CIRA Case of the Week
April 2017

Case courtesy of
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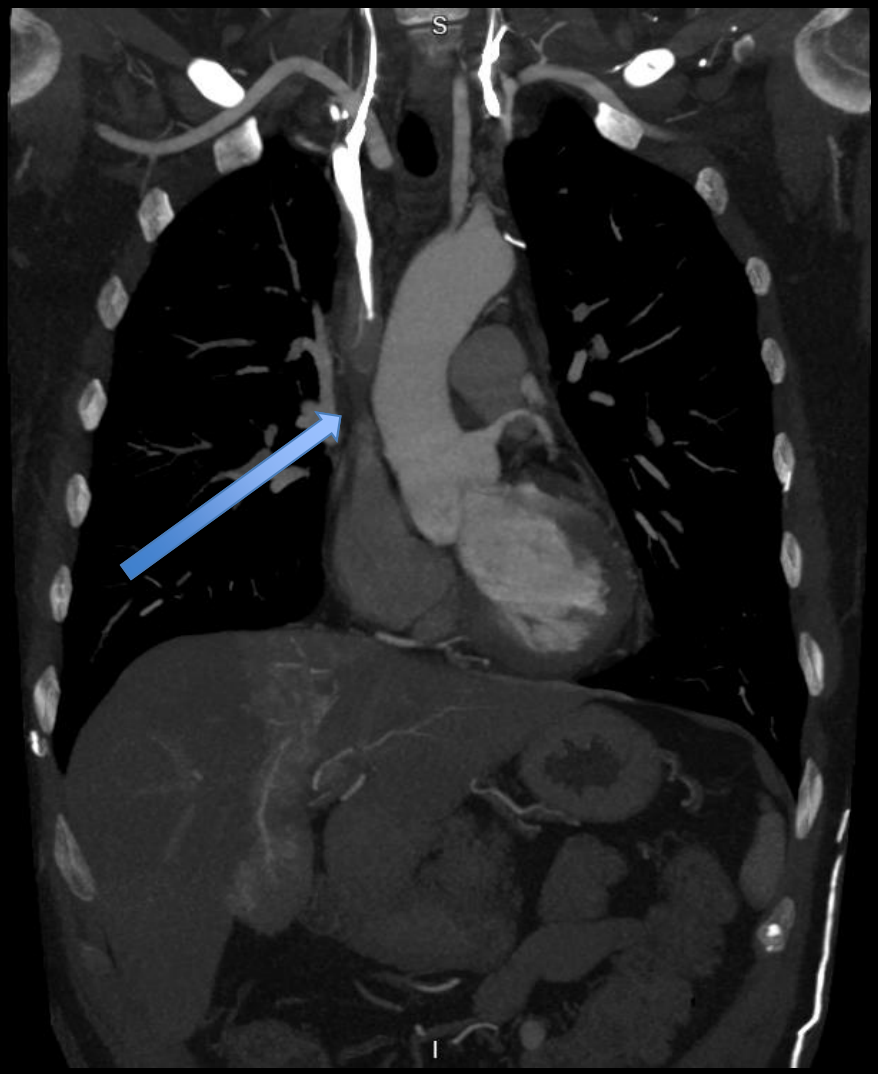
Sherbrooke University

Clinical History

- 50 year old woman
- New onset of facial swelling
- Increased venous networks: left arm, chest and upper abdomen
- Previous history of right breast carcinoma with surgery and radio/chemotherapy via a left-sided Port-a-Cath
- The Port-a-Cath was removed 2 years after
- Labwork: unremarkable
- A CT scan and MRI of the thorax was performed

Initial CT

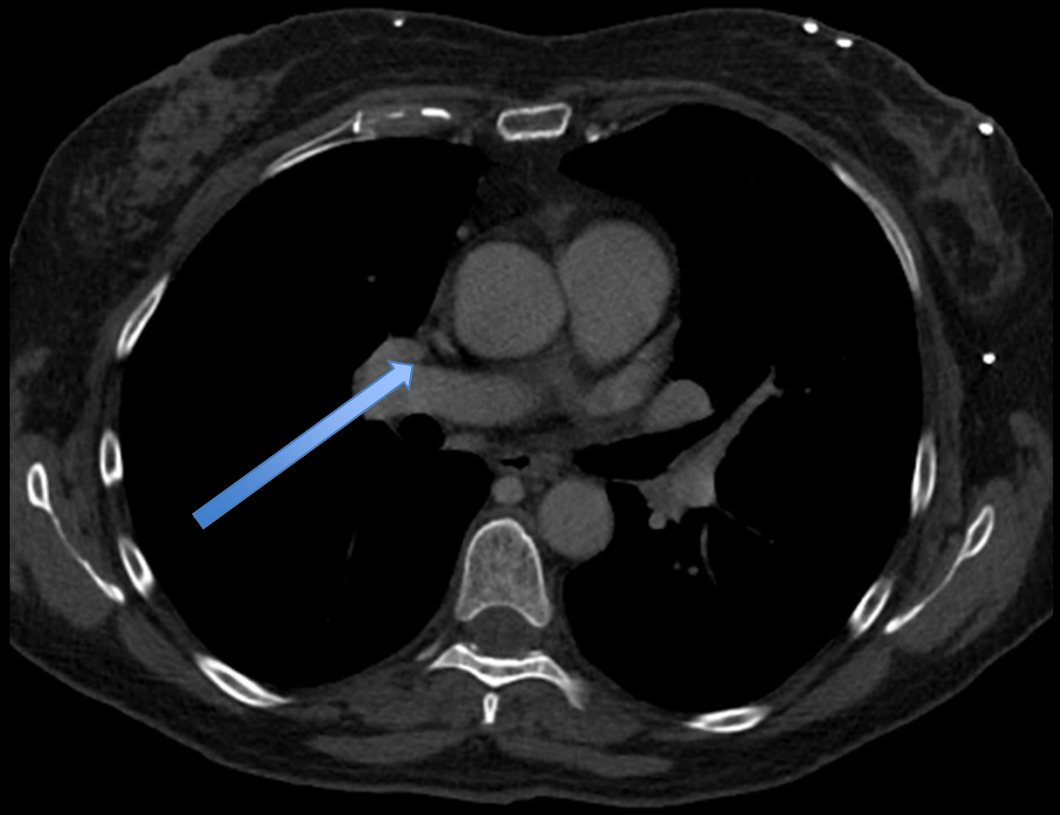
Severe SVC stenosis just below the left innominate vein



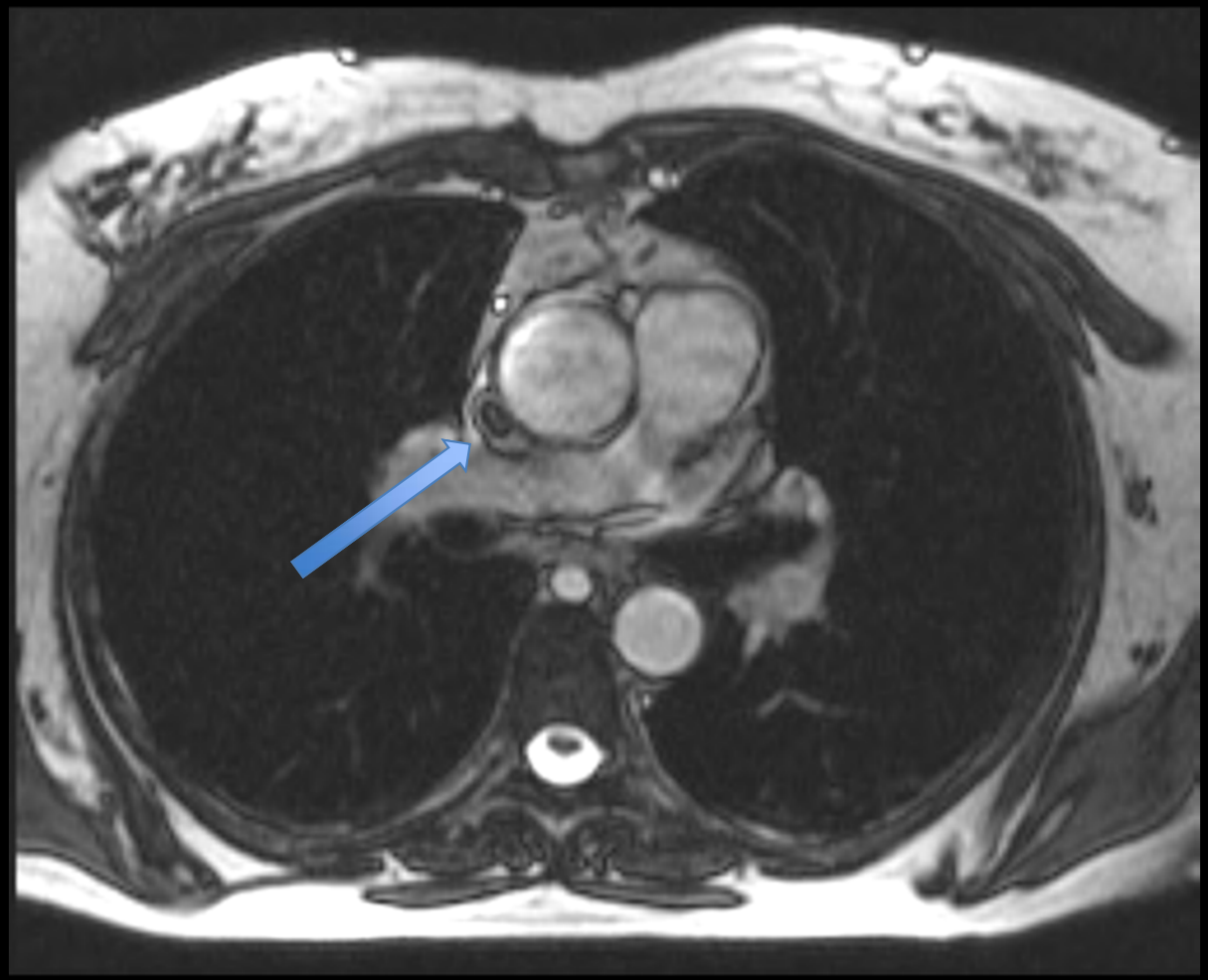
Initial CT

Severe SVC stenosis just below the left innominate vein

Several left thoracic collaterals



MRA



MRA

Hypertrophy of the azygos system

Findings

- No thrombus
  - left and the right innominate vein
- No evidence of neoplastic recurrence

A diagnosis of benign SVC stenosis secondary to a chest port was made

The patient's symptoms were getting worse

She was scheduled for SVC Angioplasty

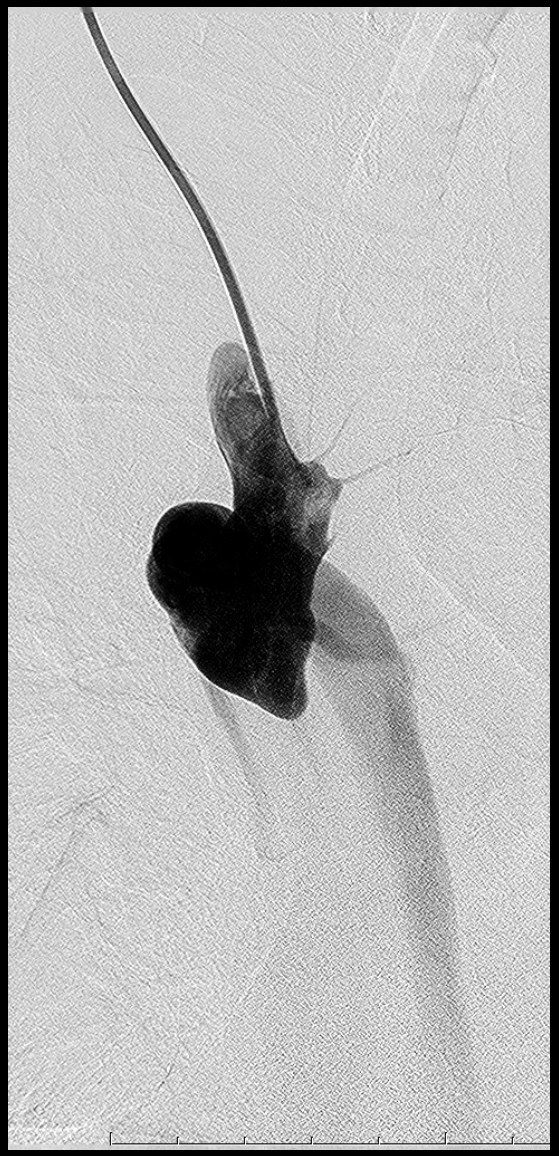
SVC Angioplasty

6F access was established through both femoral and jugular veins

Both images show SVC stenosis just below the right main bronchus corresponding to the level of the left innominate vein

SVC Angioplasty

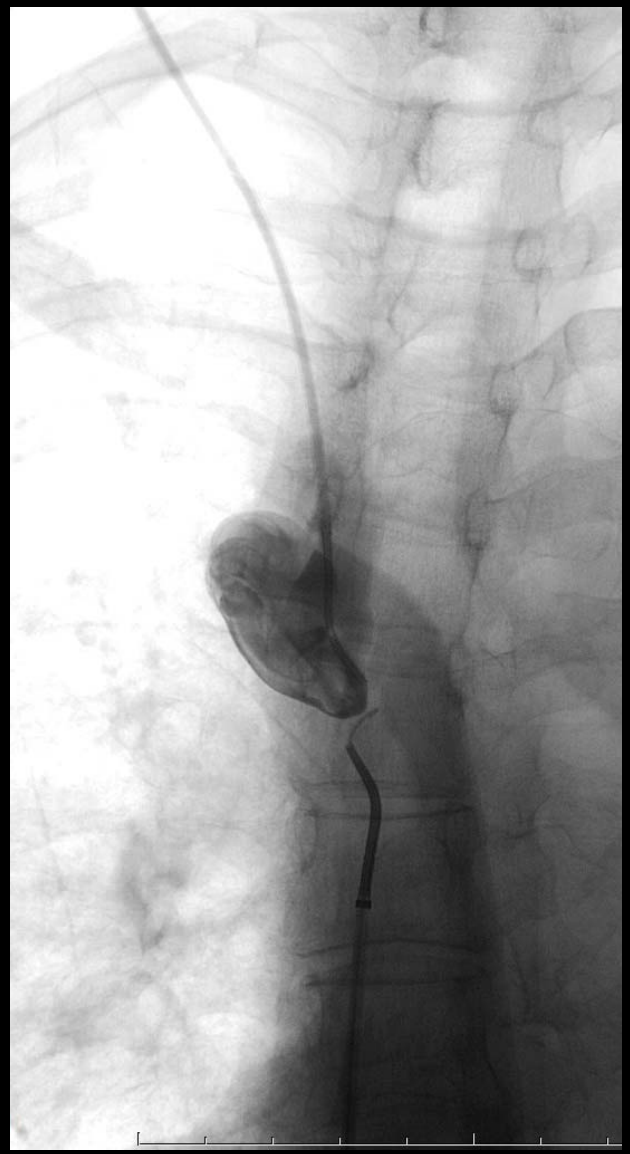
Opacification from the jugular access shows SVC stenosis, hypertrophy of the azygos system and several collaterals

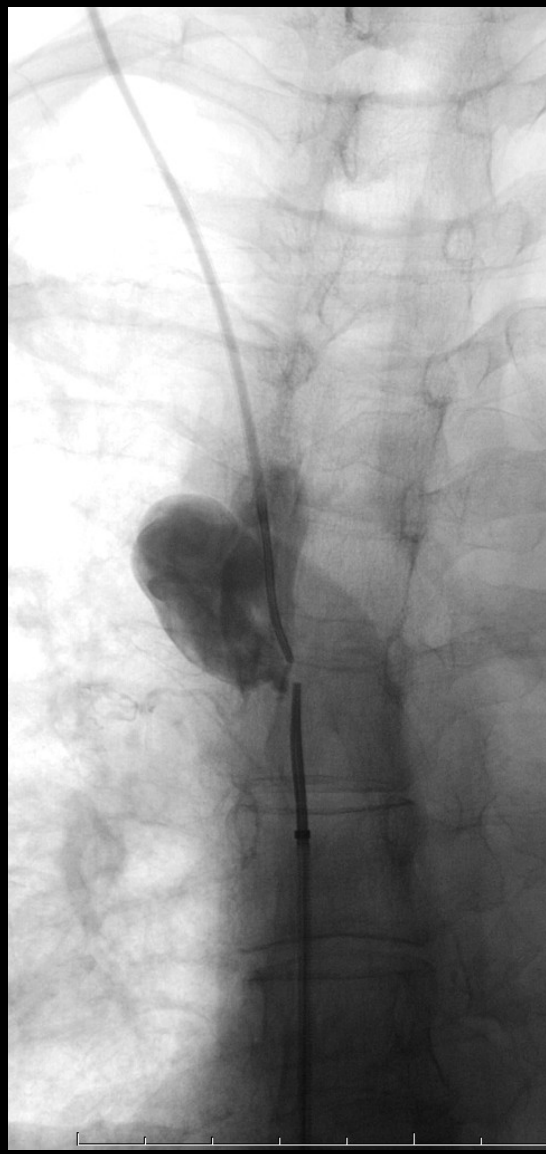


SVC Angioplasty

Recanalization was attempted through jugular and femoral accesses

Both standard recanalization and sharp recanalization with the stiff end of the guidewire were attempted





SVC Angioplasty

- Standard and sharp recanalization attempts were unsuccessful
- Extraluminal tracts were created with extravasation noted
- Reentry into the lumen was impossible

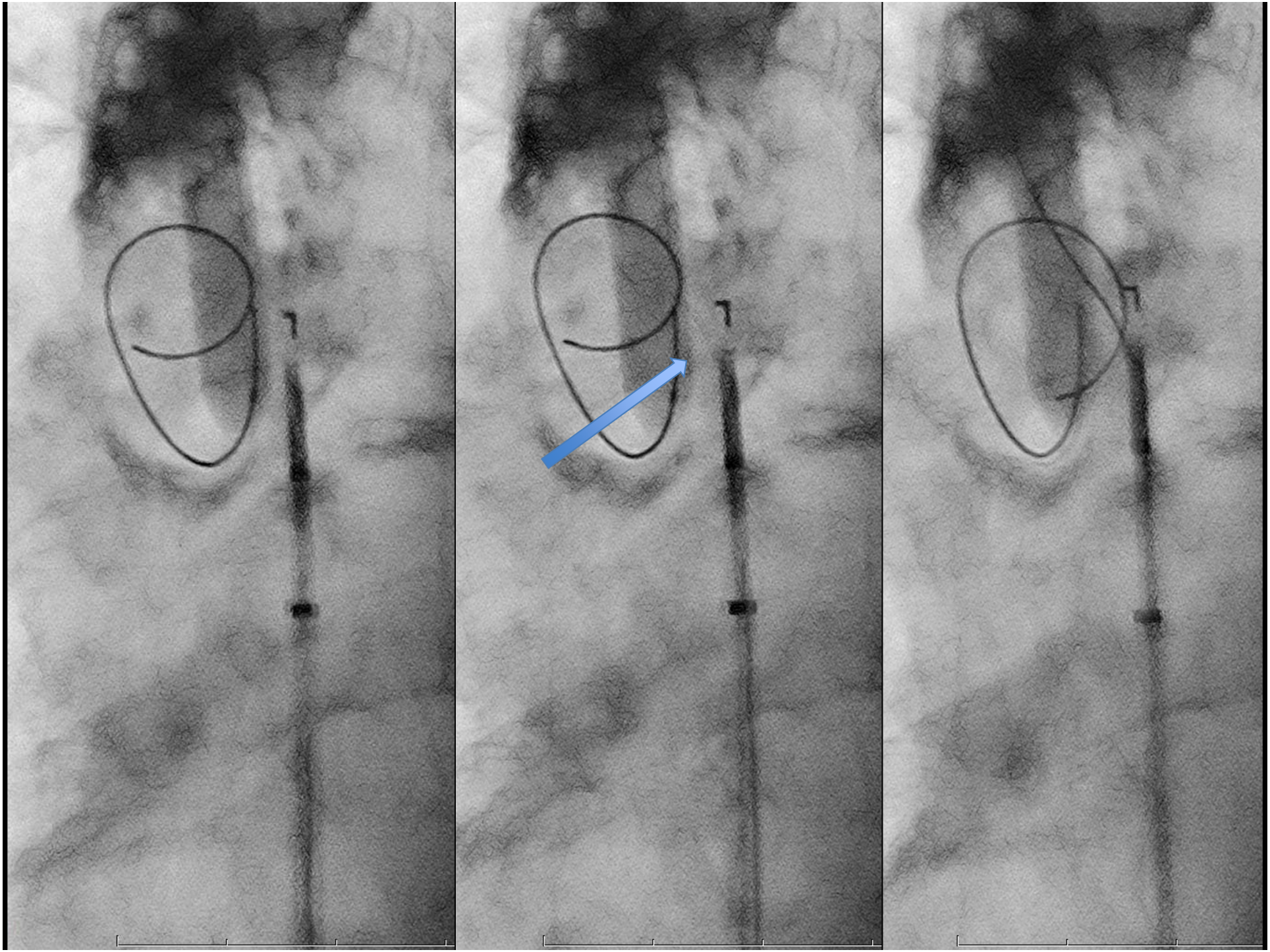
So what to do?

Recanalization with the Outback LTD catheter

Re-entry catheter allowing true lumen re-entry

The catheter is placed in a subintimal tract beyond the occlusion

The needle is deployed laterally in the true lumen and a guidewire is advanced into the true lumen distal to the level of occlusion



SVC Angioplasty

- An 8 mm angioplasty balloon was advanced from the jugular approach to the level of the SVC and inflated just above the level of the occlusion

- The Outback catheter was advanced from below with its tip placed adjacent to the balloon. The L-shaped marker was directed towards the angioplasty ballon

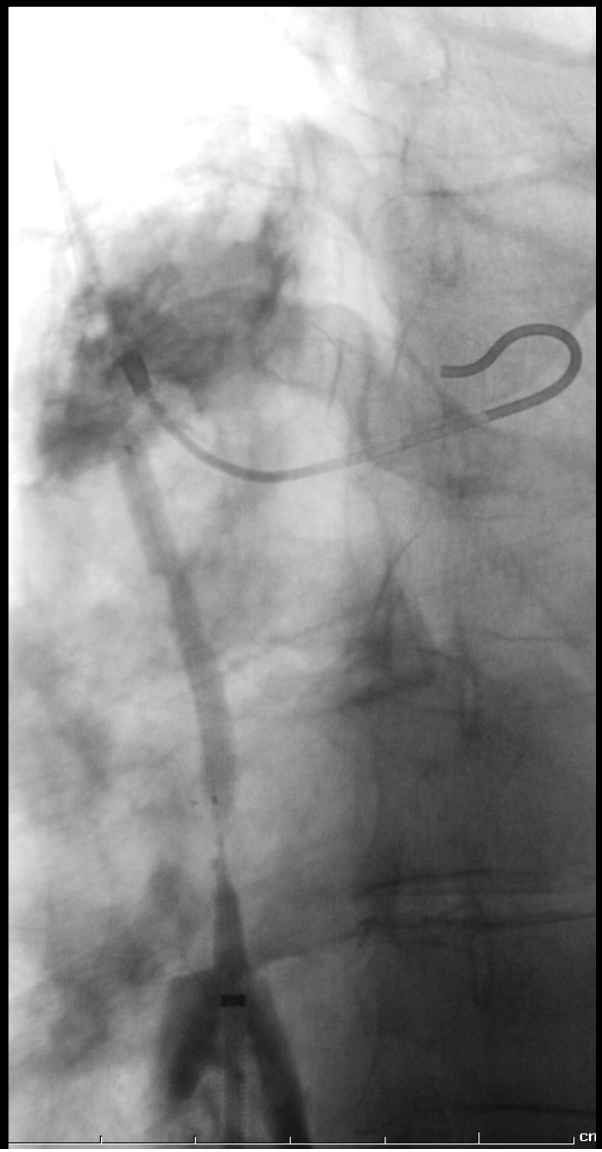
- Needle deployment was performed and lateral displacement of the angioplasty balloon in the SVC confirmed proper orientation of the needle

- A guidewire was advanced through the needle into the SVC, establishing an access into the target lumen distal to the level of occlusion

SVC Angioplasty

Predilatation was performed with a small 4 mm balloon

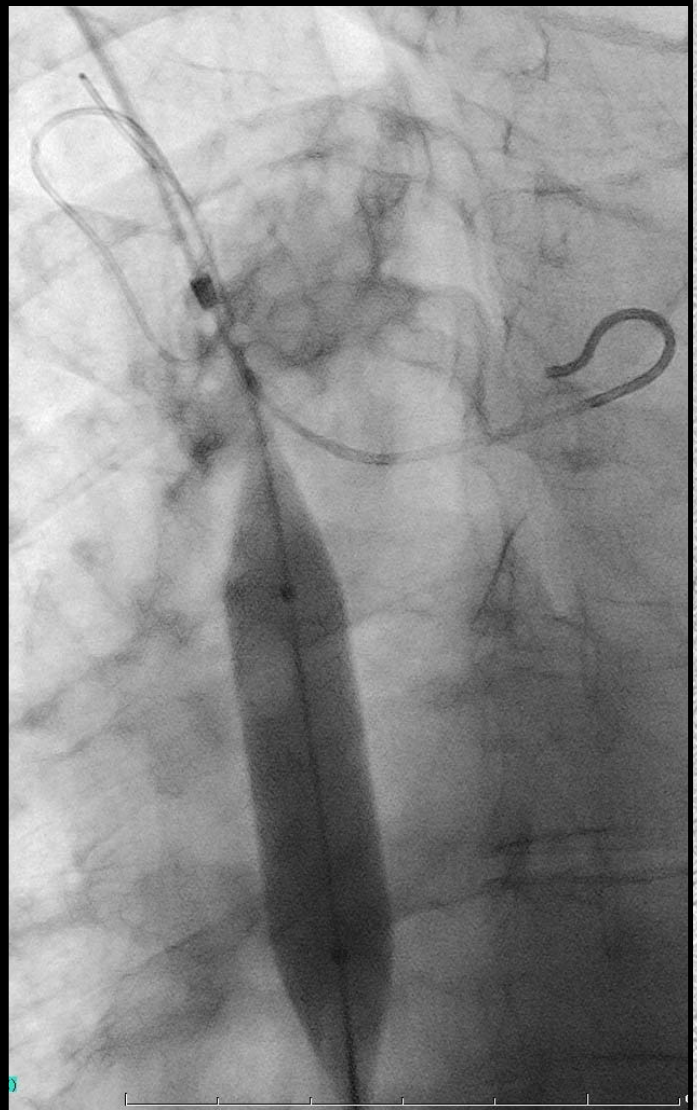
This image shows contrast extravasation from the previous attempts to cross with the stiff end of the wire and also shows that the stenosis is long, extending to the junction with the right atrium

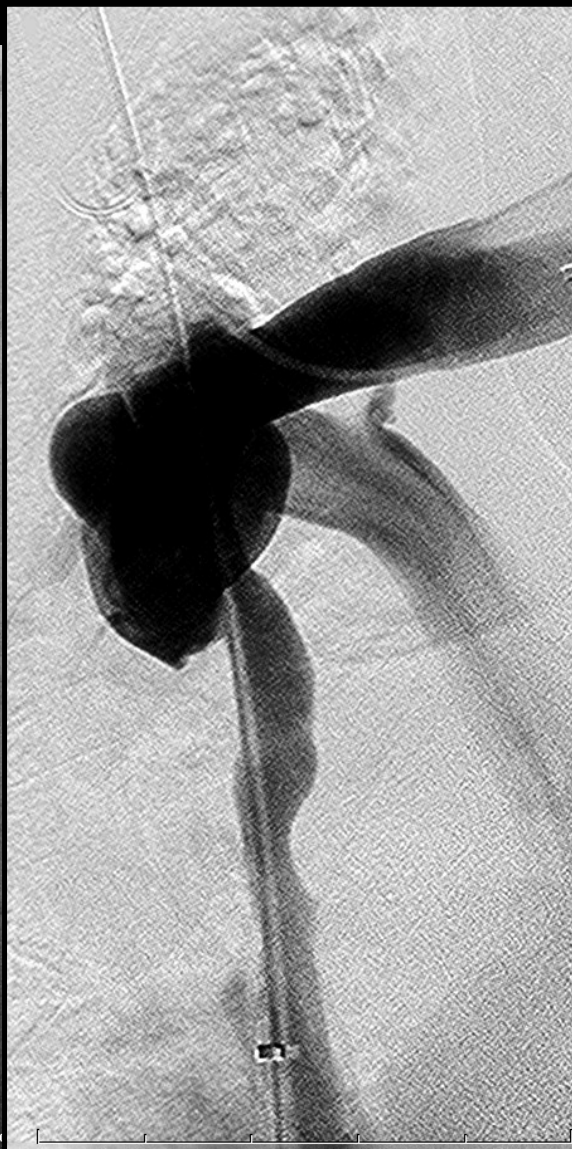


SVC Angioplasty

Angioplasty was performed with 8 mm and 10 mm balloons

After the angioplasty, the azygos was still visible with a significant residual stenosis





SVC Angioplasty

Finally, an Atrium 12-61 covered stent was deployed and dilated to 14 mm

Post Angioplasty

- The final result was excellent, without residual stenosis or extravasation
- Anticoagulation with Xarelto was initiated for 6 months
- After more than 18 months, the patient reports complete regression of symptoms, without complication

Discussion: Use of a Re-Entry Device

- An article by Anil and Taneja (2010) described the use of the Outback catheter in the venous system to recanalize an innominate vein occlusion, and this is the only such report in the literature
- In our case, the use of a balloon as a target proved useful
  - facilitated proper orientation
  - Displacement/perforation of the balloon indicated the needle had entered the target lumen
- This technique has not yet been reported
- It can increase technical success and minimize the risk of mediastinal complications

Discussion: Choice of Stent

- For benign disease
  - PTA
  - PTA + stenting
- In our case, POBA was considered as a possible treatment option to avoid stenting, since the patient had a good long-term prognosis
- A stent was nonetheless required because of significant residual stenosis post POBA
- A stent graft was chosen
  - Off-label technique
  - Extraluminal tracts
  - Long-term prognosis
- Stent migration is a risk
- For us, balloon-expandable stents work well in the SVC

Take-Home Message

- In benign SVC stenosis
  - If conventional technique fails, consider alternatives
    - Sharp recanalization
    - Re-entry catheter
  - POBA is a possible treatment to avoid stenting
    - Normal life expectancy
  - The type of stent should be determined by the diameter, length, and location of the stenosis