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PERSISTENT HEMATURIA AFTER GRADE IV GUNSHOT RENAL TRAUMA:
Delayed Arterio-Ureteral Fistula Diagnosed on Repeat Angiography

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INTRODUCTION & OBJECTIVES

- **Arterio-ureteral fistula (AUF)** is an **exceptionally rare and potentially fatal** cause of hematuria, usually associated with pelvic surgery, radiotherapy, or chronic ureteral stenting; its occurrence after penetrating renal trauma is exceedingly uncommon.
- We report a **delayed AUF** following **grade IV** gunshot renal injury, highlighting the diagnostic value of repeat angiography and the efficacy of selective embolization.

MATERIALS & METHODS (CASE OVERVIEW)

- 25-year-old man with a gunshot abdominal injury and left flank entry wound.
- Emergency laparotomy with enterectomy for jejunal perforation.
- Preoperative CT: **grade IV** left renal laceration.
- Conservative urological management with prophylactic double-J stenting due to persistent gross hematuria.
- Ongoing hematuria, anemia and hemodynamic instability requiring transfusion of 4 units of packed red blood cells.
- CT angiography: lower pole pseudoaneurysm with arteriovenous fistula, but no active bleeding.
- Because hematuria persisted, **repeat** renal angiography was performed.

RESULTS

- Repeat angiography demonstrated an **arterio-ureteral fistula (AUF)** with **active contrast extravasation.**
- **Selective endovascular embolization** of the involved segmental renal artery achieved complete exclusion of both the pseudoaneurysm and the fistula.
- No further transfusions were required after intervention.
- Serum **creatinine improved** from **2.4 to < 0.7 mg/dL.**
- eGFR **increased** from **36.39** to **132.09 mL/min/1.73 m².**
- The double-J stent was removed **1 month later**, and retrograde pyelography confirmed fistula resolution.
- At **24-month follow-up**, renal function remained preserved and no recurrent hematuria occurred.

IMAGING FINDINGS (REAL CASE IMAGES)



Figure 1. Renal laceration (grade IV) on initial CT.



Figure 2. Perirenal hematoma adjacent to the left kidney.



Figure 3. Pesudoaneurysm with arteriovenous fistula and high-density content within the collecting system consistent with arterio-ureteral fistula (AUF).

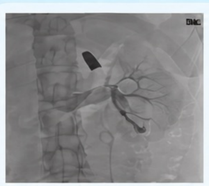


Figure 4. Repeat angiography demonstrating arterio-ureteral fistula with active contrast extravasation.



Figure 5. Post-embolization control angiography demonstrating complete exclusion of the lesion.

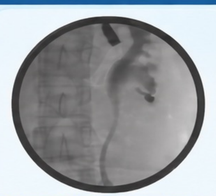


Figure 6. Retrograde pyelography after embolization showing no contrast extravasation.

CLINICAL OUTCOME & KEY QUANTITATIVE RESULTS

- **25** years old man
- **Grade IV** renal trauma
- **4** units PRBC transfused
- Creatinine **2.4 → < 0.7** mg/dL
- eGFR **36.39 → 132.09** mL/min/1.73 m²
- Double-J stent removed at **1 month**

24-month follow-up
No recurrent hematuria • Preserved renal function

CONCLUSIONS

- Persistent hematuria after penetrating renal trauma should raise suspicion for delayed vascular complications, even when CT angiography does not demonstrate active bleeding.
- Although exceptionally rare in this setting, **AUF** must be considered in the differential diagnosis.
- Repeat angiography may be decisive for diagnosis.
- Selective embolization offers effective hemorrhage control, durable fistula exclusion, and renal preservation.

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