

ANNEXES TO CHAPTER 5

**Clinical Question XVI. Are there any criteria that indicate in which cases, when and how to treat central vein stenosis, assessed in terms of usable arteriovenous fistula patency and/or thrombosis?**

A number of different alternatives have been used to treat central venous stenosis in patients with haemodialysis vascular access: the conservative approach, endovascular surgery and percutaneous angioplasty with or without stenting.

No RCT were found comparing these different interventions in cases of central venous stenosis.

However, two narrative reviews were located that address this issue (Agarwal 2013; Yevzlin 2008). We present here the information gathered in the Agarwal review (2013), as it is more complete and up-to-date.

The NKF-KDOQI guidelines (National Kidney Foundation 2006) contend that patients with limb oedema that persists beyond two weeks after placement of the graft should have an imaging study (including dilute iodinated contrast agent) to assess the patency of the veins. They consider that the treatment of choice for central venous stenosis is percutaneous angioplasty.

**Low quality**

They argue that stent placement be considered in the following situations:

- acute elastic recoil of the vein (stenosis >50%) after the angioplasty.
- the stenosis recurs within three months.

**Conservative approach**

In the Agarwal narrative review (2013), they suggest that ongoing monitoring without intervention may be sufficient for cases with chronic obstruction who have adequate development of collateral veins.

They stress that in very mild cases, simple steps such as elevation of the affected limb may suffice. In cases where there is thrombosis in the central vein, they propose anticoagulant therapy according to the SOR guidelines (Debordeau 2008).

They argue the need for intervention if there is malfunction in dialysis or symptoms of venous stenosis such as peripheral oedema, swelling, pain, erythema of the ipsilateral limb or swelling on the ipsilateral chest.

The review presents the results of the Levit clinical series (2006) where they analysed the progress of 35 asymptomatic patients with central venous stenosis >50%: 28% had no intervention and none progressed to symptoms or additional stenosis, or required stenting; the rest of patients had percutaneous angioplasty and 8% of them had worsening of the stenosis requiring further interventions.

**Low quality**

**Percutaneous angioplasty**

According to Agarwal (2013), endovascular treatment should be considered with caution because experience shows that outcomes are suboptimal and it may even be harmful.

They point to one clinical series (Chang 2004) which found hyperplasia lesions in the intima and neoproliferative lesions in re-stenosed areas after angioplasty that were more aggressive than those found in the original lesions.

**Low quality**

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<p>Agarwal (2013) summarises the seven published clinical series evaluating the efficacy of percutaneous angioplasty in the treatment of central venous stenosis.</p> <p>Technical success rates were high, ranging from 70% to 90%.</p> <p><u>Primary patency at 6 months</u> after percutaneous angioplasty ranged across studies from 23% to 63%, and the <u>cumulative patency</u> rate from 29% to 100%; <u>at 12 months, primary patency</u> ranged from 12% to 50%, and the <u>cumulative patency</u> rate from 13% to 100%.</p>	
<p><b>Placement of stents</b></p> <p>Agarwal (2013) analysed 17 published clinical series evaluating the efficacy of placement of self-expanding stents in the treatment of a total of 409 cases of central venous stenosis. They considered that stent placement achieved a high degree of technical success, but primary and secondary patency after stent placement was modest in the best of cases.</p> <p><u>Primary patency at one year</u> varied across studies in a range of 14.3% to 100% and <u>secondary patency</u> from 33% to 91%.</p> <p>Several studies found cases of stent-related complications, such as migration, fracture, in-stent neointimal hyperplasia, and the occurrence of new stenosis not related to the original. They point out that stents placed in venous systems, with low pressure, are less effective in maintaining patency than those placed in the high-pressure arterial system.</p> <p>They report the study by Ozyer (2009), which compared outcomes for 46 patients treated with stent and 101 patients treated with angioplasty alone, finding better primary patency for those treated with angioplasty alone and similar secondary patency between the two treatments. Another two recent studies also report similar patency for the two treatments (Kim 2009; Bakken 2007).</p> <p>Agarwal (2013) considers stent insertion to be an option to maintain vascular access for patients with problems creating new accesses and lesions refractory to treatment with percutaneous angioplasty who require a stop gap until further more definitive treatment.</p>	<p><b>Low quality</b></p>
<p><b>Summary of evidence</b></p>	
<p><b>Conservative approach</b></p> <p>Observational studies found that ongoing monitoring without intervention may be sufficient for cases where there is adequate development of collateral veins and symptoms are not severe.</p>	<p><b>Low quality</b></p>
<p><b>Percutaneous angioplasty</b></p> <p>Observational studies found endovascular treatment to be suboptimal and that it can lead to hyperplasia lesions in the intima and neoproliferative lesions in re-stenosed areas that are</p>	<p><b>Low quality</b></p>

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<p>more aggressive than those in the original lesions.</p> <p>Observational studies found that percutaneous angioplasty achieves primary patency rates at 12 months of 12% to 50%, and cumulative patency of 13% to 100%.</p>		
<p><b>Placement of stents</b></p> <p>Observational studies found that primary patency at one year varied across studies from 14.3% to 100% and secondary patency from 33% to 91%. Several studies found cases of stent-related complications, such as migration, fracture, in-stent neointimal hyperplasia, and the occurrence of new stenosis not related to the original.</p>		<b>Low quality</b>
<p><b>Percutaneous angioplasty vs stent</b></p> <p>Observational studies found patency to be similar for the two treatments.</p>		<b>Low quality</b>
<p><b>Patients' values and preferences</b></p> <p><i>No relevant studies related to this aspect have been identified.</i></p>		
<p><b>Use of resources and costs</b></p> <p><i>No relevant studies related to this aspect have been identified.</i></p>		
<p><b>Recommendations [Proposal]</b></p>		
<b>Weak</b>	<p>Use ongoing monitoring, without vascular intervention, for cases of central venous stenosis where there is adequate development of collateral veins and symptoms are not severe.</p>	
<b>Weak</b>	<p>Use percutaneous angioplasty in cases of central venous stenosis accompanied by malfunction in dialysis or significant symptoms (peripheral oedema, swelling, pain, erythema of the ipsilateral limb or swelling on the ipsilateral chest).</p>	
<b>Weak</b>	<p>Place intravascular stent if, after the percutaneous angioplasty:</p> <ul style="list-style-type: none"> <li>- acute elastic recoil of the vein occurs (stenosis &gt;50%).</li> <li>- the stenosis recurs within 3 months.</li> </ul>	

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### References

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**GRADE TABLES**

**Date:** 2014-02-12

**Question:** Should percutaneous angioplasty be used for central venous stenosis in patients with vascular access for haemodialysis?

**Bibliography:** Narrative overview by Agarwal AK. Central vein stenosis. Am J Kidney Dis. 2013 Jun; 61(6):1001-15.

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Percutaneous angioplasty	Control	Relative (95% CI)	Absolute		
<b>Primary patency at one year (range of scores: 23-63%; Better indicated by higher values)</b>												
7	observational studies <sup>1</sup>	serious <sup>1</sup>	serious <sup>2</sup>	no serious indirectness	no serious imprecision	none	Not available	-	-	-		CRITICAL
<b>Cumulative patency at one year (range of scores: 13-100%; Better indicated by higher values)</b>												
7	observational studies <sup>1</sup>	serious <sup>1</sup>	serious <sup>2</sup>	no serious indirectness	no serious imprecision	none	Not available	-	-	-		CRITICAL

<sup>1</sup> Case series

<sup>2</sup> High variability among results from different studies.

Date: 2014-02-12

Question: Should stent placement be used for central venous stenosis in patients with vascular access for haemodialysis?

Bibliography: Narrative overview by Agarwal AK. Central vein stenosis. Am J Kidney Dis. 2013 Jun; 61(6):1001-15.

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Stent placement	Control	Relative (95% CI)	Absolute		
<b>Primary patency at one year (range of scores: 14.3%-100%; Better indicated by higher values)</b>												
17	observational studies <sup>1</sup>	serious <sup>1</sup>	serious <sup>2</sup>	no serious indirectness	no serious imprecision	none	409	-	-	-		CRITICAL
<b>Secondary patency at one year (range of scores: 33%-91%; Better indicated by higher values)</b>												
17	observational studies <sup>1</sup>	serious <sup>1</sup>	serious <sup>2</sup>	no serious indirectness	no serious imprecision	none	409	-	-	-		CRITICAL

<sup>1</sup> Case series

<sup>2</sup> High variability among results from different studies.