

Case Report

Late Recurrent Hematuria following Laparoscopic Radical Prostatectomy May Predict Internal Pudendal Artery Pseudoaneurysm and Arteriovenous Fistula

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Abstract

We report two cases of a pseudoaneurysm of the internal pudendal artery with arteriovenous fistula after extraperitoneal laparoscopic radical prostatectomy. The clinical presentation was delayed recurrent hematuria and urinary retention that necessitated bladder clot evacuation. Subsequent arteriography detected the vascular abnormality and a superselective embolization was performed. Hematuria was no longer observed, and the quality of penile erection remains unchanged in both patients.

Introduction

PURE OR ROBOT-ASSISTED laparoscopic radical prostatectomy (RALRP) is a current option for surgical management of localized cancer of the prostate.¹ Generally, in the immediate postoperative period, intensive bleeding is not usually observed in the drain or in the Foley catheter left for some days (before removal).

Hematuria in the following weeks is also uncommon, and the recurrence may be associated with a vascular, not a urologic, problem. Hematuria as a consequence of a pseudoaneurysm of an internal pudendal artery with arteriovenous fistula formation was never reported. Only one similar case of accessory pudendal artery pseudoaneurysm with fistula was reported after RALRP.

We present two cases of internal pudendal artery with arteriovenous fistula formation with successful arteriographic management after extraperitoneal pure laparoscopic radical prostatectomy (LRP).

Case Reports

Case 1

A 55-year-old man with localized prostate cancer that involved 20% of the right lobe (transrectal ultrasonography volume of 34 cc; stage pT_{2c}; prostate-specific antigen [PSA]

concentration, 5.1 ng/mL; Gleason score, 7 [3+4]) underwent extraperitoneal LRP. Nerve sparing was bilateral, and anastomosis was performed with a continuous suture with 3-0 polydioxanone. Early postoperative recovery was uneventful, and the patient was discharged from the hospital on postoperative day 2.

On postoperative day 9, the Foley catheter was removed. On postoperative day 20, the patient presented with urinary retention caused by clot formation. A cystostomy was performed, because bladder catheterization could not be achieved in another hospital and the patient was sent to our facility.

Retrograde urethrocystography demonstrated a previous anastomosis and retrovesical contrast extravasation. Urethrocystoscopy showed an inferior partial dehiscence, and the clots were evacuated from the bladder without identification of an active bleeding site. The patient remained with the Foley catheter, the suprapubic catheter was removed, and the patient was discharged the next day with hematuria resolution.

On postoperative day 30, the patient had another episode of macroscopic hematuria that again needed clot evacuation. Hematuria started after the patient awoke with an erection. Arteriography revealed a left internal pudendal artery pseudoaneurysm with arteriovenous fistula formation (Fig. 1A) eliminated by superselective embolization with 1 mL of

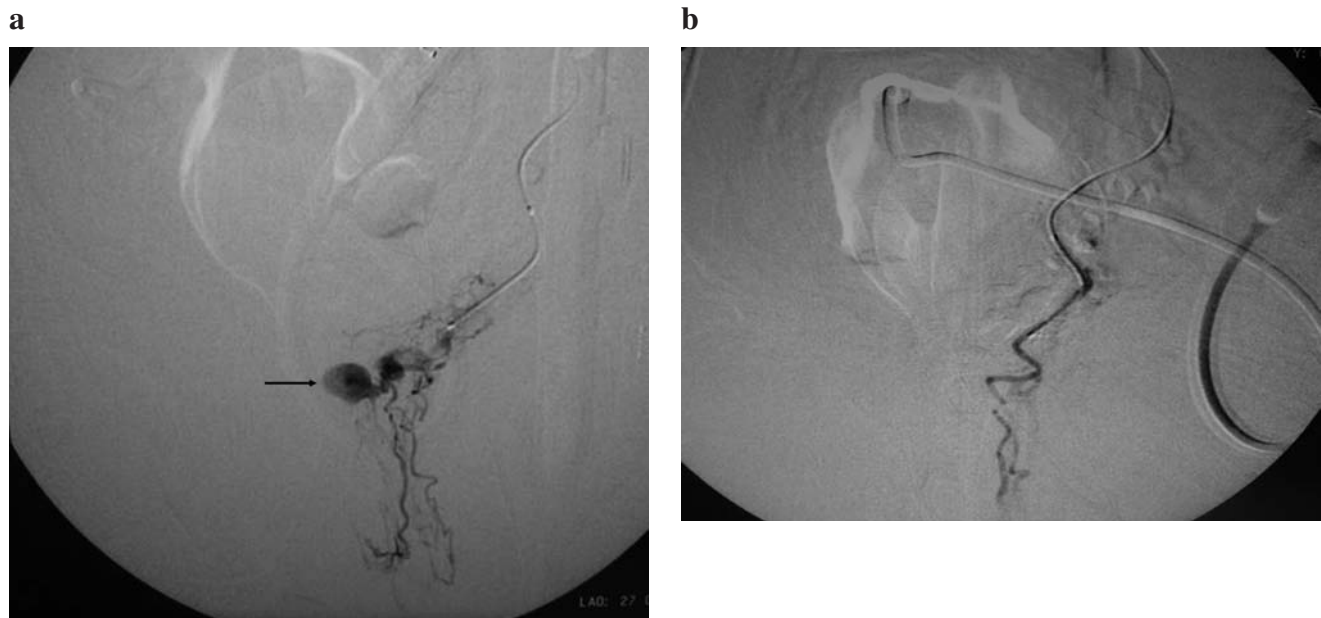


FIG. 1. (a) Pseudoaneurysm (arrow) arises from the left internal pudendal artery. (b) Postembolization image shows successful management of the pseudoaneurysm.

N-butyl-cyanoacrylate in lipiodol (70% glue and 30% lipiodol) (Fig. 1B).

There were no postprocedure complications or further hematuria. One year after surgery, the patient is continent (without pads), with preserved erectile function (good response with sildenafil 100 mg) and a PSA level of 0.02 ng/mL.

Case 2

A 57-year-old-man with early localized prostate cancer that involved 60% of the left lobe (transrectal ultrasonogra-

phy volume 48 cc; stage pT_{2c}; PSA concentration, 3.8 ng/mL with free PSA/total PSA of 2%; Gleason score 3+3) underwent extraperitoneal LRP. Nerve sparing was bilateral, and anastomosis was performed with a continuous suture with 3-0 polydioxanone.

Early postoperative recovery was normal, with hospital discharge on postoperative day 2 and Foley catheter removal on postoperative day 8. On postoperative day 21, the patient presented with hematuria and bladder retention. The episode followed a strong sneeze. Urethrocystoscopy for clot evacuation was performed and showed partial dehiscence of the posterior aspect of the vesicourethral anastomosis, with-

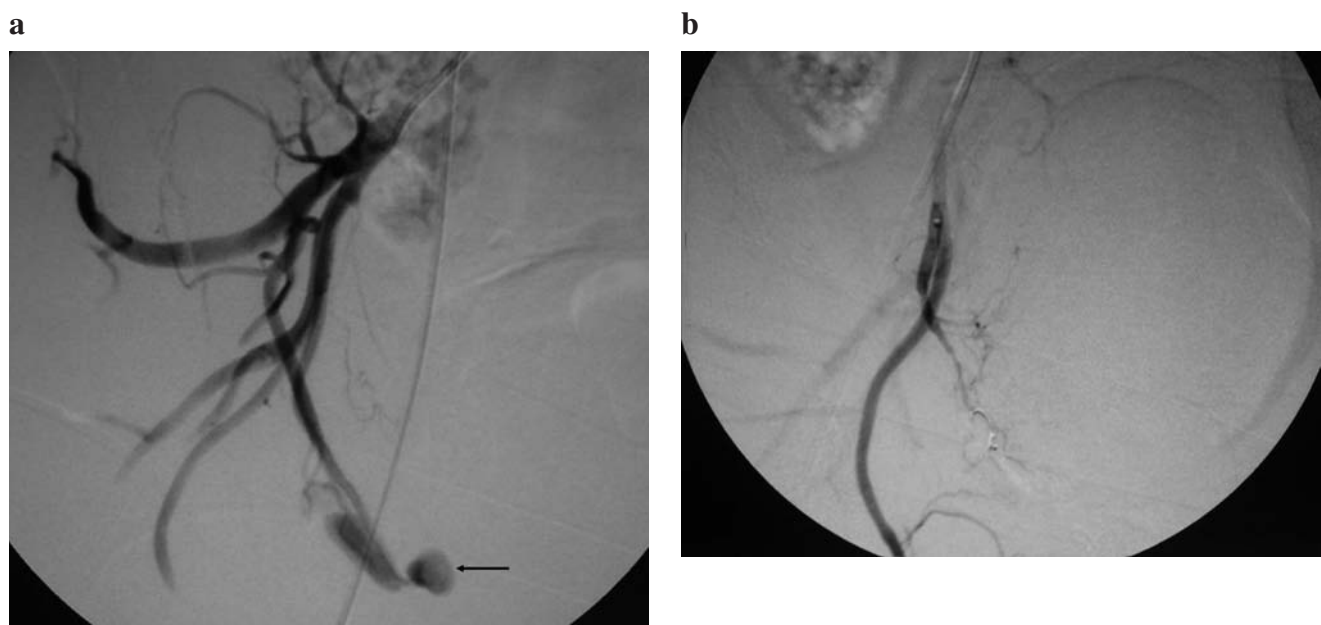


FIG. 2. (a) Pseudoaneurysm arises from the right internal pudendal artery. Note that a vein arises from pseudoaneurysm. (b) Postembolization image demonstrates successful management of the pseudoaneurysm.

out active bleeding. The Foley catheter was left in place for one additional week.

On postoperative day 28, the patient presented with a second episode of hematuria and once more needed clot evacuation. Arteriography revealed a right internal pudendal artery pseudoaneurysm with arteriovenous formation (Fig. 2) and superselective embolization with a 2×2.5 mm coil produced an adequate angiographic result (Fig. 2B).

There were no postprocedure related complications or further hematuria. One year after surgery, the patient is continent (without pads), with good erectile function, and a PSA level of 0.04 ng/mL.

Discussion

Internal pudendal artery pseudoaneurysm with arteriovenous fistula formation has not been reported to date. Only one case of accessory pudendal artery pseudoaneurysm with arteriovenous fistula formation was reported after RALRP.² To our knowledge, there is no report after traditional open retropubic prostatectomy. We report the first two cases after our experience of 100 extraperitoneal LRPs.

In our cases and also in the case reported by Beckley and coworkers,¹ presentation was recurrent hematuria and the need for bladder clot evacuation. As a consequence of recurrent bleeding, angiography (or CT angiography) was necessary to elucidate the origin of bleeding and, in such cases, internal pudendal artery pseudoaneurysms were diagnosed.

The management with selective embolization was successful in our cases without pos-procedure complications with respect to erectile function or further hematuria. Reported substances used for embolization of pudendal arterial system alterations include autologous clots, absorbable gelatin sponge (Gelfoam), coils or microcoils, polyvinyl alcohol foam (Ivalom), tissue adhesive, N-butyl-cyanoacrylate or a combination of the mentioned substances.³

In case 1, embolization was performed with N-butyl-cyanoacrylate, a glue that undergoes polymerization when in contact with blood and adheres firmly to the endothelium, causing a permanent arterial occlusion. In case 2, we used a 2×2.5 mm coil to manage the internal pudendal pseudoaneurysm. As seen in Fig. 2A, there was a vein just after the pseudoaneurysm (arrow). In this case, treatment with particles, such as autologous clots, was contraindicated because of the risk of pulmonary embolism if these substances embolized in the pudendal arterial system, then reached the venous system and ultimately the pulmonary circulation. Therefore, it is necessary to be cautious about the properties of materials used for embolization to avoid serious complications.

Pseudoaneurysm of the internal pudendal artery is most commonly a complication of blunt and penetrating pelvic trauma.³ We believe that in LRP or RALRP, it might be the result of small bleeding (under CO₂ pressure) left behind in the dissection of the prostate when seeking nerve-sparing techniques. Another hypothesis may be in-block artery and vein ligature using clips or other kind of ligature, as rarely described for renal pedicle. The acquired vascular anomaly predisposes to bleeding, especially after a sudden effort or under penile erection. The intermittent bleeding accumulated in the retrovesical space drains spontaneously through the vesicourethral anastomosis.

On the other hand, it is well known that pseudoaneurysm and arteriovenous internal pudenda fistula can cause high-

flow priapism³ not observed in our patients. There is also a risk of erectile dysfunction with embolization for the management pseudoaneurysm of pudendal artery.³

The two major mechanisms for postprostatectomy erectile dysfunction are neural and vascular injury. Because the internal pudendal arterial system provides the inflow for penile tumescence and rigidity, there is increased interest in the role of pudendal artery preservation, including accessory pudendal arteries, which may be identifiable in a third of all men during radical prostatectomy.^{4,5} Their preservation is considered critical to erectile function after radical prostatectomy and, therefore, surgeons should try to preserve them.⁵ The exact influence of the pudendal arterial system in postprostatectomy erectile dysfunction is still under investigation.

In our patients, although a unilateral pudendal artery pseudoaneurysm was found and managed with occlusive embolization, hopefully both patients could achieve good erections, with sildenafil used by one of the patients.⁴

Based on our two cases and one previously reported, we propose that in cases of late recurrent hematuria after LRP, prompt angiography is recommended to detect and manage an eventual arteriovenous fistula and pseudoaneurysm of the internal pudendal artery.

Disclosure Statement

No competing financial interests exist.

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Abbreviations Used

LRP = laparoscopic radical prostatectomy
PSA = prostate-specific antigen
RALRP = robot-assisted laparoscopic radical prostatectomy

