# Uretero-arterial fistulas : a rare cause of hematuria
# Review of literature based on two cases

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## Introduction

Uretero-arterial fistulas (UAF) are rare conditions in which communication develops between the ureter and a major artery, the most frequent being the common iliac artery. Leading to potentially lethal situations, this type of fistulas have a large specter of presentations. As it mostly develops in a selected group of patients with specific medical and surgical history, one should always suspect UAF when exposed to suggestive symptoms in these populations.
Based on 2 cases encountered in our center, we tried to summarize literature content in order to help urologists in making the good choices when facing patients with a suspected UAF.

## Case Reports

**Case n°1 : 50 years old female**

- At 38 years old : radical hysterectomy + adjuvant radio-chemotherapy for an epidermoïd epithelioma of uterine cervix.

- At 46 years old : progressive worsening of renal function with left uretero-hydronephrosis and severe atrophy of right kidney.
  - Placement of a left JJ stent with stabilisation of renal function, changed every 6 month.
  - Several episodes of severe urinary infection justifying iterative changements of the left JJ and placement of a right JJ stent.

- At 50 years old : Decision to perform an open right nephrectomy. After 2 days severe gross haematuria with blood clots leading to hemorragic shock.
  - Transfusion and extraction of clots with clinical stabilization.
  - CT scan : No active haemorrhage.
  - New episodes of severe haematuria with shock.
    - ➢ Arteriography : late opacification of residual segment of the right ureter (image 1). Suspicion of ilio-ureteral fistula at the level of the distal right common iliac artery.
    - ➢ Endovascular surgery with stenting of right common and external iliac artery.
    - ➢ Clinical stabilisation, no more episode of haematuria.

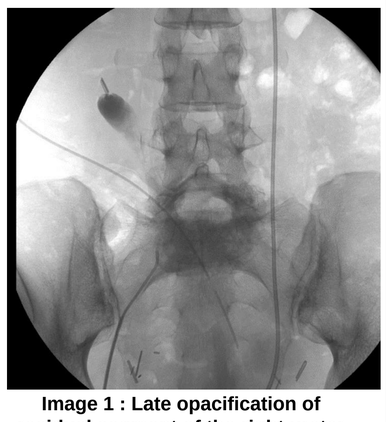


**Image 1 : Late opacification of residual segment of the right ureter**

**Case n°2 : 79 years old female**

- At 76 years old : sero-papillar ovarian carcinoma treated by chemotherapy followed by a surgical debulking.

- Chronic postoperative lymphocele with left uretero-hydronephrosis and pyelonephritis.
  - ➢ Left ureteral stent, changed yearly.

- Peritoneal recurrence. Adjuvant chemotherapy.

- At 79 years old : emergency room for lipothymia and gross hematuria.
  - ➢ Anemia with vesical and renal blood clots on injected CT scan. No active bleeding (image 2).
  - ➢ Transfusion and extraction of blood clots.
  - ➢ New episodes of severe hematuria causing hypotension and anemia.
  - ➢ Arteriography : no fistula (image 3).
  - ➢ Embolization of left renal artery.
  - ➢ Persistance of severe hematuria. Decision to perform an open left nephro-ureterectomy.
    - → Peroperative diagnosis of Uretero-iliac fistula.
    - → Reparation of iliac artery with Prolene.

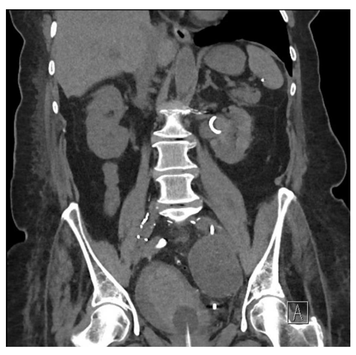


**Image 2 : CT with renal and bladder blood clots, left JJ stent and chronic left lymphocele**

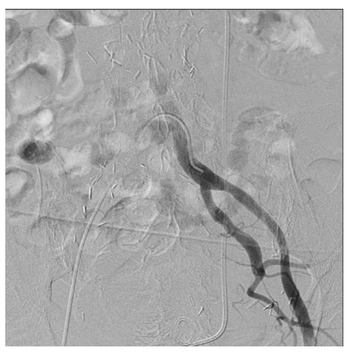


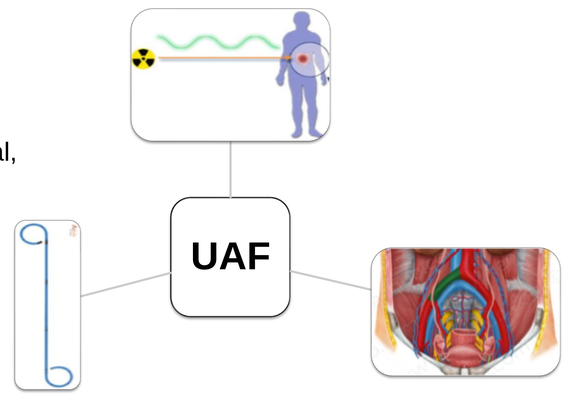
**Image 3 : Left iliac arteriography showing no fistula**

## Etiology

Two etiological groups typically described for the development of UAF :
- Primary fistulas (<15%) are from vascular etiology : aorto-iliac aneurysms, other vascular malformations
- Secondary fistulas (>85%) linked to patient's clinical history and comorbidities.

The three typical factors encountered in patients with UAF are ;

1. **History of pelvic surgery** : urological, gynecological, colorectal or vascular surgery.
2. **History of pelvic radiotherapy**.
3. **Chronical ureteral catheterization with JJ stent.**




## Symptoms

- Heterogeneous presentation.

- **Hematuria** : most common symptom (74% of cases).
  - Microscopic Vs severe : hypotension, weakness, hemorrhagic shock.
  - Circulatory compromise in about 17,8% of cases.

- Other symptoms : Urinary retention, flank pain, Infectious symptoms.

- Precipitation of symptoms at time of ureteral stent changement : 13,5% of cases.

## Diagnosis

- **Angiography** = Most effective modality. Indicated in stable patients, but often negative. Provocative angiography possible with immediate surgical backup.

- Cystoscopy : pulsatory bleeding from ureteral orifice or from the stent, non specific

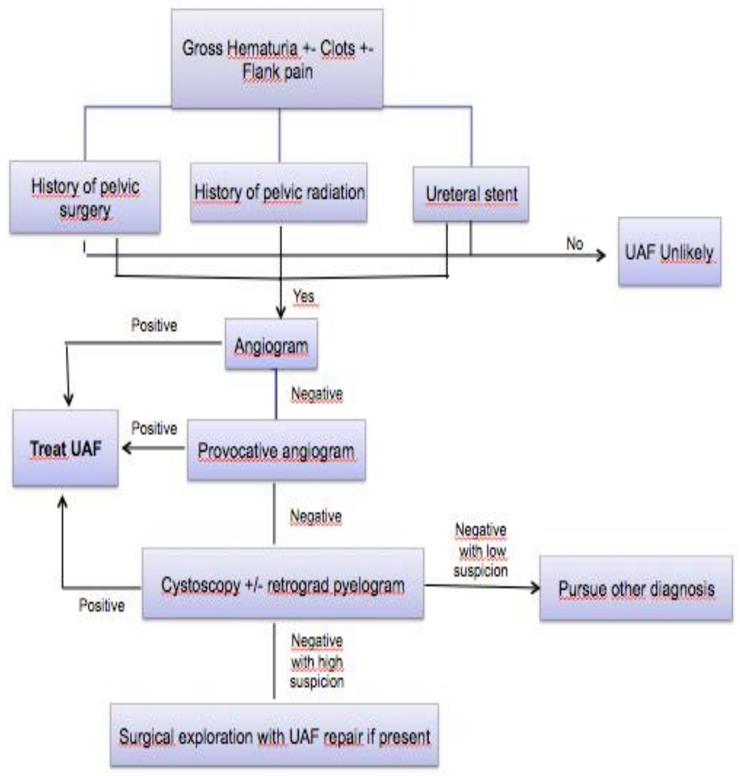
- Anterograde or Retrograde pyelogram

- Abdomino-pelvic CT : non specific and rarely positive. Not recommended as a first line diagnostic tool.

- Ureteroscopy : not advised, risk of tearing the fistula and/or dislodging a clot.

➢ **No single diagnostic test completely excludes UAF with high predictive value.**

➢ **Key for the diagnosis is the clinician's suspicion of the diagnosis of UAF**




## Treatment

- Historically : systematic open surgery.
  - ➢ Risk linked to an hostile local surgical field and specific comorbidities.

- Development of mini-invasive endovascular surgery : embolization, grafts or stents.
  - ➢ Complete closing of the fistula and maintenance of arterial blood flow.
  - ➢ Less morbidity and mortality than open surgery.

- Few long-term data available : no significant difference in terms of rates of early mortality, recurrence or complications.

- Open surgery :
  - ➢ Indications :
    - Complex UAF (multiple, infection,…).
    - Complication of stent grafts (occlusion, lower limb ischemia,…).
    - Urgent situations with uncontrolled bleeding and no clear diagnosis of fistula.
  - ➢ Procedures : exploration with bypass grafting, arterial ligation or repair, patch, +/- nephrectomy.

- Follow up : recurrent hemorrhage, graft infection or lower limb complication.

## Conclusions

- Uretero-iliac artery fistulas are rare but severe conditions, with high morbidity and mortality rates.
- Suspicion is based on patient specific clinical history and adapted imaging. Having a suspicion of UAF when treating a patient with hematuria and predisposing comorbidities is the key to ensure early diagnosis and management.
- Arteriography is the best study to help establishing the diagnosis.
- Management can be done by open surgery or with endovascular approach without significant differences concerning early mortality, recurrence and complications. Endovascular treatment seems to be the best initial modality in stable patients with highest surgical risk due to preexisting comorbidities. Treatment choice has to be discussed within specialists involved, and to be adapted to every specific case.

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