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CASE SERIES

Management and Outcomes of Lower Limb Pseudoaneurysms: A Retrospective Case Series from a Tertiary Care Centre

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Abstract

Background: Pseudo aneurysm of the lower limb is an uncommon but potentially limb- and life-threatening vascular condition, often secondary to trauma, iatrogenic intervention, or infection. **Aim:** To analyse the aetiology, clinical profile, management, and outcomes of patients with lower limb pseudo-aneurysms treated at a tertiary care centre. Methods: A retrospective review of seven patients diagnosed and managed for lower limb pseudo aneurysm January 2023 to October 2025 was conducted. Clinical presentation, aetiology, imaging, surgical management, and outcomes were analysed. **Results:** The mean age was 43.4 years (range 20–75). Etiologies included traumatic (57%), iatrogenic (29%), and spontaneous (14%) causes. The commonest sites were the popliteal artery (43%) and the profunda Femoris artery (29%). All cases underwent surgical intervention—ligation, excision, or bypass. No postoperative ischemia or graft occlusion was noted. One mortality occurred due to sepsis in a patient with chronic kidney disease. **Conclusion:** Early diagnosis and prompt surgical management of lower limb pseudo-aneurysms result in favourable limb outcomes. Iatrogenic pseudo-aneurysms in patients with comorbidities carry a higher mortality risk.

Keywords: Iatrogenic, Management, Pseudo-aneurysm, Traumatic

1. Introduction

Lower limb pseudoaneurysms are uncommon vascular lesions caused by a contained arterial wall disruption that maintains communication with the arterial lumen. They typically arise from trauma, iatrogenic arterial puncture, infection, or inflammatory injury. Unlike true aneurysms, they are enclosed by surrounding connective tissue or a contained hematoma, leading to turbulent blood flow and risk of progressive enlargement. Although some remain asymptomatic, pseudoaneurysms may present with pain, swelling, or mass effect and carry a significant risk of rupture and life-threatening haemorrhage. With increasing percutaneous interventions, iatrogenic femoral pseudoaneurysms are being reported more frequently. This study examines the aetiology, anatomical distribution, management, and outcomes of lower limb pseudoaneurysms treated at our tertiary care Centre from January 2023 to October 2025.

2. Aim and Objectives

This study reviews the aetiology, anatomical distribution, management, and outcomes of lower limb pseudoaneurysms treated at our institute.

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3. Review of Literature

Lower limb pseudoaneurysms are rare, most commonly affecting the femoral, profunda femoris, and popliteal arteries. Trauma and iatrogenic arterial injury are the predominant causes, with the latter increasingly reported due to the rise of percutaneous vascular procedures. Clinical presentation varies from asymptomatic lesions to painful, pulsatile masses, swelling, or neuropathy. Deep-seated pseudoaneurysms often present late, necessitating CTA for accurate delineation and surgical planning.

Management depends on size, location, and etiology. Small iatrogenic pseudoaneurysms may be treated conservatively or with ultrasound-guided thrombin injection, while large, traumatic, or infected lesions generally require open surgical repair with autologous vein reconstruction; ligation is acceptable when collateral circulation is adequate. Literature reports high limb salvage rates with tailored surgical strategies, though comorbidities such as chronic kidney disease increase the risk of systemic infection and mortality.

In comparison, our study of three patients with traumatic lower limb pseudoaneurysms aligns with these findings: all lesions were managed surgically, anatomical planning relied on CTA, and limb salvage was achieved in all cases, highlighting the effectiveness of individualized open surgical management for complex traumatic pseudoaneurysms.

4. Materials and Methods

This study was conducted in the Department of Vascular Surgery at Stanley Medical College, Chennai, from January 2023 to October 2025. During this time, seven patients who presented with lower limb pseudoaneurysms and underwent treatment are included in the analysis. Data collected for each patient included demographics, clinical presentation, physical examination findings, blood investigations, and computed tomography evaluation. Surgical information such as the site of vessel injury, technical details of the repair, intraoperative and postoperative complications, and overall clinical outcomes, was also recorded.

5. Results

5.1 Population and Demographics (Table 1)

- Total patients: 7

Table 1. Demographic analysis of anatomical distribution, management and outcomes

Case	Age	Sex	Etiology	Site of Injury	Management	Outcome	Figure
1	56	Male	Trauma	Profunda Femoris	PFA Ligation	Alive	13.1
2	20	Male	Trauma	Mid Popliteal	Thrombus Evacuation+Vein Patch	Alive	13.2
3	48	Male	Trauma	Proximal Popliteal	Ligation + Distal SFA –Popliteal Bypass (GSV)	Alive	13.3
4	75	Female	Iatrogenic/Post Pci	Profunda Femoris	PFA Ligation	Alive	13.4
5	35	Female	Iatrogenic/Post Puncture	Common Femoral	Exploration+Repair	Died-Sepsis	13.5
6	50	Male	Iatrogenic/ Permcath Insertion	Common Femoral	Extra-Anatomic Bypass	Alive	13.6
7	20	Male	Stab Injury	Inferior Gluteal Aretry	Internal Iliac Artery Ligation	Alive	13.7

- Mean age: 43.4 years (range 20–75)
- Sex: 5 Males, 2 Females
- Comorbidities: HTN (2), CKD (2), CAD with recent PCI (1)

5.2 Aetiology and Timing

- Trauma-related: 4/7 (57%) — blunt (falls/skid) and penetrating (stab)
- Iatrogenic/post-procedural: 3/7 (43%) — including femoral puncture for ABG, permcath attempt, recent PCI access-related

5.3 Anatomic Distribution (Figure 1)

- Popliteal artery: 3 (43%)
- Profunda femoris artery: 2 (29%)
- Common femoral artery: 1 (14%)
- Inferior gluteal artery: 1 (14%)

CASE 1

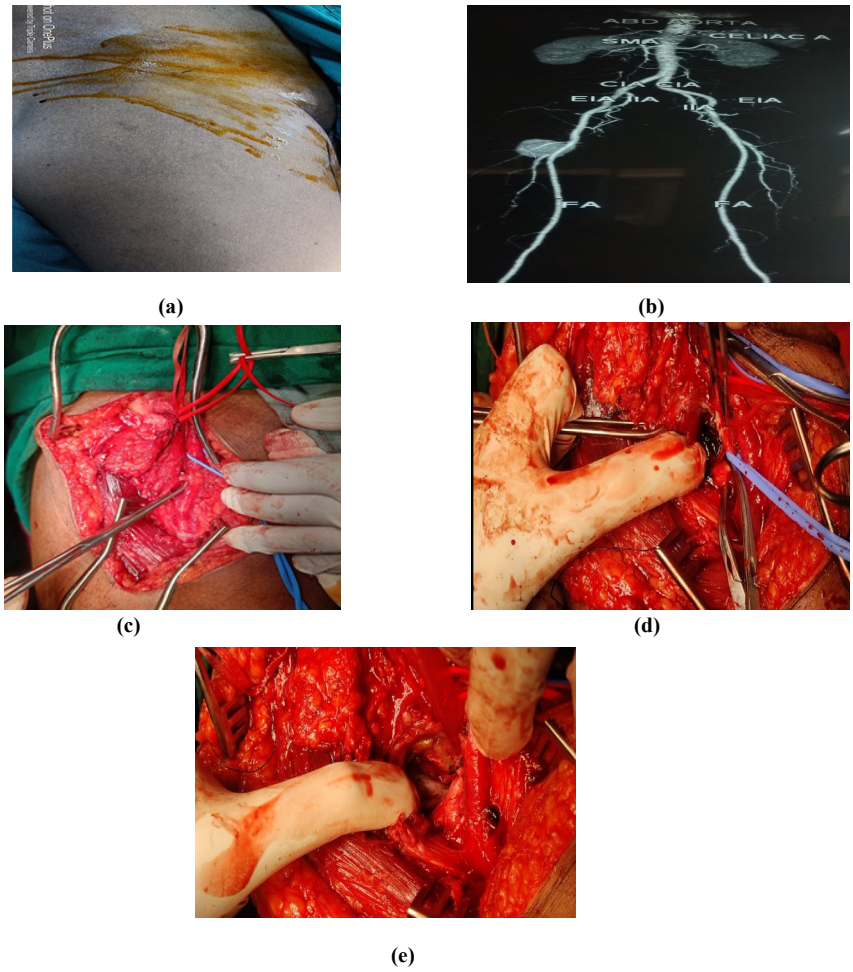

Figure 1. **(a)** 56/Male, known HTN, right upper thigh swelling and pain 9 days following trivial trauma. **(b)**CT angio: 6x 4.2x 4.6cm right profunda femoral artery pseudoaneurysm. **(c)** CFA, SFA and PFA controls taken. **(d)** Sac evacuated, and PFA ligated. **(e)** PFA is ligated proximally and distally to the origin of pseudo aneurysm.

5.4 Imaging (Figure 2)

All patients had CT angiography (detailed sizing and neck measurement available in 5/7). Mean maximal diameter (when measurable) ≈ 5.3 cm.

5.5 Operative Management (Figure 3-7)

- Ligation (PFA, internal iliac artery where collateral perfusion is judged adequate): 2
- Primary repair :1
- Open repair with vein patch: 1

CASE 2

20-year, male, fall from steps 12 days history O/E: Tense swelling with bruit and flexion deformity.

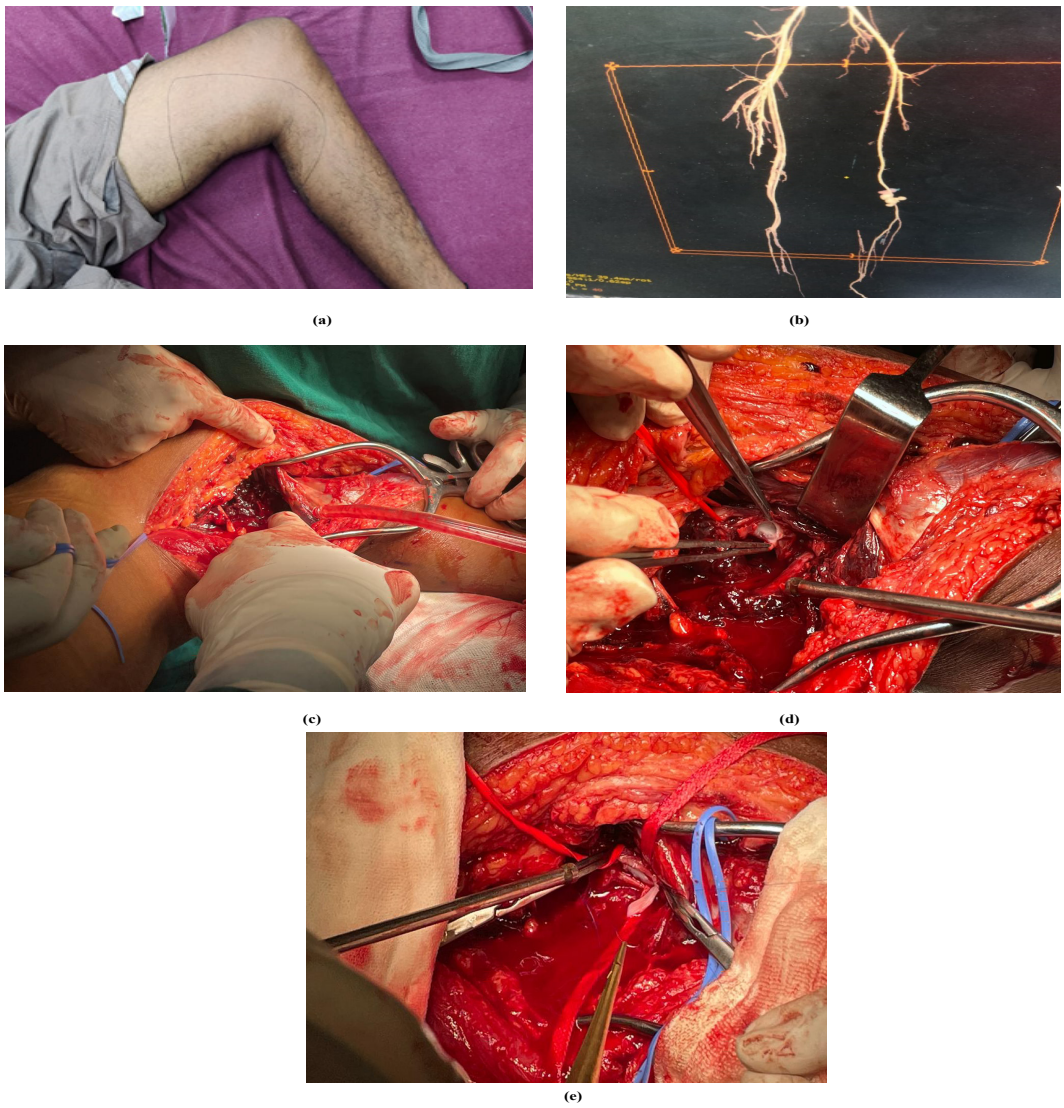

Figure 2. **(a)** Tense swelling with bruit and flexion deformity. **(b)** CT angiogram: 7.6*4.2*3.4 cm left mid popliteal artery pseudo aneurysm. **(c)** Mid Popliteal artery pseudo aneurysm with thrombus. **(d)** Mid Popliteal artery rent. **(e)** Rent closed with vein patch.

CASE 3

48/male, two-wheeler skid 8-day history

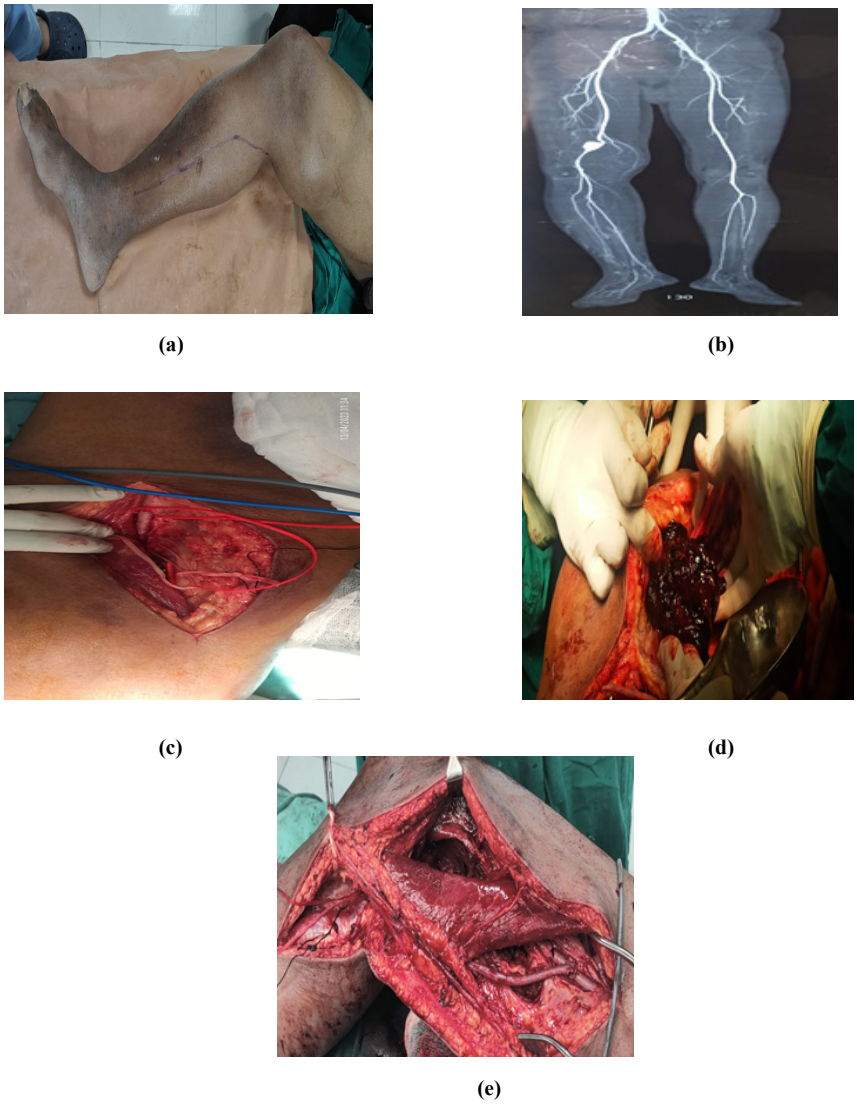

Figure 3. **(a)** Painful swelling near the right knee. **(b)** CT angio: 5.2*4.1*3.3 cm right proximal popliteal artery pseudo aneurysm. **(c)** SFA and distal PA control. **(d)** Thrombus removed, and sac evacuated. **(e)** SFA to distal PA bypass with opposite limb GSV.

- Vein bypass (autologous contralateral GSV): 2
- Extra-anatomic PTFE bypass (contaminated field): 1
- Sac evacuation ± excision performed in all open cases; thrombus/wall sent for culture in all cases.

5.6 Microbiology and Infection

Cultures were sterile in 6/7; blood culture positive for Pseudomonas in one CKD patient who later died of sepsis.

CASE 4

75/ female, HTN, Recent PCI

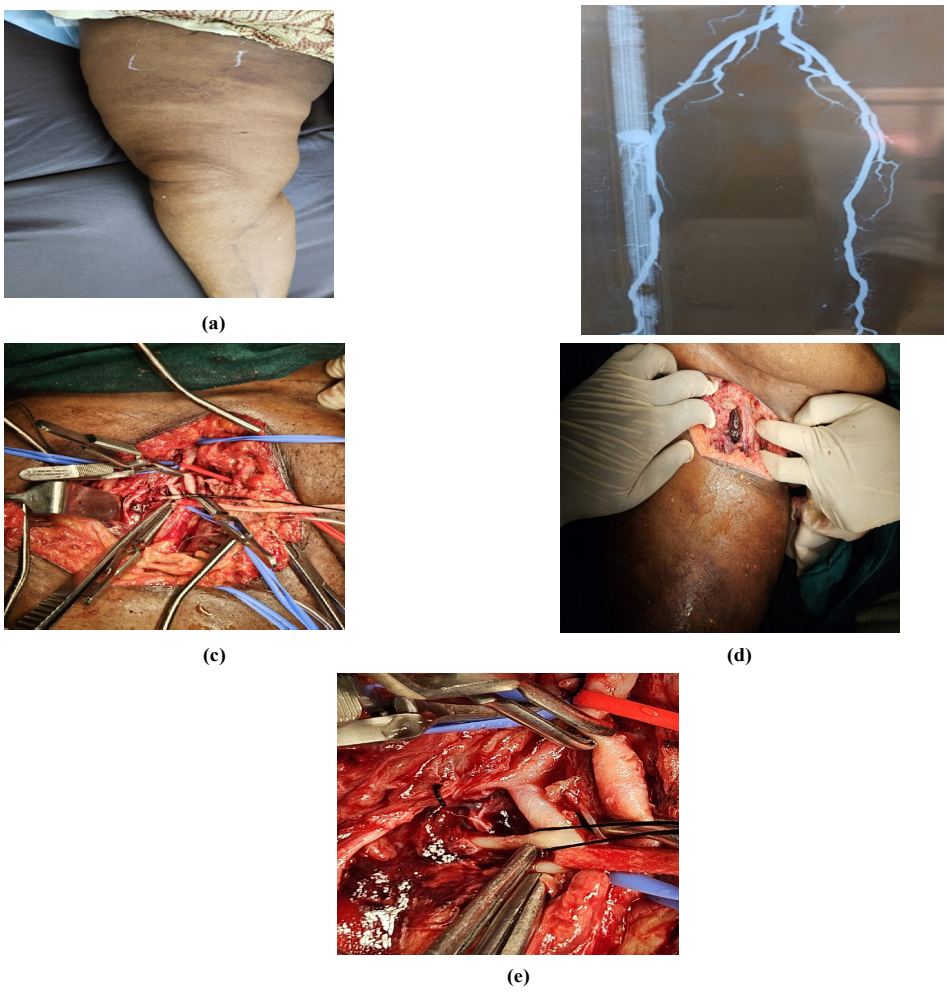

Figure 4. **(a).** Tender mass in right groin region 4*4*3cm, non-pulsatile. **(b).** Pseudo-aneurysm in the right profunda femoris artery of size 2.5*2cm. **(c).** CFA, SFA and PFA controls taken. **(d).** Pseudoaneurysm with thrombus. **(e)** sac evacuated and pfa ligated.

CASE 5

50/female, CKD, post –puncture of CFA for arterial blood gas analysis.

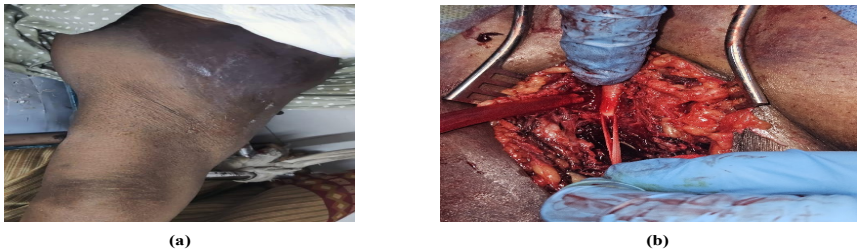

Figure 4. **(a)** contusion in the right groin following post-puncture. **(b)** Puncture site closed primarily.

CASE 6

50/Male, CKD, post attempted permcath insertion

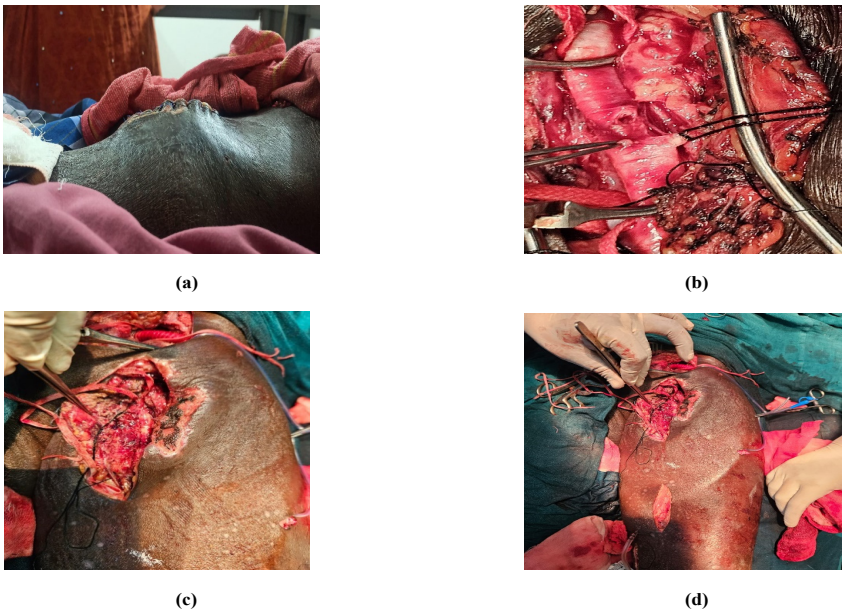

Figure 6. **(a)** Swelling of left groin following perm cath insertion. **(b)** Rent noted after haematoma evacuation. **(c)** Infected field. **(d)** Extra anatomic bypass from EIA to mid SFA.

CASE 7

20/male,stab injury to right gluteal region

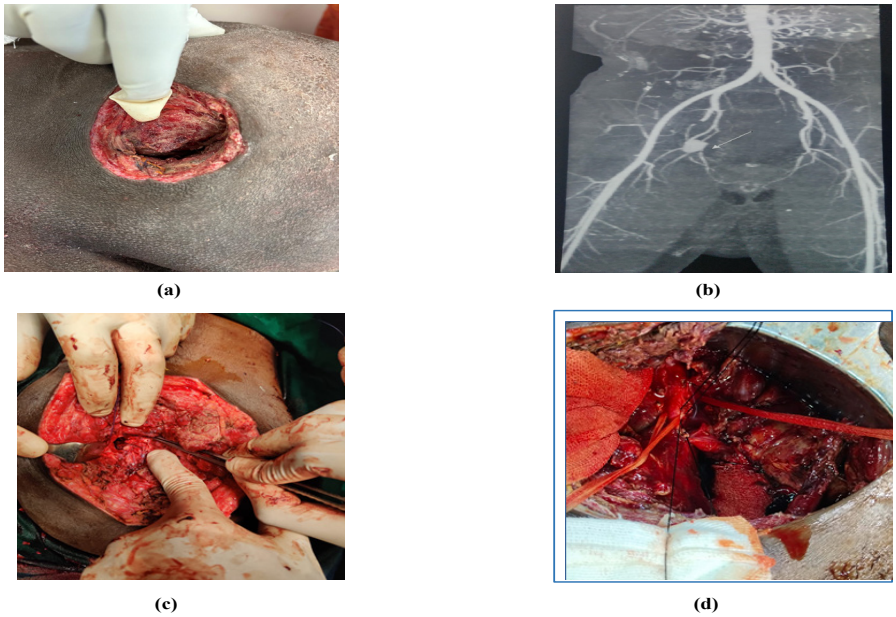

Figure 7. (**a)** Pulsatile swelling in right gluteal region. **(b)** CT angio : pseudoaneursym in right inferior gluteal artery. **(c)** Haematoma evacuation. **(d)** Internal iliac artery ligation.

5.7 Outcomes and Complications

- Limb ischemia: None (all distal pulses palpable post-op)
- Wound infection: None recorded during inpatient stay
- DVT / neuropathic pain: None reported
- Re-intervention: None during initial admission
- Mortality: 1/7 (14%) — sepsis in a CKD patient

5.8 Key Quantitative Observations

- Time from injury/procedure to presentation: median 9 days (range 1–30 days)
- Lesion size: median maximal diameter ~5.2 cm (range 2.5–7.6 cm)
- Ligation is chosen in deep/branch vessel lesions (PFA) and when distal perfusion is judged preserved by collaterals; bypass is used when a large arterial rent or limb perfusion is at risk.

6. Discussion

In this series, trauma[1] and iatrogenic[2] injury were the predominant etiologies of lower limb pseudoaneurysms, consistent with previously published reports. Lesions of the popliteal and profunda femoris arteries were commonly observed, with deep-seated pseudoaneurysms often presenting late and requiring computed tomography angiography (CTA) for precise surgical planning. Open surgical repair was preferred for large, traumatic, or contaminated pseudoaneurysms, with autologous vein grafts used for reconstruction when feasible, while ligation was considered acceptable for profunda femoris artery lesions with adequate collateral circulation.[3,4] Overall, tailored surgical strategies resulted in high limb salvage rates, although mortality was noted in patients with systemic sepsis and chronic kidney disease. These findings align with the literature, which emphasises CTA for anatomical delineation, ultrasound-guided thrombin injection for small iatrogenic lesions, and open repair for complex or infected pseudoaneurysms.

7. Summary and Conclusion

7.1 Limitations

- Small single-centre retrospective series limits generalizability.
- No comparative arm (endovascular vs open) and limited microbiological/infection source analysis.

7.2 Conclusion

Lower limb pseudoaneurysms present variably and require individualised management. In this series, open surgical approaches tailored to anatomy and contamination status achieved excellent limb salvage. Comorbid conditions such as CKD increase the risk of systemic infection and mortality. Early CTA, prompt surgery, and consideration of autologous vein reconstruction where feasible are recommended.

8. References

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