

## Penile trauma - Corpus spongiosum tear

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**Section:** Uroradiology & genital male imaging

**Area of Interest:** Genital / Reproductive system male

Abdominal wall Anatomy Abdomen Interventional vascular

**Procedure:** Cystography / Uretrography

**Procedure:** Embolisation

**Imaging Technique:** CT

**Imaging Technique:** Percutaneous

**Imaging Technique:** Lymphography

**Imaging Technique:** Digital radiography

**Imaging Technique:** Catheter arteriography

**Special Focus:** Acute Trauma Abscess Blood

Embolism / Thrombosis Case Type: Clinical Cases

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**Patient:** 51 years, male

### Clinical History:

50-year-old patient came to the emergency room with an active urethral bleeding, probably related to a direct trauma, although other mechanisms could not be ruled out (i.e. urethral sticks).

### Imaging Findings:

- CT findings:

On arterial phase, we observed contrast extravasation in the penile bulb. Iodinated contrast extended anteriorly within the corpus spongiosum (Fig. 1).

On venous phase, the amount of extravasated contrast increased and changed its morphology, suggesting an active bleeding (Fig. 2).

On coronal view, a significant enlargement of corpus spongiosum was observed. This was caused by the active bleeding, which evacuated through the urethra (Fig. 3).

- Angiography:

The tip of the diagnostic catheter was positioned in the left internal iliac artery ostium and after contrast injection, a contrast blush from the internal pudendal artery was observed (Fig. 4a).

Embolisation was performed using absorbable haemostatic gelatin sponge, to avoid complications (erectile dysfunction) (Fig. 4b, Fig. 5). Despite a correct embolisation, pudendal arteries recanalized and two new contrast blushes were observed, both of them stemming from pudendal arteries (Fig. 6). The use of a liquid embolic agent

(Onyx) was required (Fig. 7).

- Antegrade/retrograde cystourethrogram:

A stenosis in membranous urethra was observed (Fig. 8)

### **Discussion:**

-ANATOMY [1, 4]:

The penis is composed of two corpora cavernosa and a corpus spongiosum.

Corpora cavernosa consist of venous sinusoids surrounded by the tunica albuginea (one of the strongest fascias of the body).

Corpus spongiosum surrounds the urethra and expands anteriorly to form the gland of the penis.

-BLOOD SUPPLY [3]:

The internal pudendal artery has 3 main branches:

1. Dorsal artery, which supplies the glans penis and skin.
2. Cavernosal artery which is located in the centre of each corpus cavernosum.
3. Bulbo-urethral artery which supplies the urethral bulb and posterior corpus spongiosum.

-BACKGROUND [1, 2, 4]

There are 4 main lesions in penile traumas:

1- Penile fracture is a traumatic rupture of the albuginea and corpora cavernosa of an erect penis. Urethra and corpus spongiosum may also be affected.

2- Priapism is a prolonged penile erection not associated with sexual desire.

Priapism is categorized as low flow (hypercoagulability, sickle cell disease, or medication) or high flow (arterial trauma). Low flow priapism is an emergency, it could lead to irreversible ischaemic changes and erectile dysfunction.

3- Intracavernosal haematomas: They are usually bilateral and result from injury to the cavernosal tissue in the absence of complete tunical disruption.

4- Traumatic avulsion of the dorsal penile vessels: Thrombosis of the superficial and deep dorsal penile veins is a urologic emergency. Detumescence of the penis does not occur because tunica albuginea is not affected (key point to differentiate this case from penile fractures).

5- Others: Penile amputation, penetrating injuries and soft tissue injuries.

-IMAGING PERSPECTIVE:

Our case is an example of active bleeding stemming from the bulbourethral artery and caused by a corpus spongiosum tear (penile bulb) (Fig.1). This is an atypical case of penile trauma, involving corpus spongiosum (corpus spongiosum tear) and urethra (Fig. 3). The mechanism of injury unknown.

-OUTCOME:

Four weeks after bilateral embolisation, the patient had normal erections. However, he referred changes in the volume and frequency of urination. An antegrade/retrograde cystography was performed to rule-out urethral injuries. It showed a stenosis in the membranous urethra (Fig. 8).

Antegrade urethrography is advocated in any case of voiding difficulty or haematuria.

-TAKE HOME MESSAGE [1, 2]:

vessel lesion.

Penile fracture is a rupture of the albuginea and corpora cavernosa of an erect penis.

Less likely penile traumas: Penile amputation, penetrating penile injuries and penile soft tissue injuries.

Anterograde urethrography is advocated in any case of voiding difficulty or haematuria.

**Differential Diagnosis List:** Penile trauma - Corpus spongiosum tear, Penile fracture, Priapism, Intracavernosal haematoma, Dorsal penile vessels injury

**Final Diagnosis:** Penile trauma - Corpus spongiosum tear

**References:**

Avery LL, Scheinfeld MH. (2013) Imaging of Penile and Scrotal Emergencies. Radiographics May;33(3):721-40 (PMID: [23674771](#))

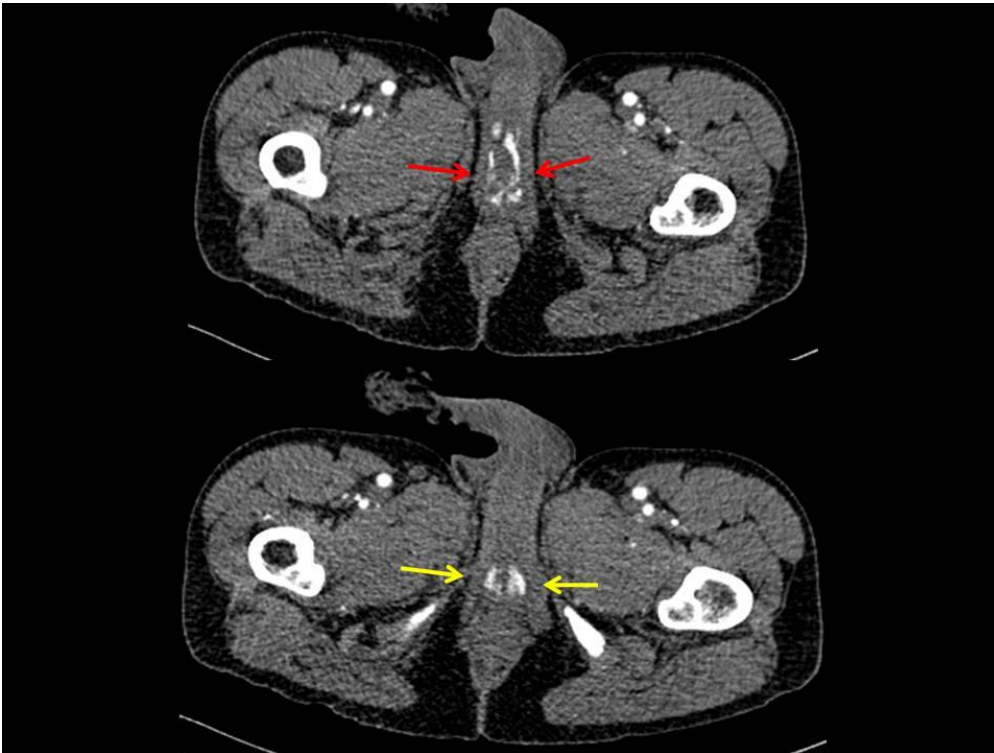
Choi MH, Kim B, Ryu JA, Lee SW, Lee KS. (2000) MR imaging of acute penile fracture. Radiographics Nov-Dec;20(6):1818. (PMID: [10992029](#))

Martinez-Pineiro L, Julve E, Martinez-Pineiro JA. (1997) Topographical anatomy of the penile arteries. Br J Urol 80(3):463–467. (PMID: [9313669](#))

Parker RA, Menias CO, Quazi R, Hara AK, Verma S, Shaaban A, Siegel CL, Radmanesh A, Sandrasegaran K. (2015) MR Imaging of the Penis and Scrotum. Radiographics Jul-Aug;35(4):1033-50 (PMID: [26090569](#))

# Figure 1

a



**Description:** Contrast extravasation within the penile bulb (yellow arrow), which is the base of the corpus spongiosum. Note the anterior extension of contrast within the corpus spongiosum (red arrows).

**Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

b



**Description:** Yellow arrows: Non-enhanced CT showing a voluminous and slightly hypodense corpus spongiosum. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

## Figure 2

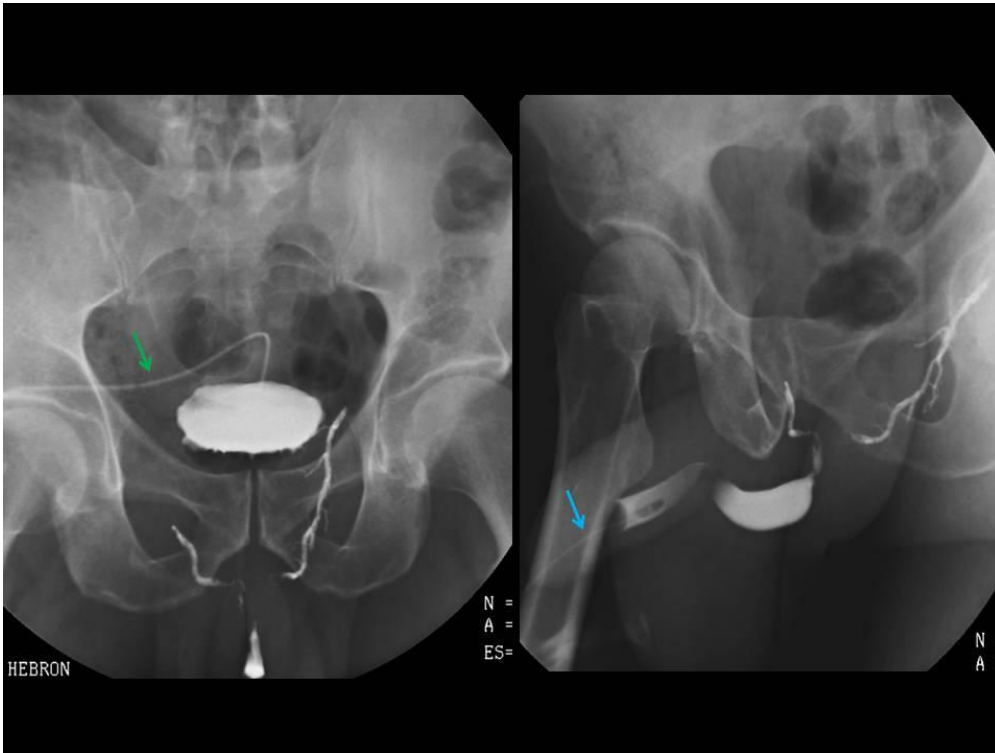
a



**Description:** Contrast extravasation in the penile bulb (yellow arrow) and anterior extension within the corpus spongiosum (red arrows). Extravasated contrast show an increased size as well as a different morphology, suggesting active bleeding. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

## Figure 3

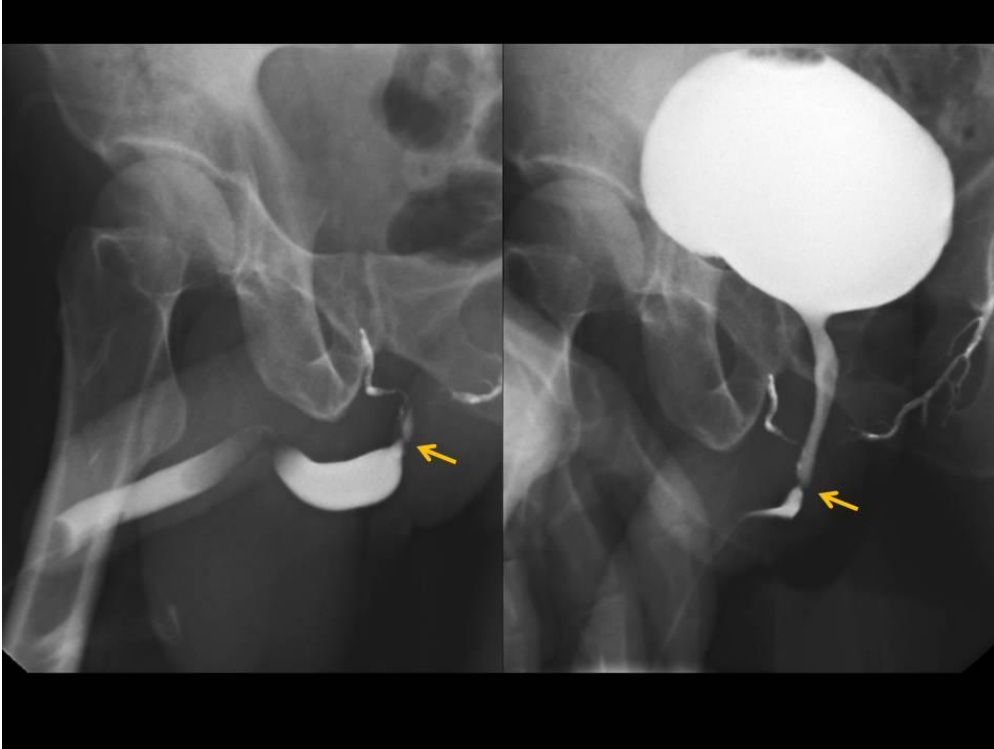
a



**Description:** Green arrow: Suprapubic catheter used to perform an antegrade cystourethrogram.

Blue arrow: Foley catheter tip in the anterior urethra (penile segment) with an inflated balloon at the end, to prevent contrast reflux. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

b

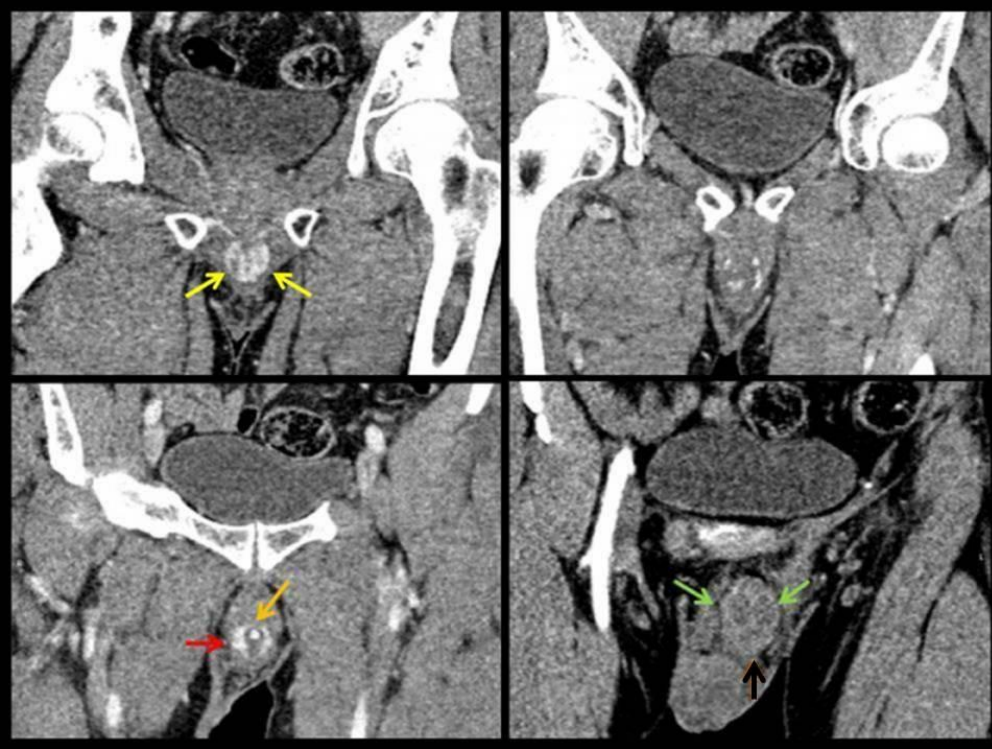


**Description:** Note the stricture in membranous urethra, probably caused by the previous traumatic injury or the ischemic injury of embolisation (yellow arrows). **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department



## Figure 4

a

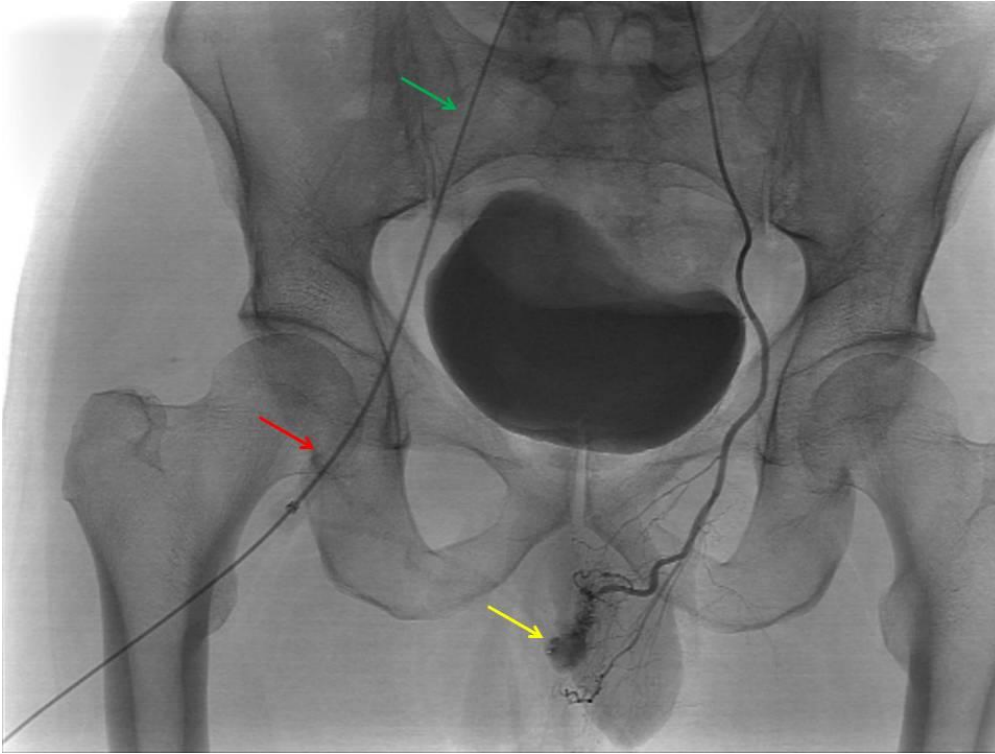


**Description:** Coronal view: - Yellow arrows: Penile bulb / - Red arrows: anterior extension of contrast within corpus spongiosum / - Orange arrow: Urethral extension of contrast.

Normal penile anatomy: Corpus cavernosus (green arrows), corpus spongiosum (black arrow). **Origin:** J.A Prat-Matífol; Vall Hebron Hospital, Radiology Department

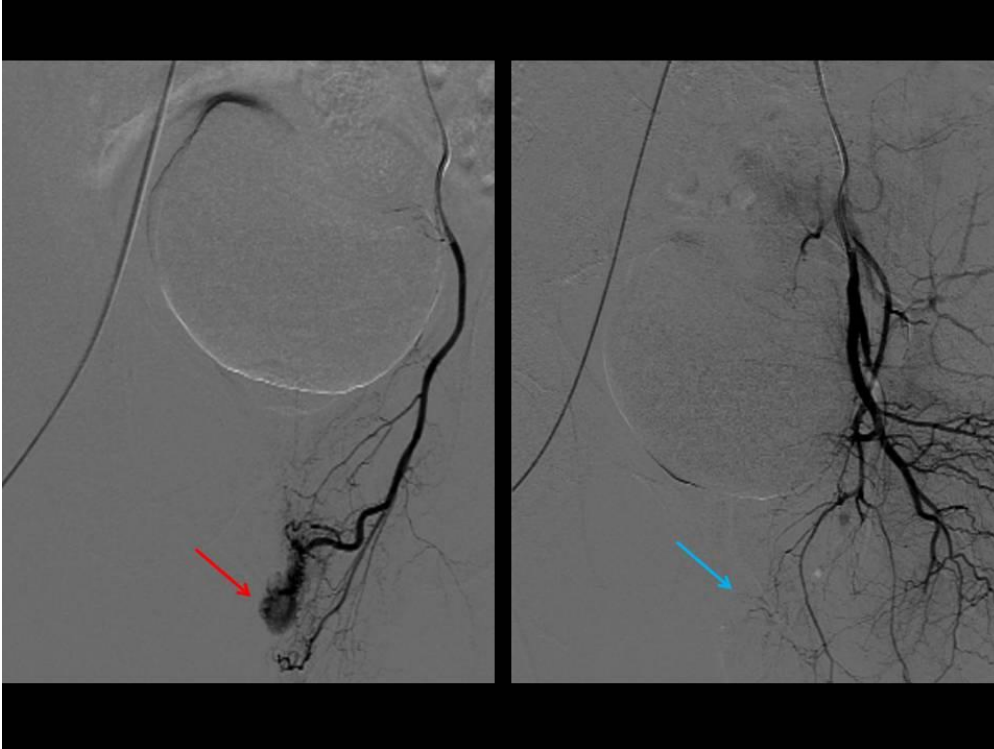
## Figure 5

a



**Description:** Red arrow: Introducer; Green arrow: Diagnostic catheter; Yellow arrow: Left internal pudendal artery contrast blush. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

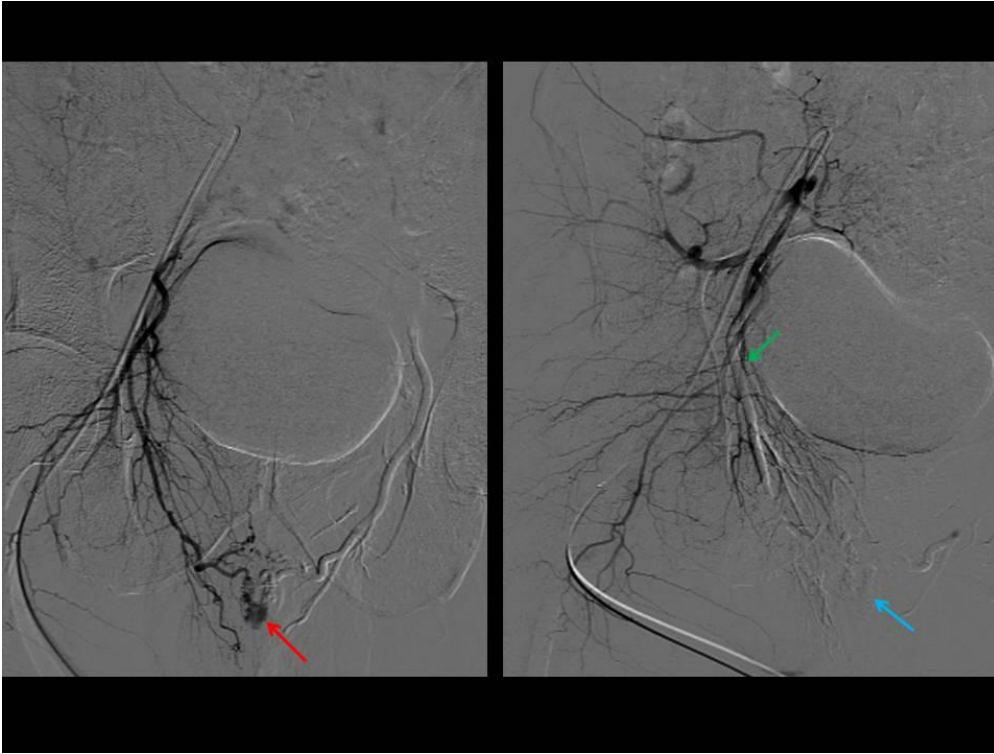
**b**



**Description:** Note the contrast extravasation from the left internal pudendal artery (red arrow). After using absorbable haemostatic gelatin sponge, active bleeding was interrupted (blue arrow). **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

## Figure 6

a



**Description:** At the same time, contrast extravasation from the right internal pudendal artery was observed (red arrow) and the use of absorbable gelatin sponge was required (green arrow). Active bleeding was interrupted (blue arrow). **Origin:** J.A Prat-Matifoll; Radiology Department; Vall Hberon Hospital

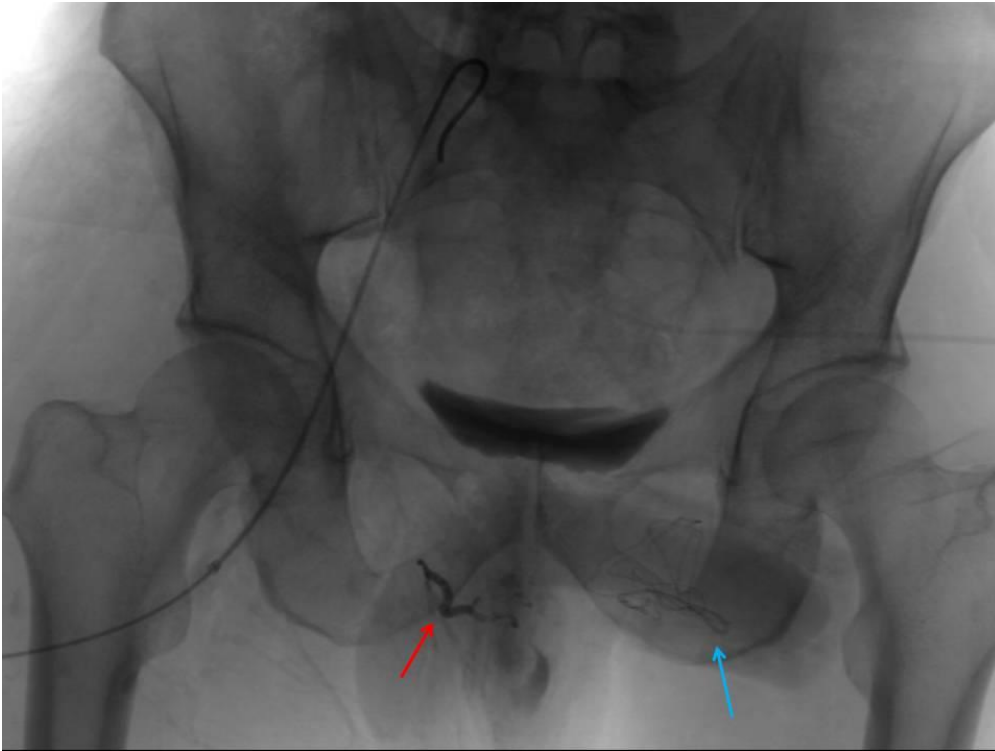
## Figure 7

a



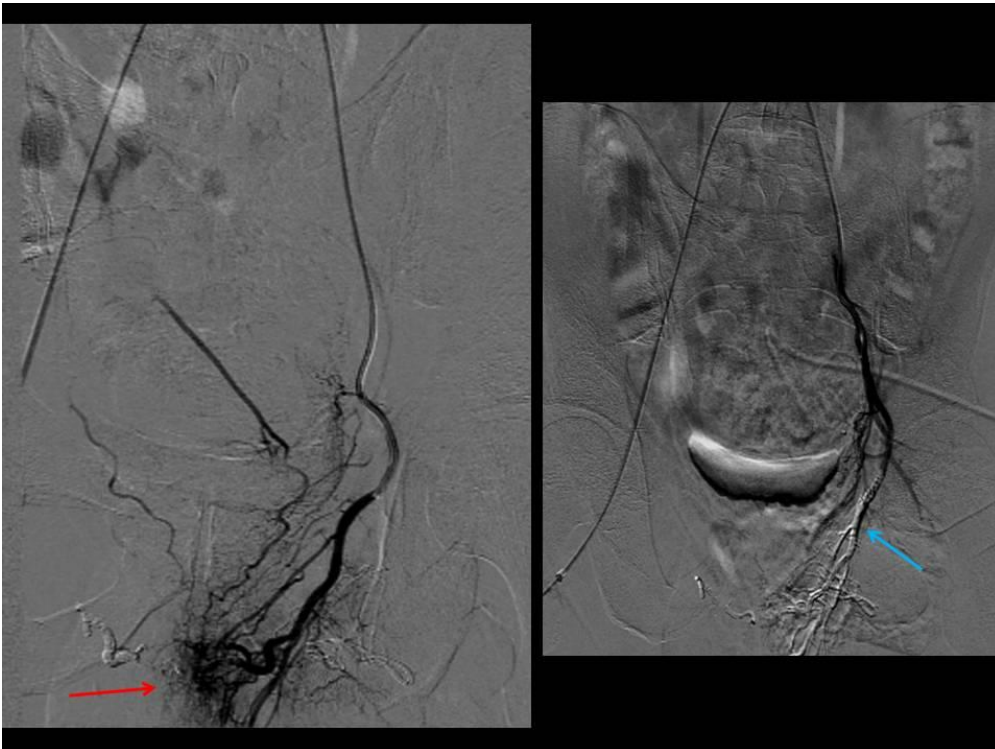
**Description:** After a few minutes, a new focus of contrast extravasation originating in the right internal pudendal artery was observed (red arrow). A selective angiography was performed using a microcatheter (green arrow), confirming the bleeding. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department

**b**



**Description:** A liquid embolic agent (red arrow, Onyx) was injected through a micro-catheter. Blue arrow: gauze pad. **Origin:** J.A Prat-Matfoll; Vall Hebron Hospital, Radiology Department

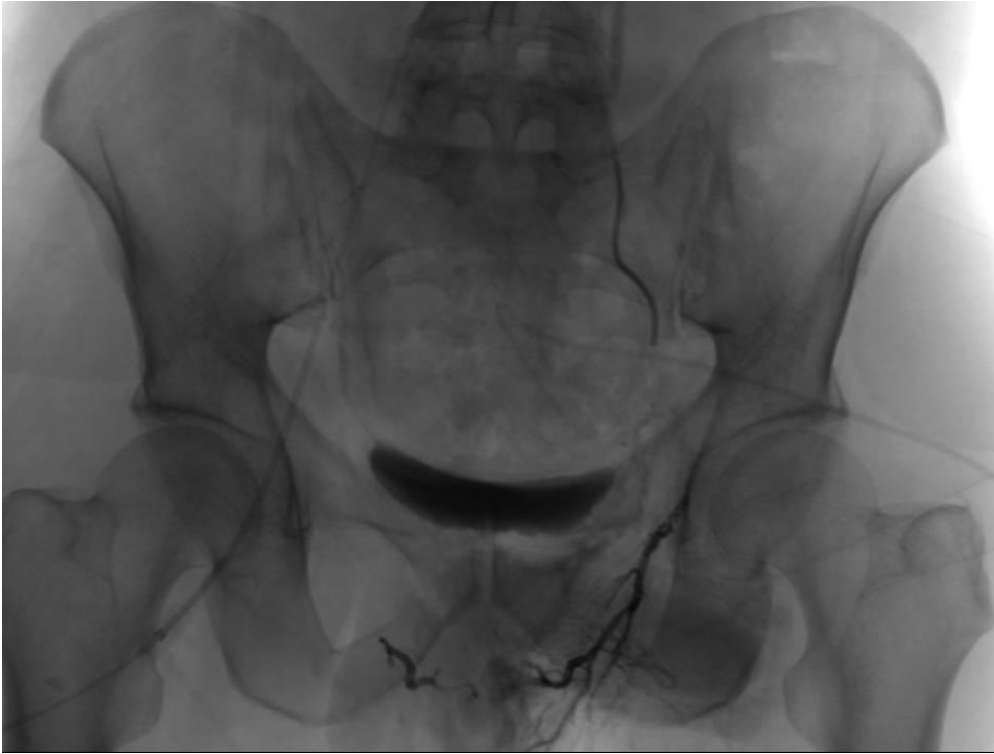
**c**



**Description:** At the same time, another focus of contrast extravasation originating in the left pudendal artery was also observed (red arrow) and required the use of a liquid embolic agent (blue arrow, Onyx). **Origin:** J.A Prat-Matfoll; Vall Hebron Hospital, Radiology Department

## Figure 8

a



**Description:** After the procedure, a pelvic plain film was performed. Note the presence of bilateral liquid embolic agent (Onyx) in both internal pudendal arteries. **Origin:** J.A Prat-Matifoll; Vall Hebron Hospital, Radiology Department