

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**

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**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