

### Rigid venous stenosis in a hemodialysis fistula

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**Section:** Interventional radiology

**Imaging Technique:** Digital radiography

Case Type: Clinical Cases

**Authors:** D. Vorwerk

**Patient:** 63 years, male

#### Clinical History:

Venous stenosis in a Brescia-Cimino fistula

#### Imaging Findings:

Patient presented with shunt dysfunction of his Brescia-Cimino fistula at his right forearm. Primary surgery had been performed two years earlier. Fine needle angiography (22 G) via a transbrachial arterial approach detected a minor stenosis at the level of the anastomosis but a significant venous stenosis about 2 cm distally to the anastomosis.

#### Discussion:

After retrograde puncture of the cephalic vein, a 0.035 in hydrophilic guidewire was guided into the radial artery. Via a 6 F sheath, a high-pressure balloon (Powerflex Extreme, Cordis Inc) with a diameter of 5mm which was adapted to the size of the vein was advanced into the stenotic section (Fig. 2a). During manual inflation, a waist remains at the level of the stenosis (Fig. 2 b). After retrieving the balloon to protect the distal radial artery, manometer-driven inflation of the venous stenosis only was performed with the waist disappearing at 20 atm (Fig. 2 c). Control angiography showed complete opening of the stenosis (Fig. 2 d). A narrowing of the more distal vein was only present after PTA and was considered as a local venous spasm. Rigid venous stenoses are frequent in dialysis fistulas. Routine use of high-pressure balloons is therefore recommendable. There are only few high-pressure balloons available that can stand a rated burst pressure of 20 atm. In some cases, the pressure may be even exceeded up to 25 - 30 atm. This is usually sufficient to dilate even very rigid stenoses. It is noteworthy that the rated burst pressure of most high-pressure balloons is between 18 and 20 atm depending on its diameter. By experience, rated burst pressure can be exceeded up to 50% with only a minor risk of balloon rupture.

**Differential Diagnosis List:** Rigid stenosis that was dilated by a high-pressure balloon

**Final Diagnosis:** Rigid stenosis that was dilated by a high-pressure balloon

#### References:

Turmel-Rodrigues L, Pengloan J, Blanchier D, Abaza M, Birmele B, Haillot O, Blanchard D.

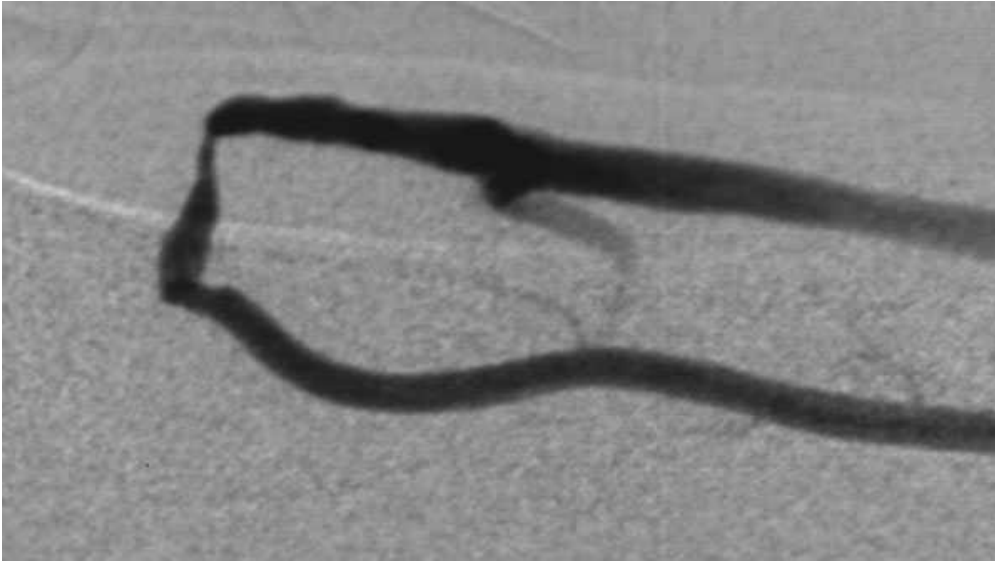
Insufficient dialysis shunts: improved long-term patency rates with close hemodynamic monitoring, repeated percutaneous balloon angioplasty, and stent

placement.

Radiology. 1993 Apr;187(1):273-8. (PMID: [8451428](#))

**Figure 1**

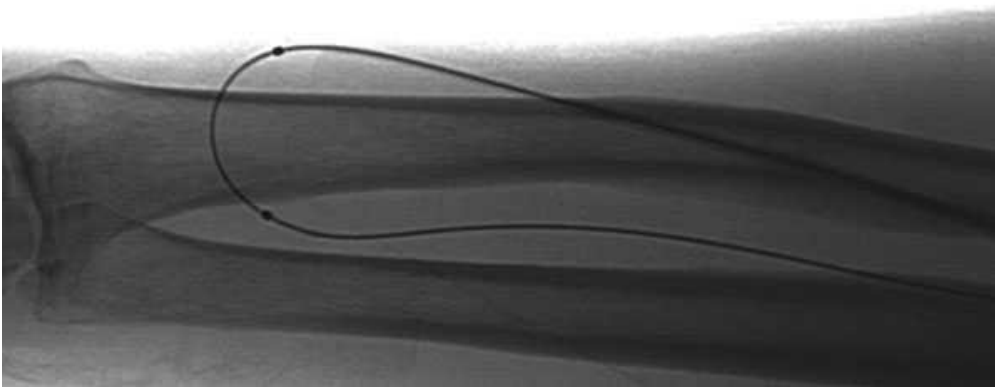
**a**



**Description:** Transbrachial angiography shows stenosis at the level of the anastomosis but a more significant stenosis in the proximal vein **Origin:**

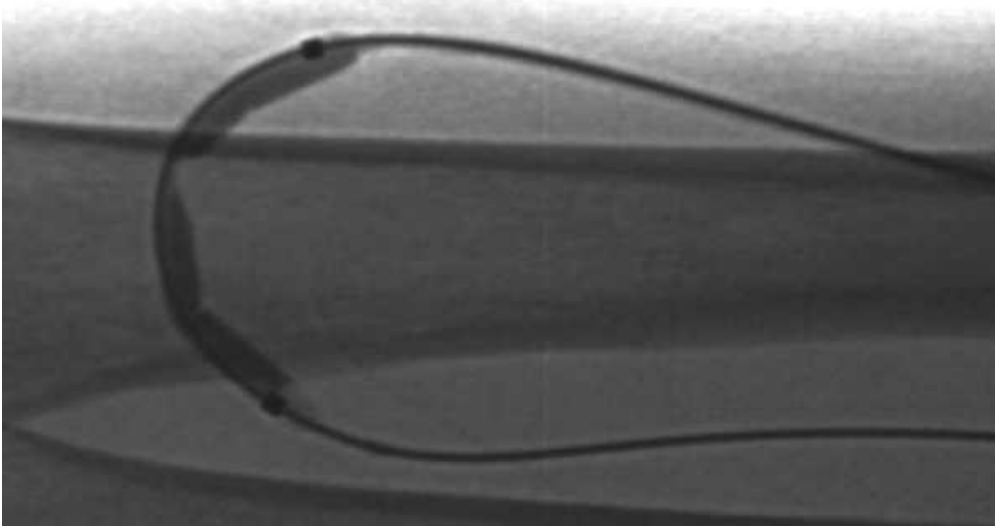
## Figure 2

a



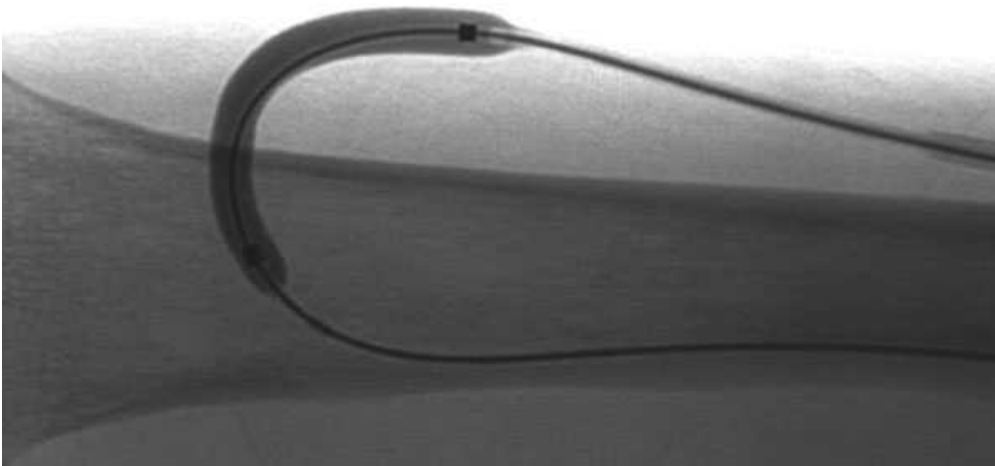
**Description:** By a retrograde venous access, the balloon catheter is advanced over the stenosed segment **Origin:**

b



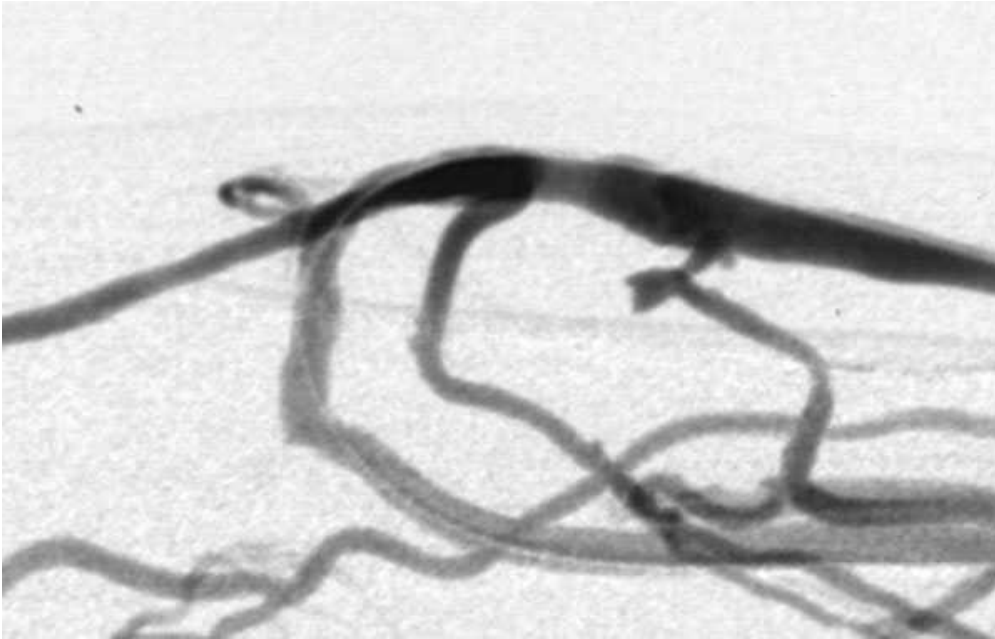
**Description:** While manually inflated, a waist is seen at the location of the venous stenosis **Origin:**

**c**



**Description:** After retrieving the balloon into the vein, full pressure of 20 atm is used that opens the waist completely **Origin:**

**d**



**Description:** After high-pressure dilation, the lesion is gone **Origin:**