



# Traumatic cavernosal artery pseudoaneurysm: a rare cause of erectile dysfunction following pelvic trauma: a case report and comprehensive literature review

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**Introduction and importance:** Erectile dysfunction (ED) resulting from pelvic trauma, particularly cavernosal artery pseudoaneurysm, poses a complex clinical challenge. Traumatic injuries, including blunt force trauma, can lead to diverse vascular complications affecting erectile function. Recognizing and addressing these issues is pivotal for optimal patient management.

**Case presentation:** A 40-year-old male presented with gradual-onset ED following a traumatic incident, involving a fall from a bike and subsequent hematoma on the penile shaft. Despite initial successful conservative management, the patient experienced recurrent symptoms. Comprehensive evaluation, including ultrasonography and computed tomography (CT) angiography, revealed a cavernosal artery pseudoaneurysm. The diagnostic journey involved Doppler ultrasound and penile arteriography, confirming the arteriogenic etiology.

**Clinical discussion:** Pelvic trauma, a common cause of erectile dysfunction in men under 40, can lead to cavernosal arterial injuries and pseudoaneurysms. This condition often results from blunt perineal trauma or iatrogenic factors, requiring precise diagnostic tools like Doppler ultrasound and penile arteriography. Treatment options include coil embolization and Gelfoam application, emphasizing the importance of timely intervention.

**Conclusion:** Successful angiography and coil embolization yielded significant improvement in symptoms for the presented case. This underscores the critical role of accurate diagnosis and tailored interventions in addressing cavernosal artery pseudoaneurysms resulting from pelvic trauma, thereby enhancing patient outcomes and quality of life.

**Keywords:** cavernosal artery pseudoaneurysm, doppler ultrasound, erectile dysfunction, pelvic trauma

## Introduction

Erectile dysfunction is a common complication of pelvic and perineal trauma<sup>[1]</sup>. Impotence is the most common sign of erectile dysfunction; however, priapism, which is an extended erection, can also be a minor aspect of it<sup>[2]</sup>. Trauma is the most common cause of impotence in men under 40. The mechanisms could involve, central or peripheral nerve injury, proximal or distal artery injury, or venous leak. In pelvic trauma, pelvic bone fractures related to posterior urethral injuries most likely cause urethral injuries. The most important vessel in the erectile process is

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## HIGHLIGHTS

- This study elucidates the rare occurrence of cavernosal artery pseudoaneurysm as a consequential complication of pelvic trauma, emphasizing its role in arteriogenic erectile dysfunction in men under 40.
- A comprehensive diagnostic approach, utilizing Doppler ultrasound and penile arteriography, leads to successful identification and subsequent treatment of the pseudoaneurysm through angiography and coil embolization.
- The successful intervention emphasizes the significance of early recognition and tailored management for improving erectile function and patient satisfaction.

the cavernosal artery. Traumatic pseudoaneurysm of the cavernosal artery is an uncommon but recognized condition since the patient presents with high-flow priapism<sup>[3]</sup>. Here, we present a case of a male presenting with erectile dysfunction 2 months following an episode of trauma.

This case has been reported in line with Surgical Case Reports (SCARE) guidelines<sup>[4]</sup>.

## Case details

A 40-year-old male presented at our Outpatient Department (OPD), reporting concerns about erectile dysfunction. He

experienced difficulty in sustaining an erection despite being able to initiate a normal one during sexual activities. The onset of symptoms was gradual, with his initial awareness occurring approximately a week prior. He described the symptoms as inconsistency in maintaining an erection throughout sexual activity. The patient recalled a history of injury, having fallen from his bike about 3 months earlier. This incident resulted in a hematoma on the shaft of the penis, which was managed conservatively in the emergency department. The patient reported a successful restoration of normal erectile function following this treatment. He did not complain of painful erections. He was a non-smoker and did not have a history of known comorbidities like hypertension and diabetes. He was not currently under any medications. The patient had not undergone any surgeries. He was sexually active and in a monogamous relationship with his wife. He described his relationship as stable and with mutual support and understanding. He did not have any symptoms suggestive of anxiety or depression but was concerned about the impact of the erectile dysfunction on his relationship.

During the examination, he presented well, with a moderate build, and showed no apparent distress. There were no signs of pallor, icterus, edema, or dehydration. Vital signs were within normal limits. The physical examination, including the assessment of the genitals, did not reveal any abnormalities. A comprehensive panel of tests including complete blood count (CBC), liver function test (LFT), renal function test (RFT), thyroid function test (TFT), lipid profile, random blood sugar (RBS), and testosterone levels was conducted, all of which returned normal results (Table 1). Additionally, ultrasonography of the penis with spectral Doppler was performed. Ultrasonography displayed a

sub-centimetric anechoic area in the left corpus cavernosus, and the Doppler study indicated a focal outpouching from the left cavernosal artery with a ying and yang pattern (Figs. 1A and B). This was followed by computed tomography (CT) angiography which confirmed a cavernosal artery pseudoaneurysm (Figs. 2A and B). The patient was explained about the diagnosis and treatment options were discussed. He subsequently underwent successful angiography and coil embolization. The patient declined a post-embolization CT scan due to financial constraints; however, on follow-up he described an improvement in symptoms. He expressed satisfaction with the outcome of the procedure.

### Discussion

Erectile Dysfunction (ED) is the consistent inability to achieve or maintain a rigid penile erection for satisfactory sexual performance. It commonly affects men over 40, with a global prevalence of 16%, rising to 22% in the US, with increasing age<sup>[5]</sup>. ED can be caused by any disease process that affects penile arteries, nerves, hormone levels, smooth muscle tissue, corporal endothelium, or tunica albuginea including neurological, psychogenic, structural, hormonal, drug-induced, and vasculogenic factors<sup>[6]</sup>. The major risk factors associated with ED include diabetes, hypertension, hyperlipidemia, cardiac disease, and depression, all of which have been observed frequently in individuals with ED<sup>[5]</sup>. In men under the age of 40, pelvic or perineal trauma is frequently cited as the primary cause of ED<sup>[6]</sup>. Pelvic or perineal trauma often leads to arterial injury, a significant factor in ED. Pseudoaneurysm of the cavernosal artery, though rare, occurs when a sac forms, communicating with the arterial lumen, confined by surrounding tissues post-injury. Unlike true aneurysms, pseudoaneurysms involve one or two arterial wall layers, usually just the adventitia<sup>[7]</sup>. These pseudoaneurysms are characterized by contained disruptions of the vascular wall, resulting in turbulent blood flow and hematoma formation<sup>[7-9]</sup>. Therefore, arteriogenic ED commonly presents in men who have experienced pelvic or perineal trauma<sup>[6]</sup>. The presence of a pseudoaneurysm can result in catastrophic complications such as permanent erectile dysfunction, life-threatening hemorrhage, and mortality. Hence, early diagnosis and prompt intervention are crucial in the management of cavernosal pseudoaneurysms.

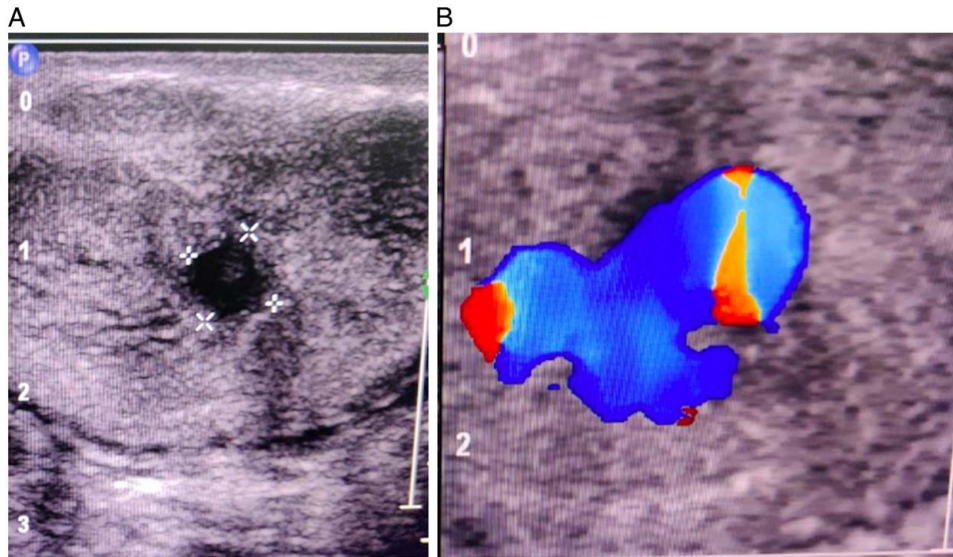
ED manifests as persistent difficulty in achieving or maintaining an erection, often accompanied by decreased sexual desire, impacting both individual and partner's quality of life. Post-traumatic pseudoaneurysms, though often asymptomatic, can cause sexual difficulties, necessitating suspicion, especially in young males. Symptoms may include hematoma, swelling, or penile curvature, observed during local examination<sup>[10]</sup>. In our case, the patient presented with erectile dysfunction two months after sustaining trauma to the penis from a motorcycle accident. He experienced sexual difficulties, particularly in maintaining an erection despite being able to initiate penetration. Local examination revealed no presence of hematoma, swelling, or abnormal curvature of the penile shaft.

Imaging plays an important role in the identification of pseudoaneurysms. Doppler ultrasound is employed to classify arteriogenic erectile dysfunction by analyzing the blood flow pattern. It remains a key diagnostic tool for distinguishing between

**Table 1**  
**Biochemical parameters of the patient.**

Test	Result	Unit	Reference
WBC	10 200		/cumm
4000–10 000			
Differential count			
Neutrophil	71	%	40–70
Lymphocyte	28	%	20–45
Eosinophil	01	%	1–6
Monocyte	00	%	2–10
Basophil	00	%	0–1
Hemoglobin	15	gm/dl	13–18
P.C.V	44	%	40–54
Platelets	244 000		/cumm
150 000–400 000			
Total cholesterol	173	mg/dl	75–220
Triglyceride	110	mg/dl	35–150
HDL cholesterol	50	mg/dl	40–75
LDL cholesterol	115	Mg/dl	< 150
Serum bilirubin total	0.8	mg/dl	0.4–0.1
Serum bilirubin direct	0.3	mg/dl	0–0.4
Alanine transaminase	24	IU/l	5–35
Aspartate transaminase	23	IU/l	5–40
Alkaline phosphatase	104	IU/l	3–150
Total protein	7.5	gm/dl	6–8
Albumin	4.1	gm/dl	3.5–5.5
Random blood sugar	105	mg/dl	70–140
Serum testosterone	440	ng/dl	350–450

HDL, High density lipoprotein; LDL, Low- density lipoprotein; P.C.V, Packed Cell Volume; WBC, white blood cell.

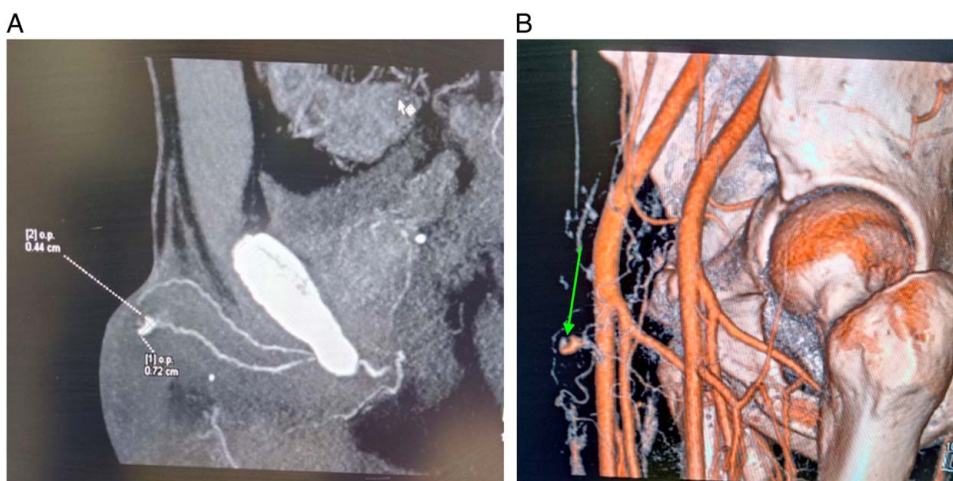


**Figure 1.** (A) Greyscale ultrasound image showing sub-centimetric anechoic lesion in left corporal cavernosum of penis. (B) Doppler ultrasound image showing focal outpouching arising from cavernosal artery with ying and yang pattern in left corpora cavernosum.

hemodynamic abnormalities in the penile inflow and outflow tracts<sup>[11]</sup>.

Color Doppler sonograms reveal arterial flow within the cavity exhibiting a characteristic “Yin and Yang” or “swirl” pattern, alongside a dilated feeding artery. This technique is favored for pseudoaneurysm diagnosis due to its sensitivity, non-invasiveness, and accessibility, although bilateral internal pudendal angiography remains the gold standard. Penile ultrasound, CT scan, and MRI are additional useful imaging modalities for assessing associated injuries<sup>[8,12]</sup>. In our patient, a penile ultrasound revealed a sub-centimetric anechoic area in the corpora cavernosa, while the color Doppler study indicated a focal outpouching from the cavernosal artery with a “Ying and yang” pattern. Subsequent CT angiography confirmed the presence of a cavernosal artery pseudoaneurysm.

Cavernosal pseudoaneurysms can be managed using either embolization or traditional surgical techniques. The choice of management depends on the physician’s experience and preference. The available surgical procedures include proximal ligation of the internal pudendal artery, shunting, penile exploration with incision, irrigation, and drainage of corporeal sinuses, and percutaneous aspiration of the corpus cavernosum. However, surgical interventions carry the risk of postoperative complications and subsequent erectile dysfunction<sup>[7,8]</sup>. While there is limited data directly comparing the effectiveness of these procedures in patients with traumatic pseudoaneurysms, selective arterial embolization is currently the preferred therapy in experienced hands with higher rates of detumescence, lower rates of post-procedure erectile dysfunction, and minimal complication rates<sup>[7,8]</sup>. Both microcoil and gelfoam are commonly used as



**Figure 2.** (A) Sagittal maximum intensity projection thin reconstructed computed tomography angiography image showing sub-centimetric focal outpouching arising from the left cavernosal artery. (B) Sagittal 3D VRT reconstructed image showing the focal outpouching arising from a left cavernosal artery (green arrow).

embolizing techniques and have yielded similar outcomes<sup>[6]</sup>. Regardless of the embolization technique chosen, outcomes tend to be very similar, with erectile function returning to normal in all reports upon follow-up<sup>[6–8]</sup>. Following successful treatment with arterial embolization, a postprocedural penile Doppler ultrasound evaluation is recommended to assess for recanalization of the embolized cavernosal artery<sup>[8]</sup>. Our patient underwent successful angiography and coil embolization. He reported an improvement in erectile function. Although a post-embolization CT scan was declined, the patient expressed satisfaction with the outcome after embolization on follow-up.

The review of the articles revealed only one case of spontaneous resolution of pseudoaneurysm<sup>[13]</sup>. The majority of cases were successfully treated with angioembolization, while one case required a surgical procedure (Table 2)<sup>[13–22]</sup>.

**Conclusion**

This case report highlights the critical role of accurate diagnosis and tailored interventions in addressing ED due to cavernosal artery pseudoaneurysms resulting from pelvic trauma. Successful angiography and endovascular coil embolization reveal the effectiveness of individualized management strategies leading to significant improvement in symptoms and enhanced quality of life in this patient.

**Ethical approval**

This case report did not require review by the ethical committee.

**Consent**

Written informed consent was obtained from the patient for publication of this case report and the accompanying images. A copy of the written consent is available for review by the Editor-in-chief of this journal on request.

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None.

**Author contribution**

S.K.: conceptualization, as mentor and reviewer for this case report and for data interpretation. A.G.: contributed in performing literature review and editing. P.P.: contributed in writing the paper and reviewer for this case. B.K.: contributed in writing the paper. All authors have read and approved the manuscript.

**Conflicts of interest disclosure**

All the authors declare that they have no competing interest.

**Research registration unique identifying number (UIN)**

Not applicable.

**Table 2**

**Literature review of various case reports of cavernosal artery trauma.**

Authors	Year	Etiology	Clinical feature	Diagnostic modality	Lesion size	Management	Time for formation	Pathology of cavernosal artery
Kumar <i>et al.</i> <sup>[13]</sup>	2006	Blunt perineal trauma	Painless priapism	ultrasound and DSA	NA	Spontaneous resolution	10 days	Pseudoaneurysm
Köse <i>et al.</i> <sup>[14]</sup>	2012	Blunt trauma	Mass in cavernous body	MRI and color Doppler Study	1 cm	Surgical	3 months	Pseudoaneurysm
Mourikis <i>et al.</i> <sup>[15]</sup>	2000	Straddle injury	Painless priapism	Ultrasound and arteriogram	NA	Supers elective microcoil embolization	NA	Pseudoaneurysm
Yilmaz <i>et al.</i> <sup>[16]</sup>	2003	Blunt perineal trauma	Painless priapism	Ultrasound and arteriogram	NA	N-butyl-cyanocrylate embolization	2 months	Pseudoaneurysm with fistula
Yesilkaya <i>et al.</i> <sup>[17]</sup>	2013	Straddle perineal trauma	Painless priapism for 1 month	Ultrasound and arteriogram	1.5 cm	Autologous blood clot	1 month	Pseudoaneurysm
Dallas <i>et al.</i> <sup>[18]</sup>	2017	Straddle perineal trauma	Intermittent urethral bleeding	Angiogram	NA	Coil embolization	5 weeks	Pseudoaneurysm and cavernosal urethral fistula
Williams <i>et al.</i> <sup>[19]</sup>	2021	Blunt trauma perineum	Painless priapism	Ultrasound, CT angiogram and DSA	NA	Microcoil embolization	NA	Pseudoaneurysm
Lee <i>et al.</i> <sup>[20]</sup>	2003	Blunt trauma perineum	Erectile dysfunction	Ultrasound and angiogram	1 × 1 cm	Microcoil embolization	NA	Pseudoaneurysm
Akpinar <i>et al.</i> <sup>[21]</sup>	2016	Blunt perineal trauma	Painless priapism	Ultrasound and DSA	2.1 × 1.3 cm	Autologous blood clot	NA	Pseudoaneurysm and fistula
Arunachalam <i>et al.</i> <sup>[22]</sup>	2021	Spontaneous	Priapism	Ultrasound, MRI and DSA	2 × 1 cm	Endovascular embolization (alcohol and gelfoam)	NA	Pseudoaneurysm
Our Study	2024	Blunt perineal Trauma	Erectile dysfunction	Ultrasound, CT angiogram and DSA	7.2 × 4.4 mm	Endovascular embolization with coil	1 month	Pseudoaneurysm

CT, computed tomography; DSA, digital subtraction angiography; NA, not available.



**Guarantor**

Shailendra Katwal.

**Data availability statement**

Data sharing is not applicable to this article.

**Provenance and peer review**

Not commissioned, externally peer-reviewed.

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