

ANNEXES TO CHAPTER 5

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

<p>The systematic review by Kuan 2013 included studies published up to the end of 2012, but they found no randomised clinical trials comparing surgery and percutaneous angioplasty in the treatment of thrombosis of the vascular access fistula. Only one study comparing series of patients treated with endovascular treatment and surgery (Ito 2011) and different clinical series included in Tordoir's literature review of 2009 were identified.</p>	
<p>The study by Ito (2011) compared 54 patients who underwent 156 endovascular treatment procedures, and 533 patients who underwent 879 surgical procedures. Those treated by surgery were divided into two groups: the first group underwent 189 procedures where the thrombus was surgically removed and the stenotic lesions dilated by balloon angioplasty; the second surgical repair group underwent 690 procedures, in which the stenosis lesions were bypassed with an additional graft or a new access was created. Vascular access was via graft in 75% of patients and fistula in the remaining 25%.</p> <p>In patients with fistula, patency at 2 years was 33.7% for endovascular treatment, 35.75% for the first surgery group and 59.80% for the second surgery group (p=0.0005).</p>	<p><b>Very low quality</b></p>
<p>The review by Tordoir (2009) includes the results from different clinical series, which we show below in Table 2.</p> <p>The <i>technical success rate</i> in the different studies ranged from 70% to 100% for surgery and from 73% to 96% for endovascular procedures.</p> <p><i>Primary patency rate at one year</i> of treatment was higher for those treated by surgery (51-84%) than endovascular treatment (9-70%).</p> <p>Two studies on patients treated with endovascular intervention analysed according to vascular access location. Both studies found worse results for primary patency at one year for fistulae in the arm than in the forearm (9% vs 49% in the Turmel-Rodrigues study from 2000; 47% vs 51% in the Moossavi study from 2007). A study on patients treated by surgery (Morosetti 2002) showed worse results for primary patency at six months for fistulae in the upper arm than for the forearm (84% vs 93%) and also for the technical success rate (66% vs 82%).</p> <p><i>Secondary patency rate at one year</i> of treatment was higher for those treated by surgery (69-95%) than endovascular treatment (44-89%).</p>	<p><b>Very low quality</b></p>
<p><b>Summary of evidence</b></p>	
<p>The clinical series comparing surgical and endovascular treatment show somewhat better overall results for surgery in relation to technical success and patency rates at one year.</p>	<p><b>Very low quality</b></p>

**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]**

**Weak**

We suggest surgery or percutaneous angioplasty for treating vascular access thrombosis in patients with arteriovenous fistula.

**References**

Chan MR, Bedi S, Sanchez RJ, Young HN, Becker YT, Kellerman PS, Yevzlin AS. Stent placement versus angioplasty improves patency of arteriovenous grafts and blood flow of arteriovenous fistulae. *Clin J Am Soc Nephrol* 2008; 3(3):699-705.

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Kundu S, Clemens R, Aziza J, Tam P, Nagai G, You J, Au V. Ultrahigh-pressure angioplasty versus the Peripheral Cutting Balloon for treatment of stenoses in autogenous fistulas: comparison of immediate results. *J Vasc Access* 2010; 11(4):303-11.

Tordoir JH, Bode AS, Peppelenbosch N, van der Sande FM, de Haan MW. Surgical or endovascular repair of thrombosed dialysis vascular access: is there any evidence? *J Vasc Surg* 2009; 50(4):953-6.

**Table 1. STUDIES EXCLUDED**

<b>Study</b>	<b>Cause for exclusion</b>
Kundu 2010	Compares two angioplasty techniques ( <i>ultrahigh-pressure angioplasty and peripheral cutting balloon</i> ).
Chan 2008	Compares two endovascular procedures: stenting and the percutaneous angioplasty.

**Table 2. Clinical series included in the Tordoir review (2009)**

Endovascular treatment					% Patency at one year	
Study	Number	Fistula Location	Intervention	% Technical success	Primary	Secondary
Overbosch 1996	24	24 forearm	Mechanical thrombectomy	89	32	
Turmel-Rodrigues 2000	73	56 forearm, 17 arm	Thrombus aspiration ± urokinase	93	49/9 *	81/50
Haage 2000	54	50 forearm, 4 arm	Mechanical thrombectomy	89	27	51
Schon 2000	20		Mechanical thrombectomy + tPA	92		
Liang 2002	42	37 forearm, 5 arm	Angioplasty + urokinase	93	70	80
Rajan 2002	25	19 forearm, 6 arm	Mechanical thrombectomy	73	24	44
Bittl 2005	39		Mechanical thrombectomy	87	23	
Shatsky 2005	62	24 forearm, 36 arm, 2 leg	Thrombus aspiration ± urokinase	87	18	69
Moossavi 2007	49	23 forearm, 26 arm	Mechanical thrombectomy	96	51/47 *	84/62
Jain 2008	41	21 forearm, 20 arm	Mechanical thrombectomy	76	20	54
Wu 2009	48	48 forearm	Mechanical thrombectomy	96	44	89
Total	477					

Surgical treatment					% Patency at one year	
Study	Number	Fistula Location	Intervention	% Technical success	Primary	Secondary
Oakes 1998	29	29 forearm	Proximal reanastomosis	80	69	89
Morosetti 2002	26	17 forearm, 9 arm	Thrombectomy ± proximal reanastomosis	82/66 *	93/84 (at 6 months)	
Mickley 2003	30	30 forearm	Proximal reanastomosis	100	80	95
Ponikvar 2005	268		Thrombectomy ± proximal reanastomosis	93	75	77
Georgiadis 2005	59	59 forearm	Thrombectomy ± Graft	95		85
Palmar 2006	10	3 forearm, 7 arm	Thrombectomy	70	51	69
Lipari 2007	32	32 forearm	Proximal reanastomosis or graft	84	73	88
Total	454					

\*: fistula in forearm/fistula in arm. tPA: Tissue plasminogen activator