

Calcified in-stent restenosis in a venous stent

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Case

35-year-old woman, non smoker, no oral contraceptives, Faktor V Leiden heterozygous

10 years earlier treated for acute left-sided DVT with catheter-directed thrombolysis (CDT) and stenting of the left common iliac vein

Stent used: 12mm, 12cm arterial nitinol stent

Terminated anticoagulation after 1 year

2 successful pregnancies within the past 10 years

Presented with 1 week's recurrent symptoms of acute left-sided DVT (lower back pain, swelling and pain of left leg)

Initial treatment with 72 hrs of ultrasound accelerated CDT (UACDT) unsuccessful, significant residual thrombus inside the stent

CT-scan (Fig 1) revealed severe calcification of the in-stent restenosis

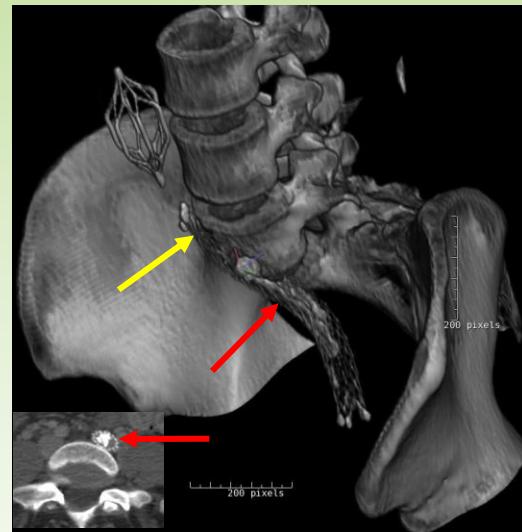


Fig 1 3D CT reconstruction showing severely calcified material (red arrows) inside the old stent in the left iliac veins. The stent is severely compressed at the May-Thurner point (yellow arrow). IVC filter in place. Inlay picture shows cross sectional view of the stent with the calcification (arrow)

Lessons learned from this case

- With increasing numbers of stentings of central veins, the first ones being far more than a decade ago, we might just begin to see the tip of the iceberg in regards of late stent-related complications, as these, like in our case, seem to be able to occur even after many symptom-free years
- Long-term stent-surveillance might be indicated, particularly in patients at risk (i.e. suboptimal initial result, post-stent pregnancies, trombophilia) as in our case
- Late in-stent restenoses and occlusions of stents inside the deep veins can be calcified
- The treatment of these calcified stenoses is complex and challenging, but nevertheless possible with the described minimally invasive approach

Reference: Schmidt J-O, Christensen JK, Houliind KC. Calcified in-stent restenosis in a venous stent. *J Vasc Surg Cases* 2015;1:261-3



Fig 2 Venograms showing the results after 48 hrs of UACDT (left) and after debulking using the Rotarex catheter (middle) Fluoroscopy showing the Atlas balloon forcing the residual thrombus material (arrow) into the vessel wall (right)

Treatment

- IVC filter for protection against embolisation (Opt-Ease®, Cordis Corp, Fremont, CA)
- 48 hrs of UACDT (EKOS®, EKOS Corp, Bothell, Wash.)
- Mechanical debulking with 8F over-the-wire thrombectomy-catheter (Rotarex®, Straub Medical AG, Wangs, Switzerland)
- Pre-ballooning at 16 Bar with 12mm, non-compliant high-pressure balloon (Atlas®, C.R. Bard Inc, Murray Hill, NJ)
- Stenting of the entire lesion, covering the May-Thurner point and the entire old stent with a 12mm, 15cm high-radial-force, dedicated venous nitinol stent (Sinus Venous®, Optimed GmbH, Ettlingen, Germany)
- Post-ballooning of the entire stent-complex at 14 Bar with 12mm Atlas®-balloon
- Removal of IVC filter
- Life-long anticoagulation with Warfarin (INR 2,0 – 3,0)
- Knee-high compression stockings (CCL 2)

Results

Rotarex®- debulking resulted in removal of apx. 25-50% of the calcified material

Pre- and post- ballooning furthermore maximized the inner diameter of the stent complex

The May-Thurner compression was completely resolved

Un-obstructed venous outflow from the left leg was re-established (no collaterals visible), but the inner diameter of the stent-complex is only 9-10mm

The patient experienced instant symptom-relief

We discovered partial rethrombosis after 8 mths, which resolved spontaneously after raising the INR to 3,0-3,5

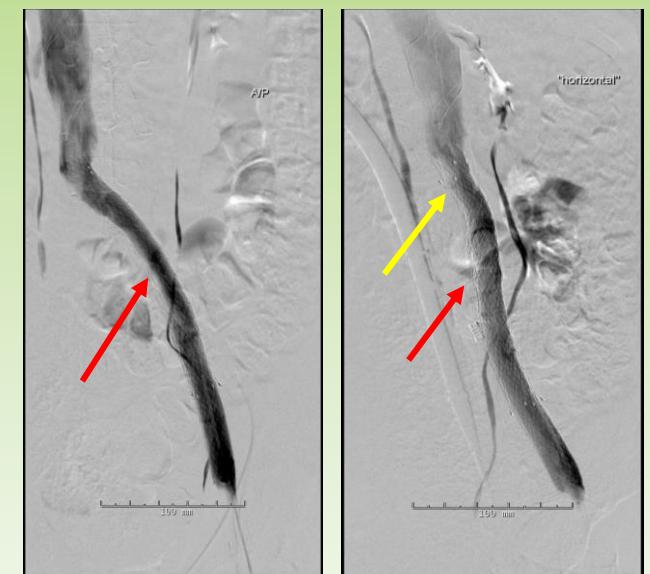


Fig 3 Final venograms, A-P view (left) and at the same angle-of-view as Fig 1 (right), showing reestablished unobstructed venous outflow from the left leg. The residual calcified material is sandwiched between the stents (red arrows) The May-Thurner compression is completely resolved (yellow arrow)