

**Role of drug coated balloon angioplasty in treatment of
recurrent dysfunctional arteriovenous fistulae for
hemodialysis**

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FAYOUM UNIVERSITY

2023

Summary

Arteriovenous fistula patency is an imperative need for HD patients and its dysfunction due to stenosis or occlusion is a thorny problem due to high incidence of occurrence because of the physiological nature of HD AVF circuit necessitating repeated punctures.

Management of these repeated lesions pass through various methods from surgical repair to Percutaneous transluminal angioplasty (PTA) that effectively prolongs access lifespan but high restenosis rates means that most patients require repeated procedures, leading to increased morbidity and healthcare costs.

Restenosis is multi-factorial, resulting from neo-intimal hyperplasia, negative vascular remodeling, smooth muscle cell migration, vasoconstriction, inflammation, and scarring secondary to repeated venipunctures.

Notably, barotrauma resulting from balloon angioplasty is an independent risk factor for restenosis. Re-stenotic lesions are known to have higher cell proliferation rates compared to de novo stenoses and poorer outcome after PTA.

Drug-eluting technology promises reduced reintervention. Randomized and non-randomized studies have shown that drug-coated balloons (DCBs) are effective in the AVF as paclitaxel inhibits neointimal hyperplasia acting as antiproliferative agent.

Our study included 20 patients from our outpatient clinic who have dysfunctional autogenous or synthetic AVFs and have been adequately evaluated and investigated pre- and post-operatively according to our protocols.

Dysfunctional AVFs were those not able to provide the conditions for adequate dialysis, clinically identified by variations in thrill/bruit, difficult cannulation, recirculation, or suggestion of outflow stenosis such as excessive bleeding from the venipuncture sites, decreased flow (<600 ml/min), increased venous pressure (>150 mmHg) or prolonged bleeding at access sites post cannulation.

Lesions were included only if they were hemodynamically significant (greater than 50% reduction in luminal diameter confirmed on angiography), had recurred after previous plain balloon angioplasty (POBA).

Lesions were treated firstly by conventional angioplasty to ensure complete effacement of lesions or at least less than 30% residual stenosis then DCB angioplasty was applied.

Patients were followed up clinically after 1 week, 2 weeks, 1 month, 3 months and 6 months and by duplex after 3 months and 6 months to exclude any recurrent lesions and confirm adequate flow rate and well-functioning fistula.

Our results show that one case failed after 1 month follow up (95%), 4 cases failed after 4 month follow up (80%) and 7 cases failed after 6 month follow up (65%) which is higher than previous plain angioplasty (70% patency after 3 months and 30% after 6 months).

Almost no complications were detected related directly to DCB during follow up.