ANNEXES TO CHAPTER 5

Clinical Question XVIII. In prosthetic arteriovenous fistula thrombosis, what would be the initial indication (percutaneous transluminal angioplasty versus surgery versus fibrinolysis) assessed in terms of patency of the arteriovenous fistula and/or thrombosis? Does it depend on location?

Surgery versus percutaneous angioplasty	
We were able to find a number of systematic reviews comparing surgery and percutaneous angioplasty (Green 2002; Tordoir 2009; Talaulikar 2011; Kuhan 2013) which identified several randomised clinical trials. The combined analyses are presented below in a meta-analysis from the most recent review (Kuhan 2013).	
The systematic review by Kuhan (2013) identifies six randomised clinical trials that compared surgery with endovascular treatment in 573 occluded grafts. On comparing the two treatments, no statistically significant differences were identified, except for assisted primary patency at one year: - Technical success rate (5 RCT; 493 patients): 74.5% for percutaneous management and 80.3% for surgical treatment (OR 1.40, 95% CI: 0.91 to 2.14, p=0.13). - Primary patency at 30 days (6 RCT, 573 patients): 64.6% for percutaneous management and 66.8% for surgical treatment (OR 1.15, 95% CI: 0.79 to 1.68, p=0.46). - Primary patency at one year (3 RCT, 226 patients): 14.2% for percutaneous management and 23.9% for surgical treatment (OR 2.08, 95% CI: 0.97 to 4.45, p=0.06). - Assisted primary patency at one year (1 RCT, 80 patients): 20.5% for percutaneous management and 43.9% for surgical treatment (OR 3.03, 95% CI: 8.18 to 1.12, p=0.03). - Secondary patency at one year (1 RCT, 31 patients): 86.7% for percutaneous management and 62.5% for surgical treatment (OR 0.26, 95% CI: 0.04 to 1.55, p=0.14). - Need for new access line (3 RCT, 189 patients): 19.6% for percutaneous management and 25.6% for surgical treatment (OR 0.77, 95% CI: 0.44 to 1.34, p=0.35). - Morbidity at 30 days (6 RCT, 573 patients): 15% for percutaneous management and 11.6% for surgical treatment (OR 1.12, 95% CI: 0.67 to 1.86, p=0.67). Therefore, the clinical outcomes of surgery and percutaneous treatment are similar at one year of follow-up, although the authors stressed that longer follow-up of patients is necessary.	**High quality**
Fibrinolysis versus percutaneous mechanical techniques	
Three RCT were identified comparing fibrinolysis with urokinase and three different options of percutaneous mechanical thrombectomy.	
The Beathard RCT (1994) compared **percutaneous mechanical thrombolysis alone** with the **same technique combined with a thrombolytic agent**, urokinase, in 103 cases of graft thrombosis. On comparing the two treatments, no statistically significant differences were found in relation to the removal of the thrombus (100%) and the restoration of flow (92.8% and 93.6%).	**Moderate quality**

However, the time required in the combined pharmacomechanical procedure was significantly longer, with a mean of 58 minutes, than the 48 minutes in mechanical treatment alone.	
The RCT by Trerotola (1998) compared **thrombolysis** with urokinase and **percutaneous thrombectomy** (*Arrow-Trerotola device*) in 122 patients. There were no statistically significant differences between these two options in immediate patency, primary patency at 3 months or major complications. Median procedure times were 75 minutes for the percutaneous device group versus 85 minutes in the pharmacological thrombolysis group (p<0.04).	**Moderate quality**
The RCT by Barth (2000) compared a **hydrodynamic thrombectomy system to thrombolysis** with urokinase in 120 patients on haemodialysis with recently thrombosed grafts (≤14 days). No statistically significant differences were found between these two options in any of the clinical outcome measures analysed: technical success (removal of 80% or more of the thrombus); clinical success (technical success plus capacity for dialysis); blood loss; and early and late complications. Treatment times for the thrombi were, however, significantly different: 16.8 minutes for thrombectomy and 23.4 minutes for thrombolysis (p<0.01). The authors concluded that the hydrodynamic thrombectomy system was at least as effective and safe as thrombolysis, and shortens thrombus treatment time.	**Moderate quality**
Summary of evidence	
Clinical outcomes between surgery and percutaneous angioplasty are similar in the management of graft thrombosis.	**High quality**
Comparisons between fibrinolysis and three different percutaneous mechanical thrombectomy options have shown similar clinical outcomes.	**Moderate quality**
Patients' values and preferences *No relevant studies related to this aspect have been identified.*	
Use of resources and costs *No relevant studies related to this aspect have been identified.*	
Recommendations [Proposal]	
Strong	We recommend surgery or percutaneous angioplasty for treating vascular access thrombosis in patients with graft.
Weak	We suggest considering the possibility of thrombolysis with urokinase to treat vascular access thrombosis in patients with graft.
References	
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Table 1. STUDIES EXCLUDED

Study	Cause for exclusion
Ito 2011	Not an RCT. It is a comparison of series of patients treated by surgery or percutaneously, with 587 patients, 75% with graft.
Lai 2012	Does not compare the alternative treatments with each other. It compares two variants of percutaneous angioplasty, one guided by angiography and one guided by a new technique for measuring the pressure inside the graft.