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Endovascular Treatment of Chronic Superficial Chronic Total Occlusion Lesions in the Cubital Fossa in Hemodialysis Patients with Radiocephalic AVF

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Objectives : The radiocephalic arteriovenous fistula is the preferred vascular access for hemodialysis patients. When only the deep vein drains through the perforator vein without superficial vein involvement in the cubital fossa, complications like pulsatile cannulation segments, prolonged hemostasis, and increased venous pressure often occur. Traditional prosthetic graft interposition required perforator vein ligation and frequently led to stenosis in the single outflow tract. We performed endovascular angioplasty on superficial vein chronic total occlusion lesions to restore proper blood flow drainage while maximally preserving native vessels.
Methods : From February 2023 to November 2024, we studied 67 interventions in 62 patients with RC AVF and cubital fossa CTOs. Ultrasound guided case selection based on occlusion length, traceability, and outflow condition. Treatment involved guidewire advancement and balloon angioplasty. Success criteria included reduced pulsatility, normalized pressure, improved hemostasis, and superficial venous flow preceding deep venous flow.
Results : Of 67 cases, 71.6% were left RC AVFs and 28.4% were right RC AVFs. Recanalization was attempted from the basilic vein in 50.7%, cephalic vein in 47.8%, and both sides in 1.5% of cases. The success rate was 86.6%, with 2 initially unsuccessful cases later recanalized in subsequent procedures. Six cases re-occluded during surveillance, with one lost to follow-up and one abandoned due to steal syndrome. Among 50 patent cases, median follow-up was 229(±152) days with a median intervention frequency of 1.86 times per year. Intraquartile analysis showed Q1 required no additional interventions while Q3 required a median of 4.67 interventions.
Conclusions : For RC AVF, endovascular restoration of superficial vein CTO in the cubital fossa provides a minimally invasive, effective option for reliable hemodialysis access. Patient outcomes varied significantly - responsive patients needed no additional interventions, while poorly responsive patients could be managed with conventional surgical revision. Despite relatively short median follow-up, long-term patency data should become available with continued patient surveillance.

figure1.png


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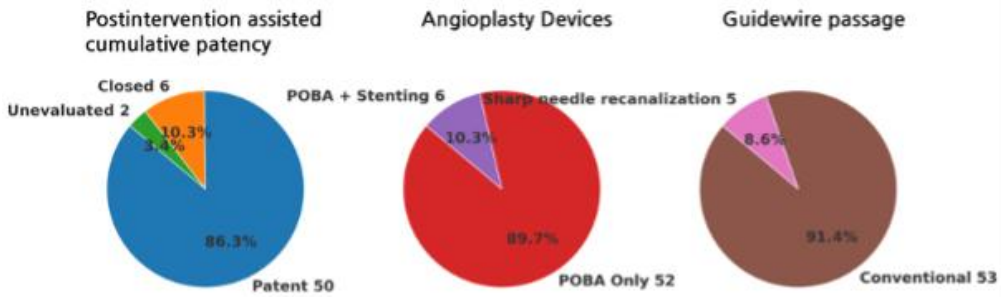
Beyond Challenges, Towards Healthier Kidney


AV access site
Right RC AVF 19
28.4%
71.6%
Left RC AVF 48
Target CTO lesion
Both 1
Basilic v. 34
1.5%
50.7%
47.8%
Cephalic v. 32
Results
Fail 9
13.4%
86.6%
Success 58

figure1.png


Postintervention assisted cumulative patency
Closed 6
Unevaluated 2
10.3%
3.4%
86.3%
Patent 50
Angioplasty Devices
POBA + Stenting 6
Sharp needle recanalization 5
10.3%
89.7%
POBA Only 52
Guidewire passage
8.6%
91.4%
Conventional 53