SVOA Orthopaedics

e-ISSN 2752-9576

ScienceVolks Open Access

Case Report

Profunda Femoris Artery Pseudoaneurysm Following Primary Total Hip Arthroplasty: A Rare Vascular Complication with Review of Literature

Anu Ranjan[1*], Prateek Gupta[1], Hariharan Triplicane Dwarakanathan[1], Rohit Maheshwari[1]

[1]Golden Jubilee National Hospital, Glasgow, United Kingdom.

***Corresponding Author:** Anu Ranjan, Golden Jubilee National Hospital, Glasgow, United Kingdom.

https://doi.org/10.58624/SVOAOR.2026.06.005

Received: January 14, 2026

Published: February 17, 2026

Citation: Ranjan A, Gupta P, Dwarakanathan HT, Maheshwari R. Profunda Femoris Artery Pseudoaneurysm Following Primary Total Hip Arthroplasty: A Rare Vascular Complication with Review of Literature. *SVOA Orthopaedics 2026*, 6:1, 46-50. doi: 10.58624/SVOAOR.2026.06.005

Abstract

Background: Vascular injury following total hip arthroplasty (THA) is rare, with an estimated incidence of 0.16–0.25%. Pseudoaneurysm of the profunda femoris artery (PFA) represents an exceptionally uncommon subset, accounting for less than 0.05% of vascular complications. Early diagnosis is essential to prevent rupture and ischemic sequelae.

Case Presentation: A 71-year-old female underwent elective primary left total hip arthroplasty through a posterior approach for advanced osteoarthritis. The immediate postoperative course was uneventful; however, on the ninth postoperative day, she developed acute left thigh pain, progressive swelling, and foot drop with absent distal pulses. Computed tomographic angiography revealed a PFA pseudoaneurysm measuring 16 × 20 mm with contained rupture and submuscular hematoma. Despite initial ultrasound-guided thrombin injection, the lesion enlarged to 22 × 24 mm. Urgent open vascular exploration identified a focal arterial wall defect, which was repaired primarily with restoration of luminal continuity. The postoperative period was stable, with restoration of distal circulation and satisfactory functional recovery.

Conclusion: Profunda femoris artery pseudoaneurysm is a rare but critical vascular complication that may occur even after primary THA due to indirect iatrogenic arterial injury. Prompt diagnosis using computed tomographic angiography and early surgical or endovascular intervention are vital to prevent catastrophic outcomes.

Keywords: *Total hip arthroplasty, Profunda femoris artery, Pseudoaneurysm, Computed tomographic angiography, Vascular repair*

Introduction

Total hip arthroplasty (THA) is one of the most frequently performed and successful orthopedic procedures worldwide, with over 370,000 cases annually in the United States and projected to exceed 700,000 by 2030 [1]. The overall complication rate after THA is approximately 6%, while vascular injuries account for only 0.16–0.25% of all cases [2]. Among these, pseudoaneurysm formation constitutes less than 0.05%, with the profunda femoris artery (PFA) being an exceptionally rare site of involvement. Most reported cases occur following revision surgeries or in the perioperative period, often linked to retractor malposition, drill or screw penetration, or migration of orthopedic hardware [1-2].

Clinical manifestations are often subtle, including persistent postoperative anemia, thigh swelling, or pain, leading to delayed diagnosis.

Duplex ultrasonography and computed tomographic angiography (CTA) are the preferred diagnostic tools, while endovascular embolization or covered stent placement represents the current standard of care [3]. Hence, present report illustrates a rare case of profunda femoris pseudoaneurysm following primary THA, highlighting diagnostic challenges and management strategies for this uncommon but potentially life-threatening complication.

Case Presentation

A 71-year-old female with a history of chronic tobacco use underwent an elective left total hip arthroplasty (hybrid construct, ceramic-on-polyethylene bearing surface) for advanced primary osteoarthritis of the hip. The procedure was performed through a posterior surgical approach with the patient in the right lateral decubitus position. Intraoperative findings were unremarkable, with no evidence of vascular injury, cortical perforation, or excessive intraoperative blood loss. Immediate postoperative radiographs demonstrated anatomically aligned femoral and acetabular components without periprosthetic fracture (Figure 1). The patient was mobilized with full weight-bearing on the first postoperative day and discharged on the second postoperative day in satisfactory condition.

On the ninth postoperative day, the patient presented to the emergency department with acute onset of severe left thigh pain, progressive swelling, inability to dorsiflex the foot, and absent distal pulses. Clinical assessment indicated acute vascular compromise. Computed tomographic angiography (CTA) of the left lower limb demonstrated a pseudoaneurysm of the profunda femoris artery (PFA) measuring 16 × 20 mm, with evidence of contained rupture and a submuscular hematoma within the gluteal compartment (Figure 2). Conservative management was initially attempted with ultrasound-guided thrombin injection, followed by repeat imaging after 24 hours. The subsequent scan revealed increase in pseudoaneurysm dimensions to 22 × 24 mm, predominantly localized within the pectineus muscle (Figure 3), indicating progressive expansion.

Given the enlarging pseudoaneurysm and risk of rupture, the patient underwent urgent open vascular exploration and repair of the PFA. Intraoperative CTA slice reconstruction confirmed localization of the lesion near the proximal shaft of the femur (Figure 4). Postoperatively, the patient demonstrated hemodynamic stability, resolution of thigh swelling, restoration of distal arterial pulsations, and progressive recovery of motor function.

Figure 1. Pre- and postoperative pelvic radiographs showing advanced left-hip osteoarthritis (A) and well-positioned total hip prosthesis (B).

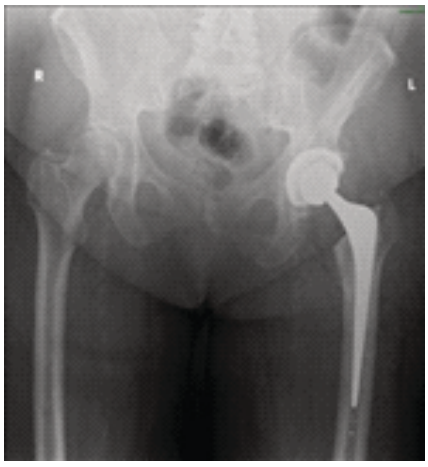

Figure 2. Coronal CT angiogram showing pseudoaneurysm of the profunda femoris artery with surrounding hematoma.

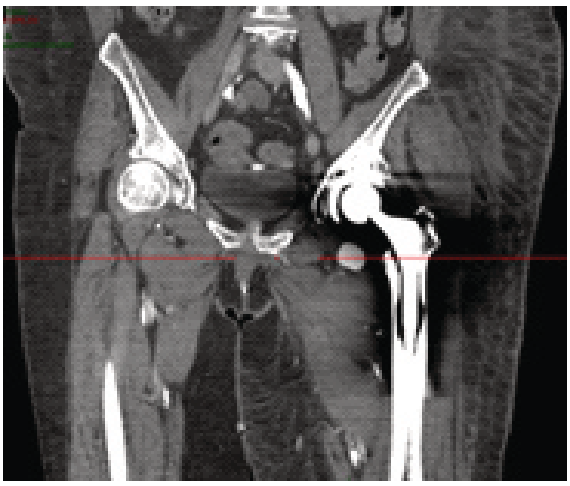

Figure 3. Axial CTA demonstrating a 16.9 × 20.2 mm pseudoaneurysm adjacent to the left hip prosthesis.

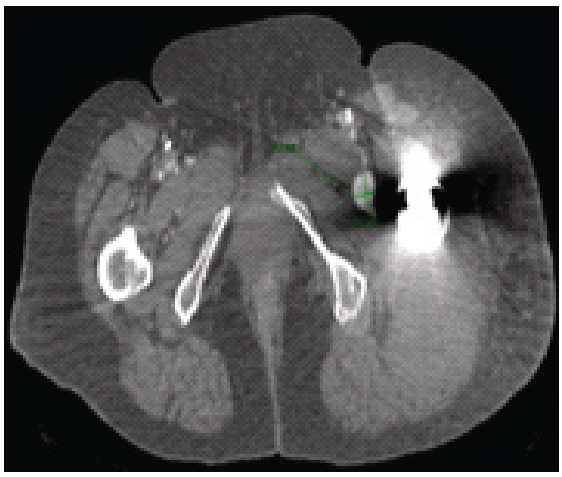

Figure 4. Coronal reconstruction depicting contrast-filled pseudoaneurysm near the left total hip arthroplasty.

Discussion

Profunda femoris artery (PFA) pseudoaneurysm is an uncommon but potentially life-threatening vascular complication following total hip arthroplasty (THA). The reported incidence of vascular injury after THA ranges from 0.16–0.25%, with pseudoaneurysm formation representing a small subset of these cases [1-2]. Most reported PFA pseudoaneurysms occur after revision procedures, often due to mechanical irritation, retractor malposition, or migration of orthopedic implants. The present case represents an early postoperative pseudoaneurysm following a primary THA, emphasizing that such vascular events may also arise in uncomplicated primary procedures.

In the current study, the pseudoaneurysm developed on the ninth postoperative day, presenting with acute thigh pain, swelling, neurological deficit, and absent distal pulses. These findings are consistent with previously reported symptomatic presentations. Computed tomographic angiography (CTA) remains the diagnostic modality of choice, as demonstrated in multiple case reports and in the systematic review by Kibrik et al. (2019), which established CTA and Doppler ultrasonography as the mainstay imaging techniques for detecting true or pseudoaneurysms of the PFA [3].

Management strategies for PFA pseudoaneurysm include ultrasound-guided thrombin injection, endovascular embolization, covered stent placement, and open vascular repair. The decision depends on hemodynamic stability, lesion morphology, and proximity to major branches. In the present case, the pseudoaneurysm enlarged despite thrombin injection, necessitating urgent open surgical repair, which successfully restored distal circulation. Similar escalation of therapy was described by Baker et al. (2020) [1], where coil embolization failed due to a large neck and endovascular covered stents were used for definitive exclusion. Harper et al. (2015) reported successful treatment of a post-revision PFA pseudoaneurysm using selective coil embolization, highlighting that smaller lesions may respond well to endovascular therapy [2].

Wattanapreechanon and Hongku (2023) documented intraoperative rupture of a PFA branch pseudoaneurysm during revision THA, resulting in massive bleeding controlled through emergent vascular repair [4]. They recommended preoperative CTA in patients undergoing revision THA who present with atypical symptoms such as unexplained anemia or thigh swelling. Huynh et al. (2016) and Nozawa et al. (2000) also described early postoperative PFA pseudoaneurysms managed successfully through open repair and coil embolization, respectively, confirming that timely identification and multidisciplinary management are crucial for favorable outcomes [5-6].

The findings of the present case, when compared with prior literature, reinforce that PFA pseudoaneurysm can develop after primary THA due to indirect iatrogenic causes such as excessive medial retraction or instrument trajectory toward the medial cortex. Persistent postoperative anemia, thigh swelling, or neurological deficits should prompt immediate vascular evaluation. Early recognition through CTA and prompt surgical or endovascular intervention are essential to prevent rupture, infection, or limb loss.

Comparative Review of Reported Profunda Femoris Artery Pseudoaneurysms After THA

Author (Year)	Type of THA	Time from Index Surgery	Etiology / Mechanism	Presentation	Diagnostic Modality	Treatment	Outcome
Present Case (71 F)	Primary THA (posterior)	9 days	Indirect iatrogenic retraction or instrument trauma	Thigh swelling, pain, foot drop, absent pulses	CTA	Failed thrombin injection → Open vascular repair	Full recovery; restored distal flow
Nozawa et al. (2000)[6]	Primary THA (post-traumatic OA)	6 weeks	Osteotome-induced arterial injury	Active bleeding, thigh swelling	Angiography	Coil embolization	Complete recovery, no recurrence
Harper et al. (2015) [3]	Revision THA	7 weeks	Retractor compression or femoral manipulation	Pain, swelling, anemia	CTA, angiography	Selective coil + Gelfoam embolization	Hemodynamic stability achieved
Huynh et al. (2016)[5]	Primary THA	4 days	Retractor-related avulsion	Pain, swelling	CTA	Open repair	Uneventful postoperative course
Baker et al. (2020)[1]	Revision THA	8 years	Medial migration of broken cerclage wire	Massive thigh swelling, anemia, active bleeding	CTA, angiography	Covered stent grafts, debridement, hardware removal	Independent ambulation at 6 months
Nabhani et al. (2022)[7]	Revision THA (recurrent dislocation)	2 weeks	Perforating branch pseudoaneurysm due to manipulation	Pain, thigh tenderness	CTA	Coil embolization	Resolution of symptoms
Pollock et al. (2022)[8]	Two-stage revision for periprosthetic infection	2 weeks post-stage	Sharp bone fragment injury	Pain, swelling, anemia	CT	Open repair	Clinical improvement
Wattanapreechanon & Hongku (2023)[4]	Revision THA for dislocation	Intraoperative rupture (≈3 months after prior THA)	Repeated manipulation and traction injury	Massive intraoperative bleeding	Intraoperative findings + postoperative CTA	Immediate vascular repair	Good recovery, stable hip

PA = pseudoaneurysm; PFA = profunda femoris artery; CTA = computed tomographic angiography; PJI = periprosthetic joint infection.

Conclusion

Profunda femoris artery pseudoaneurysm constitutes a rare but severe vascular complication following total hip arthroplasty. Although predominantly reported after revision procedures, its occurrence after primary arthroplasty underscores the potential for indirect iatrogenic arterial injury. Computed tomographic angiography remains the definitive diagnostic modality, and prompt vascular intervention either endovascular or open repair is essential to prevent rupture and ischemic sequelae. Vigilant postoperative monitoring and early evaluation of atypical symptoms, including disproportionate pain, thigh swelling, or unexplained anemia, are critical for timely diagnosis and optimal clinical outcomes.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Baker S, Huddleston MK, Goodwin TM, Voskuil R, Sanders C. Left profunda femoral artery pseudoaneurysm after revision total hip arthroplasty. Arthroplasty Today. 2020;6(4):906-10.

2. Harper K, Iorio J, Balasubramanian E. Profunda femoris pseudoaneurysm following total hip arthroplasty revision. Case Reports in Orthopedics. 2015;2015(1):301949.

3. Kibrik P, Arustamyan M, Stern JR, Dua A. A systematic review of the diagnosis, management, and outcomes of true profunda femoris artery aneurysm. Journal of Vascular Surgery. 2020;71(6):2145-51.

4. Wattanapreechanon P, Hongku N. Ruptured Pseudoaneurysm of Branch of Profunda Femoral Artery during Revision Total Hip Arthroplasty: a Case Report: Case report for rupture pseudoaneurysm of branch of Profunda Femoral Artery during Revision Total Hip Arthroplasty. Vajira Medical Journal: Journal of Urban Medicine. 2023;67(4):641-6.

5. Huynh S, Kayssi A, Koo K, Rajan D, Safir O, Forbes TL. Avulsion injury to the profunda femoris artery after total hip arthroplasty. J Vasc Surg 2016;64(2):494-6.

6. Nozawa M, Irimoto M, Maezawa K, Hirose T, Shitoto K, Kurosawa H. False aneurysm of the profunda femoris artery after total hip arthroplasty. J Arthroplasty 2000;15(5):671-4.

7. Nabhani S, Cheysson E, Sabbah P, Baaklini G. Endovascular management of a deep femoral artery perforating branch pseudoaneurysm after total hip arthroplasty: a case study. Case Rep Med 2022;2022:5925839.

8. Pollock JR, McQuivey KS, Braithwaite CL, Swanson J, Bingham JS. Pseudoaneurysm following two-stage hip revision with fasciotomy. Case Rep Orthop 2022;2022:6254542