

Spanish Clinical Guidelines on Vascular Access for Haemodialysis

ANNEXES TO CHAPTER 5

Clinical Question XXII. In native and prosthetic arteriovenous fistula pseudoaneurysm, when is surgery versus percutaneous versus conservative management indicated, assessed in terms of severe bleeding complications or death?

<p>We have been unable to find any studies comparing different approaches for arteriovenous fistula (AVF) and arteriovenous graft (AVG) pseudoaneurysm (surgical vs percutaneous vs conservative management). The available evidence is of very low quality, because it only comes from clinical series which analysed the effect of single treatment modalities, without comparator groups.</p>	
<p>Conservative management - external manual compression guided by ultrasound</p>	
<p>Witz (2000) presented three cases of pseudoaneurysms treated with ultrasound-guided external manual compression in which full access patency and functionality was achieved, with no episodes of recurrence during follow-up. They consider the above non-invasive technique to be safe and effective and that it should be tried before resorting to surgical or endovascular treatment. They also report that in other published studies, this approach had led to successful outcomes in 64-90% of patients.</p>	<p>Very low quality</p>
<p>Surgical management</p>	
<p>In the Shojaiefard study (2007), eight patients with pseudoaneurysms of the antecubital and anterior arteriovenous anastomosis in the arm were operated on with the Tourniquet Aneurysm Repair (TAR) technique and followed up for 15 months. In seven of the eight patients the fistula was patent.</p> <p>The rate of technical success of this surgical intervention was 87.5% and the patency rate was 87.5%.</p> <p>They considered it to be a technically viable, safe and cost-effective procedure. It does not require additional dissection and incision to control the vein and artery close to the pseudoaneurysm and involves a shorter procedure time without complications.</p>	<p>Very low quality</p>
<p>The Zheng study (2007) describes the results of surgery in 20 AVF pseudoaneurysms, 16 in upper limbs and 4 in lower limbs. One patient suffered an acute thrombosis, but recovered without complications following instant thrombectomy. One patient with postoperative bleeding in the incision recovered after low molecular weight heparin was discontinued. One fistula was not maturing over the following six weeks but was recovered after vein branch ligation. The authors consider surgery to be the best option for repairing fistula pseudoaneurysms.</p>	<p>Very low quality</p>
<p>The Georgiadis study (2008) evaluated surgery in correcting 16 aneurysms and 28 pseudoaneurysms; of the access types, 24 were fistulae, 18 grafts and 2 basilic vein transpositions. Primary patency post-intervention was 75% ± 8% at six months and 46% ± 9% at twelve months.</p>	<p>Very low quality</p>
<p>The Belli study (2012) is a retrospective review of arteriovenous fistula-related surgery, which analyses 35 cases of surgery in 31 patients with vascular-access aneurysms or pseudoaneurysms. They mention that nine cases were pseudoaneurysms, but provide no breakdown of the information about the outcomes of these cases.</p>	<p>Very low quality</p>

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Percutaneous management	
<p>The Hein study (2002) describes their clinical experience with the use of the <i>Arrow Percutaneous Thrombolytic Device</i>, manual compression combined with percutaneous mechanical thrombectomy, for removing thrombi from pseudoaneurysms. The technique succeeded in removing the thrombus in each of the 18 patients to whom it was applied. There was one technical failure in the thrombectomy procedure, caused by the inability to adequately treat a long venous stenosis in the access.</p>	Very low quality
<p>Ghersin (2003) evaluated ultrasound-guided percutaneous treatment with thrombin injection in five cases of pseudoaneurysm. The intervention was successful in four of the patients and in one, the pseudoaneurysm recurred despite initial success.</p>	Very low quality
<p>The retrospective study by Shah (2012) assessed endovascular placement of 27 self-expanding stents in 24 patients, in 56% of cases accompanied by balloon angioplasty of the graft stenosis. Patency was 100% at 30 days and 69.2% at 180 days. The treatment failed in five cases, three due to infection and two thrombosis.</p>	Very low quality
<p>The Barshes study (2008) evaluated placement of 32 self-expanding endovascular stents in 26 patients. In 19 patients there was a marked reduction in the size of the pseudoaneurysm and in all cases it was possible to once again successfully use this access for haemodialysis.</p>	Very low quality
<p>The study by Fotiadis (2013), on 11 patients, assessed endovascular placement of stents, that the authors note were all <i>off-label</i> products for this indication. In seven of the patients the procedure was accompanied by balloon angioplasty of another stenosis. Technically the operation was successful in 10 of the patients.</p> <p>Primary access patency rates were 72.7% (95% CI: 0.390-0.939) at three months and 36.4% (95% CI: 0.109 to 0.692) at six months. Secondary access patency rates were 72.7% at six months (95% CI: 0.233-0.832). There were no procedure-related complications</p>	Very low quality
<p>The Kim study (2012) retrospectively analysed the risk of infection in pseudoaneurysms treated with stents, in 235 interventions performed on 174 patients with grafts for vascular access. In 16.3% of cases surgical excision was required due to infection of the graft.</p>	Very low quality
<p>The Vesely study (2005) assessed endovascular placement of stents to treat pseudoaneurysms in accesses with graft in 11 patients. The endoprosthesis was successfully inserted and deployed in all 11 patients. Six patients underwent subsequent interventions, which ended primary patency at 39 days, 40 days, 63 days, 104 days, 120 days, and 327 days after insertion of the endoprosthesis. In two of the patients, the large pseudoaneurysm continued to be problematic and surgical repair was required.</p> <p>In the five patients not requiring additional interventions, primary patency continued. In these five patients the period of continuous primary patency was 55 days, 92 days, 103 days, 139 days and 196 days. In this small group of patients, the primary patency rate was 71% at 3</p>	Very low quality

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months and 20% at 6 months.	
<p>In the Najibi study (2002) ten patients with pseudoaneurysms, eight with grafts and two with fistulae, were treated with endoluminal coated stent. Immediately after implanting of the coated stent, all patients had palpable pulses in the pseudoaneurysms; at two weeks, all had lost the palpable pulsation and the access was functional in nine patients. One patient had an early thrombosis of the graft.</p> <p>After six months of follow-up, seven patients had complete exclusion of the pseudoaneurysm. Two patients had thrombosis of their dialysis access after implantation, one at three weeks and the other at three months.</p>	Very low quality
<p>The Kinning study (2012) assessed endovascular placement of self-expanding stents in 24 patients; 1.8 stents on average per patient.</p> <p>At 12 months, assisted primary patency was 50%. Prior to the 6-month follow-up five patients required removal of the stent due to infection and one patient asked for the removal of the stent due to pain at the implant site. The mean duration of patency was 17.6 months, with a range of 0 to 76 months. There was one incident of stent fracture at 36 months. Dialysis was not interrupted in any of the patients.</p>	Very low quality
<p>The Pandolfe study (2009) assessed endovascular placement of six stents in four patients with grafts to treat pseudoaneurysms, and reported that primary patency was achieved in all their grafts for one, five, and nine months respectively, and that no intervention-related complications occurred in any of the cases over the course of 29 months of follow-up.</p>	Very low quality
Summary of evidence	
<p>A clinical series with three patients showed that ultrasound-guided external manual compression may be effective in the treatment of pseudoaneurysms, to achieve patency and full functionality of the access with no recurrences during the follow-up period.</p>	Very low quality
<p>Different clinical series have separately analysed surgery and endovascular intervention with stents, and conclude that they are effective treatment techniques in high percentages of patients, in terms of recovering access patency and functionality.</p>	Very low quality
<p>Patients' values and preferences <i>No relevant studies related to this aspect have been identified.</i></p>	
<p>Use of resources and costs <i>No relevant studies related to this aspect have been identified.</i></p>	

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Recommendations [Proposal]	
Weak	We suggest that in patients with pseudoaneurysm, treatment using ultrasound-guided external manual compression should be tried first, before resorting to percutaneous or surgical treatments.
Weak	We suggest treating pseudoaneurysms which are unresponsive to treatment using external compression with percutaneous or surgical methods.
References	
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Table 1. STUDIES EXCLUDED

Study	Cause for exclusion
Pirozzi 2013	Does not address treatment of pseudoaneurysms.