

CASE OF THE YEAR



# What lies beneath?

Unexplained abdominal distension in a preterm infant

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# Clinial presentation

## Birth

Female  
31+6/7 weeks  
Vaginal delivery  
Apgar 6 / 8 / 9

## Weight

1760 g P60 (Fenton)

## Prenatal

Normal ultrasound  
NIPT normal, XX

## Maternal history

G6P2 , 34 years  
European ethnicity  
Gestational diabetes • SSRI exposure • Tobacco / cannabis use

# Admission

Day of life 0 (DOL) : Admission to the neonatal intensive care unit

- Respiratory support with CPAP was initiated
- Umbilical venous catheter was inserted

## DOL 2 —

**Abdominal  
distension  
Food intolerance**

**Oliguria**

### **Context**

UVC in place  
TPN administration  
Non invasive ventilation

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**Abdominal  
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### **Context**

UVC in place  
TPN administration  
Non invasive ventilation

**What investigations would you recommend?**

## DOL 2 —

**Abdominal  
distension  
Food intolerance**

**Oliguria**

### **Context**

UVC in place  
TPN administration  
Non invasive ventilation

### **Laboratory profile**

Na 131 mmol/L  
K 6.8 mmol/L  
Creatinine 1.10 mg/dL  
CRP 1,7 mg/L

### **Imaging**

Ascites

## DOL 3 —

### Imaging Ascites

Abdominal XRay  
Ascites. **Malposition of UVC**



Abdominal US  
Significant amounts of ascites



## At DOL 2, what is your leading hypothesis?

A

TPN extravasation

B

NEC / intestinal pathology

C

Urinary ascites

D

Other / mixed cause

## DOL 3 and 4 —

### Working diagnosis

TPN extravasation was suspected

### Intervention

UVC removal  
Discontinuation of  
Enteral Feeding

### Response

Rapid clinical improvement by  
DOL 4

## DOL 4 - 9 —

Continuation of feeding

- Enteral feeding with infant formula
- Parenteral nutrition via a peripherally inserted central catheter (PICC)

Respiratory support with high-flow nasal cannula (HFNC)

## DOL 9 — recurrence

**Abdominal  
distension  
Food intolerance**

**Oliguria**

### Laboratory profile

Na 122 mmol/L  
K 6.7 mmol/L  
Creatinine 2.29 mg/dL  
CRP <0,6 mg/L

### Imaging

Ascites

## DOL 9 —

### Imaging Ascites



Abdominal XRay  
Ascites



Abdominal US  
Significant amounts of ascites

**Same phenotype. Different episode. What did we miss the first time?**

# Neonatal ascites — keep the differential broad

## Gastrointestinal

Perforation / NEC

## Cardiac

Hydrops / heart failure

## Hepatic

Portal or hepatic disease

## Chylous

Lymphatic leakage

## Infectious

Peritonitis / sepsis

## Urinary

Urinary tract leak / perforation

# The ascites fluid changes the trajectory

|               | Fluid aspiration | Serum      | Urine   |
|---------------|------------------|------------|---------|
| Creatinine    | 5,0 mg/dL        | 2,29 mg/dL | 8 mg/dL |
| Proteins      | 4,18 g/L         |            |         |
| Glucose       | 92 mg/dL         | 111 mg/dL  |         |
| LDH           | 28 UI/L          |            |         |
| Triglycérides | <9 mg/dL         |            |         |
| Cholesterol   | <4 mg/dL         |            |         |
| RBC           | 100/mm3          |            |         |
| WBC           | 23/mm3           |            |         |

**=> Urinary ascites**



Left: Fluid aspiration  
Right: Urine

# What is the cause of the uroperitoneum?

The biochemical diagnosis is not yet the anatomical diagnosis.

A

Bowel perforation

B

Kidney malformation

C

Urachus related

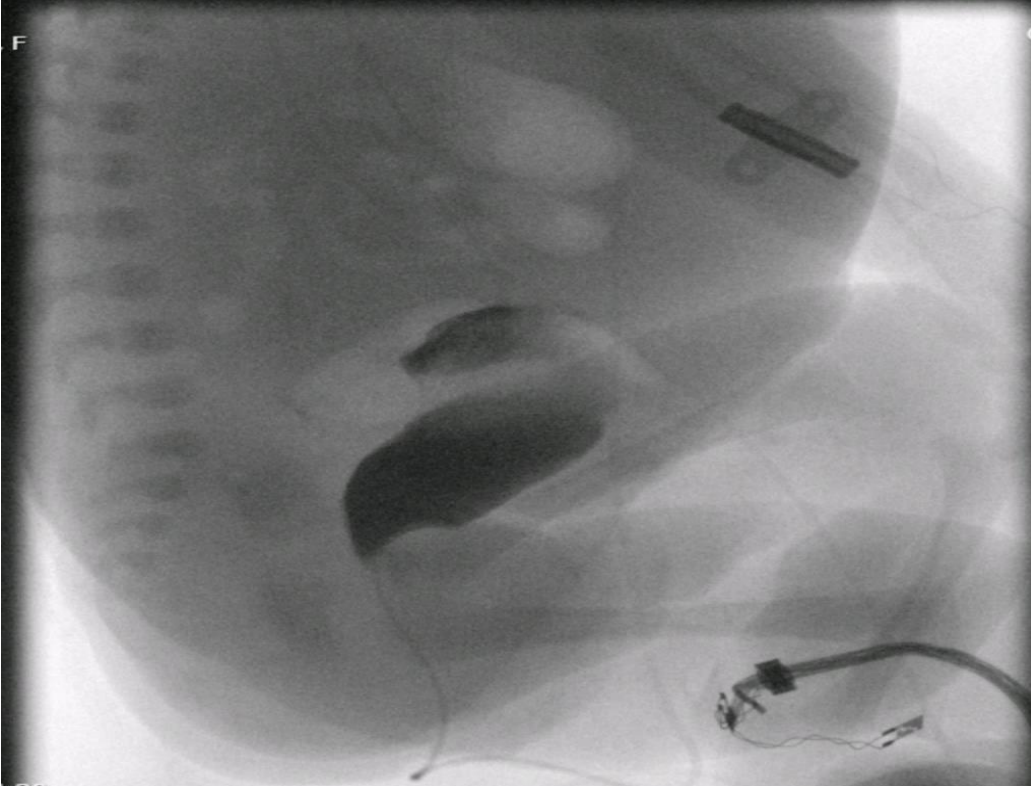
D

Posterior urethral valve

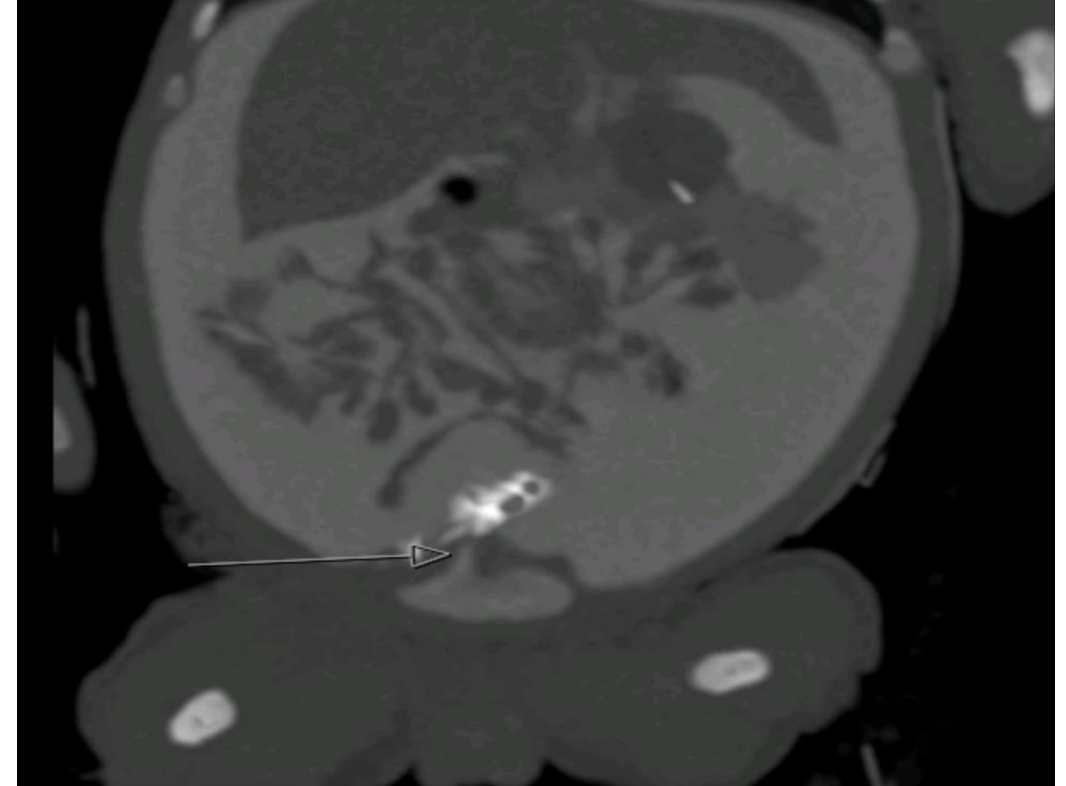
What investigations would you recommend?

# Imaging — localising the urinary leak

Urethrocystography and CT both identified a postero-superior bladder leak.



Urethrocystography

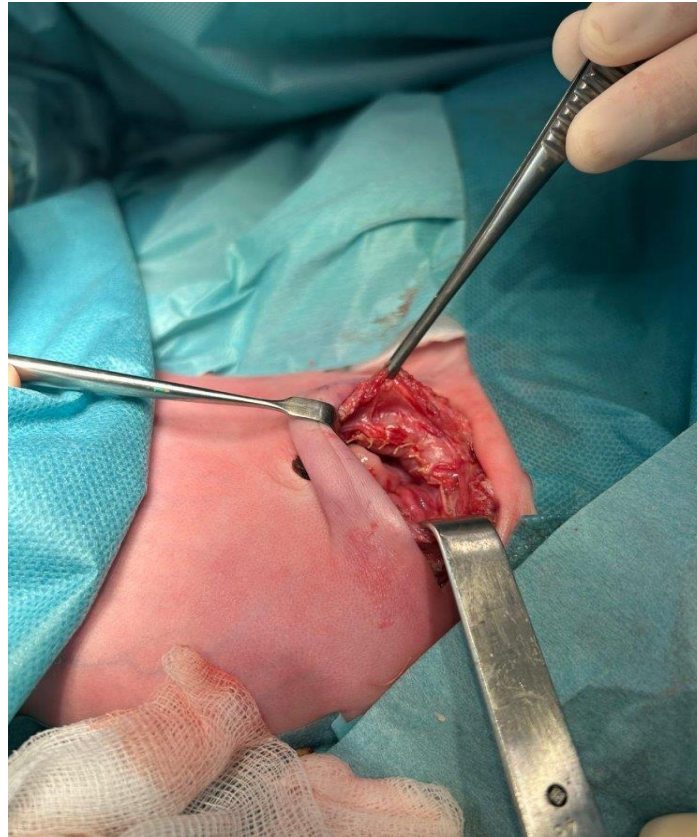
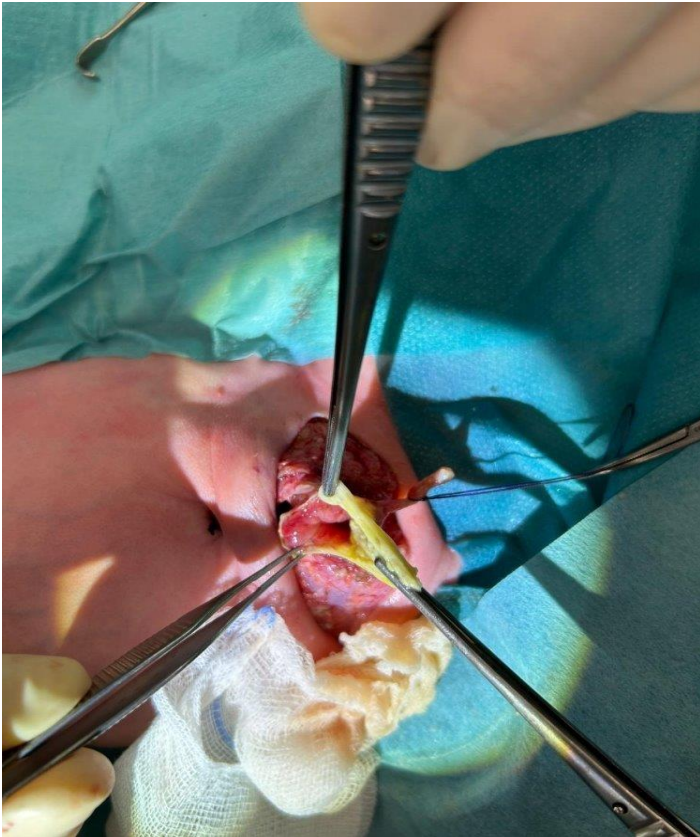


CT scan

**Focal finding: perforation of the supero-posterior bladder dome with postero-superior extravasation.**

# Surgery — the anatomical diagnosis

The leak was explained by a persistent urachal sinus associated with bladder dome perforation.



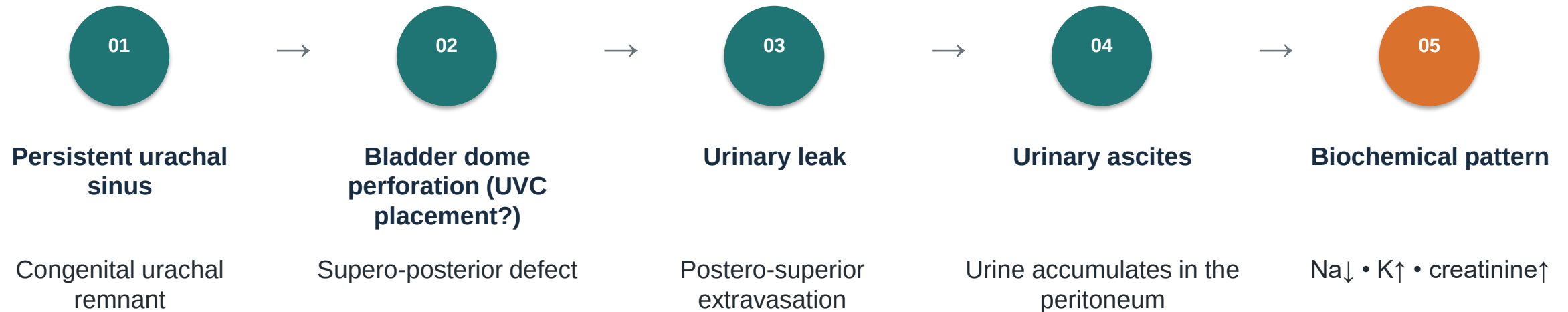
## Operative findings

- Perforation of the supero-posterior bladder dome
- Persistent urachal sinus

## Treatment

- Bladder repair
- Resection of the urachal remnant

# Physiopathology



**The apparent acute kidney injury is partly explained by peritoneal reabsorption of urinary solutes.**

Oei, J et al. "The diagnosis and management of neonatal urinary ascites." *Journal of paediatrics and child health* vol. 37,5 (2001): 513-5. doi:10.1046/j.1440-1754.2001.00656.x

"autodialyse"

# Urinary ascites in the neonate (uroperitoneum)

Rare condition

## Obstructive

- Posterior urethral valve
- Anterior urethral valve
- Urethral atresia
- Ureteropelvic junction obstruction
- Neurogenic bladder

## Iatrogenic

- Urinary catheterization
- Umbilical arterial catheterization
- Umbilical venous catheterization

## Bladder / urachal

- Bladder perforation
- Renal pelvic rupture
- Urachal rupture

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Rare condition

## Iatrogenic

Urinary catheterization  
Umbilical arterial  
catheterization++++  
Umbilical venous catheterization

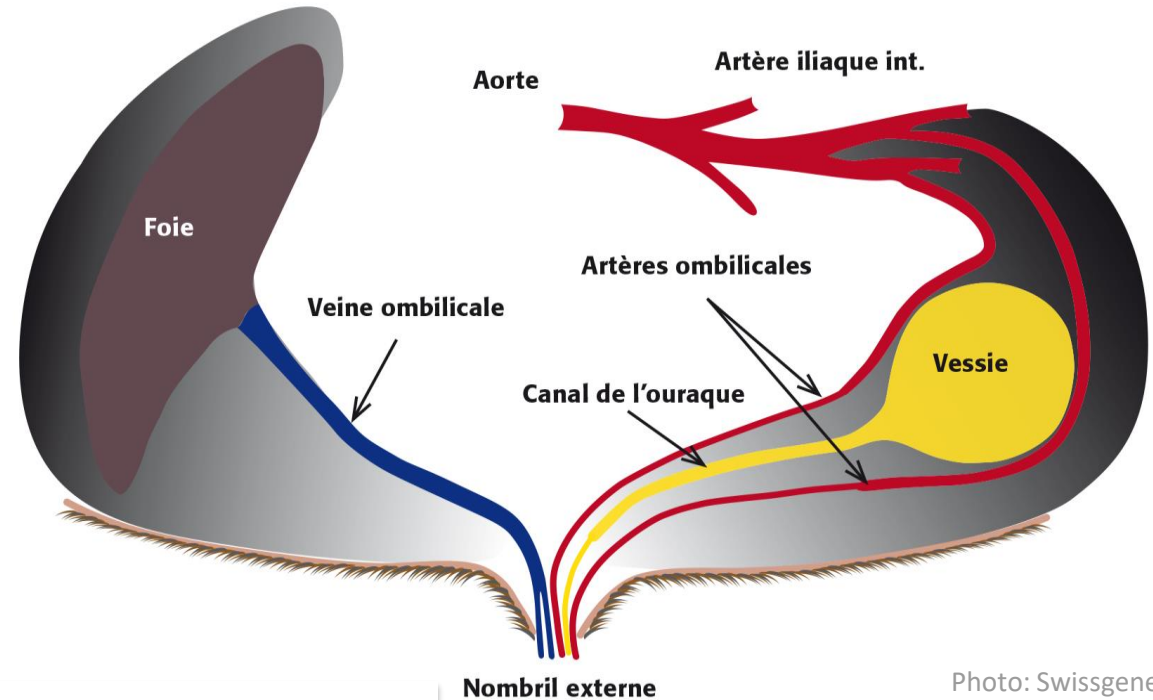


Photo: Swissgenetics

2022 Mustafa A, Mohtisham F, Sallam A, Alzahrani A, Ahmed A. A Rare Cause of Ascites in Preterm Baby: A Case Report.

=> Multifactorial

# Urinary ascites in the neonate (uroperitoneum)

Rare condition

## Bladder/Urachal

Bladder perforation  
Renal pelvic rupture  
Urachal rupture

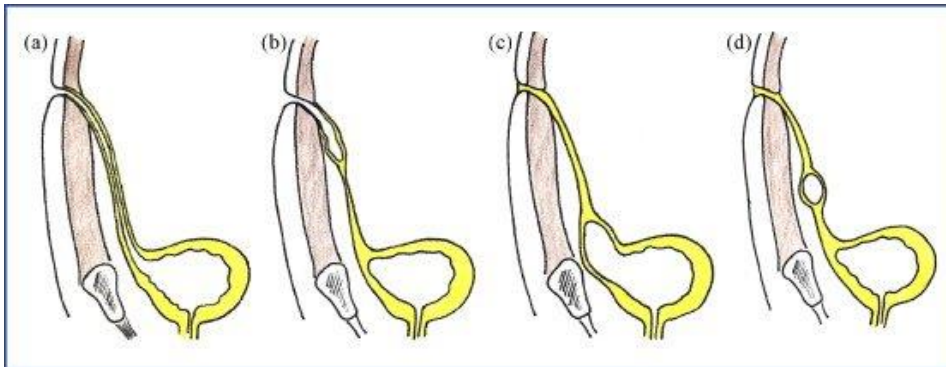
2026: Aichner, Jonathan et al. "Fetal bladder rupture: A systematic review and management recommendations."

=> 27 publications describing 28 cases

=> **Lower urinary tract obstruction was the main associated condition**

=> **Maternal opioid exposure was also reported**

**(prematurity, bladder wall ischemia, congenital weakness of the bladder wall)**



Persistence of the urachal remnant

Photo: ScienceDirect

# Take home messages

**Recurrence matters**

**Urinary ascites is rare but life-threatening condition**

**Remember iatrogenic causes, particularly umbilical catheterization**

**The analysis of the peritoneal fluid is the key diagnostic test**

# References

## References

Oei, J et al. "The diagnosis and management of neonatal urinary ascites." *Journal of paediatrics and child health* vol. 37,5 (2001): 513-5. doi:10.1046/j.1440-1754.2001.00656.x

Krzywiecka, Karolina et al. "Fetal bladder rupture in posterior urethral valves: a clinically relevant complication or a protective pop-off mechanism." *Frontiers in pediatrics* vol. 14 1880245. 10 Jul. 2026, doi:10.3389/fped.2026.1880245

Mustafa, Ahmad et al. "A Rare Cause of Ascites in Preterm Baby: A Case Report." *Cureus* vol. 14,6 e25577. 1 Jun. 2022, doi:10.7759/cureus.25577

Aichner, Jonathan et al. "Fetal bladder rupture: A systematic review and management recommendations." *Journal of pediatric urology* vol. 22,1 (2026): 105576. doi:10.1016/j.jpuro.2025.08.028

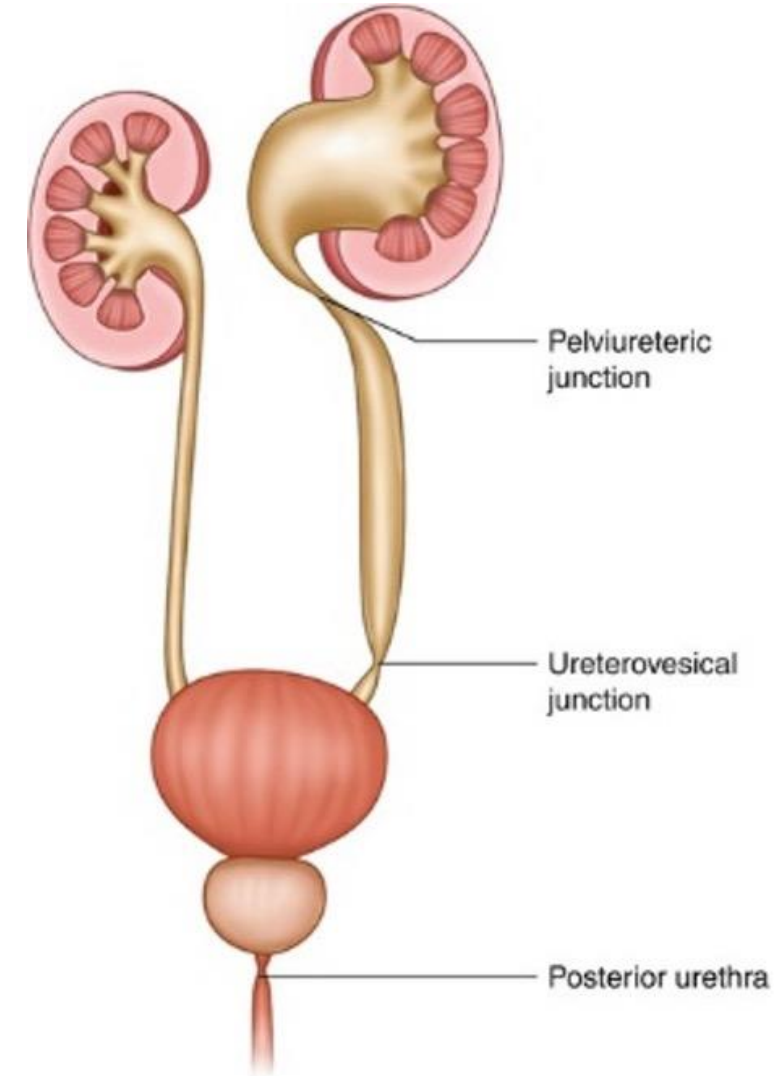
Vasdev, Nikhil et al. "Neonatal urinary ascites secondary to urinary bladder rupture." *Journal of pediatric urology* vol. 5,2 (2009): 100-4. doi:10.1016/j.jpuro.2008.09.007

# Urinary ascites in the neonate (uroperitoneum)

Rare condition

## Obstructive

- Posterior urethral valve (male)
- Anterior urethral valve (male)
- Urethral atresia
- Ureteropelvic junction obstruction
- Neurogenic bladder



"pop-off" mechanism : rupture de la vessie protégerait les reins ?

2026: Krzywiecka, Karolina et al. "Fetal bladder rupture in posterior urethral valves: a clinically relevant complication or a protective pop-off mechanism."