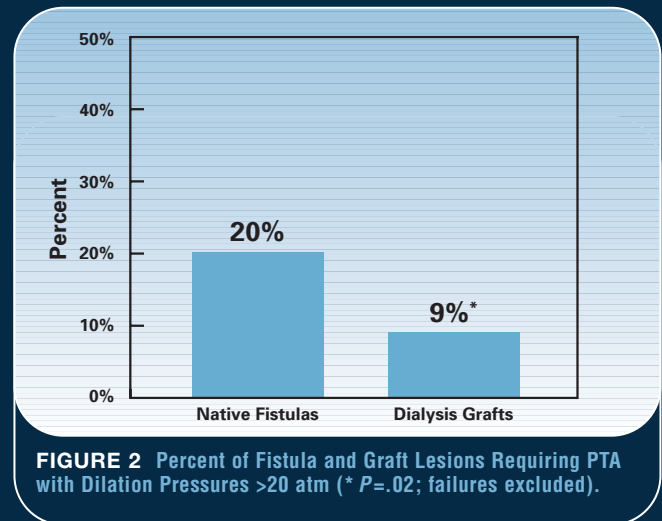
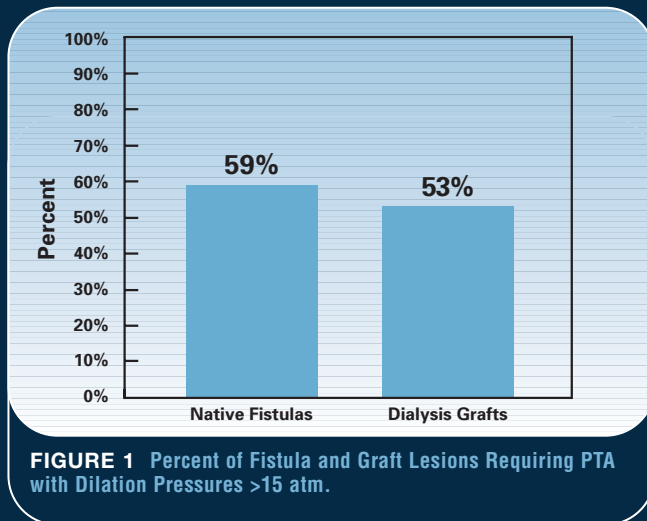


## HIGH PRESSURE ANGIOPLASTY OF STENOSSED DIALYSIS GRAFTS AND FISTULAS



## Clinical Experience

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Balloon angioplasty plays a crucial role in maintaining vascular access patency for chronic hemodialysis. The National Kidney Foundation K/DOQI guidelines promote prophylactic percutaneous transluminal angioplasty (PTA) as an integral component of the management of failing or occluded vascular access sites.<sup>1</sup> Interventions for hemodynamically significant stenoses can reduce the rate of thrombosis and access loss and prolong the useful life span of a vascular access. High pressure (>15 atm) angioplasty is more commonly required in dialysis-related venous stenosis than in arterial systems. Benefits of ultra-high pressure angioplasty (>20 atm) of resistant stenoses with the Conquest™ PTA Balloon Dilatation Catheter have been well-documented.<sup>2,3</sup> More recently, we reported a prospective study that evaluated the dilation pressures required in

the PTA treatment of 230 lesions in both dialysis grafts and native arteriovenous fistulas (AVFs).<sup>4</sup>

In this study, conventional PTA was typically attempted first with a moderate-pressure angioplasty balloon (Ultra-Thin SDS; Boston Scientific, Natick, MA; rated burst pressure, 15 atm) as described.<sup>4</sup> In cases in which the balloon waist could not be effaced with conventional pressures, high pressure angioplasty was performed using the ultra-high pressure, non-compliant Conquest™ PTA Balloon Dilatation Catheter (rated burst pressure, 30 atm) as described.<sup>4</sup> Balloon diameter and length were chosen at the discretion of the operator. Patients were not routinely heparinized. Prolonged high pressure angioplasty (e.g., 5 min duration) was employed to treat elastic lesions. A palpable thrill throughout the

PTA-treated vascular access was the desired endpoint for all percutaneous interventions.

Of the 230 lesions treated by PTA in this study, 85 were in patients with a native AVF, 138 were in patients with a graft, and 7 were in hybrid vascular access structures.<sup>4</sup> All but 2 of the 230 lesions were treated successfully by PTA. Excluding failures, 55% of all lesions required high pressure angioplasty with pressures >15 atm, while 8% of all lesions required ultra-high pressures >20 atm. Fifty-nine percent (59%) of AVF lesions and 53% of graft lesions required pressures in excess of 15 atm. Significantly ( $P = .02$ ), 20% of native fistula lesions and 9% of graft lesions required ultra-high pressures >20 atm to efface the waist on the angioplasty balloon (Figures 1 and 2). For lesions in a native fistula, mean

pressure was 15.2 atm; for graft lesions, mean pressure was 15.4 atm. Pressure was significantly associated with indication for procedure, with higher pressures linked to prophylactic PTA vs. treatment of a thrombosed graft. Pressure was also significantly associated with location of the lesion and balloon length. There were no significant associations between pressure and access type, access configuration or location, initial % stenosis, number or duration of inflations, balloon diameter, or access age.

These data suggest that conventional angioplasty balloons are inadequate for percutaneous treatment of the majority of dialysis access stenoses, indicating a need for high pressure angioplasty in hemodialysis access maintenance.<sup>4</sup> Dilation pressures in excess of 15 atm are commonly required to resolve stenotic lesions in vascular accesses. Pressures in excess of 20 atm are required in 1 in 5 fistula lesions and nearly 1 in 10 graft lesions. The prevalence of lesions requiring high dilation pressures, particularly in fistulas, may suggest a cost advantage in using ultra-high pressure PTA balloons as the first line treatment choice to avoid the costs associated with an unsuccessful initial trial with a conventional balloon, only to be followed by exchange for a high-pressure balloon to treat resistant lesions. Moreover, more than 99% of the lesions in this study were successfully treated by PTA. This observation suggests that the need for other techniques and devices for the treatment of resistant lesions is very limited, given the practicality and strength of ultra-high pressure angioplasty.

In conclusion, the incidence of resistant lesions was higher in fistulas than grafts.<sup>4</sup> High pressure PTA was required for the majority of lesions. Ultra-high pressure angioplasty with the Conquest™ PTA Balloon Dilatation Catheter allowed successful treatment of nearly all of the most challenging lesions and should play a key role in maintaining hemodialysis vascular access.

#### References:

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