

## Abstract

**Purpose.** The primary objective was to compare primary and secondary patency, number of percutaneous transluminal angioplasty (PTA) interventions and cost-effectiveness among PTA, deployment of a stent, or a stent graft in the treatment of failing arteriovenous dialysis grafts. The secondary objective was to compare the residual diameter at the site of dialysis shunt stenosis using sonography and digital subtraction angiography (DSA).

**Methods.** Sixty patients were randomly assigned to either PTA, placement of a stent or stent graft. Follow-up angiography was scheduled at 3, 6, and 12 months or when requested by the physician. Residual diameter of a dialysis shunt stenosis was measured in 20 patients with significant stenosis by ultrasonography and on an angiogram from DSA.

**Results.** During a median follow-up of 22.4 months patients with PTA, stent, or stent graft required  $3.1 \pm 1.7$ ,  $2.5 \pm 1.7$ , or  $1.7 \pm 2.1$  ( $P=0.031$ ) secondary PTA interventions. The primary patency rates were 0%, 18%, and 65% at 12 months and 0%, 18%, and 37% at 24 months in the PTA, stent, and stent graft group respectively ( $P<0.0001$ ). The cost of the procedures was  $\text{€}7,900 \pm \text{€}3,300$  in PTA group,  $\text{€}8,500 \pm \text{€}4,500$  in stent group, and  $\text{€}7,500 \pm \text{€}6,200$  in stent graft group ( $P=0.45$ ). The mean residual diameter measured by ultrasonography and DSA was  $1.69 \pm 0.05$  mm and  $1.65 \pm 0.59$  mm ( $P=0.93$ ).

**Conclusions.** The treatment of failing dialysis vascular access by the deployment of a stent graft significantly improves its primary patency rates and decreases the number of secondary PTA interventions, but the reduction in costs for maintaining arteriovenous dialysis graft patency is not significant. The measurement of the residual diameter in a dialysis shunt stenosis by ultrasound is reliable. A threshold of a 2 mm is well consistent with the finding of a significant stenosis on DSA.

**Keywords:** *arteriovenous dialysis graft, percutaneous transluminal angioplasty, stent, stentgraft*