

Outcomes of lower-extremity arteriovenous access for hemodialysis: A comprehensive review of fistula and graft for hemodialysis

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Introduction

- The upper limb is preferred over the lower limb for primary hemodialysis access creation
 - Longer patency, lower complication rates, ease of management
- Nevertheless, the creation of vascular access in the femoral region becomes the only viable option
 - Bilateral central venous obstruction
- At our institution, we frequently encounter patients who have exhausted all options for hemodialysis access in the upper extremity, leading us to assess the creation of femoral hemodialysis access
- However, most previous analyses of femoral hemodialysis access have been small, single-centered and one recent large-scale multicenter study reported high mortality rates in femoral hemodialysis access
- We aim to evaluate the actual patency of femoral hemodialysis access by comparing arteriovenous fistula (AVF) and arteriovenous graft (AVG), and identify factors that affect the patency

Methods

- A retrospective review was conducted on patients receiving femoral access (AVF & AVG) at our institution from 2006-2022.
- The study evaluated access patency (primary, secondary) and associated complications.
- Risk factors affecting patency were identified and analyzed, with a comparative analysis conducted between access types.

Result

Participants: 91 patients with femoral hemodialysis access (41 AVF, 50 AVG)

Patency rates

- ✓ Overall primary and secondary patency rates at 12 and 24 months
 - 48%, 27%
- ✓ Overall primary and secondary patency rates at 12 and 24 months
 - 90%, 89%
- ✓ The overall 12-month & 24-month primary patency rates : 48% & 27%

Subgroup analysis

- ✓ Primary patency at 12 and 24 months
 - AVF: 50% & 29%, AVG: 44%, 22%
- ✓ Secondary patency at 12 and 24 months
 - AVF: 97%, 94%, AVG: 84%, 82%
- ✓ No significant primary patency difference between groups (p=0.86) but **significant higher secondary patency and less percutaneous recanalizations** in AVF group (p<0.05)

Previous femoral vein catheterization for hemodialysis (HR, 2.95; 95% CI, 1.55-7.27; p=0.002) and the **presence of an infection** (HR, 3.24; 95% CI, 1.23-8.53; p=0.02) adversely affected secondary patency.

Discussion

- **Patency Rates:** Our study found no significant differences in primary patency rates between AVF and AVG for femoral access, but AVFs had higher secondary patency and fewer thrombotic events, aligning with prior research challenges in maintaining AVG patency.
- **Comparison with Upper Extremity Access:** While primary patency rates for femoral access are lower than those for upper extremity access, the secondary rates are still commendable.
 - Huber TS et al. (2003), JVS : A comprehensive meta-analysis covering upper extremity vascular access across 34 studies reported that the 18-months primary patency rate for AVF was 51%, and for AVG was 33%. The 18-months secondary patency rates were 77% for AVF and 55% for AVG
- **Risk Factors for Patency Loss:** **Infection** and **femoral vein catheterization** were significant risk factors for secondary patency loss, highlighting the importance of careful patient management and monitoring.
- **Clinical Practice Implications:** When upper extremity options are not viable, femoral access is a practical alternative, offering satisfactory patency and survival rates, even though it may not conclusively surpass hemodialysis catheters.
- **Study Limitations:** The study's single-institution, retrospective design may limit generalizability. Exclusion of patients with primary failure and lack of comparison with hemodialysis catheters suggest areas for further study.

Conclusion

Lower extremity hemodialysis access yields acceptable patency results, with AVF **showing superior secondary patency** than AVG. **A history of femoral vein catheterization** for hemodialysis correlates with decreased secondary patency.