Cutting balloon versus standard balloon angioplasty for the treatment of haemodialysis access stenosis: a retrospective observational study

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Introduction

The failure of hemodialysis (HD) access increases morbidity and healthcare cost in patients with end stage renal disease. HD access failure may occur by thrombosis secondary to stenosis of the anastomosis/drainage vein or of the graft. The stenosis is caused by neointimal hyperplasia, unfavorable vascular remodeling, smooth muscle cell migration and vasoconstriction. Percutaneous transluminal angioplasty (PTA) is recommended to treat significant stenosis in both autogenous arteriovenous fistulas and prosthetic arteriovenous grafts. Percutaneous cutting balloon (CB) angioplasty for treatment of hemodialysis access stenosis is used as primary treatment. The recent literature has shown conflicting results for the success rate of PCB in comparison with standard balloon (SB) PTA [1, 2]. Aim of this work is to compare the safety and efficacy of CB versus SB angioplasty for treating hemodialysis-related stenosis.

Materials and Methods

We retrospectively reviewed all the PTA performed in dysfunctional dialysis access at our center in last 5 years. US Color-Doppler records were used to assess the functionality and patency of the fistula within 1 day and after 6, 12 and 24 weeks from the intervention.

Results

A total of 421 PTA were performed in 183 patients. CB and SB angioplasty were performed respectively in 40 and 117 patients. Twenty-six patients had residual stenosis of more than 30% after conventional PTA, so additional CB angioplasty was performed. Complications occurred in 23 cases, with mild-extravasation occurring in 3 cases. No correlation was found between complications and the kind of balloon used. The use of CB was correlated with better technical results only in native fistulas (NF) (p=0.001) but not in synthetic grafts (SG) (p=0.114). No significant difference was found between CB and SB in the functional outcome improvement for NF and SG (p=0.215; p=0.393).

The technical success of the PTA correlated with better functional outcome of the fistula at 1 day (p=0.012) but not at 6, 12 or 24 weeks (p=0.350, 0.637, 0.606 respectively) from the intervention. The use of CB and SB together showed an improvement of the technical outcome (p=0.036), but not of the functional response evaluated at the US (p=0.361).

Reference:


Conclusion

CB provides better technical results compared to SB for the treatment of NF, but without affecting the functional outcome at short or long term.