COMPARISON OF CLINICAL OUTCOMES WITH DIFFERENT ANGIOPLASTIC TECHNIQUES IN HEMODIALYSIS GRAFTS

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Background

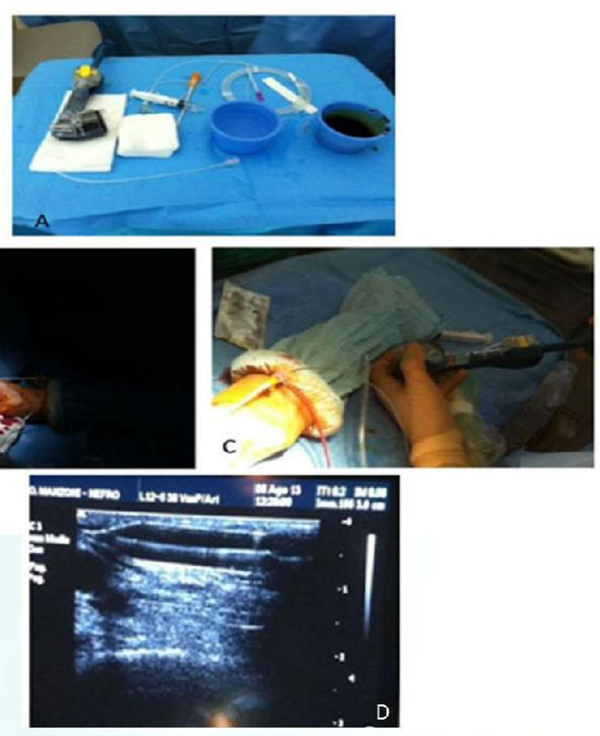
An established method of preserving failing dialysis access is percutaneous transluminal angioplasty (PTA)[1] but because of the high restenosis rate, repeated PTA is inevitable in the majority of these patients[2]. Despite of PTA, that induces a traumatic vessel wall injury, peripheral cutting balloon (PCB) creates microsurgical incisions, through its blades inducing a dilation of the stenosis at lower pressure . Some authors suggested that PCB could reduce the expression of proliferative growth factors and thereby decrease the neointimal hyperplasic response[3].

Purpose

The aim of the study is to compare, in a non-randomized retrospective study, the long-term patency after treatment of grafts' stenosis by conventional PTA and PCB, also to check the influence of stent placement on graft's survival.

Methods

We reviewed 174 angioplastic procedures of AVGs (see the table below), 112 PTA and 62 PCB. From 112 PTA, 83 were conventional PTA (PTA- group), 29 were performed by PTA plus stent implantation (PTA+ group). From 62 PCB, 32 were performed just by PCB (PCB- group) and 30 performed by PCB plus stent implantation (PCB+ group) (see the table below). Furthermore we investigated graft's survival between different types of vascular grafts, PTFE, ePTFE, polycarbonate and bovine prosthesis, associated or not to stent placement.
We performed each procedures under Doppler ultrasound guidance (see the pictures below) (Fig. A-D) .
The success rate was defined as a maximal = or < 30% residual stenosis of vessel lumen diameter, of the treated segment.
Statistical analysis was performed using SPSS.



Results

The mean graft's survival time was 742±69 days and 1325±99 days with PTA and PCB respectively (p=0,000, Log Rank and Breslow test) (Fig.1).

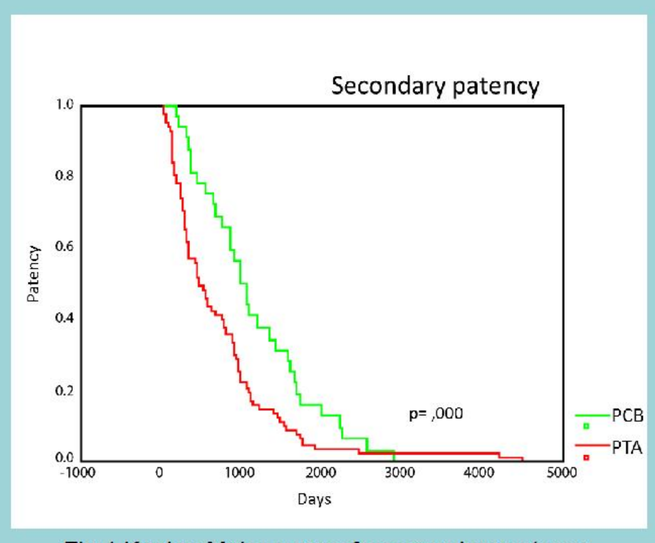


Fig.1 Kaplan Meier curves for secondary patency

Comparing the PCB procedures with or without stent implantation we noticed a statistical evidence in long-term survival just for PCB+ group (p=0,000,Log Rank and Breslow test) (Fig.2). Therefore we analyzed the influence of stent implantation associated or not to PCB and we didn't find a statistical evidence in grafts' long-term survival (p=0,15,Log Rank and Breslow test) (Fig.3). We found no significant statistical differences on grafts' survival between different types of grafts associated or not to stent implantation.

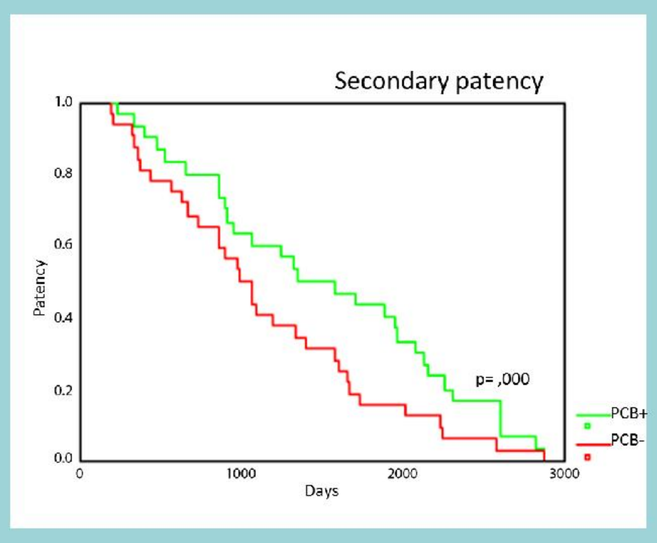


Fig.2 Kaplan Meier curves for secondary patency in PCB+ and PCB- groups

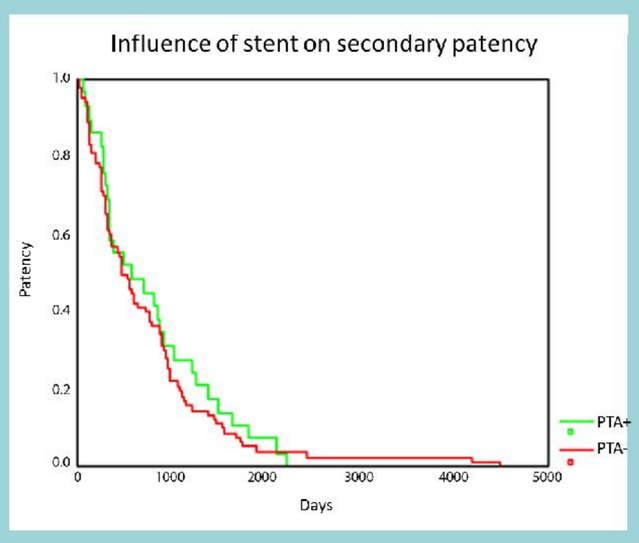


Fig.3 Kaplan Meier curves for secondary patency in PTA+ and PTA- groups

Conclusions

Interpretation of these findings suggests that PCB improves graft's survival over angioplasty alone. Stent placement influences graft's long-term survival only when associated to PCB procedure, suggesting the idea that cutting balloon technique represents the key factor for the successful treatment of AVGs' stenosis. The explanation might be that, the high-pressure balloon dilation of PTA causes a severe vessel wall injury and consequently neointimal hyperplasia while PCB provokes a controlled disruption of the vessel wall, decreasing the tendency to proliferative response and to elastic recoil.

References

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