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## A case of gross haematuria due to an ureteric-iliac artery fistula

*We report a case of a 75-year-old man presented with gross haematuria and left hydronephrosis due to an ureteric ili-ac-artery fistula. Medical history included a previous positioning of aorto-bisiliac graft and an iliac artery stent placed to exclude an hypogastric aneurysm. A retrograde pyelography revealed a compression of the middle ureter and an extravasation of contrast at that level, for this reason a double J stent was inserted. Contrast-enhanced computed tomography showed the presence of a fistula between the left ureter and the internal iliac. The patient underwent endovascular treatment using a stent-graft with the subsequent patient's recovery. Ureteric iliac-artery fistula is a rare condition and it generally manifests with life threatening gross bleeding. We suggest a multidisciplinary clinical approach in order to achieve the best results for the patient and to avoid severe complications. Endovascular techniques have been demonstrated to be effective and rapid in the treatment of this emergency condition; ureteral stenting is also recommended.*

KEY WORDS: Uretero-iliac fistula, Haematuria, Hydronephrosis

## Introduction

Ureteric iliac-artery fistula (UAF) is a rare condition and it generally manifests with gross haematuria that often causes life threatening hemorrhaging. Until now, modern experience with ureteroiliac artery fistula has been limited to few case reports. Nevertheless, the diagnosis of these rare entity has been rapidly increasing, due to the more aggressive pelvic surgery or radiotherapy and to the diffusion of ureteral catheterism. Primary UAF only constitutes 15% of such condition, while secondary

manifestation is more common, just due to the several treatments cited before <sup>1</sup>.

Current interventional approach is based either by surgery or a combination of surgery and arterial embolization.

The aim of the current case report is to illustrate our experience with a man affected by UAF who has been successfully treated at our institution.

## Case report

A 75-year-old man presented with gross haematuria and left hydronephrosis without any symptoms associated. Medical history included a previous positioning of aorto-bisiliac graft and an iliac artery stent placed to exclude an hypogastric aneurysm.

The laboratory data were as follows: white blood cell (WBC) count of 15215/l, hemoglobin 8.2 g/dl, platelets

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Fig. 1: Coronal reformatted CT image, before administration of contrast medium. The arrow shows a large aneurysm of the left hypogastric artery with an intraluminal modest share of contrast material residue from the recent urological procedure, as certain sign of a fistula between the aneurysm sac and the ureter. A portion of the pig-tail catheter inside the left ureter is visible just in front to the aneurysm. Presence of an aorto-bisiliac graft and an iliac artery stent placed to exclude the hypogastric aneurysm.

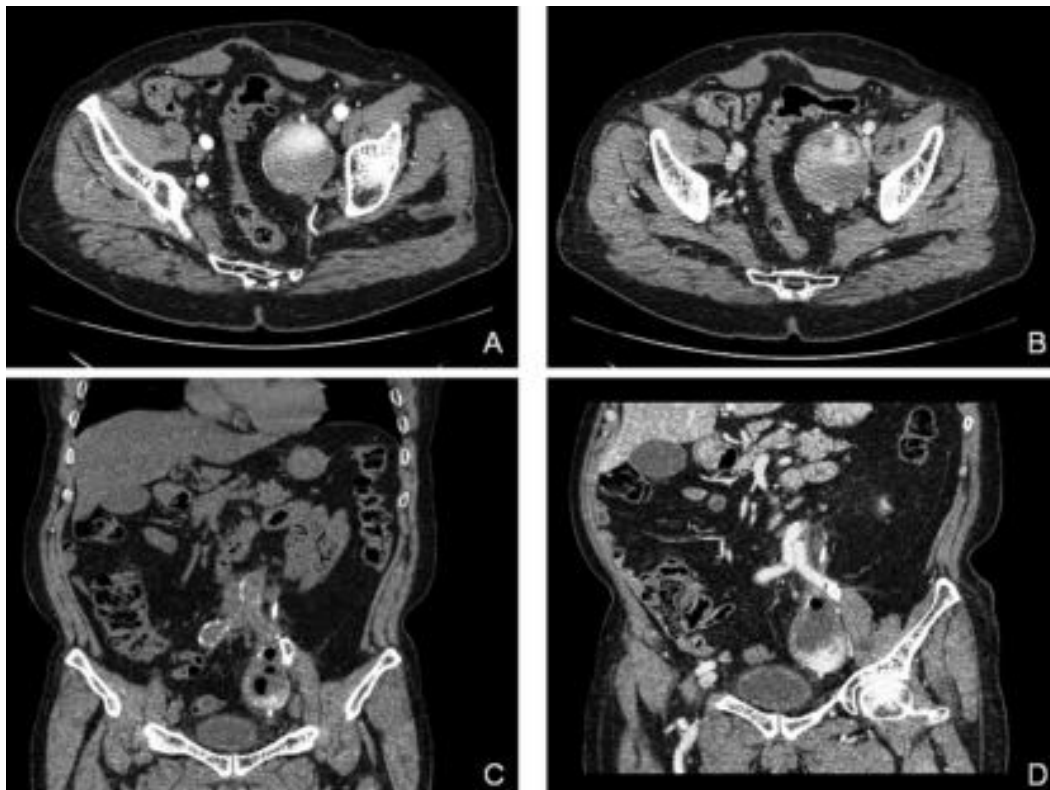


Fig. 2: Axial and coronal post-contrast CT images, in arterial phase (A,C) and tardive phase (B,D). The dynamic study after i.v. administration of contrast medium shows that the contents of the aneurysm do not change in the different phases. There is no active blood supply and the aneurysm is excluded from the vascular system by the iliac stent.

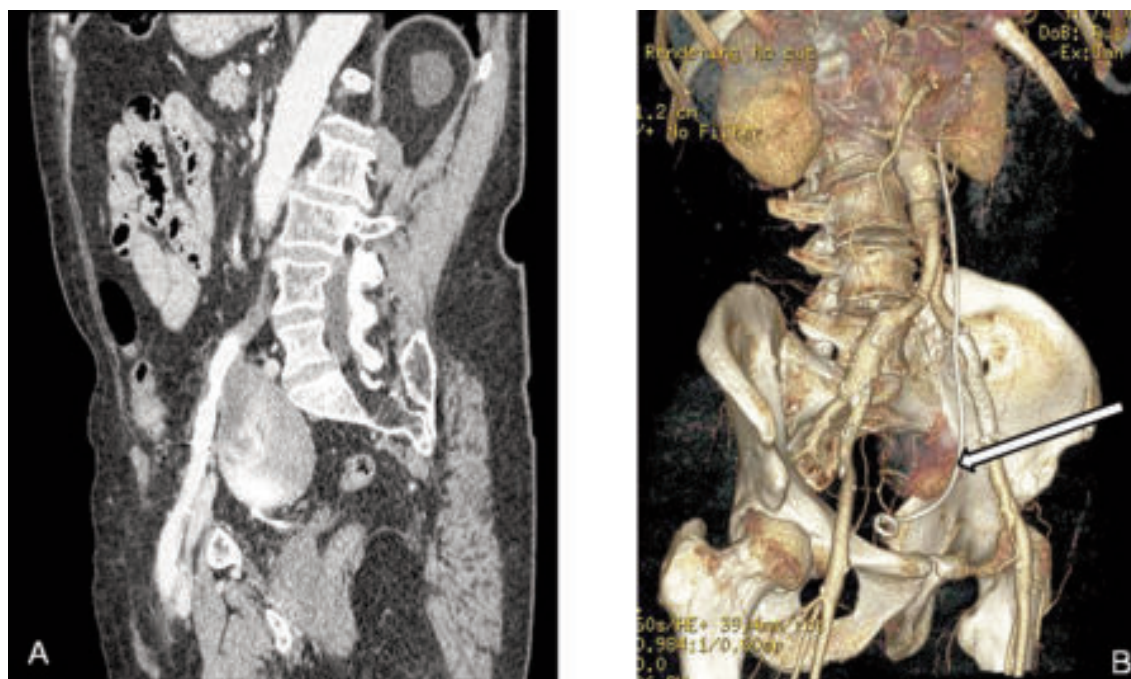


Fig. 3: Sagittal reformat CT images. Aneurysmatic dilation of the left internal iliac artery from its origin from the common iliac artery, where it was placed the endovascular stent (A). Volume-Rendered CT images, oblique plane. The figures demonstrate that the left internal iliac artery is not visible due to its exclusion by the iliac stent. The arrows shows the base of the aneurysm sac where it was formed the fistula with the urinary tract, responsible for the hematuria, behind the pig-tail catheter in the left ureter (B).

$184 \times 10^3/l$ , blood urea nitrogen 30 mg/dl, creatinine 10.0 mg/dl, and C-reactive protein 4.7 IU/l. The blood pressure and heart rate were 120/60 mmHg and 90/min, respectively.

The primary decision was to perform a left retrograde pyelography that revealed a compression of the middle ureter and an extravasation of contrast at that level, for this reason a double J stent was inserted.

After this procedure, the patients underwent contrast-enhanced computed tomography (CT) that showed a large aneurysm of the left hypogastric artery with an intraluminal modest share of contrast material residue from the recent urological procedure, as certain sign of a fistula between the aneurysm sac and the ureter (Figs. 1-3). After haemodynamic stabilization, the patient underwent immediate endovascular treatment using a stent-graft with the subsequent patient's recovery.

## Discussion and Comments

Although ureteric iliac-artery fistulas (UAFs) is a rare cause of gross haematuria, it is becoming more common due to the diffusion of pelvic surgery, pelvic radiation, chronic inflammatory conditions of the pelvis and previous vascular surgery<sup>2</sup>. The usual presenting symptom varies from microscopic haematuria to gross haematuria with the possibility of life threatening hemorrhaging.

Furthermore, flank pain is common and due to the clots formation. The exact mechanism of the development of UAFs is still uncertain, it has been postulated that as a result of previous conditions, the integrity of vasa vasorum could be disrupted<sup>1</sup>. The ureter can become fixed and obstructed by the surrounding inflammatory process, determining the formation of the fistula<sup>3</sup>. When it occurs most commonly involves the ipsilateral common iliac artery or the external or internal iliac artery<sup>4</sup>. Unfortunately there is no specific diagnostic modality as none highly sensitive. Certainly, the diagnosis of UAFs requires a high degree of suspicion. CT scanning has low sensitive being diagnostic in 50% in one series<sup>5,6</sup>. The use of provocative angiography where the indwelling ureteral stent is manipulated remains the most important diagnostic tool<sup>7,8</sup>. The vascular defect can be repaired primarily using an open approach, with embolization, ligation, and extra-anatomic arterial reconstruction, or with endovascular stenting<sup>6,9</sup>.

Historically, most patients with a diagnosis of UAF have been treated by nephro-ureterectomy in combination with local reconstruction of the arterial component by primary closure, patching, interposition graft, or bypass<sup>10</sup>. More recently, endovascular techniques have been demonstrated not only to be effective but also very rapid in this emergency condition. To this concern, a major advantage of the arterial stent is that it does not compromise the vascular supply and there is no need for

additional bypass operations. The ureter can be managed with nephroureterectomy, ureteral resection with primary repair, placement of a nephrostomy tube, or ureteral stenting. In the modern era, ureteral stenting has become an appealing approach with respect to several management options.

Multiple treatment options are available. One must consider to manage the arterial and ureteral side as well as the individual patients overall clinical status. Immediate goals of management are stabilize the hemodynamic status and control of bleeding if severe. The largest single-institution reporting by Krambeck et al revealed that the mortality rate was 0%, substantially better than in prior reports, while morbidity was at 71% <sup>6</sup>.

We suggest to undertake multidisciplinary approach in order to achieving the best results for the patient and to avoid severe complications.

## Conclusions

Although ureteric iliac-artery is a rare finding, this condition may manifest with a severe hemorrhaging that cause life threatening for patients. A multidisciplinary approach is recommended to better manage this disease.

## Riassunto

La fistola uretero-Iliaca è una rara condizione che può però determinare delle gravi complicanze per il paziente. Un uomo di 75 anni è giunto alla nostra osservazione per la presenza di ematuria macroscopica ed idro-nefrosi. L'anamnesi patologica remota includeva un precedente posizionamento di graft aorto-bisiliaco ed il posizionamento di un stent nell'arteria iliaca per escludere un aneurisma dell'arteria ipogastrica. È stato sottoposto a pielografia retrograda che ha dimostrato la presenza di una compressione ab estrinseco dell'uretere iliaco e uno stravasamento di contrasto a quel livello: per questo motivo è stato posizionato uno stent ureterale tipo J. L'esame TC con mezzo di contrasto ha evidenziato la presenza di una fistola tra l'uretere sinistro e l'arteria iliaca omolaterale. Successivamente il paziente è stato sottoposto ad intervento endovascolare con il posizionamento di uno stent-graft, con successiva guarigione.

La fistola uretero-iliaca è una condizione che sta diventando sempre più frequente, a causa della diffusione del-

la chirurgia pelvica, della radioterapia pelvica e del posizionamento di stent ureterali. La presentazione usuale varia dall'ematuria microscopica, fino ad una grave emorragia che può mettere a rischio la vita del paziente. L'esatto meccanismo della sua formazione non è tutt'ora chiarito. Generalmente coinvolge l'arteria iliaca comune o l'arteria iliaca interna o esterna. Le tecniche endovascolari si sono dimostrate rapide ed efficaci nel trattamento di questa condizione, così come lo stenting ureterale. Un approccio multidisciplinare è comunque fortemente suggerito al fine di raggiungere il miglior risultato per il paziente e per evitare la comparsa di severe complicanze.

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