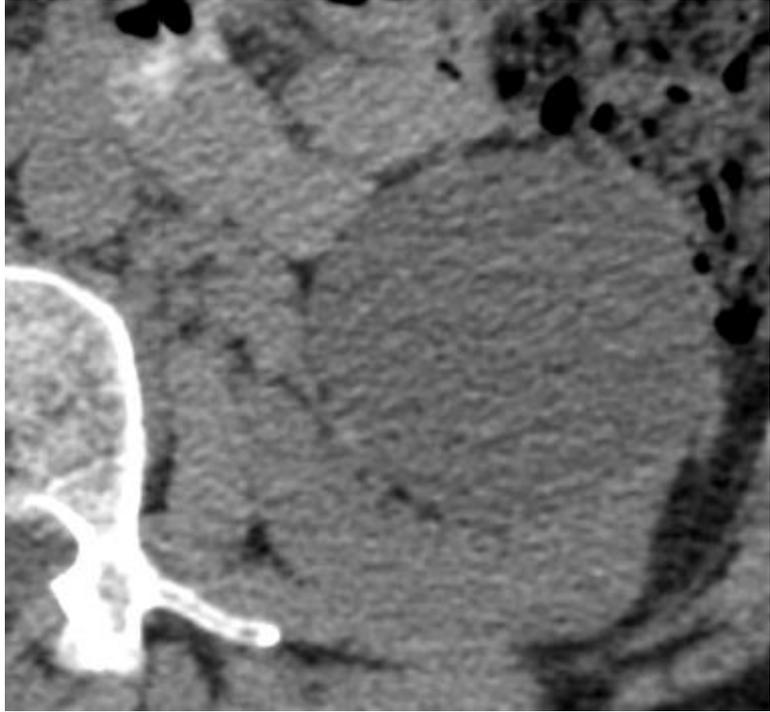
Des études ont démontré que la CEUS était capable de voir plus de nodules / septa rehaussants que le CT sans amélioration de l'exactitude diagnostique.

Kyste Bosniak 1

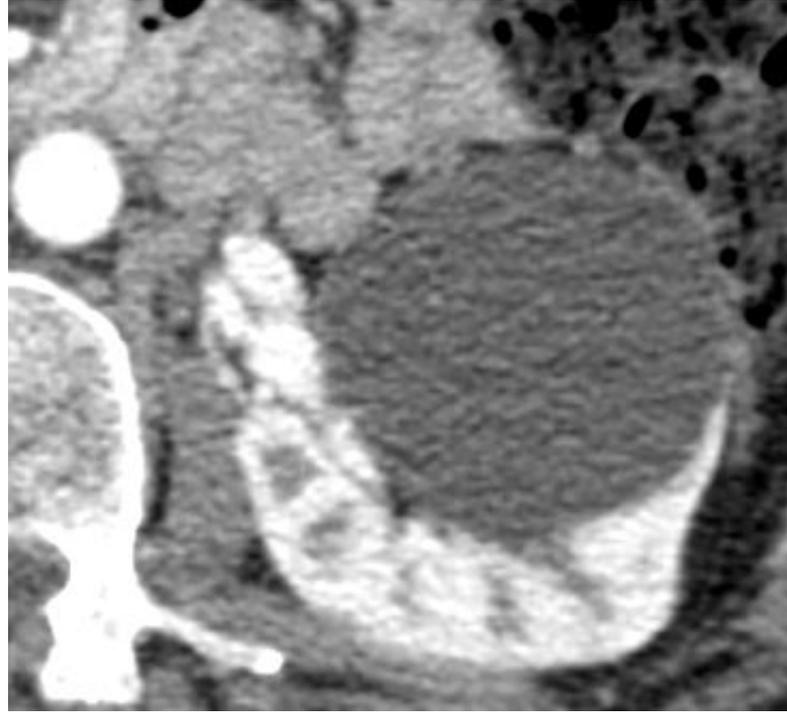
US - IRM - CT



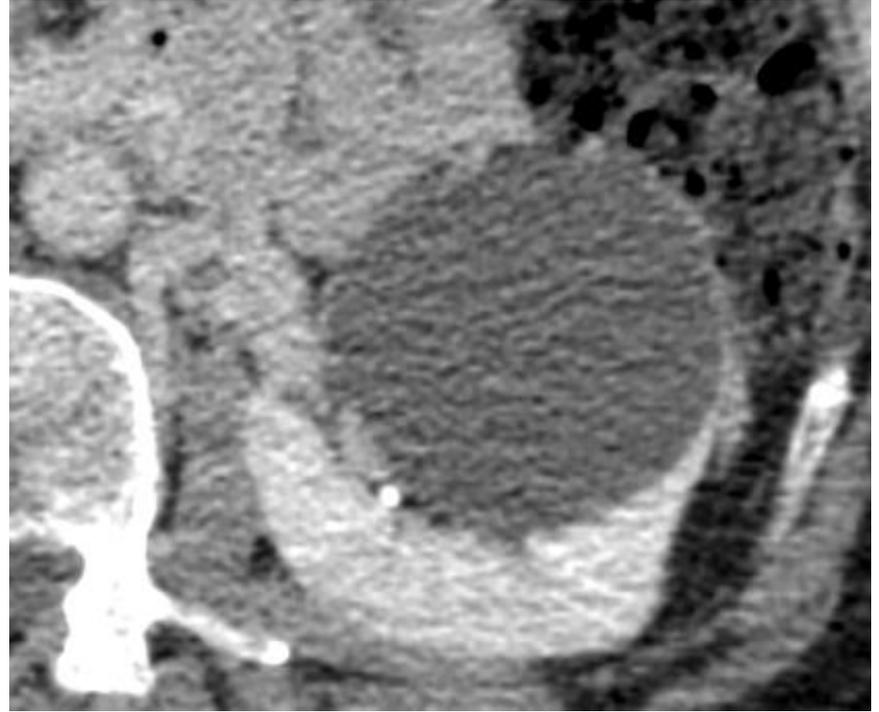
Homme 52 ans



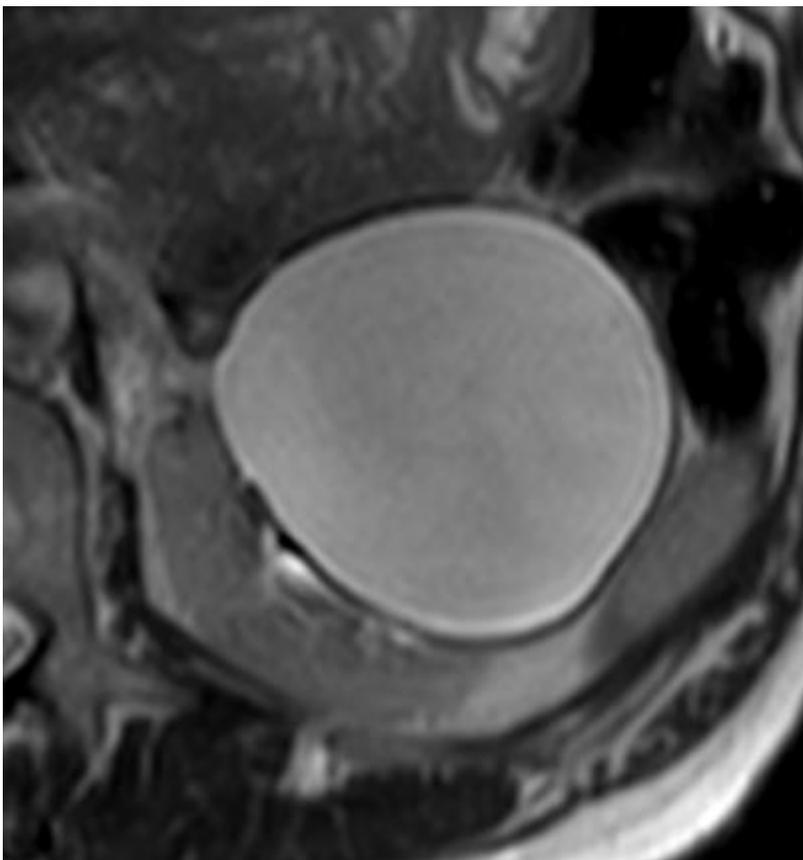
CT à blanc



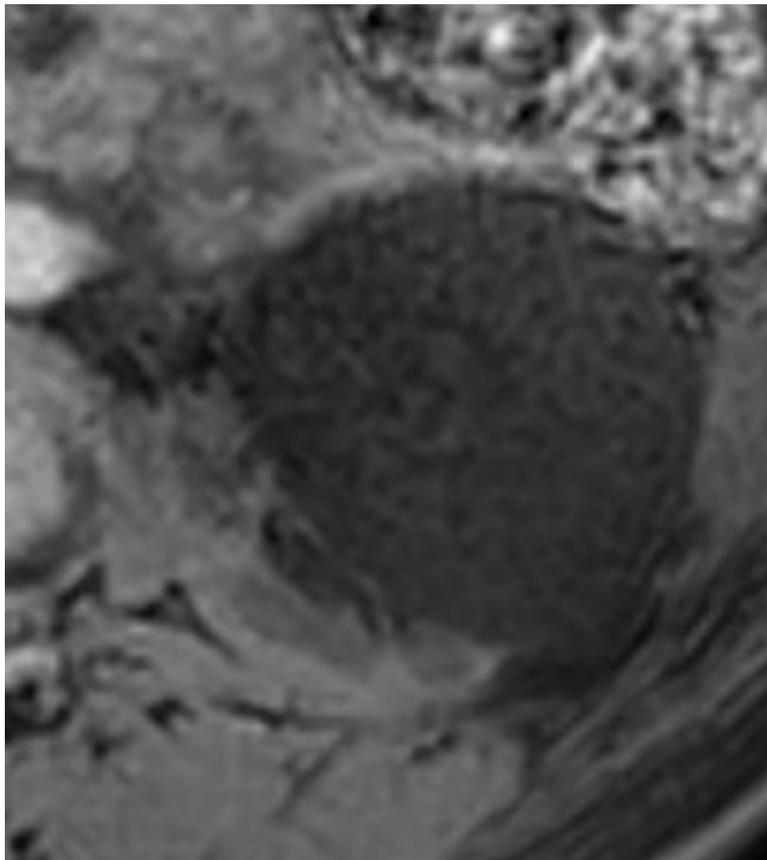
CT post IV de contraste 60s



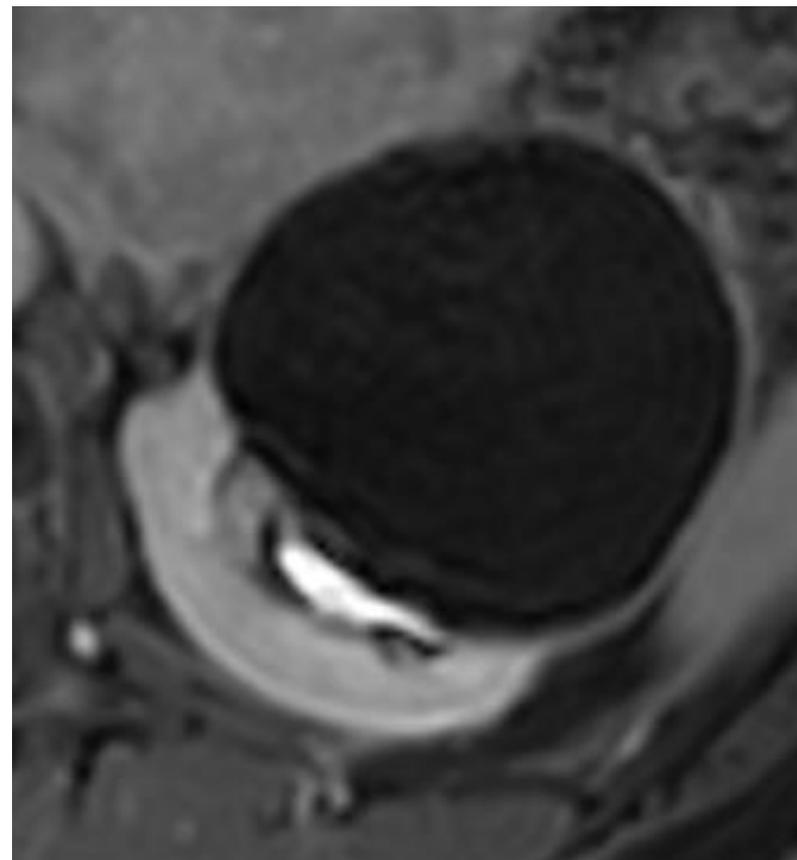
CT post IV de contraste 3 min



T2



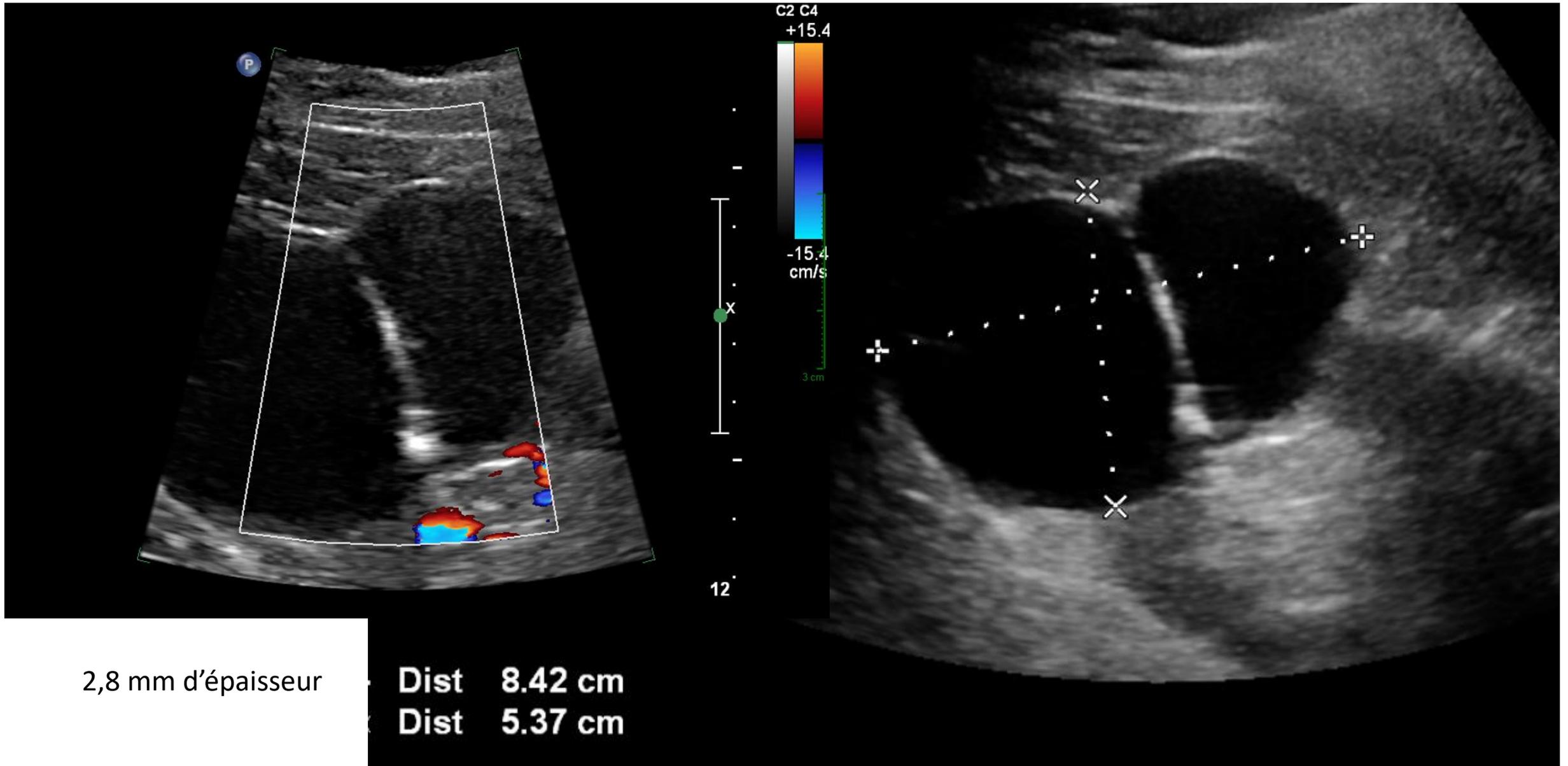
T1 FS



T1 FS post IV de contraste 3 min

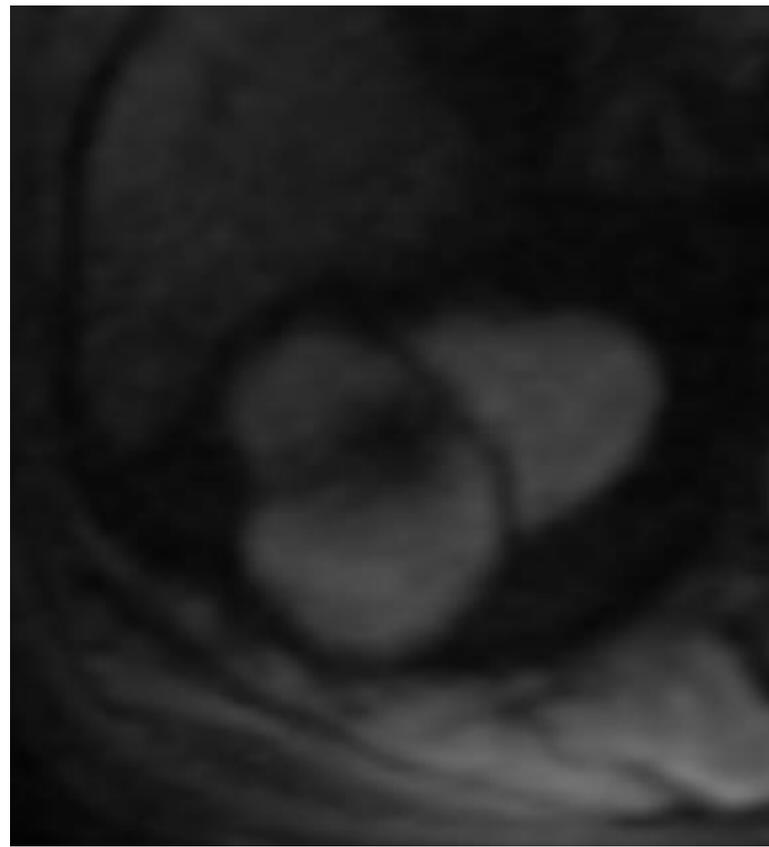
Kyste Bosniak 2

US - IRM - CT





T2 TSE

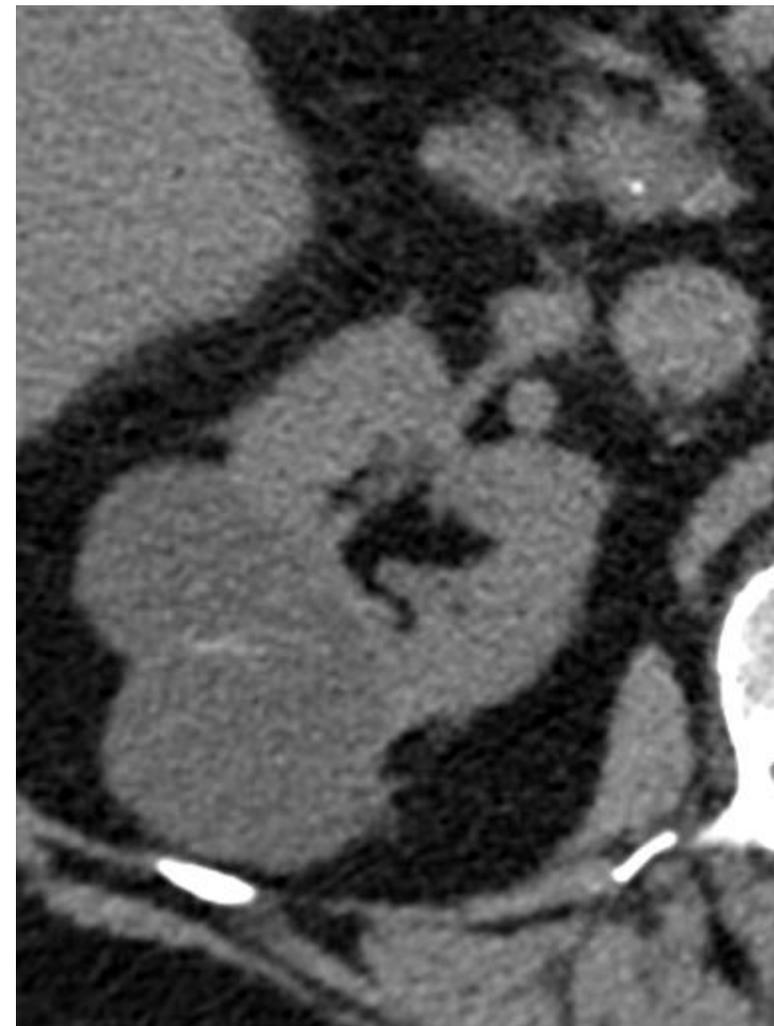


Diffusion $b=800 \text{ s/mm}^2$

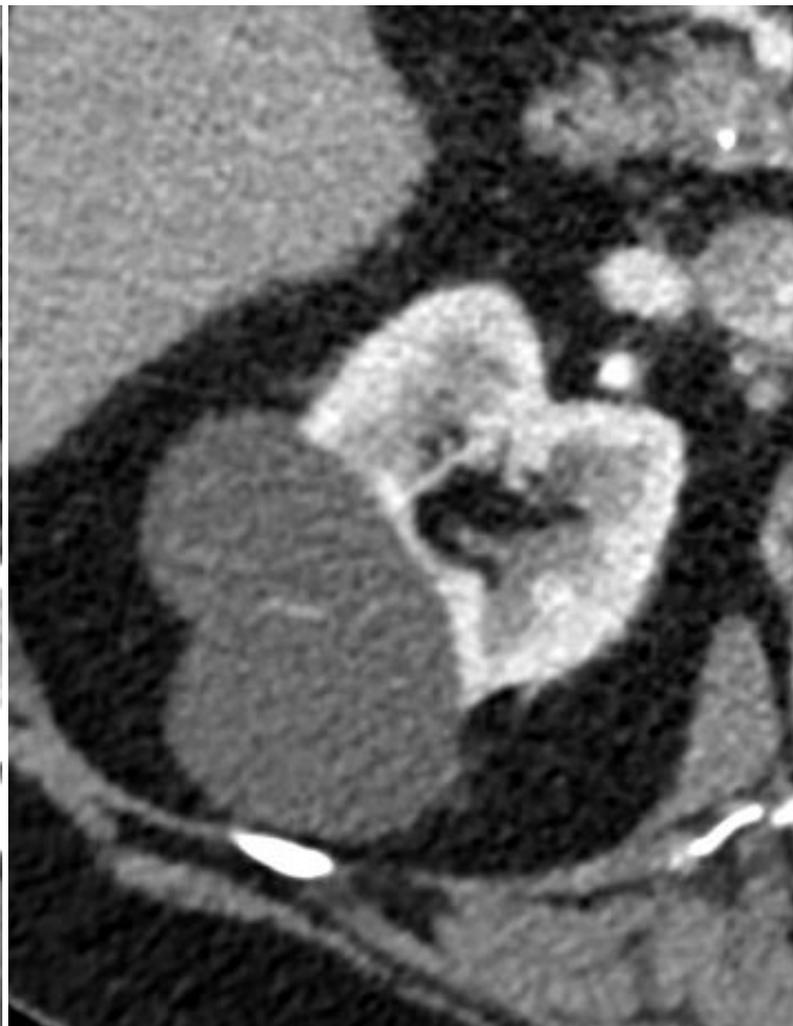
2014



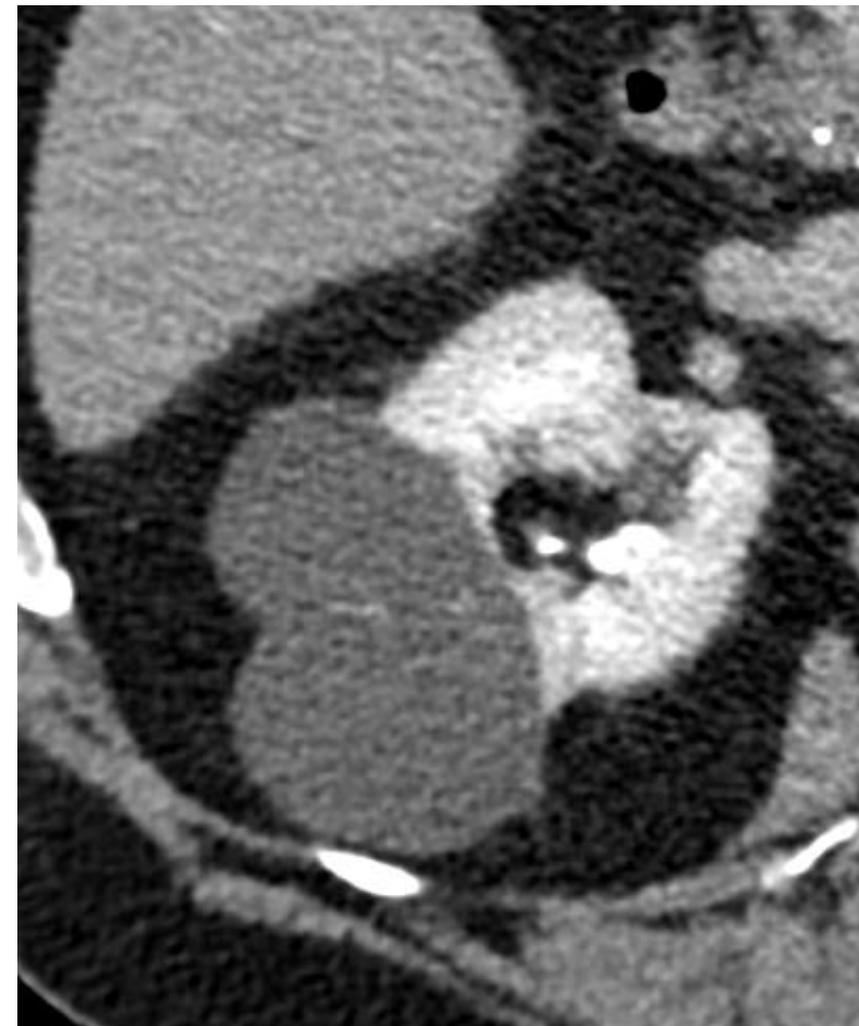
T1 IP



CT à blanc



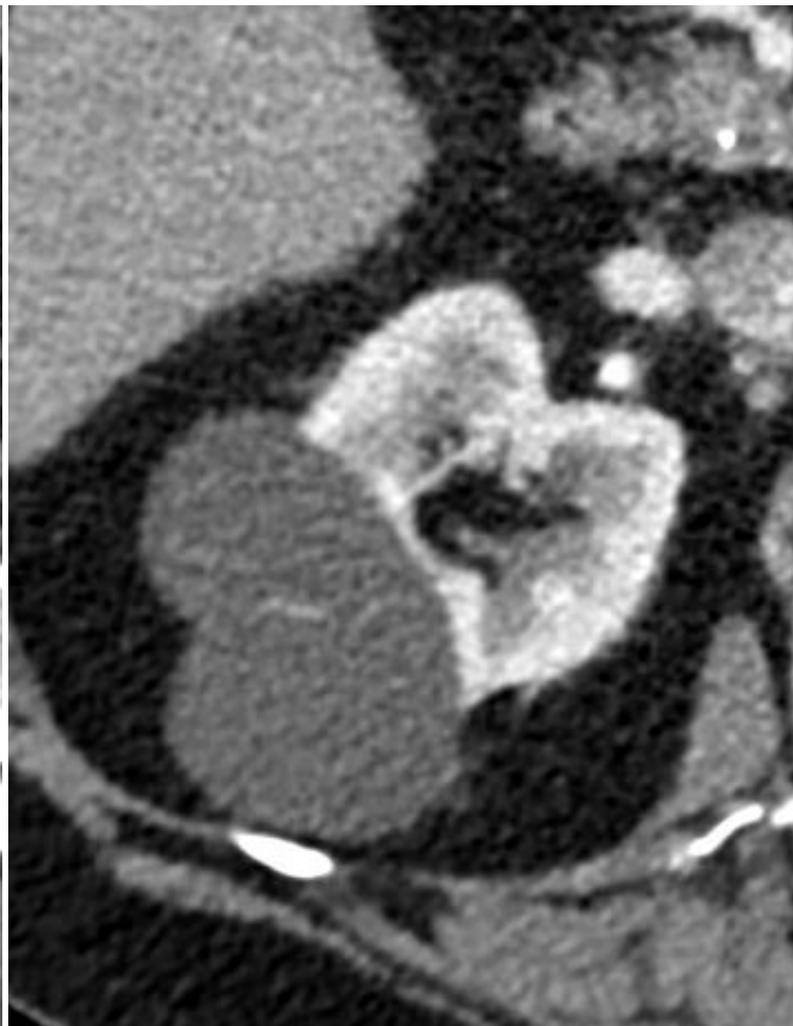
CT post IV de contraste 60s



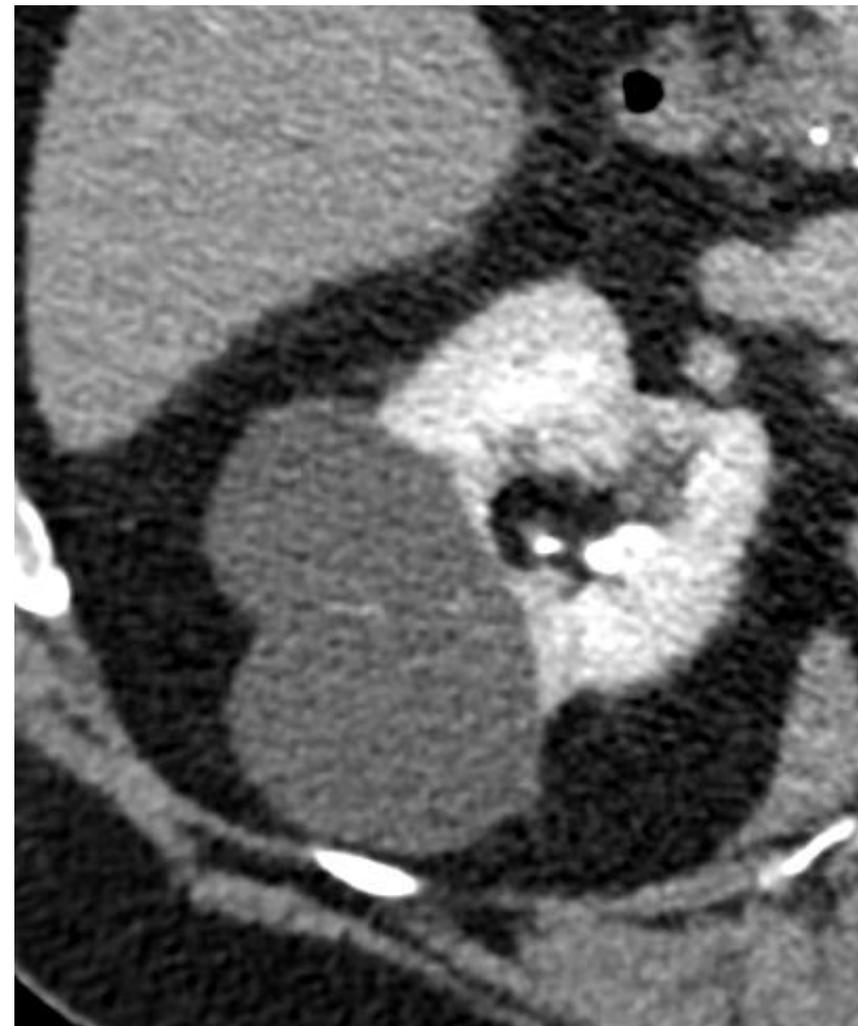
CT post IV de contraste 3 min



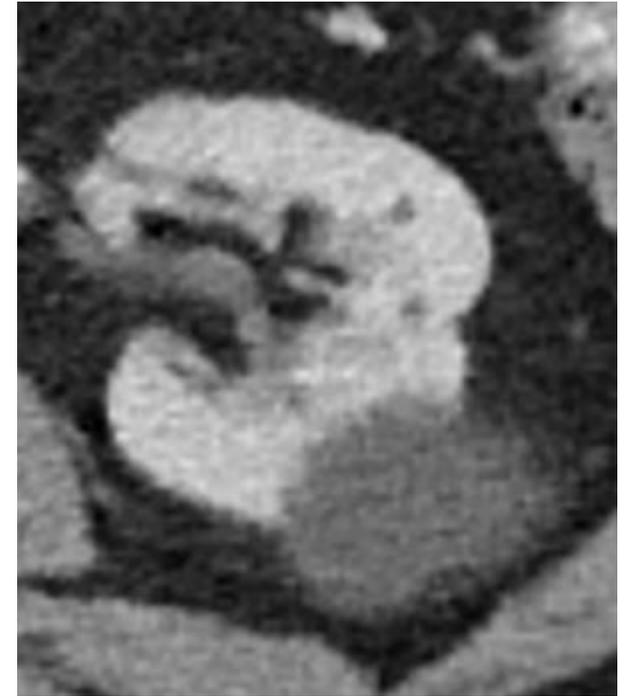
CT à blanc



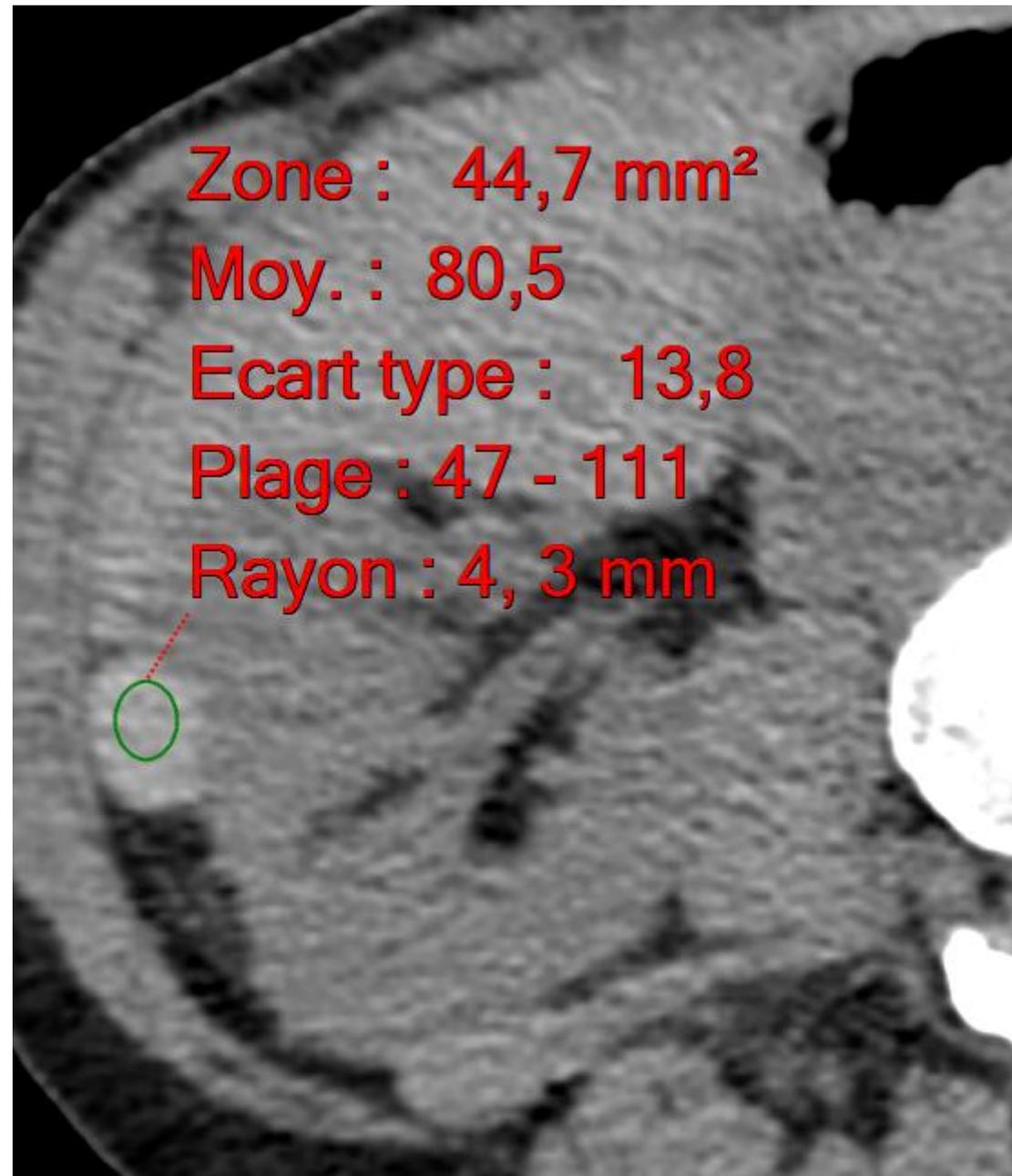
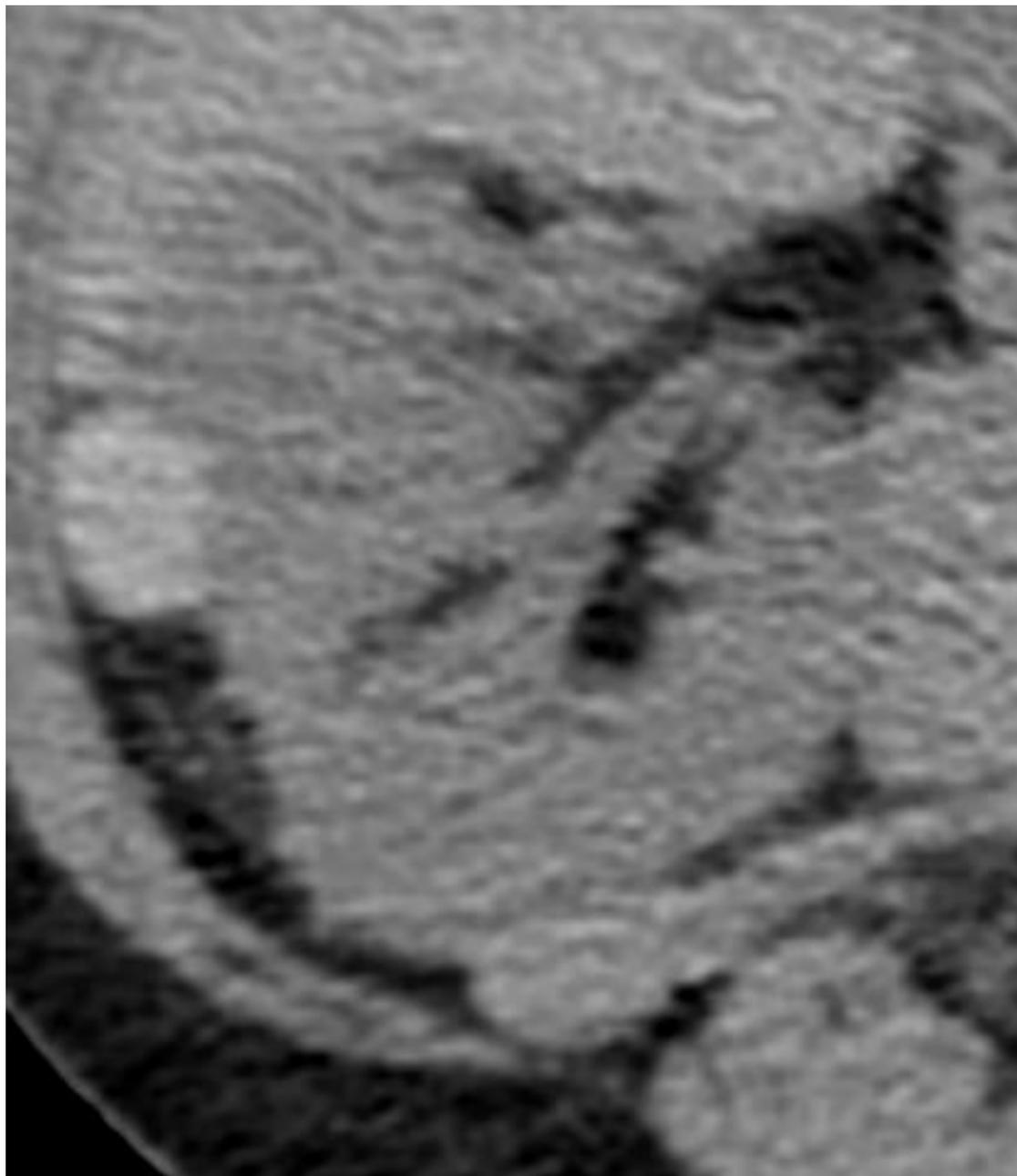
CT post IV de contraste 60s



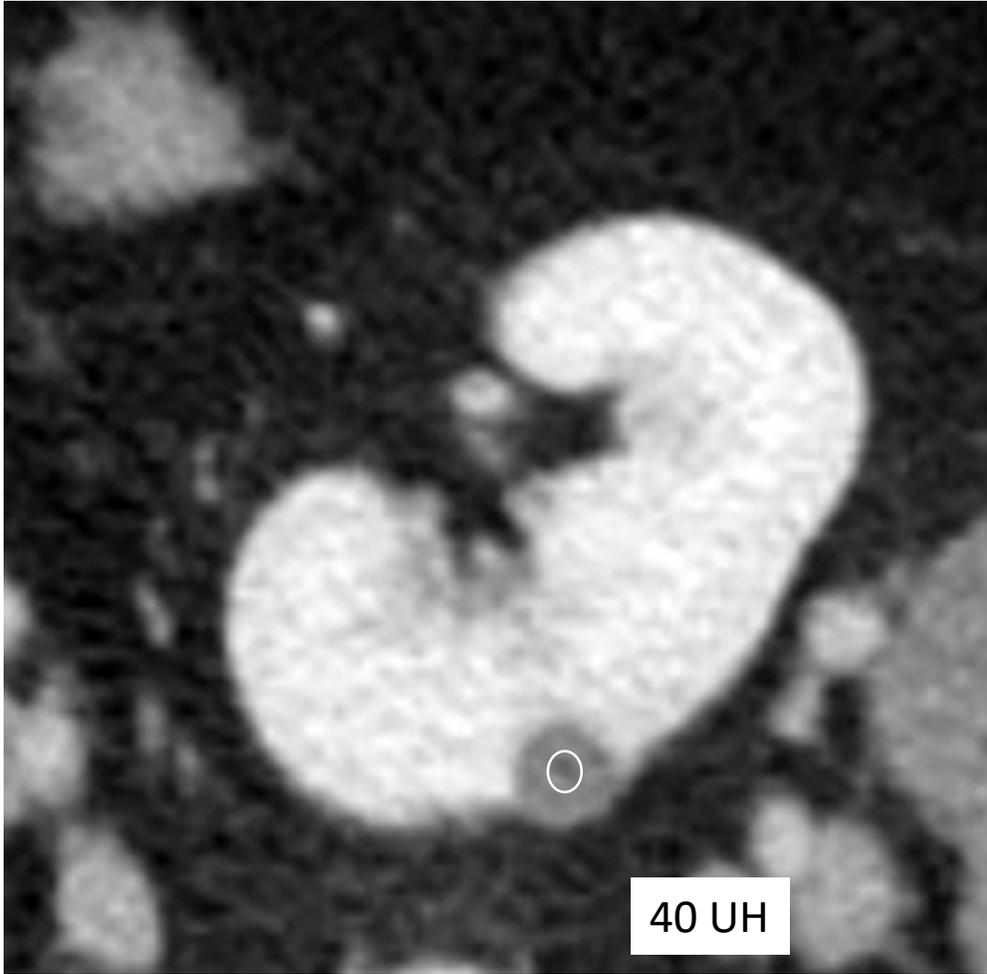
CT post IV de contraste 3 min



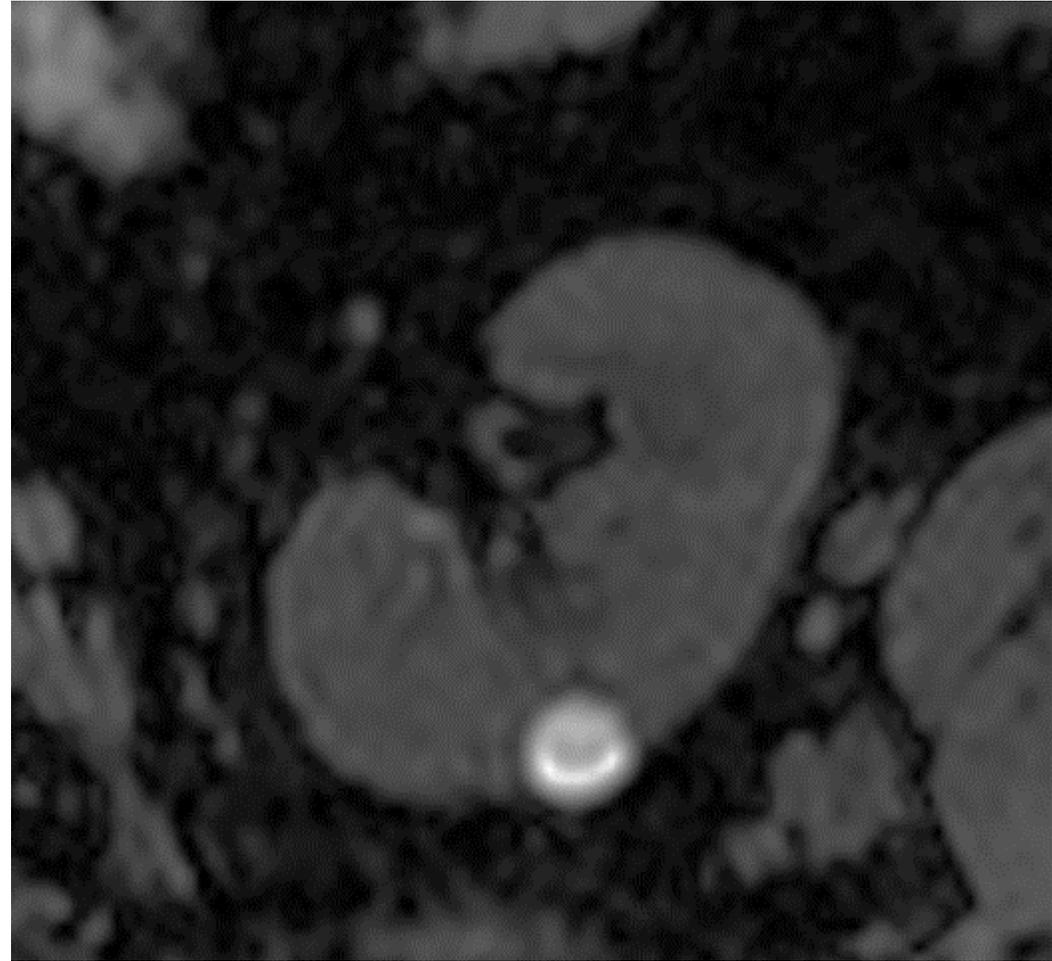
Homme 65 ans



Femme 64 ans



CT post IV de contraste

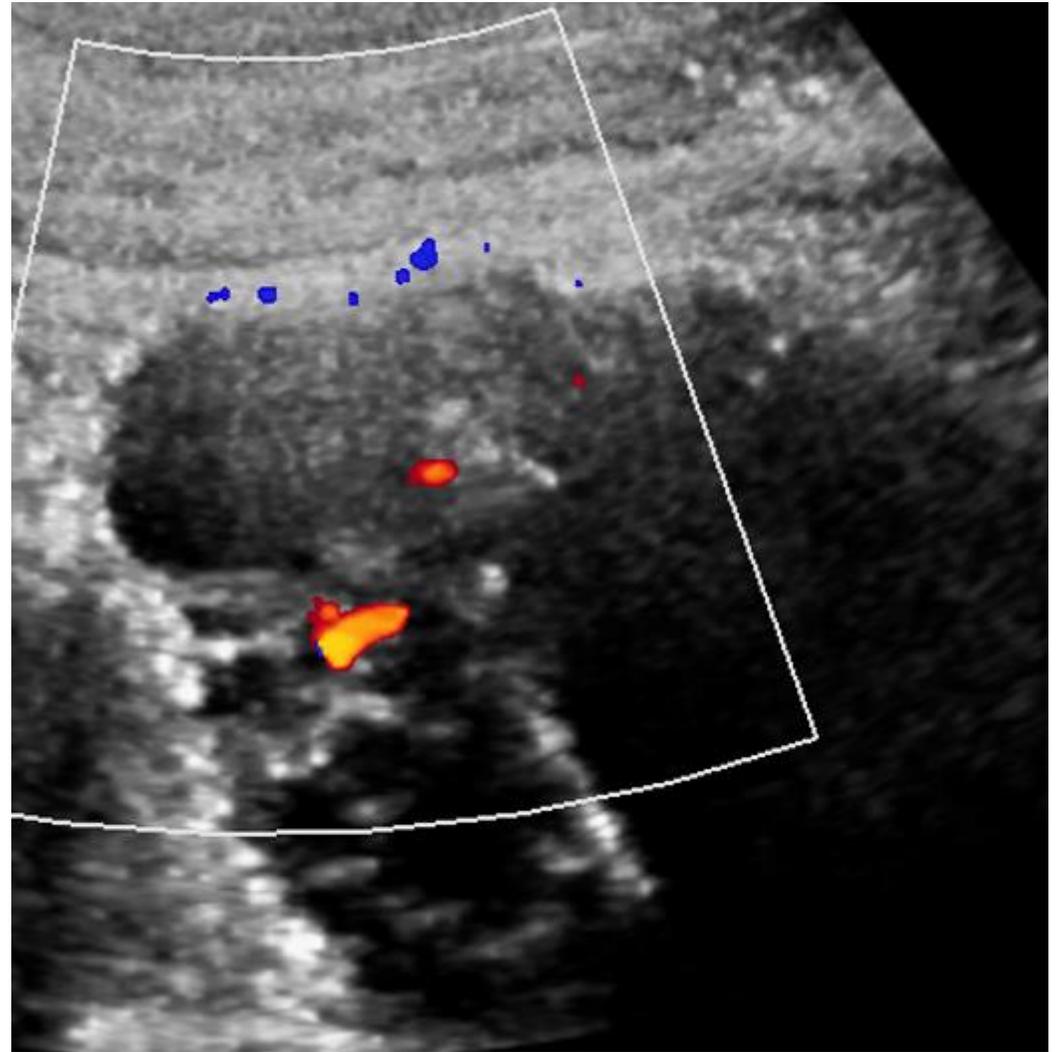


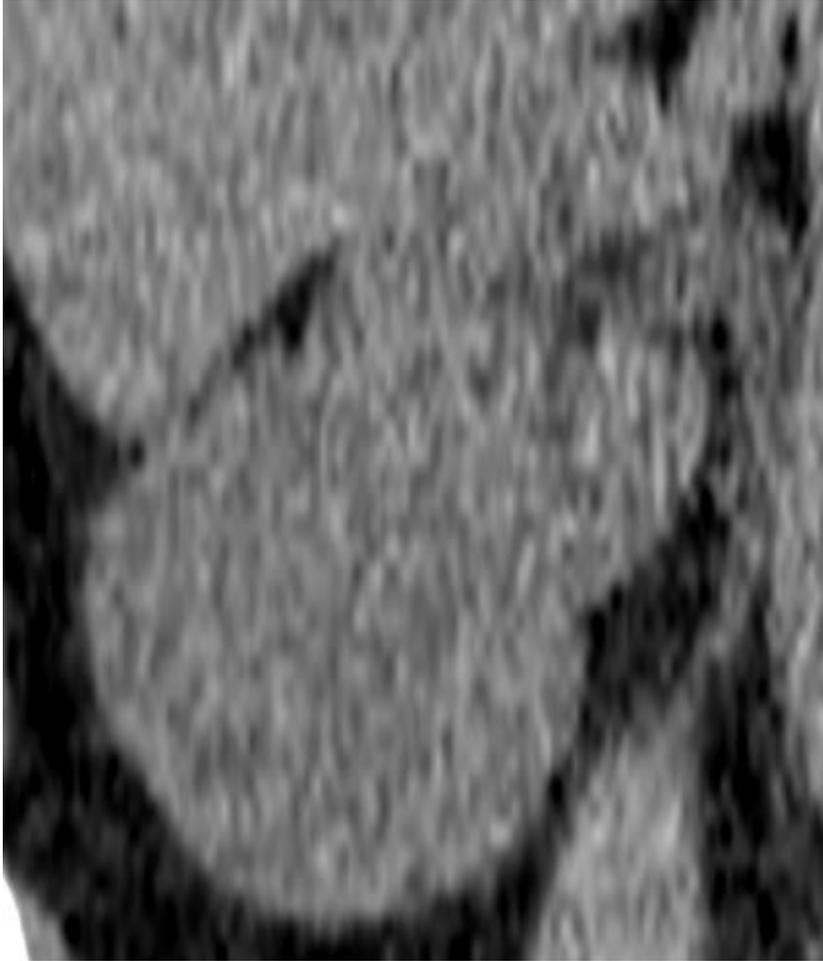
T1FS

Homme 45 ans – bilan pré-greffe cardiaque

Kyste Bosniak 2F

US – CT - IRM





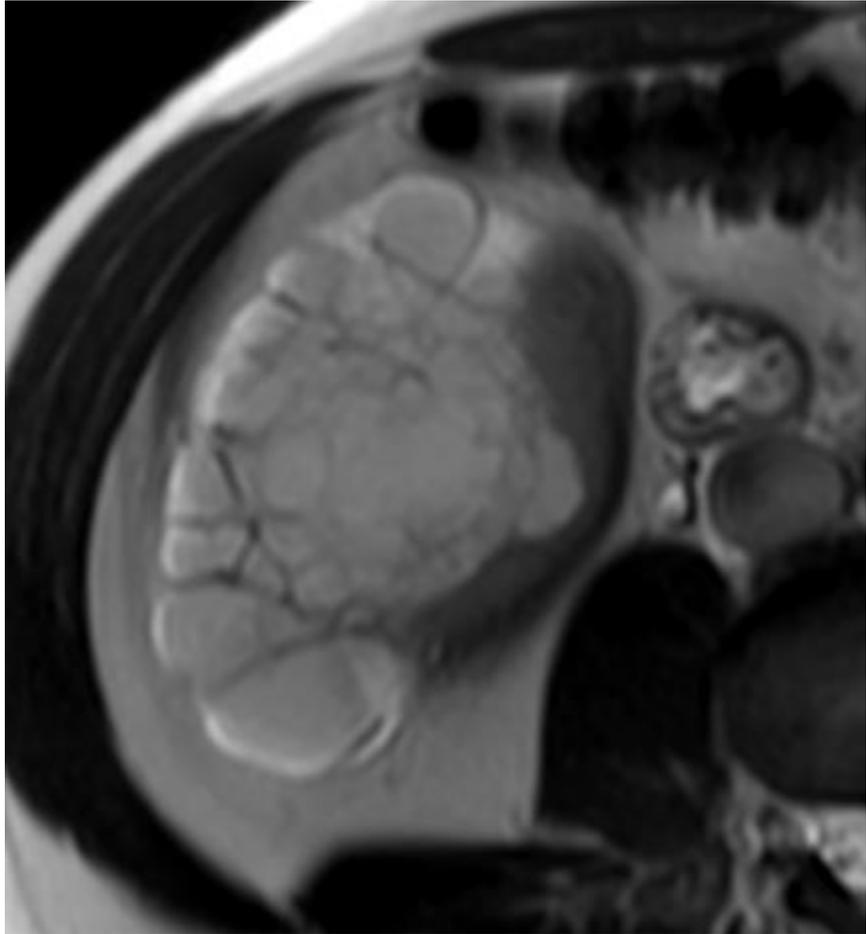
CT à blanc



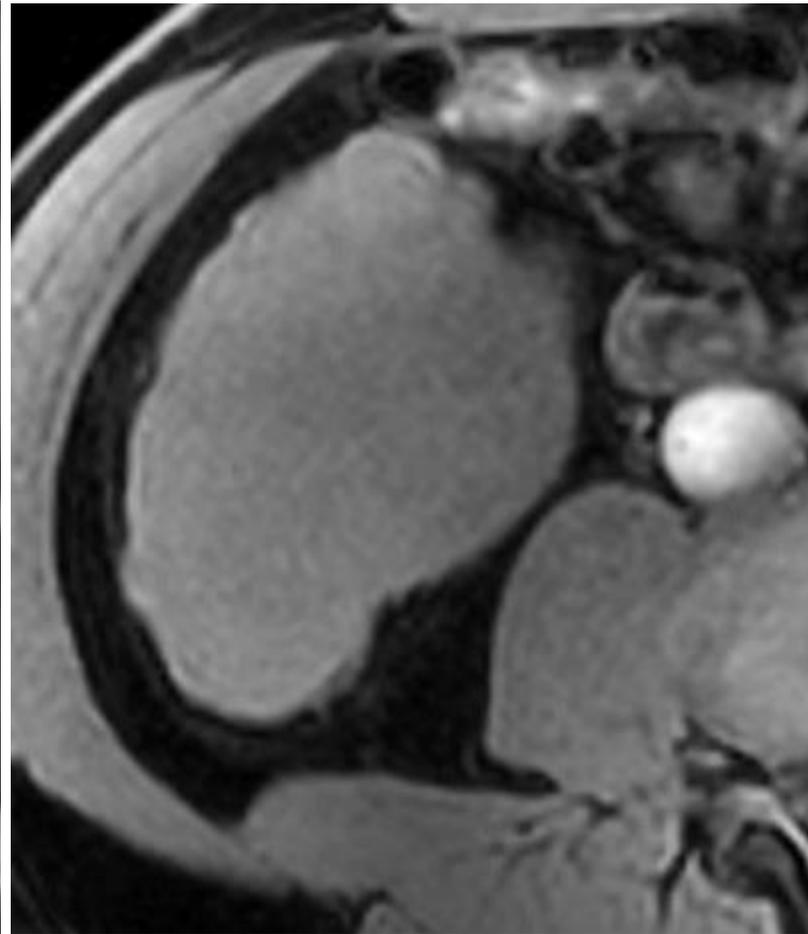
CT post IV de contraste 60s



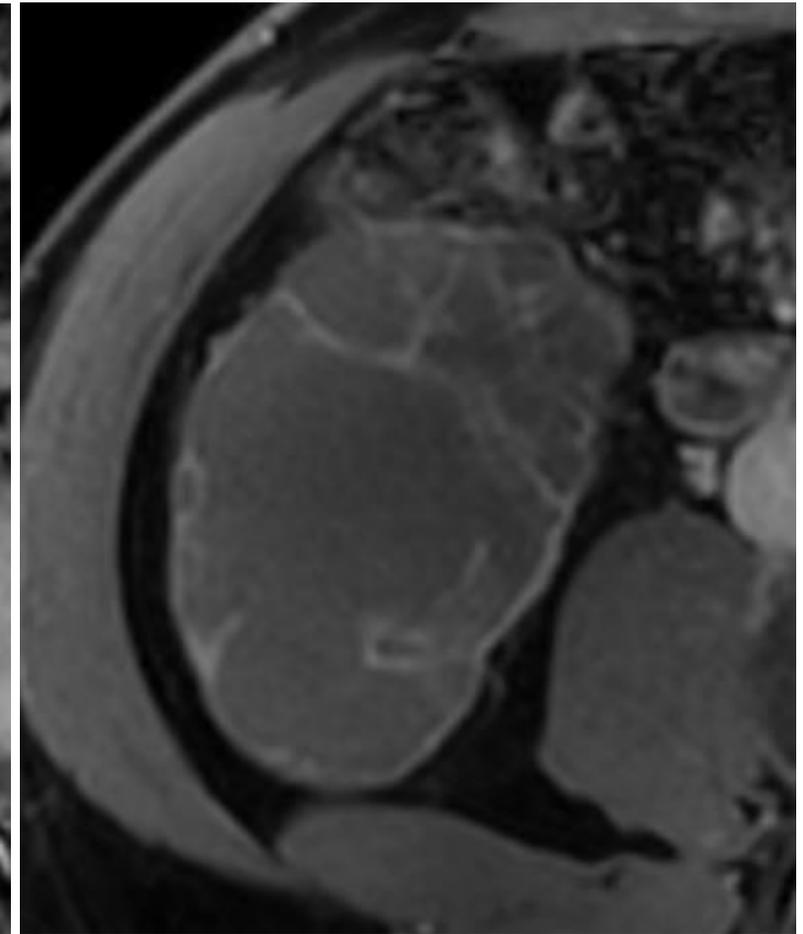
CT post IV de contraste 3 min



T2



T1 FS

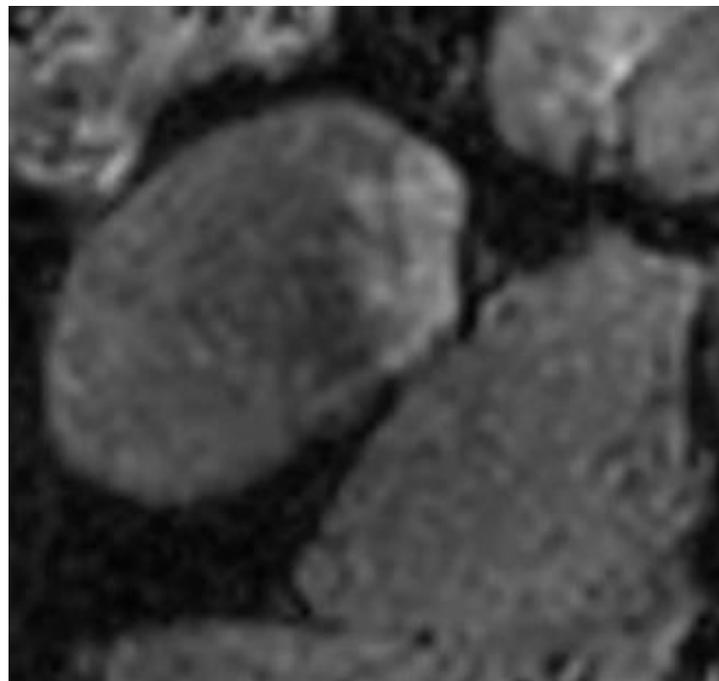


T1 FS post IV de contraste 3 min

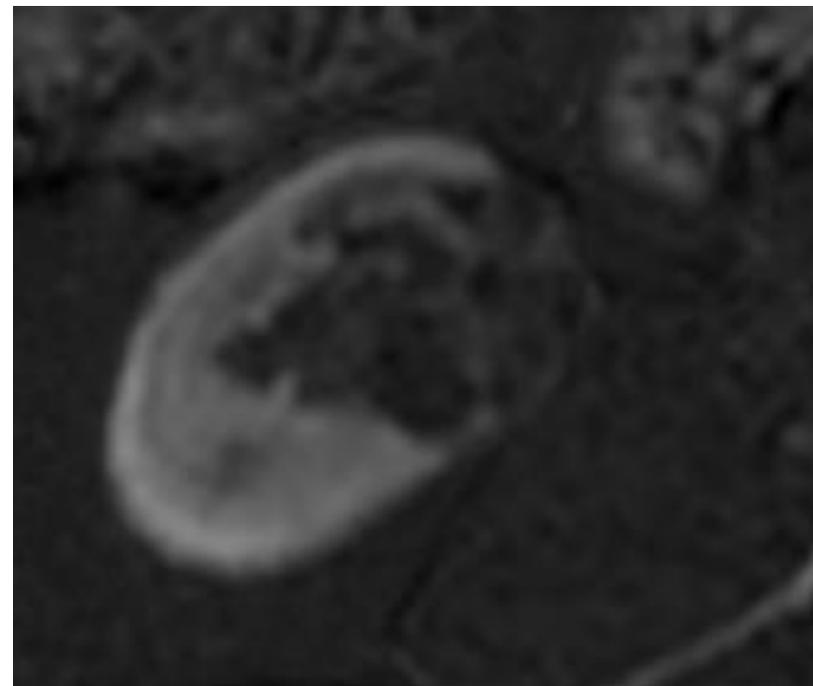
Découverte fortuite, homme de 44 ans / donneur vivant foie 2016



T2



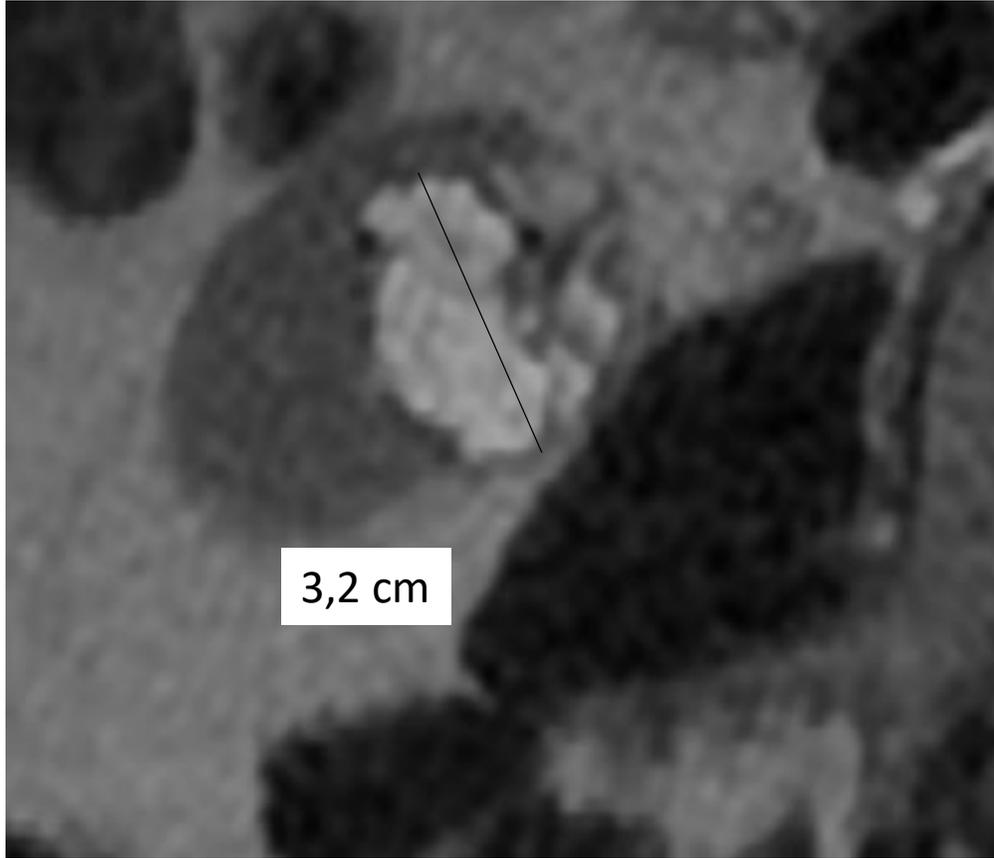
T1 FS



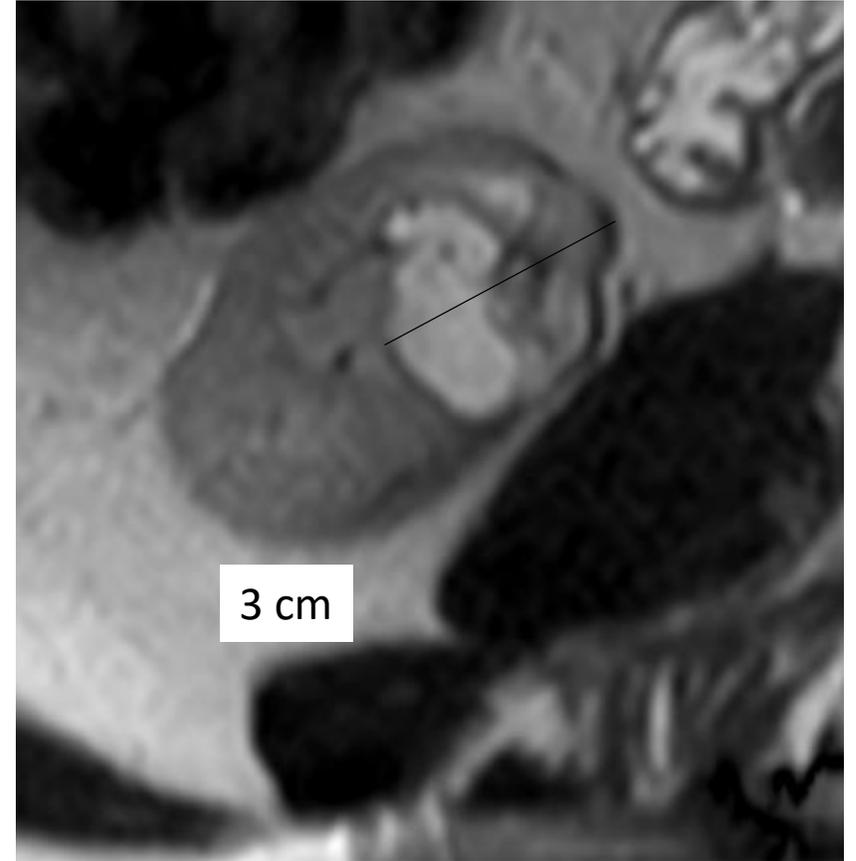
Sous-tractions T1 FS post IV de contraste

2017

Homme 53 ans , découverte fortuite



2020

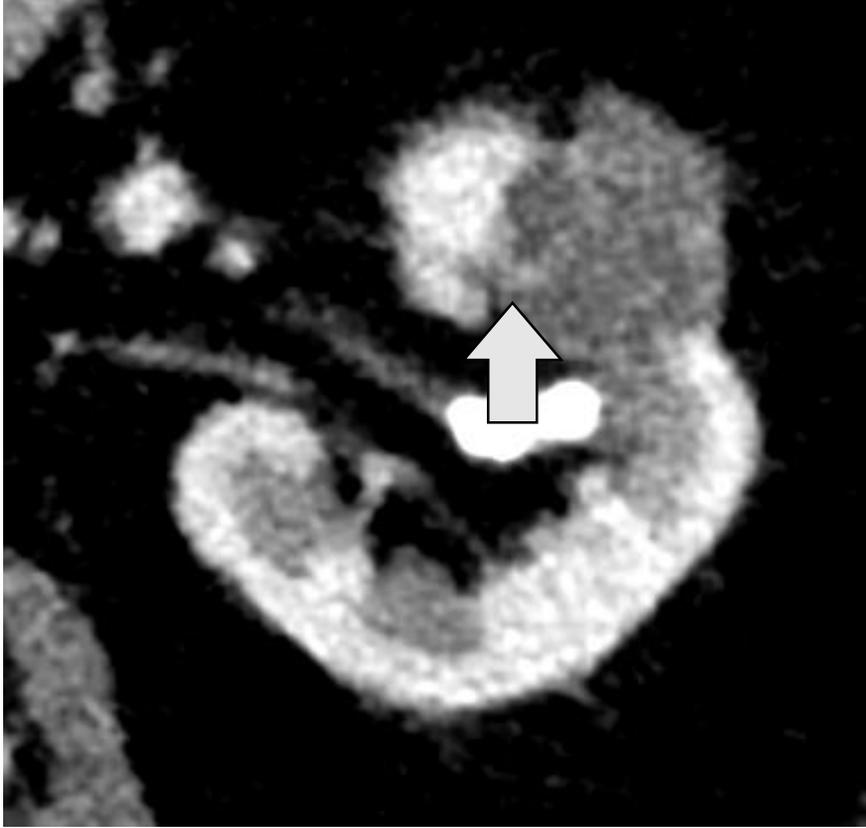


2017

Kyste Bosniak 3



CT post IV de contraste 60 s



CT post IV de contraste 60s



CT post IV de 60 s

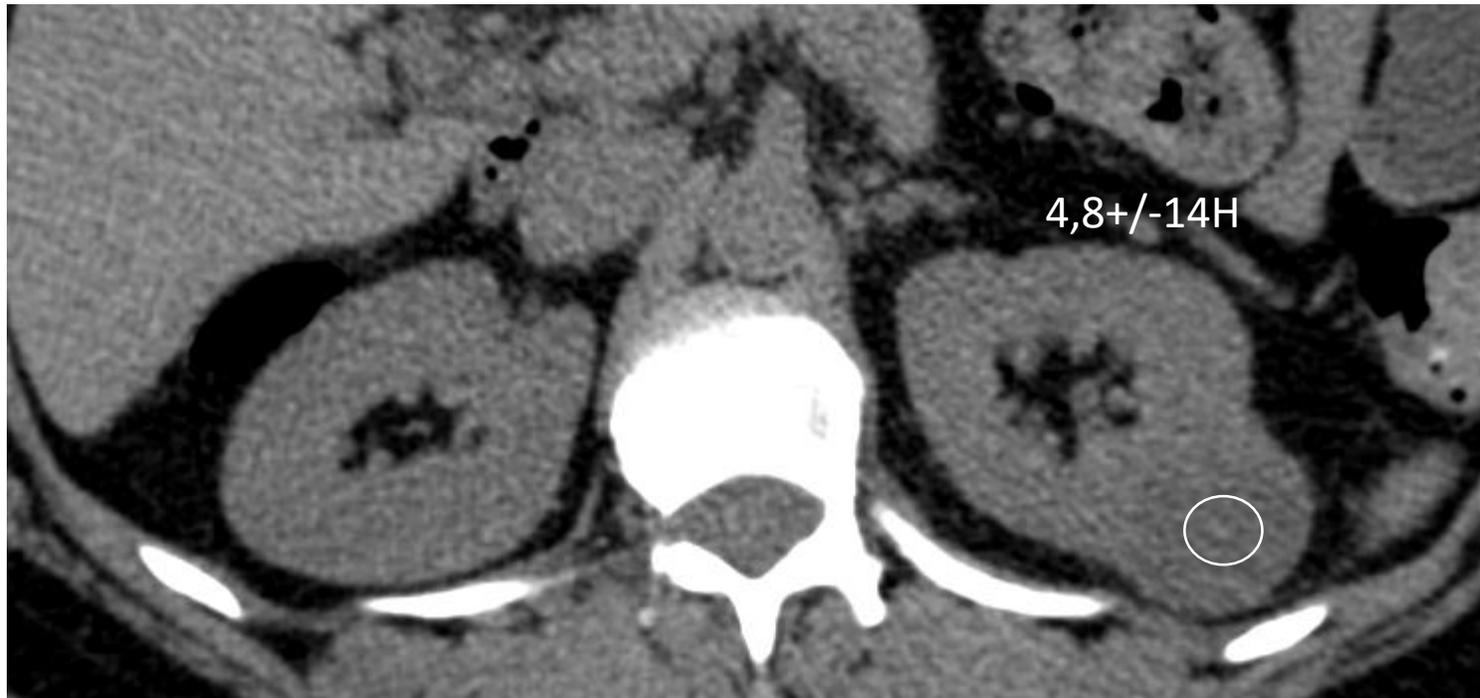
Homme 56 ans – néphrectomie partielle : RCC type 1

Bosniak 4

CT-IRM-US



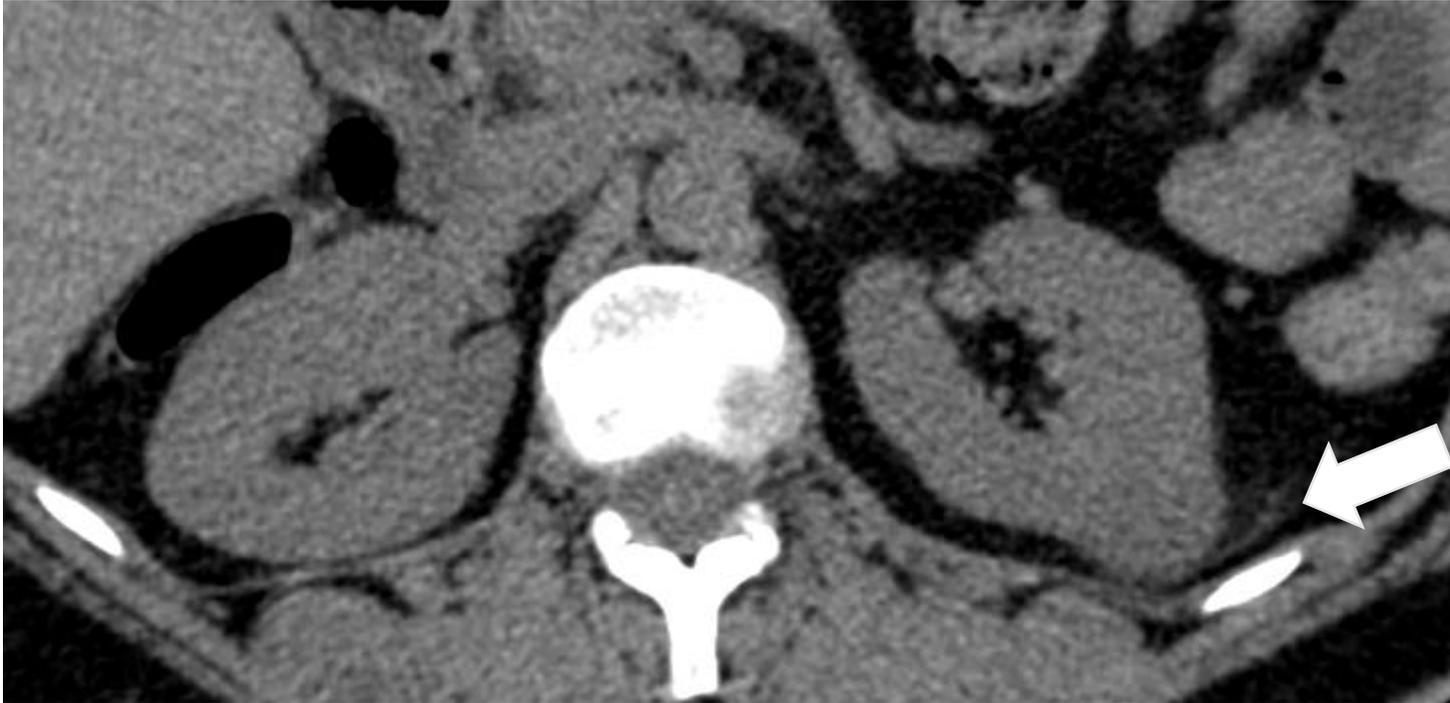
Crise de CCN gauche , femme 50 ans



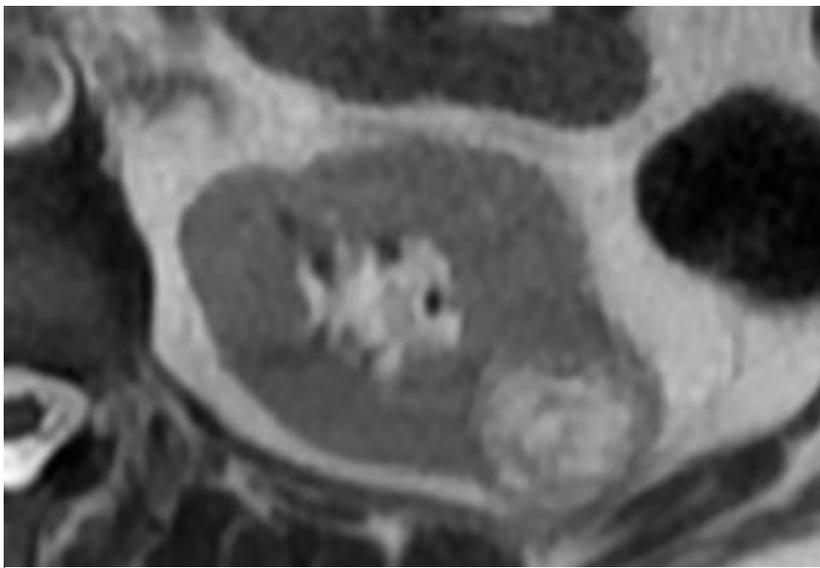
Crise de CCN gauche , femme 50 ans



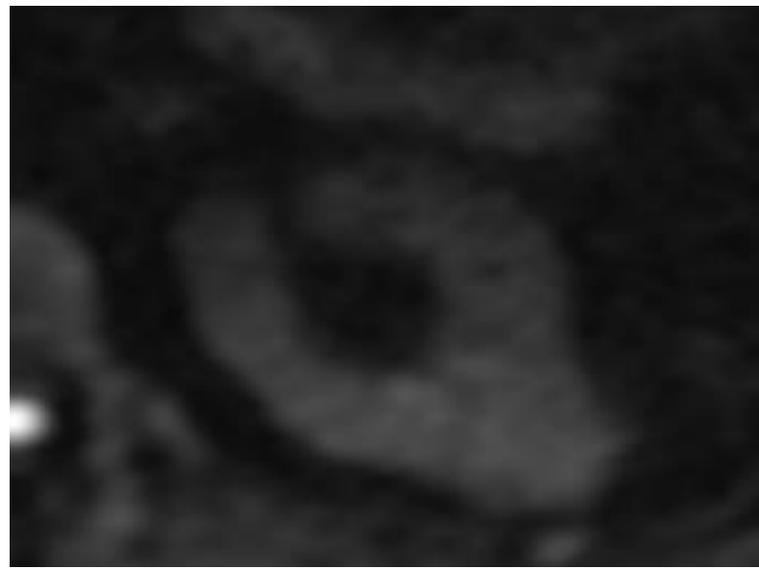
Crise de CCN gauche , femme 50 ans



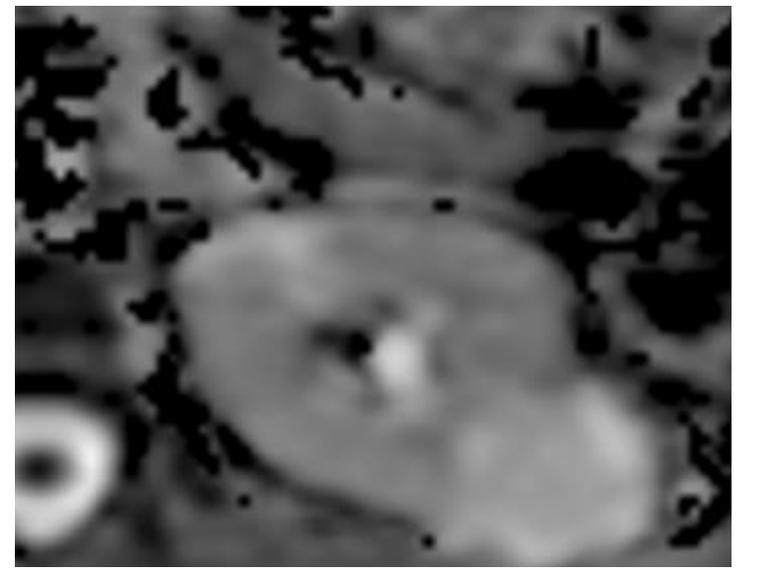
Crise de CCN gauche , femme 50 ans



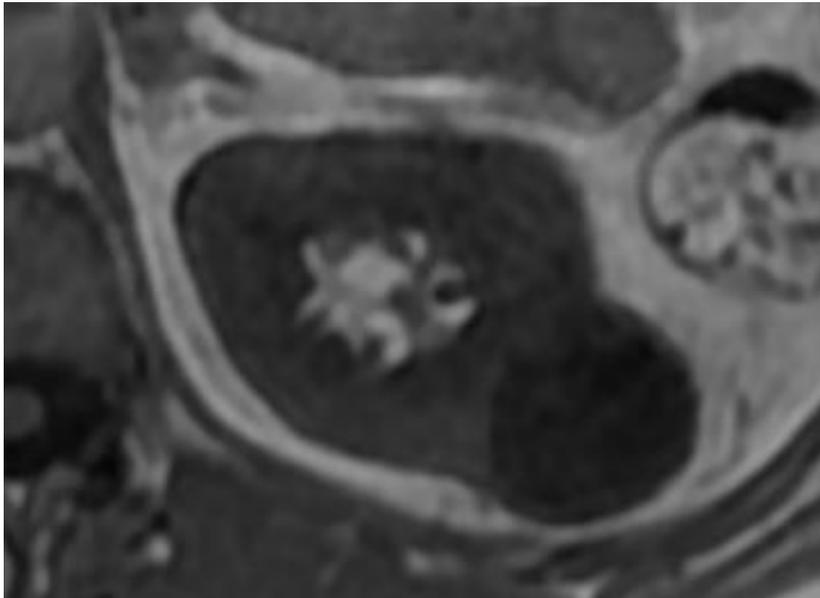
T2



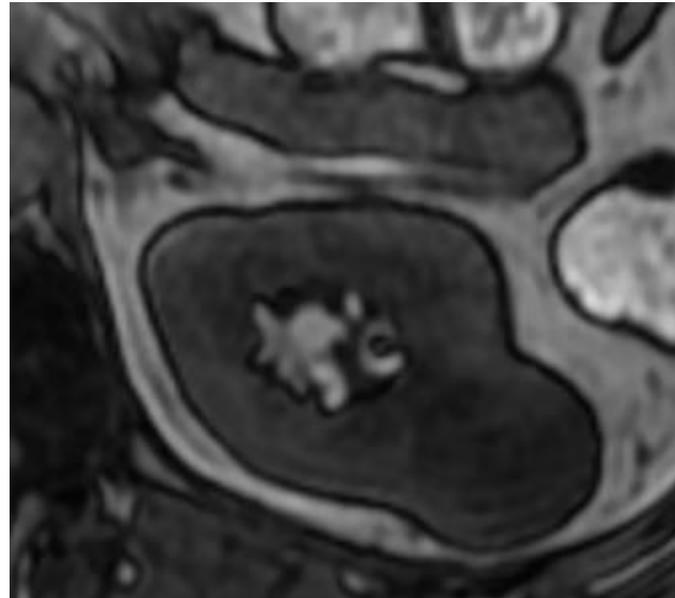
Diffusion $b=800 \text{ s/mm}^2$



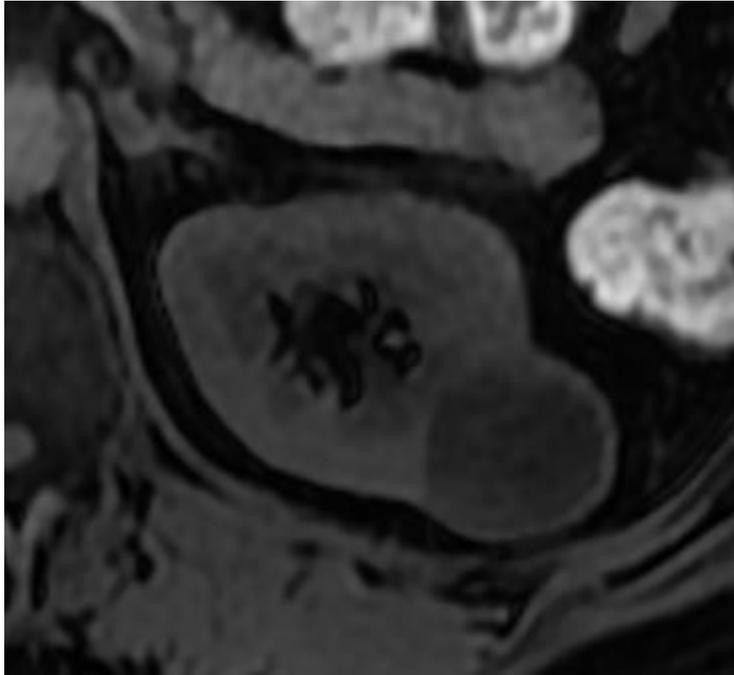
ADC



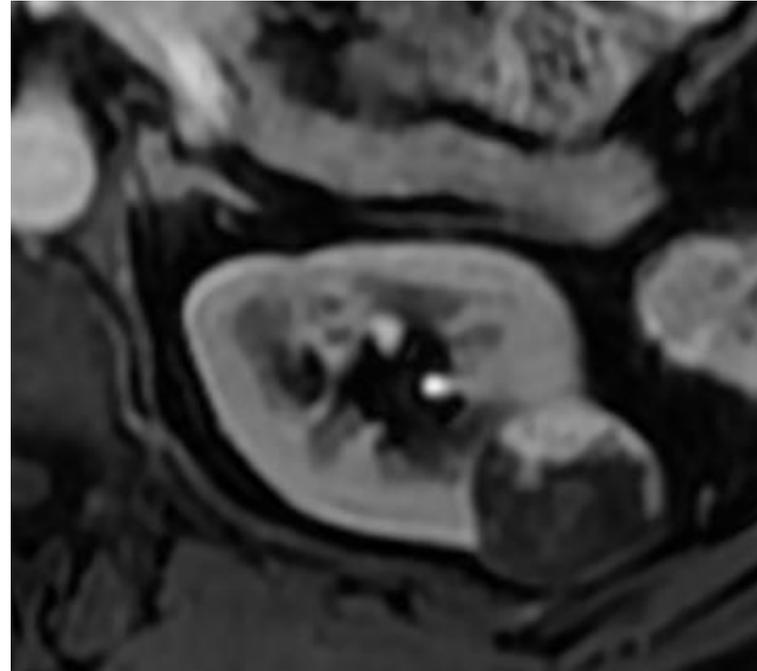
T1 IP



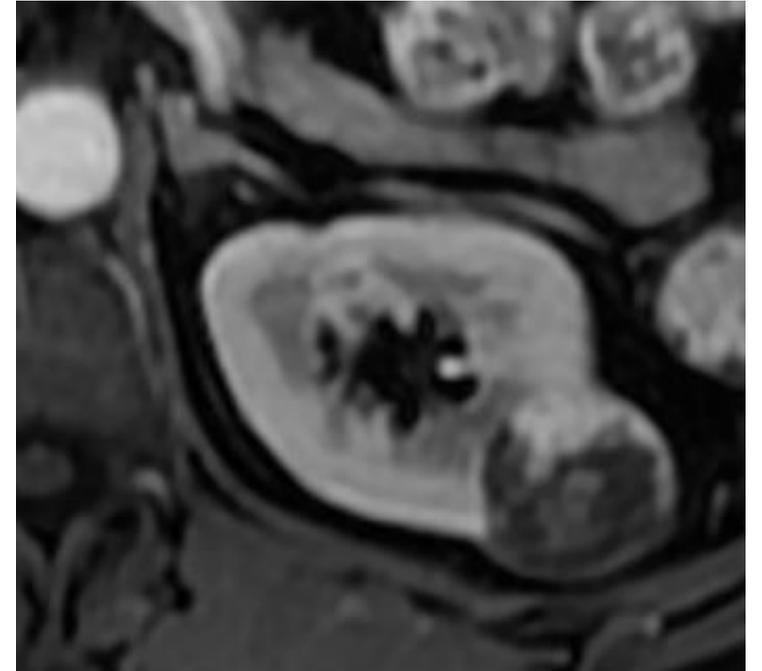
T1 OP



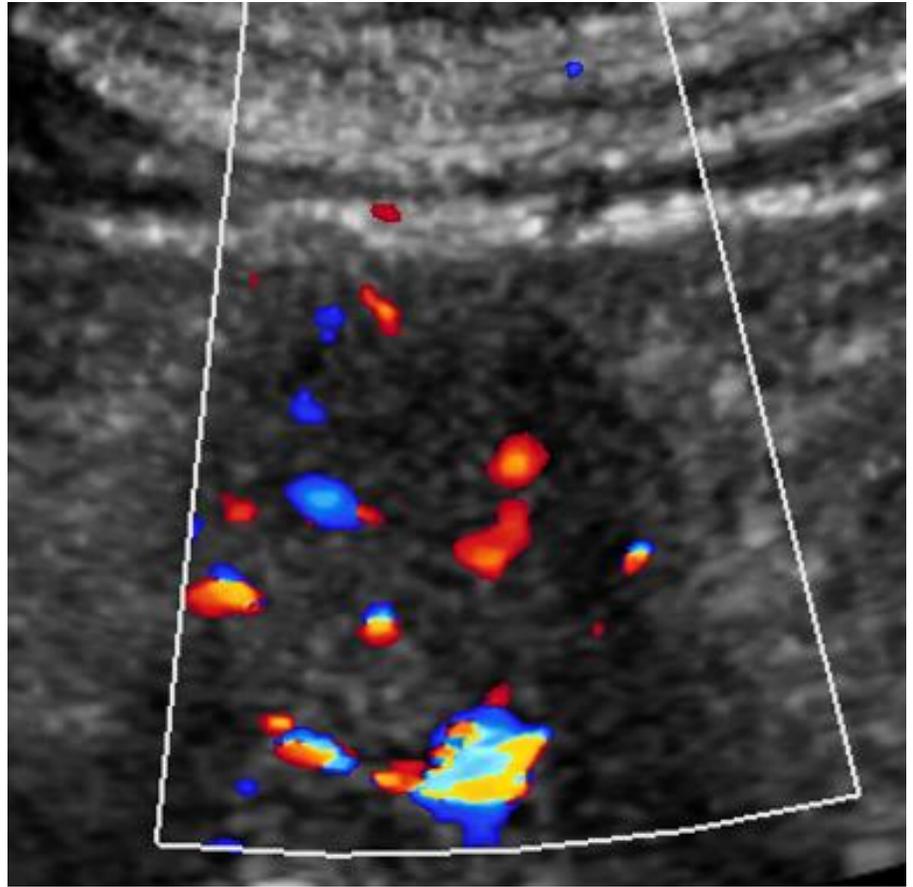
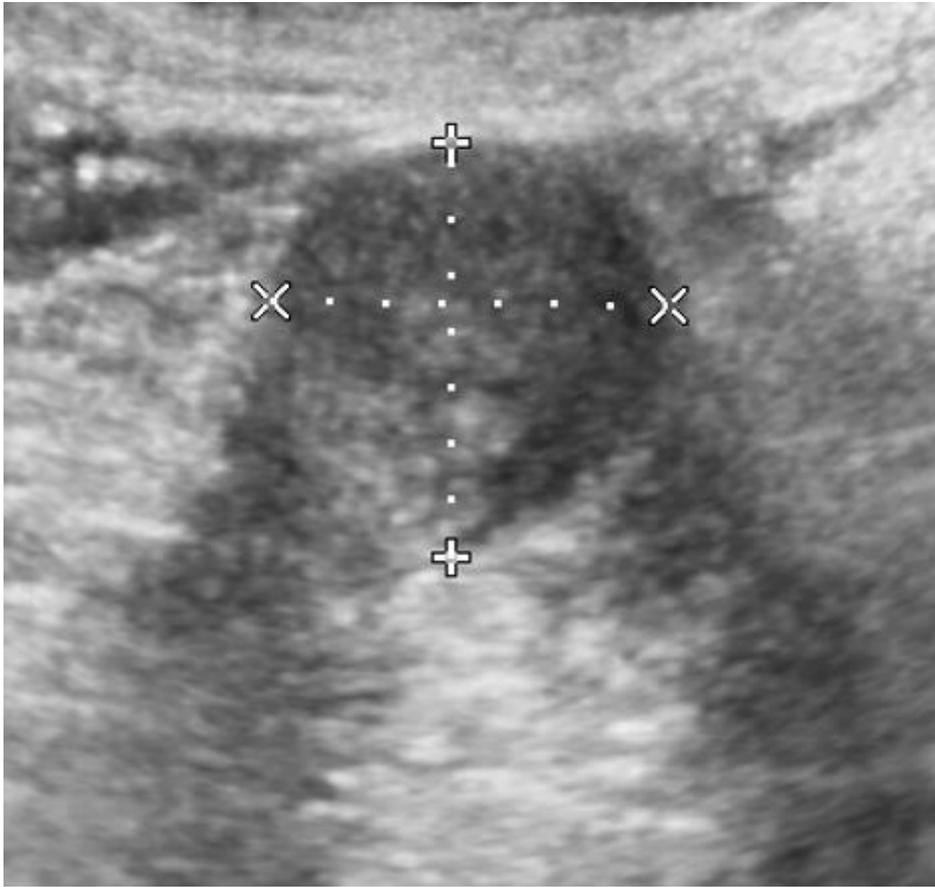
T1FS

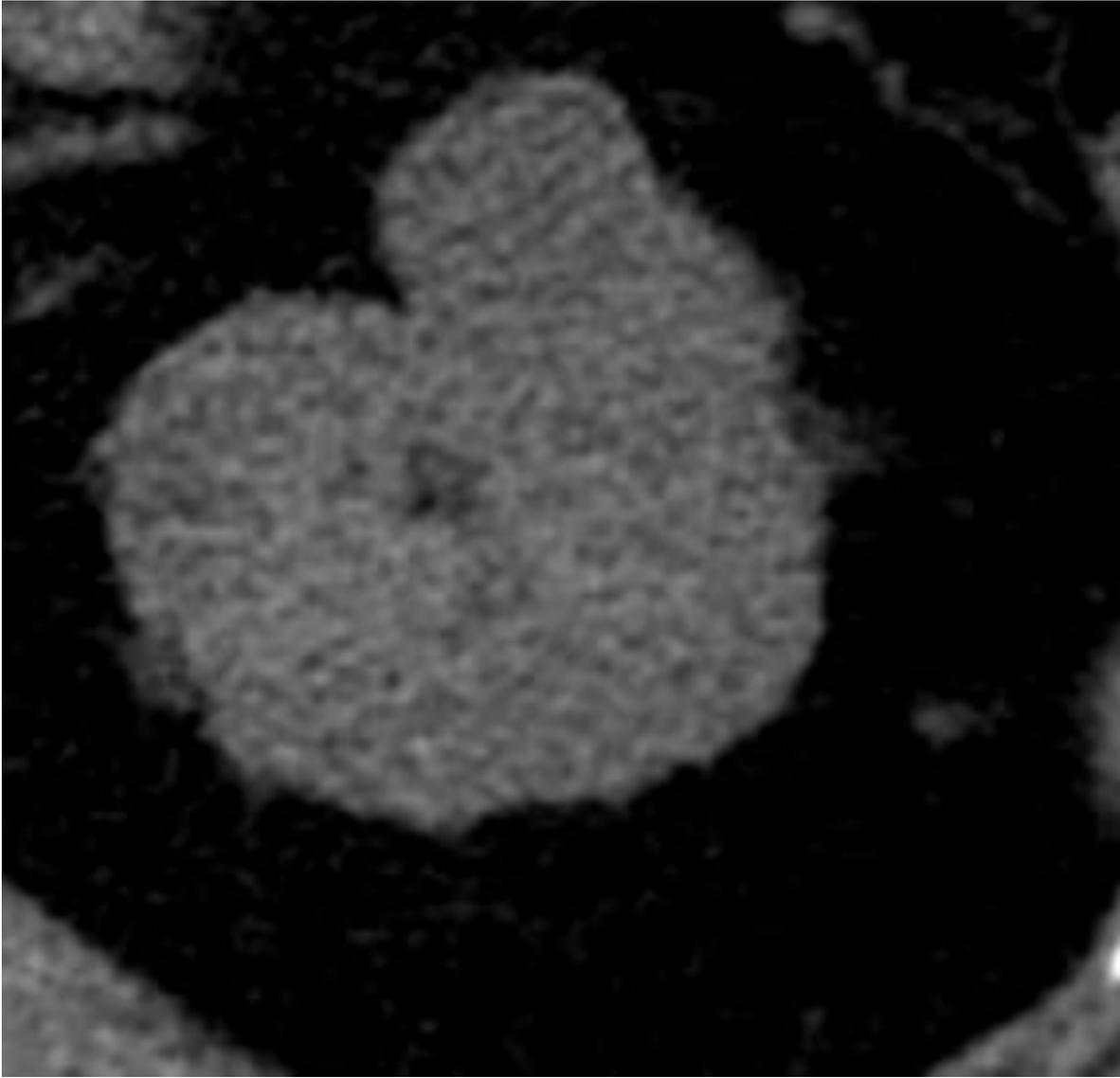


T1 FS post IV de contraste (60s)



T1 FS post IV de contraste (80s)

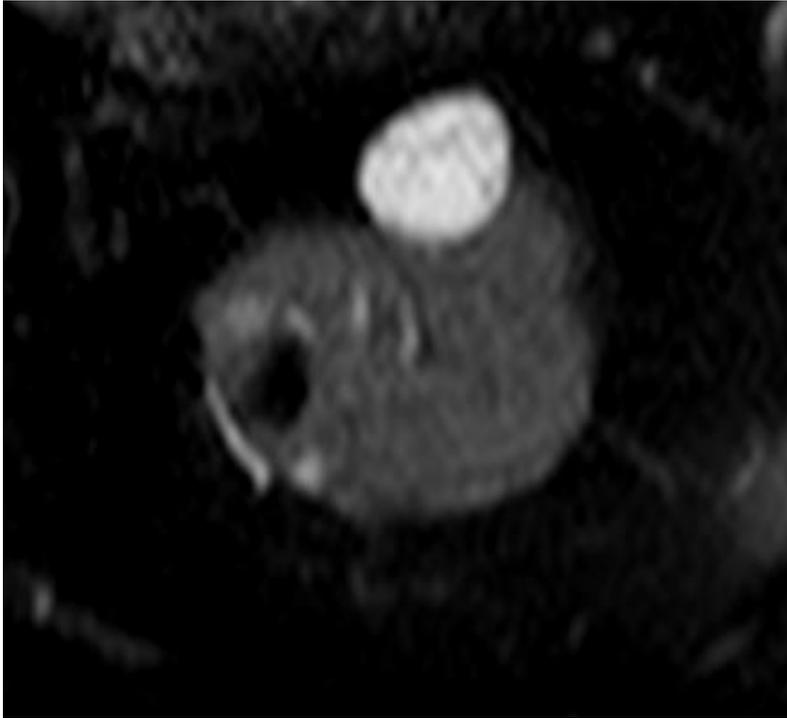




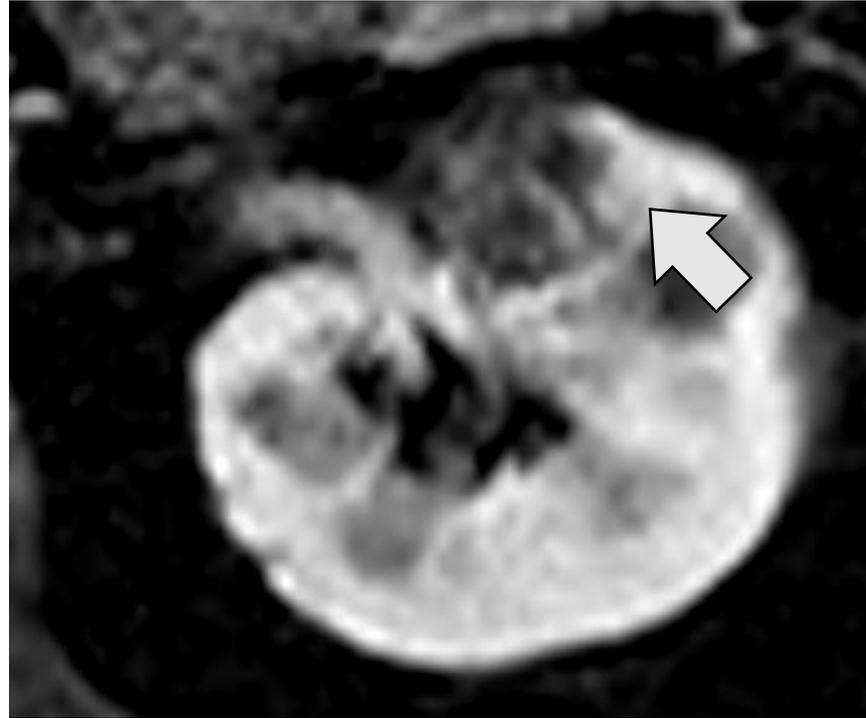
CT à blanc



CT post IV de contraste (60s)



T2FS



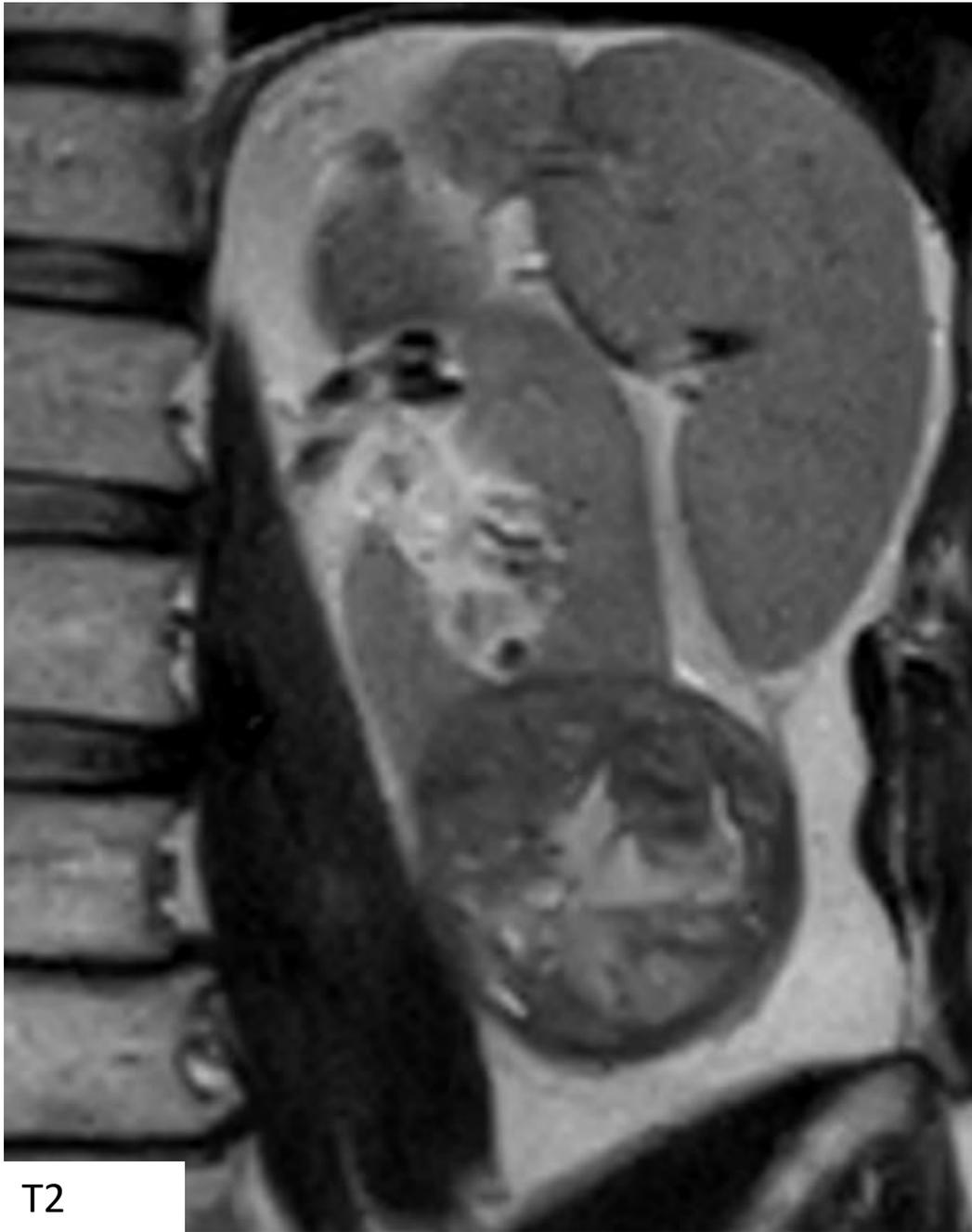
T1 FS post IV de contraste (60s)



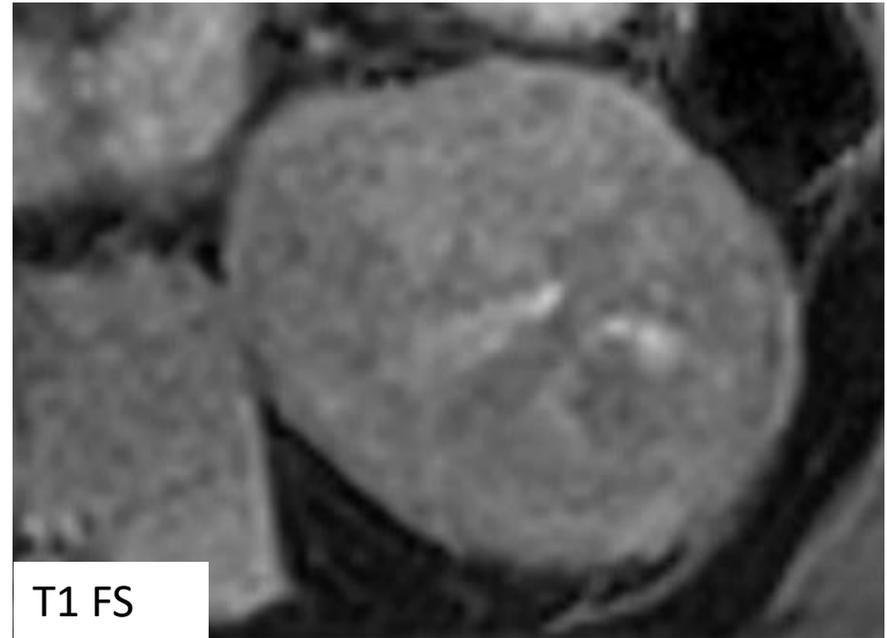
T1 FS post IV de contraste (60s)

Homme 56 ans – néphrectomie partielle : carcinome papillaire à cellules claires

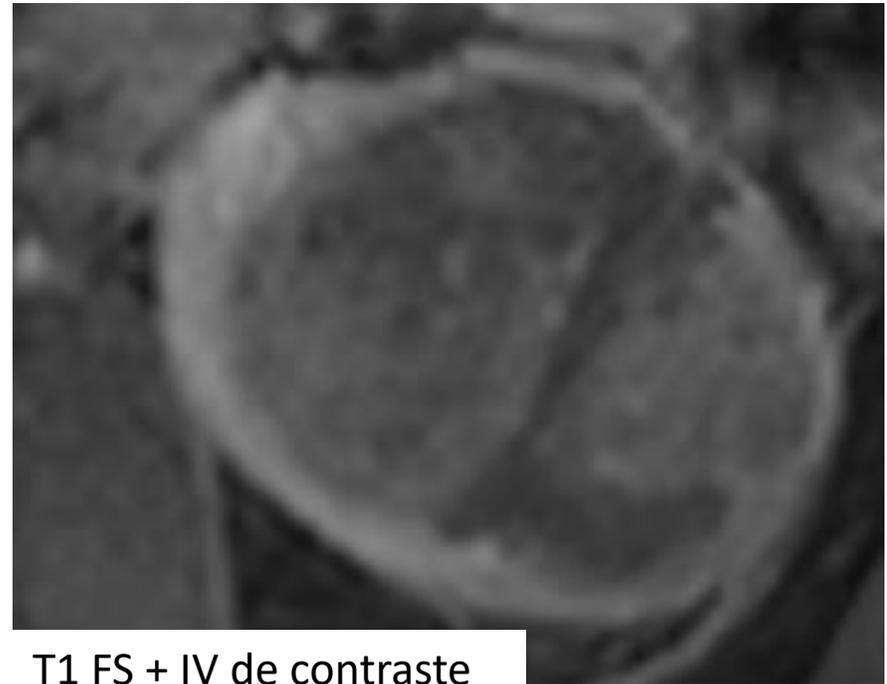
Pitfalls



T2

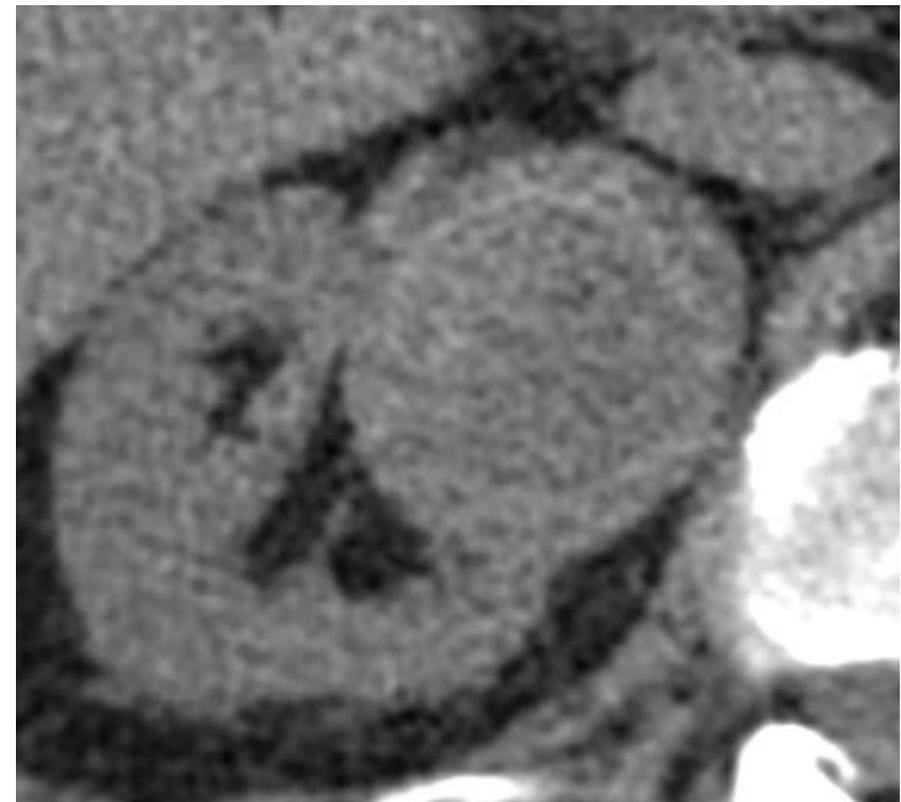


T1 FS

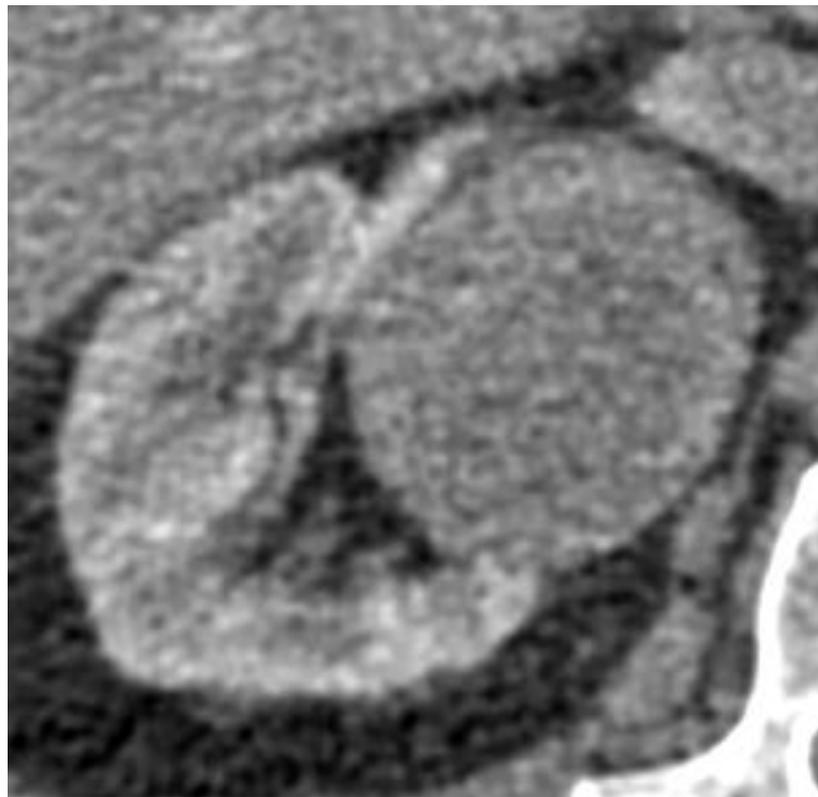


T1 FS + IV de contraste

55 ans



CT à blanc



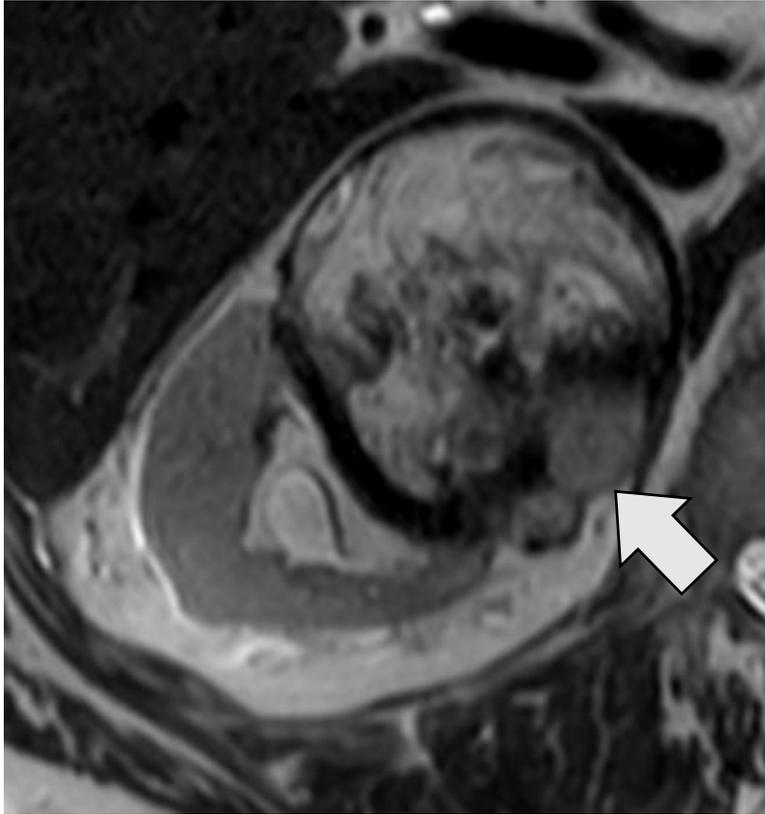
CT post IV de contraste 60s



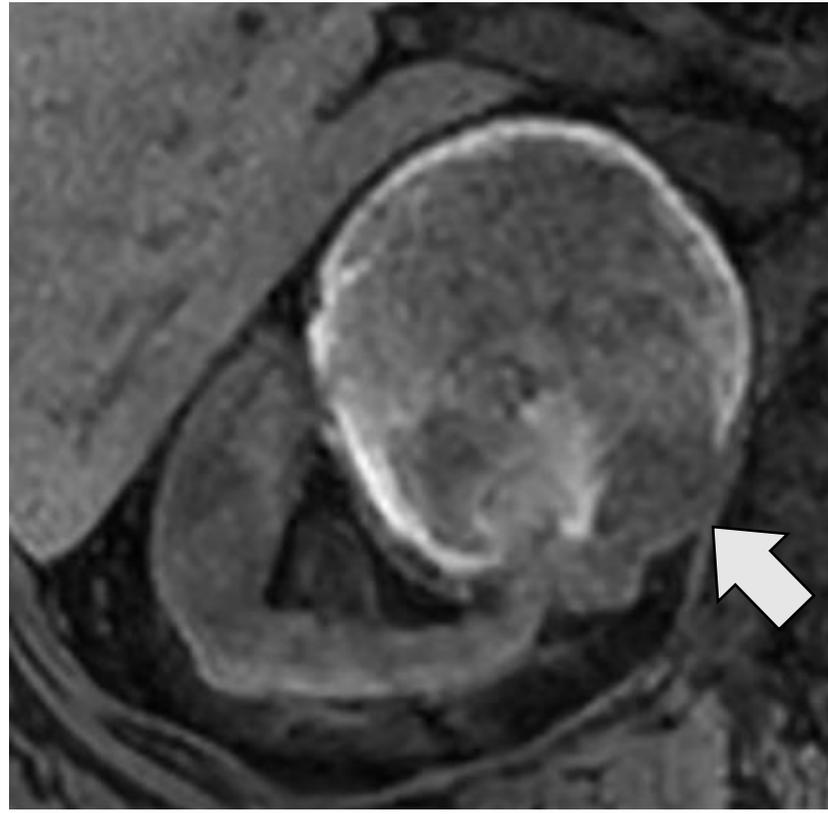
CT post IV de contraste 3 min

Homme 69 ans

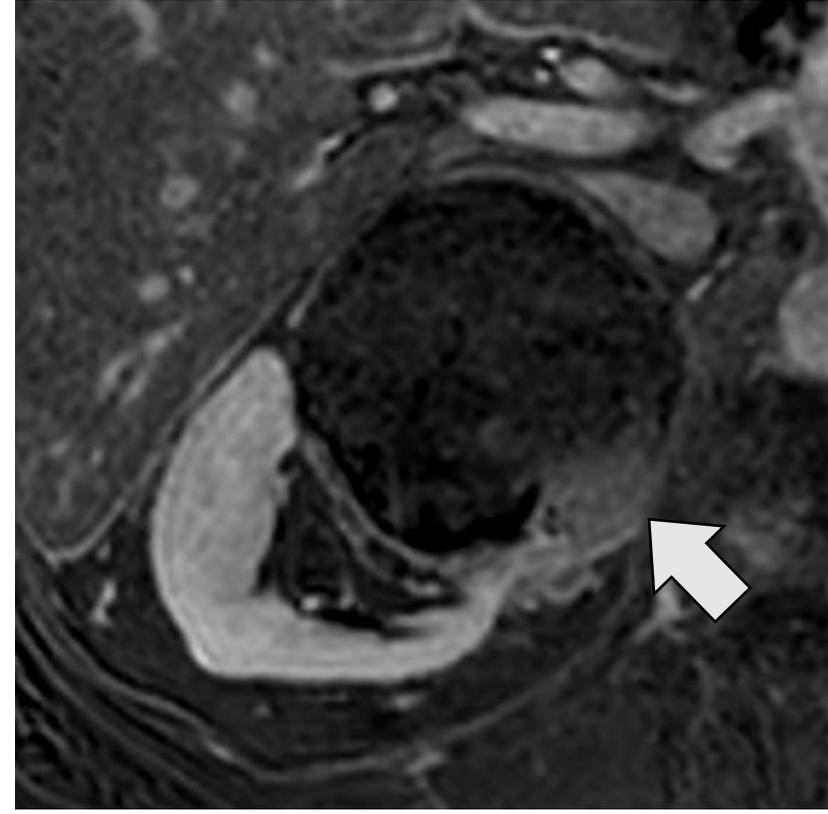
2014



T2



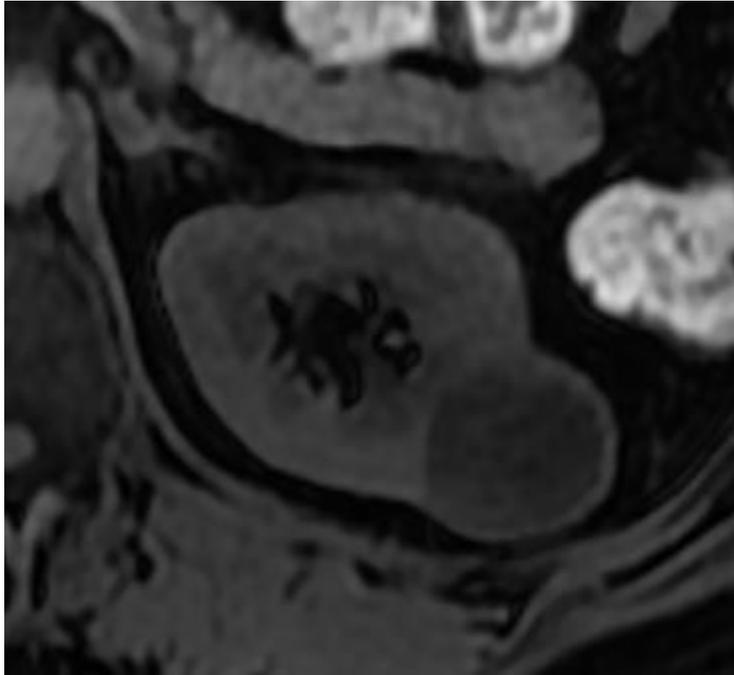
T1 FS



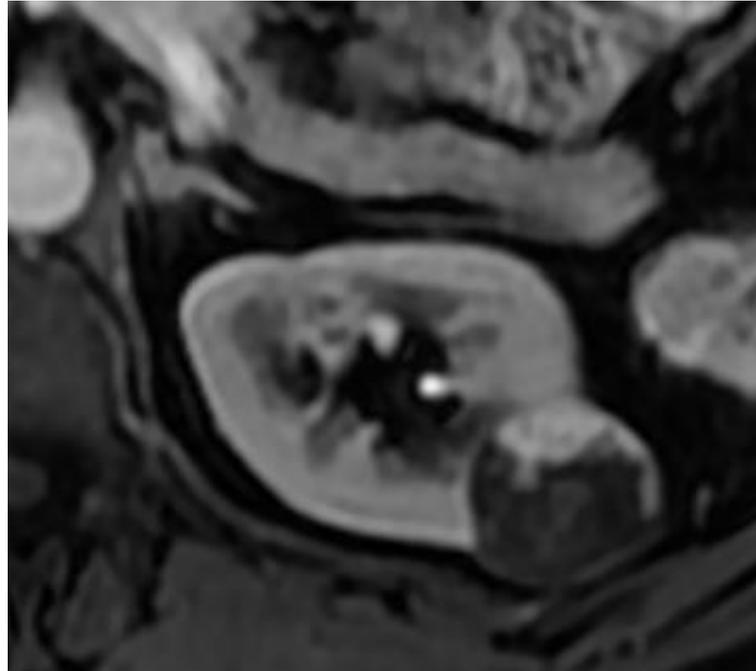
Soustractions T1 FS post IV de contraste

2018

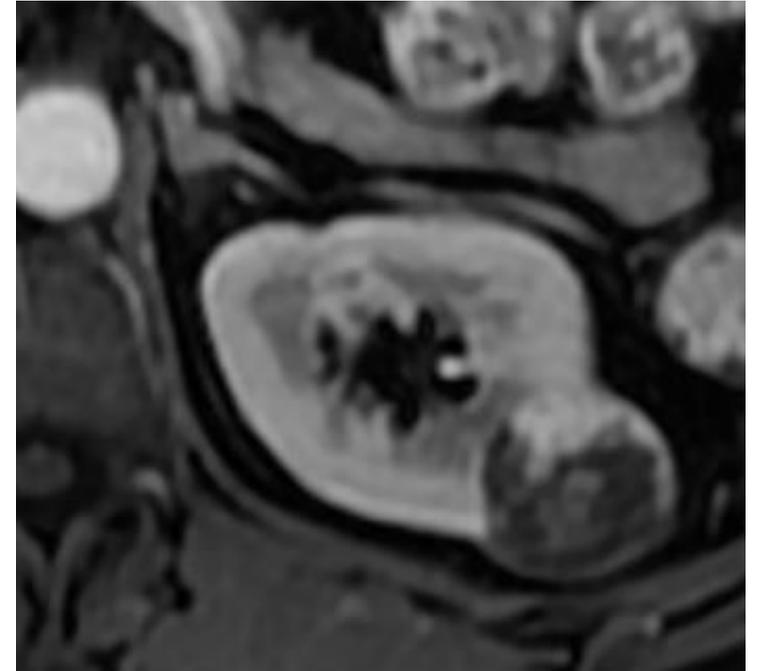
Ne pas utiliser la classification de Bosniak dans les tumeurs nécrotiques hémorragiques !



T1FS



T1 FS post IV de contraste (60s)



T1 FS post IV de contraste (80s)

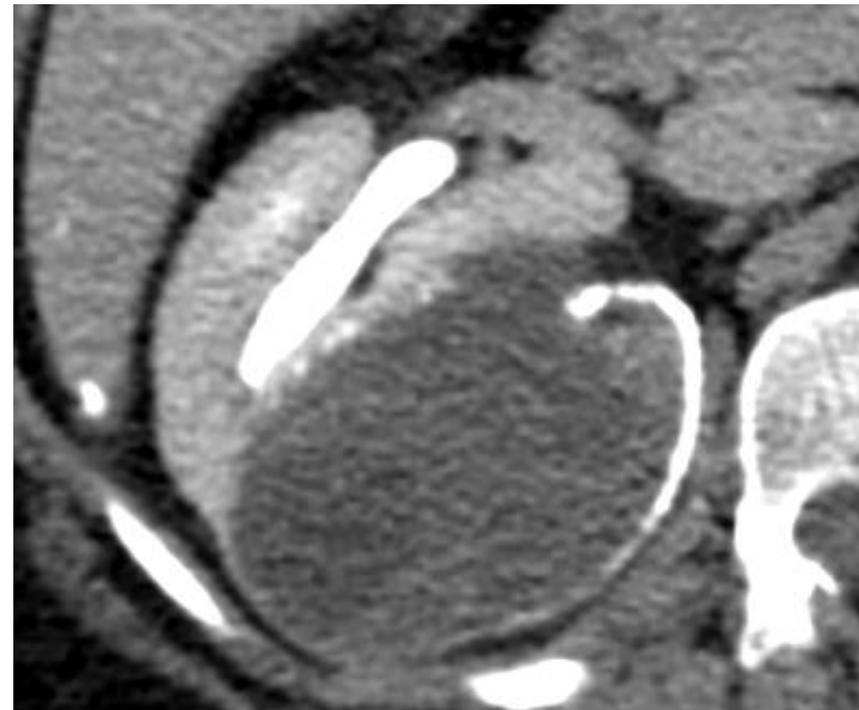
Dans la classification Bosniak 2019, une lésion kystique est définie comme une lésion ayant un rehaussement de $<25\%$



CT à blanc



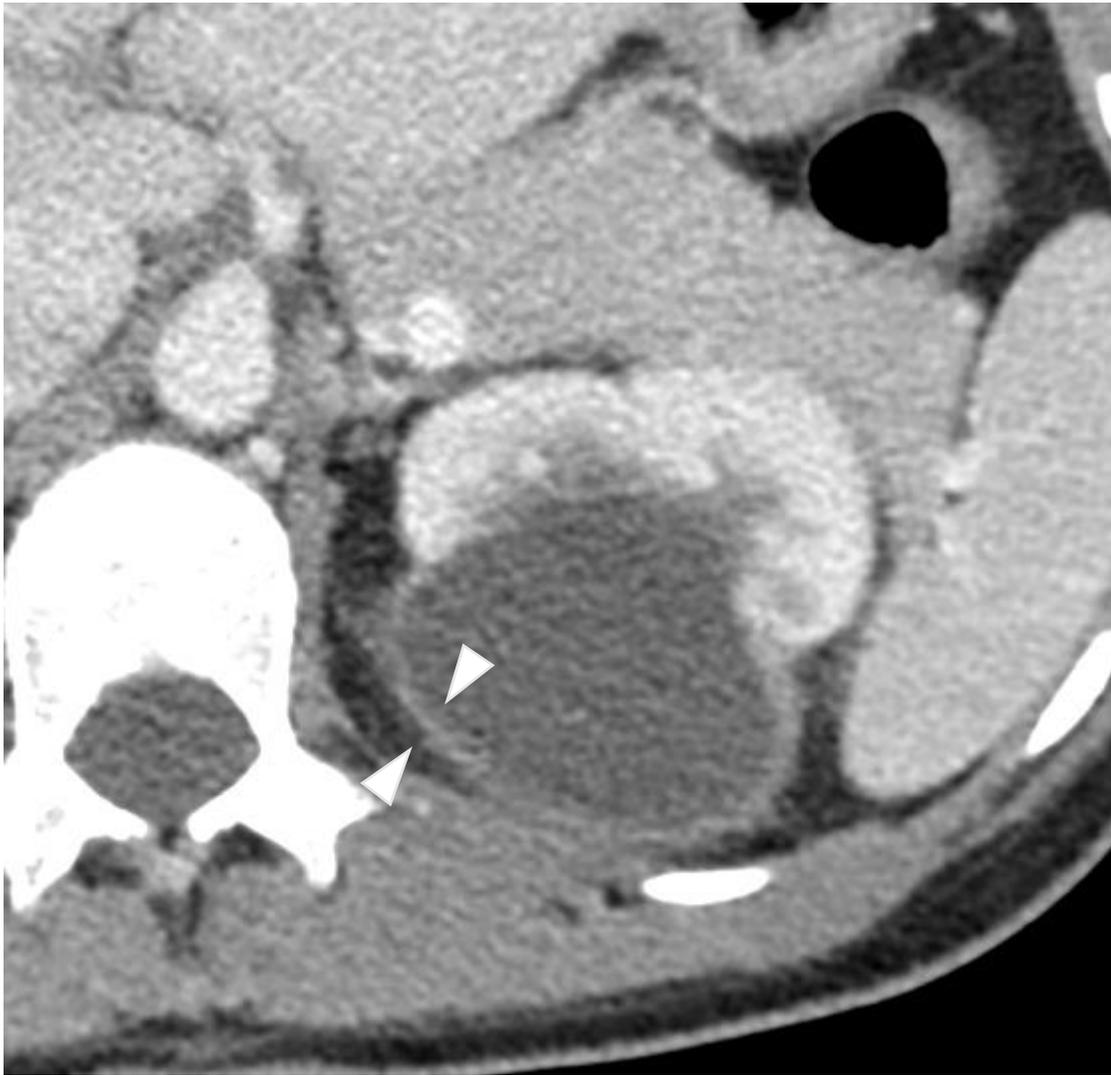
CT post IV de contraste 60s



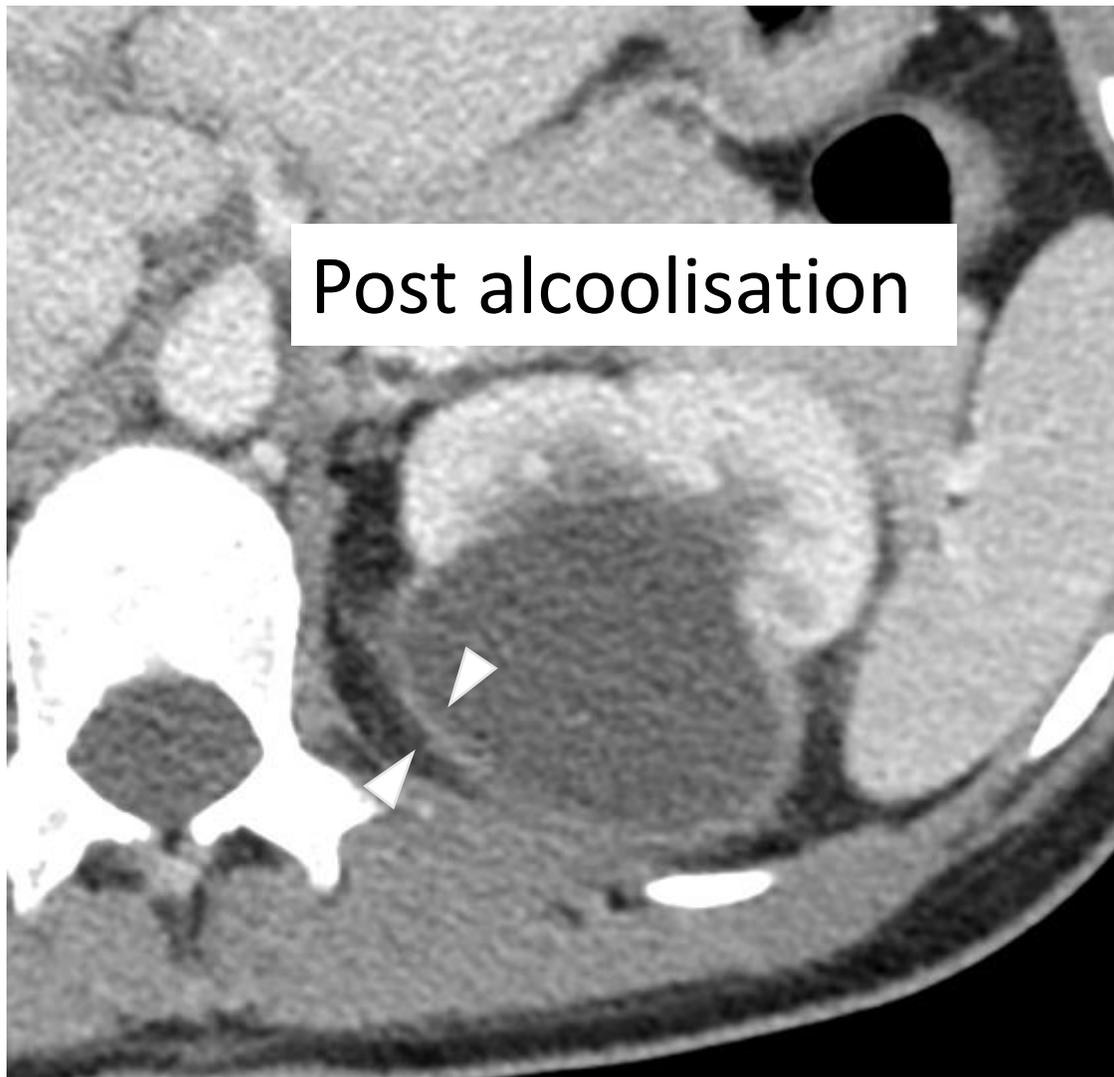
CT post IV de contraste 3 min

Homme de 50 ans – kyste hydatique (Gharbi 4)

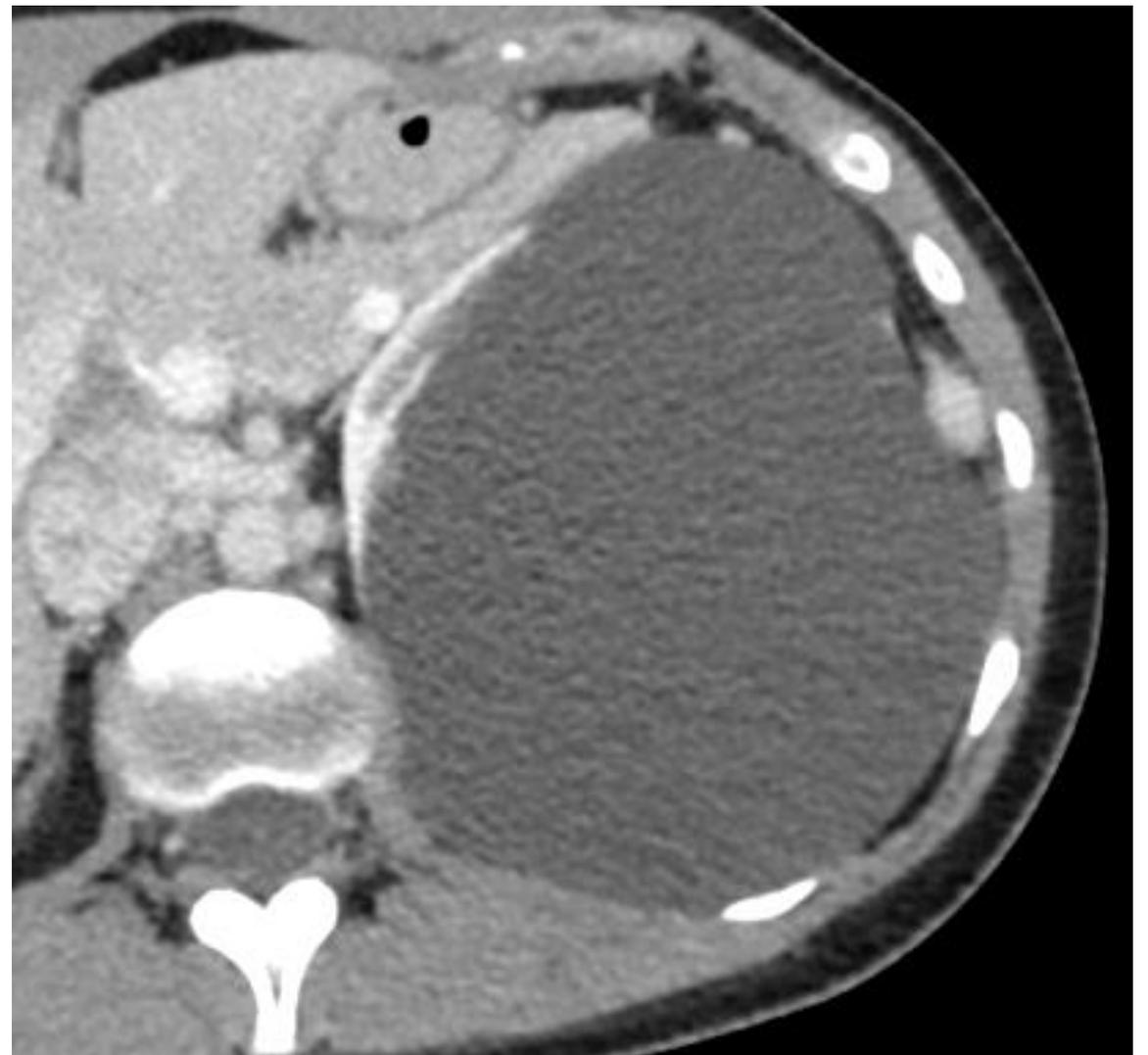
Pas de classification des lésions kystiques parasitaires et infectieuses



2014 femme de 28 ans

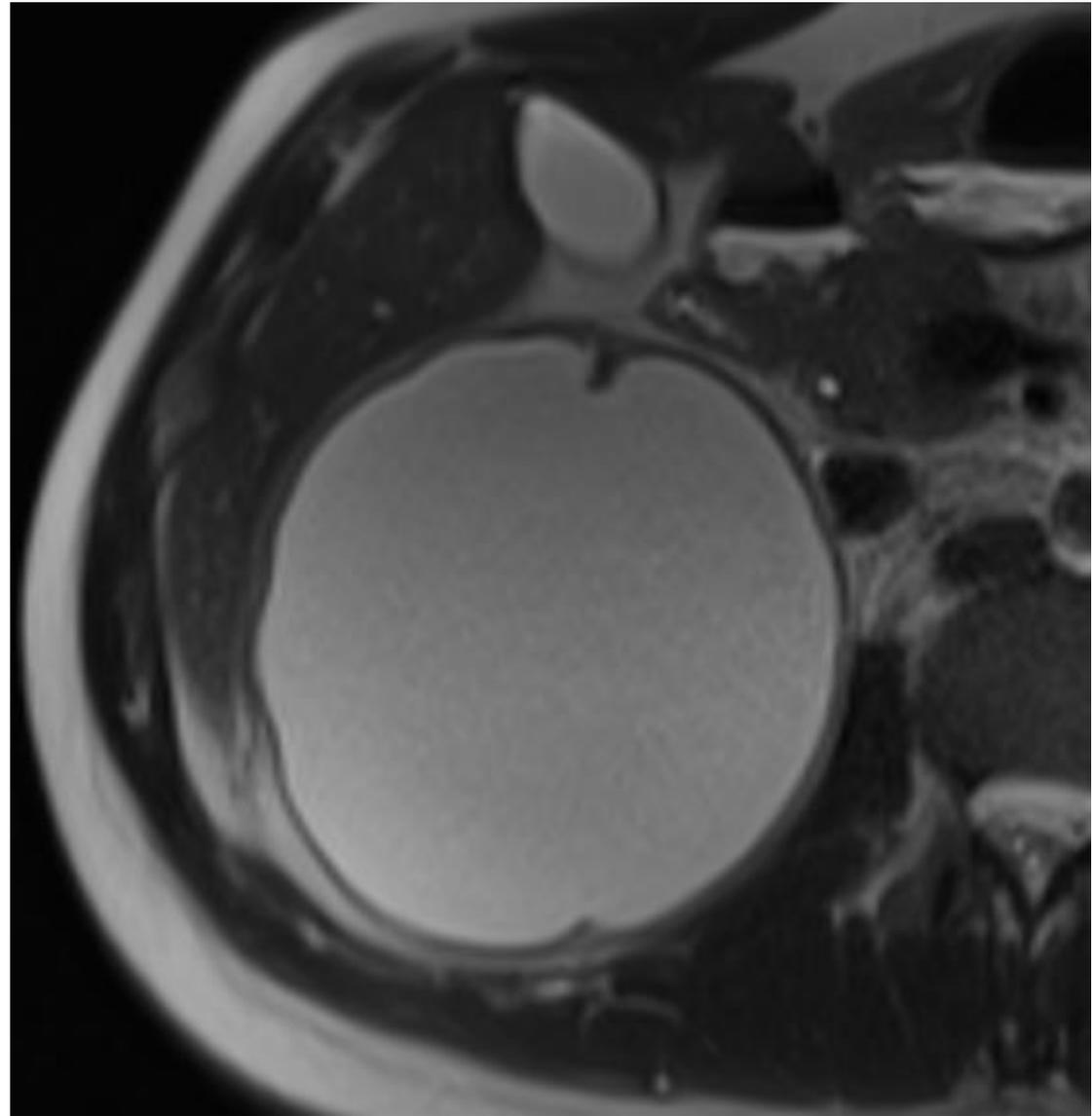
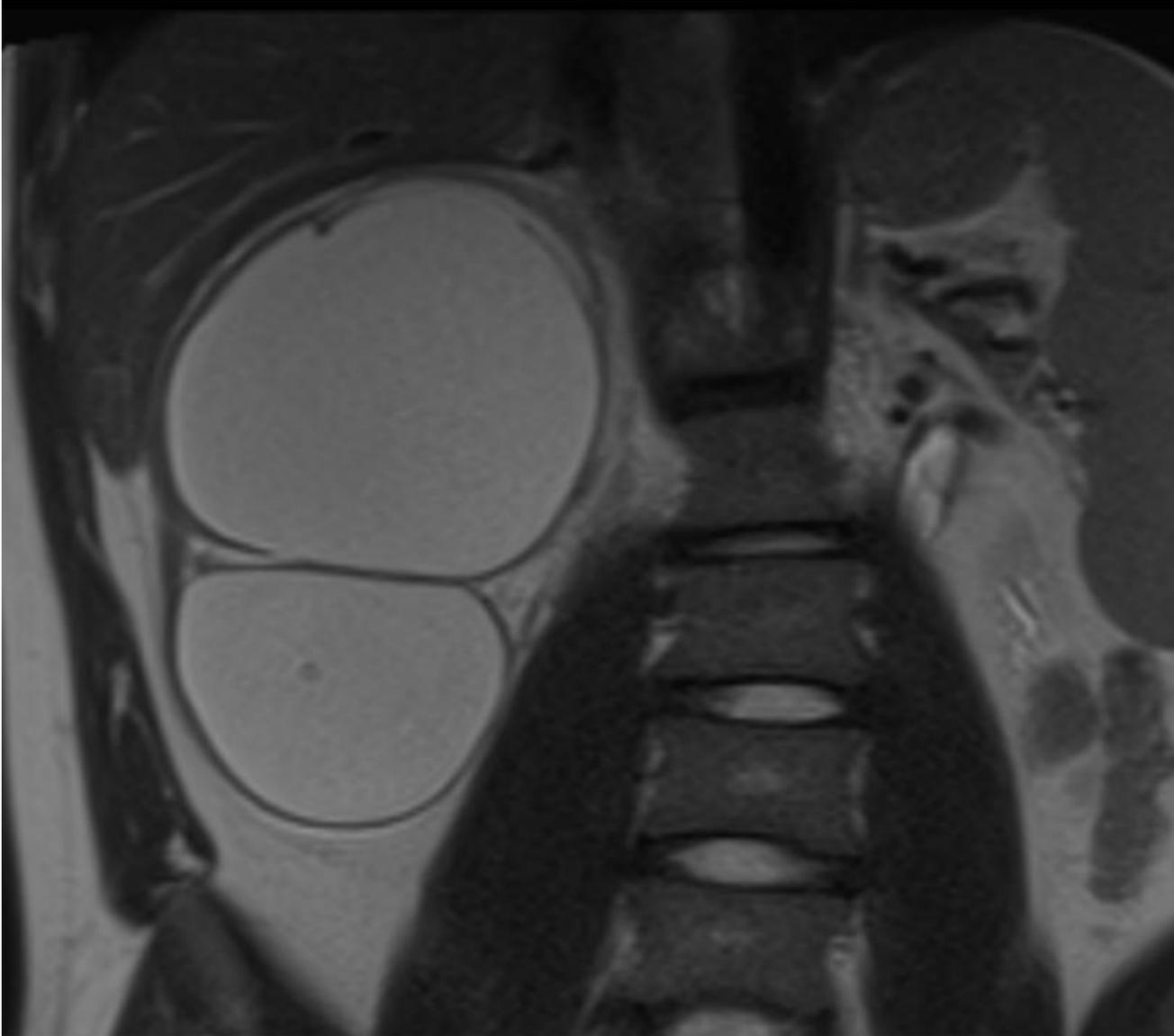


2014 femme de 28 ans

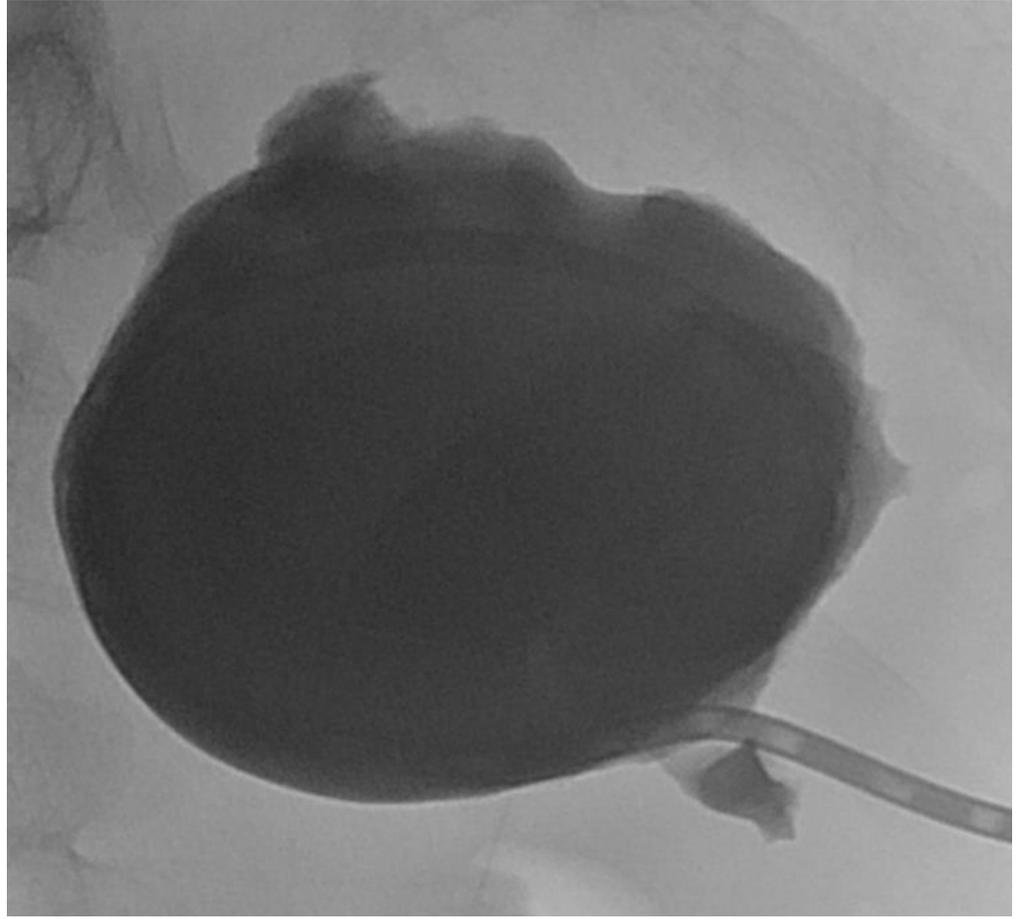
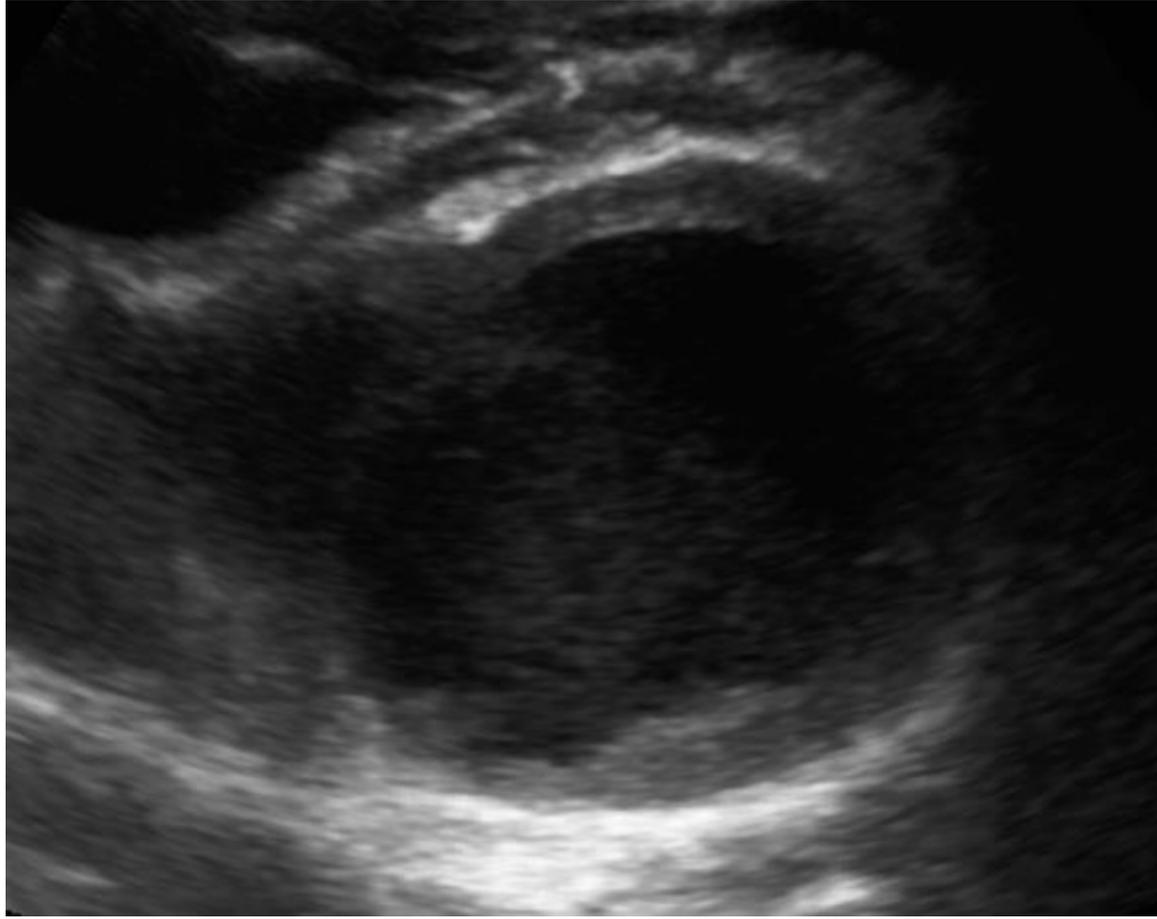


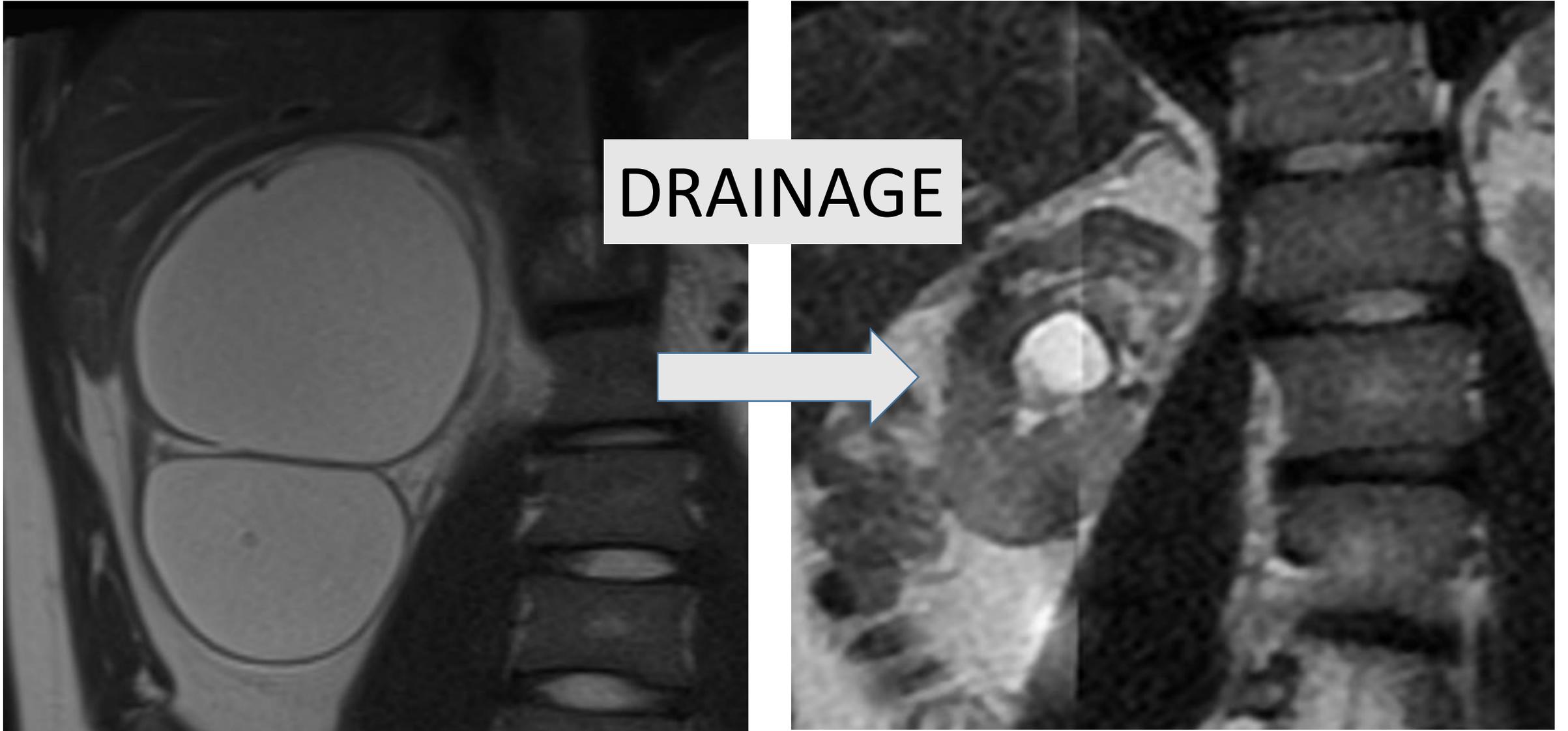
2014 - 6mois avant

Pas de classification des lésions infectieuses



Homme 24 ans, MAP insuffisance rénale et infection urinaire





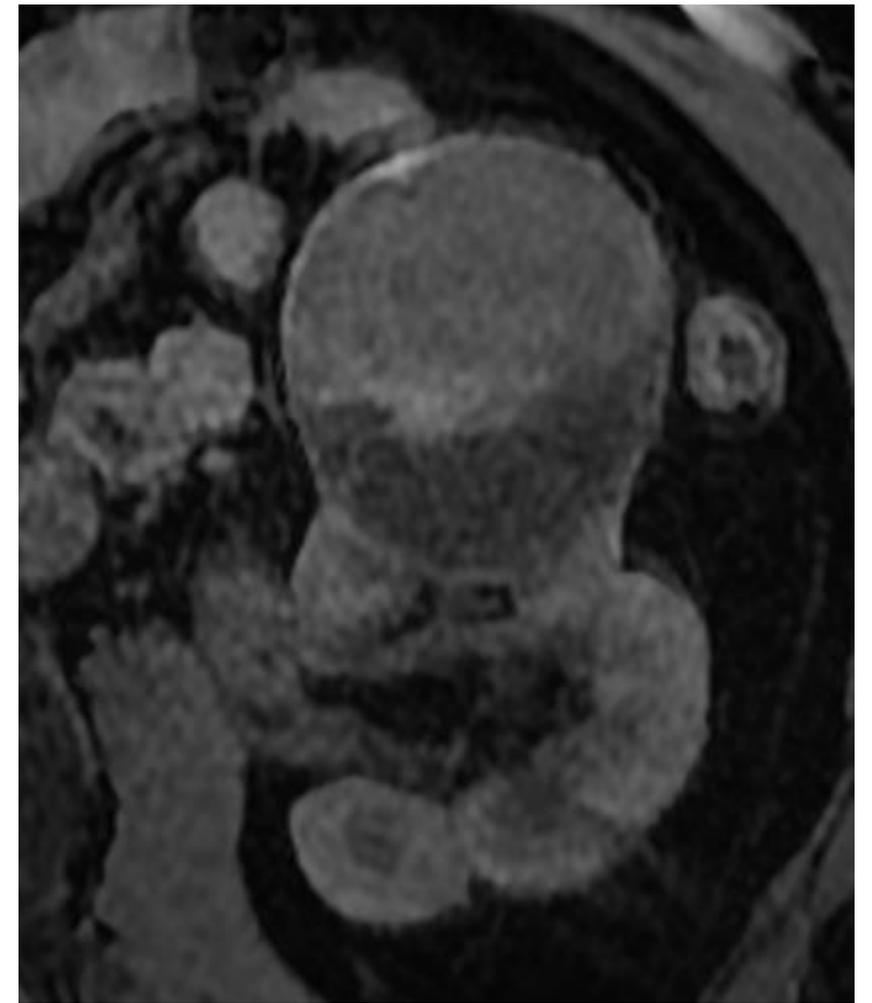
! Aux faux kystes (hydrocalices) !



T2



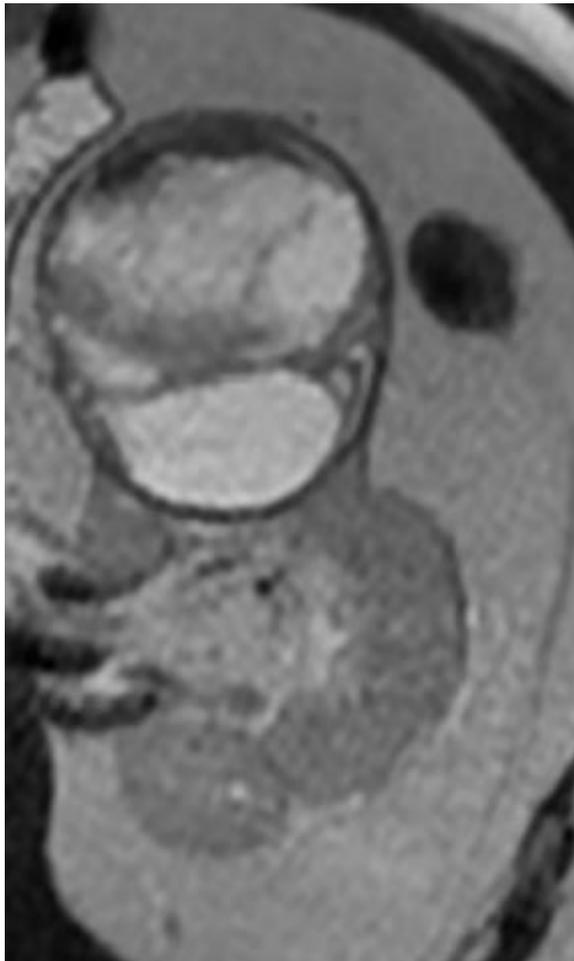
T1 FS



T1 FS post IV de contraste

Homme 62 ans, rein unique 2017

Kyste Bosniak 2F

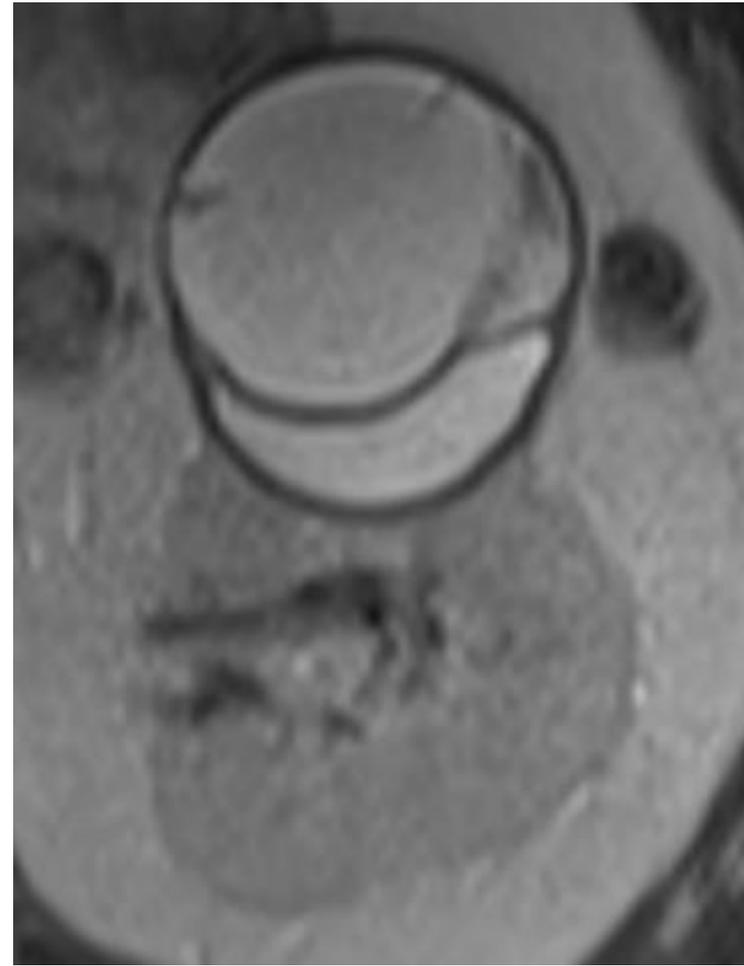


2019

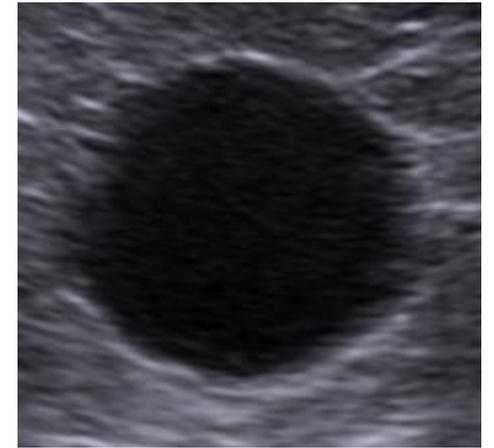


2017

Kyste Bosniak 2F



2016



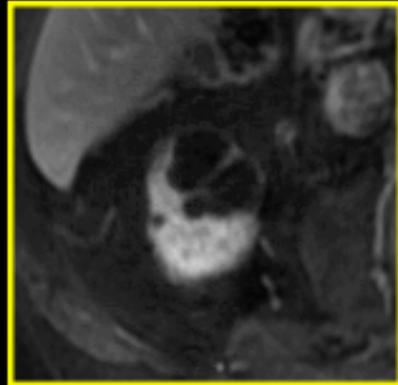
2014



Kyste Bosniak 1

Bosniak version 2019

Pictorial review and update summary



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