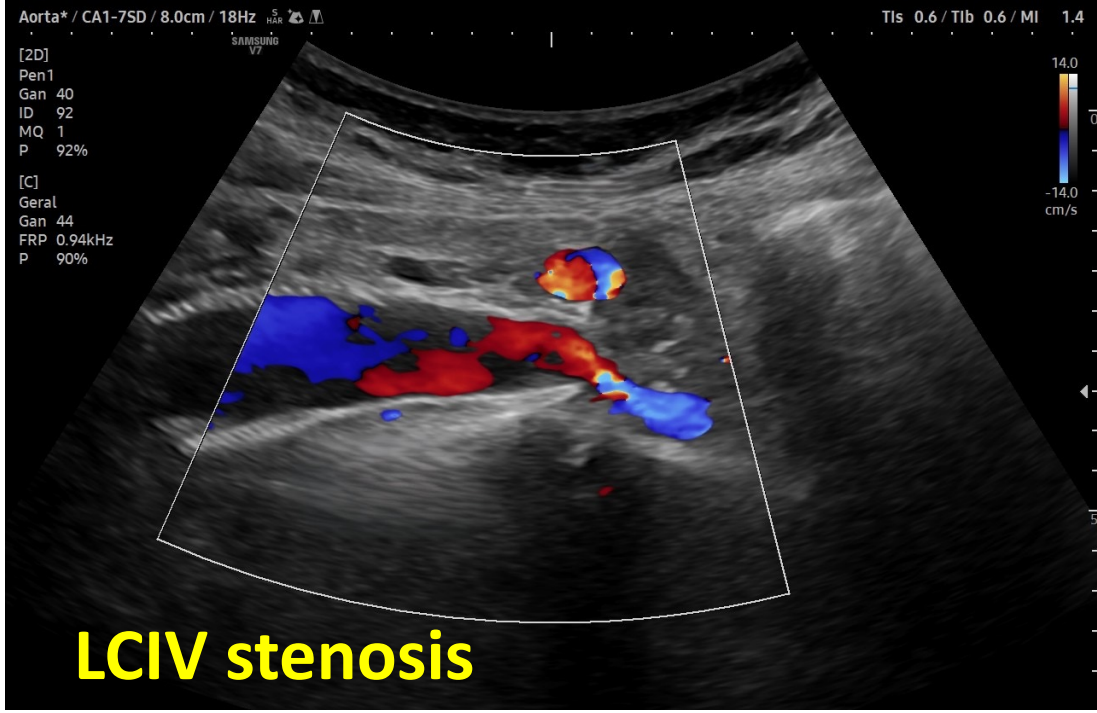
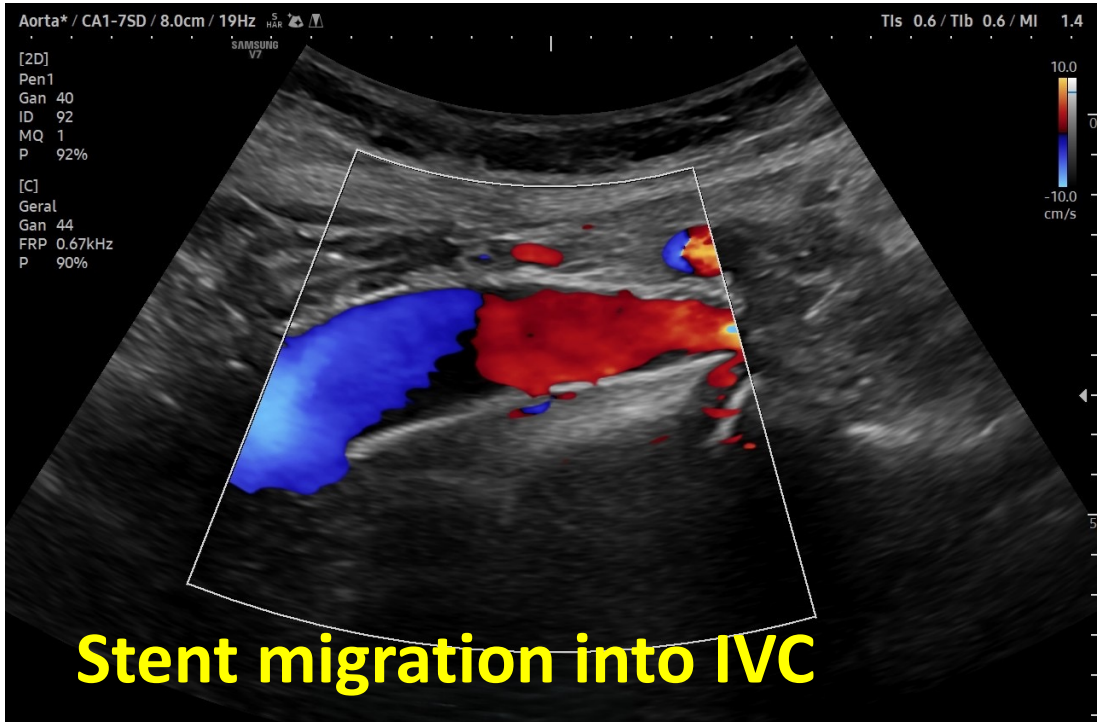
Clinical case

Venous obstruction and stent migration

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Belo Horizonte, Brazil and New York, USA





Female 47 years old presented with edema of the left lower limb.

Symptoms worsened about 3 months ago.

Family history: Both parents had cardiovascular disease. No history of DVT

Medical History: She is taking Rosuvastatin for dyslipidemia with no other major comorbidities.

Surgical history: A stent was placed in the LCIV 8 months ago for ipsilateral limb edema which improved after the procedure.

Physical Examination

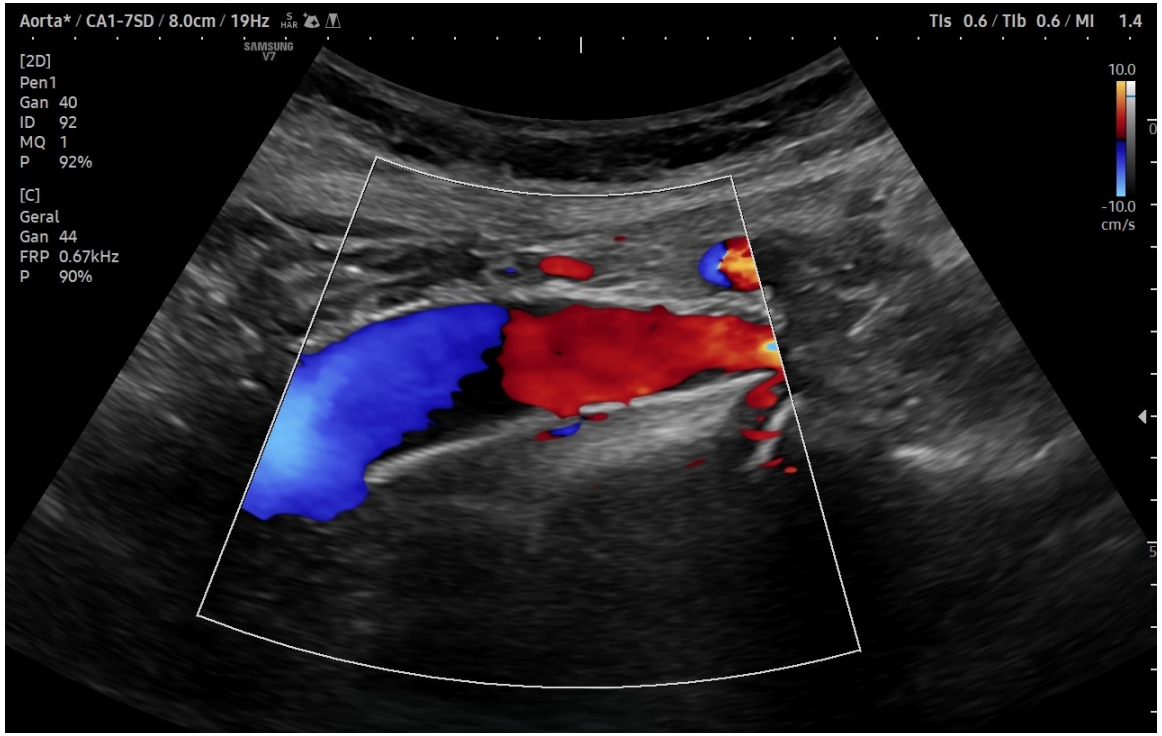
Normal arterial exam in all extremities

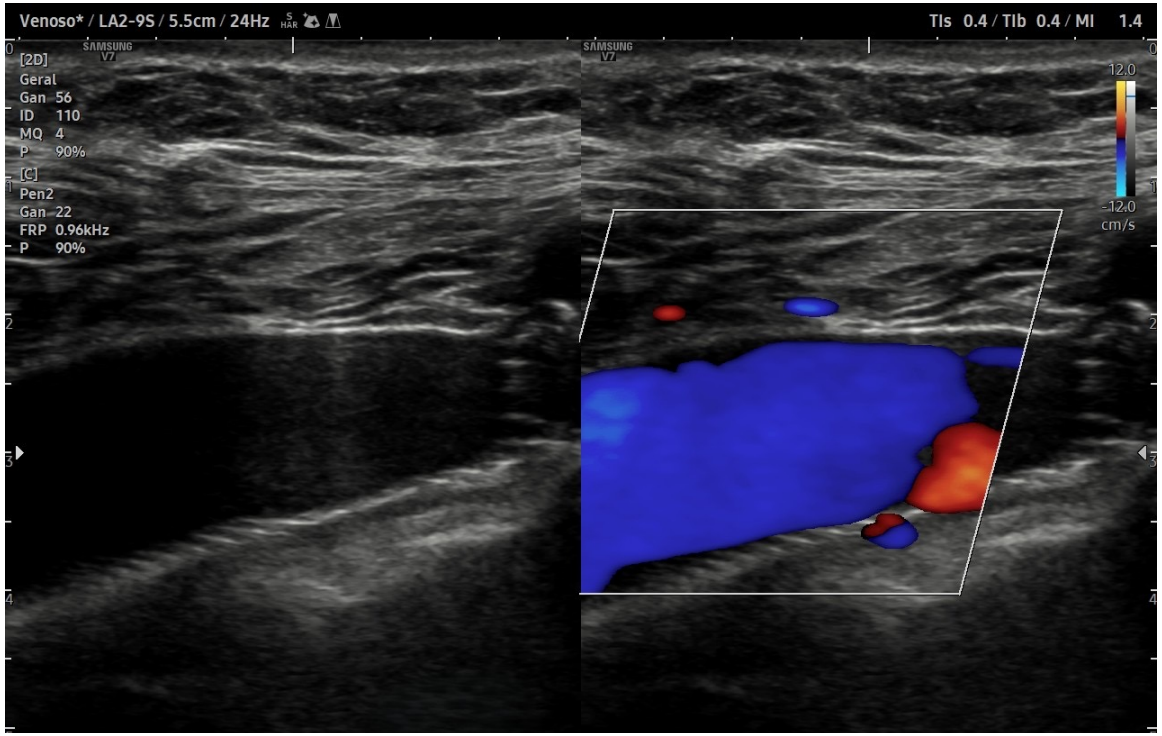
BMI 22

Mild edema of the left lower limb (examination performed in the morning)

The patient was referred to our Vascular Laboratory to investigate the cause of the edema and assess stent patency.

Patent stent in the middle and distal thirds of the IVC

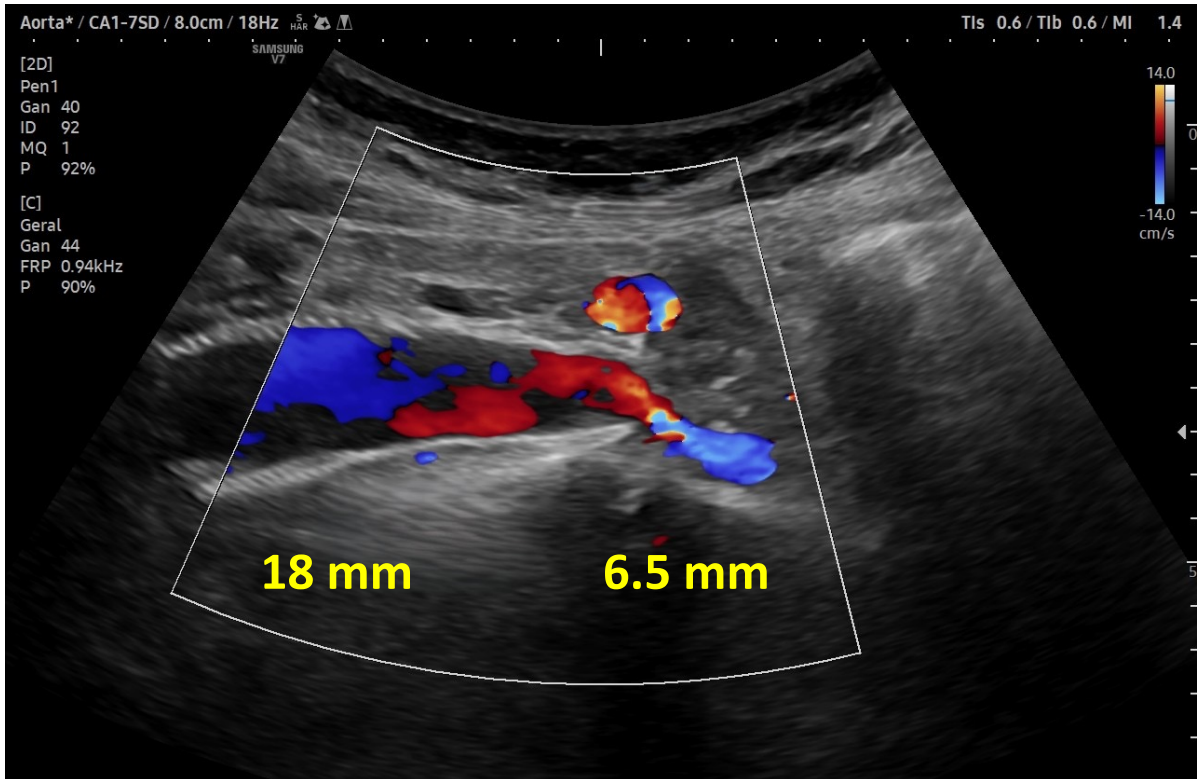




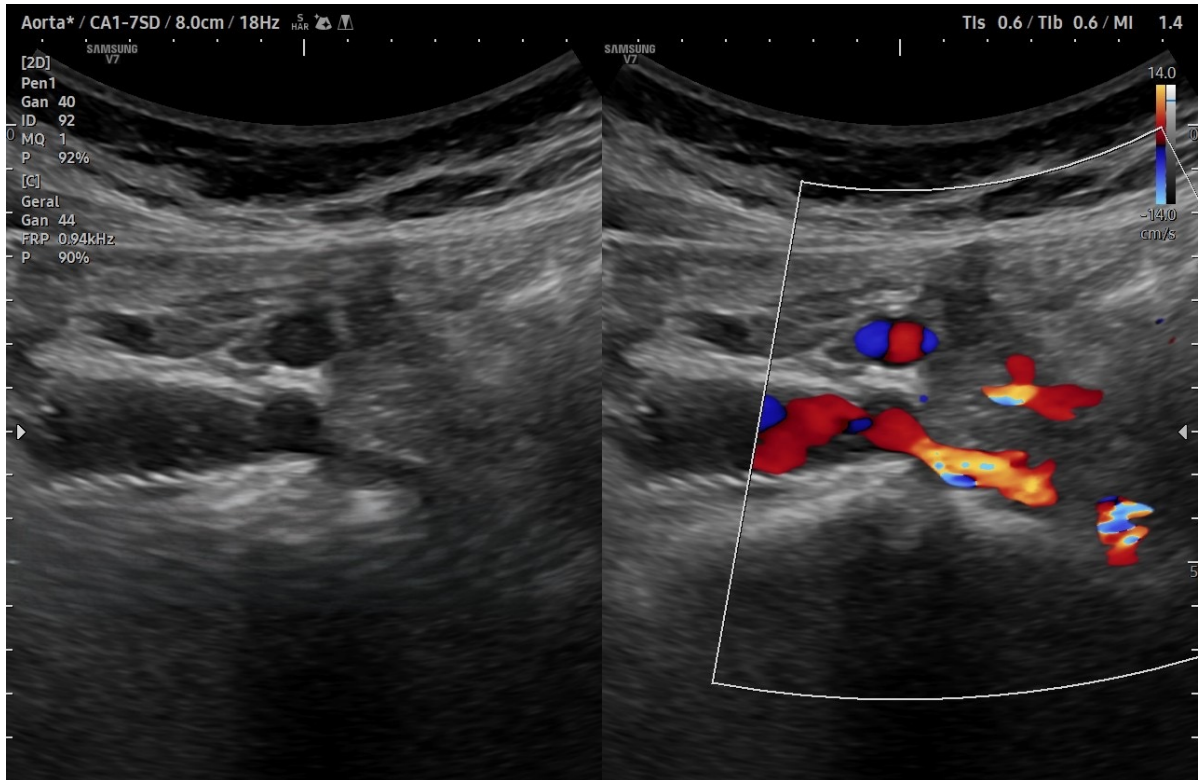
No filling defects

Well visible with convex and linear transducers

LCIV between the RCIA and the adjacent vertebral body

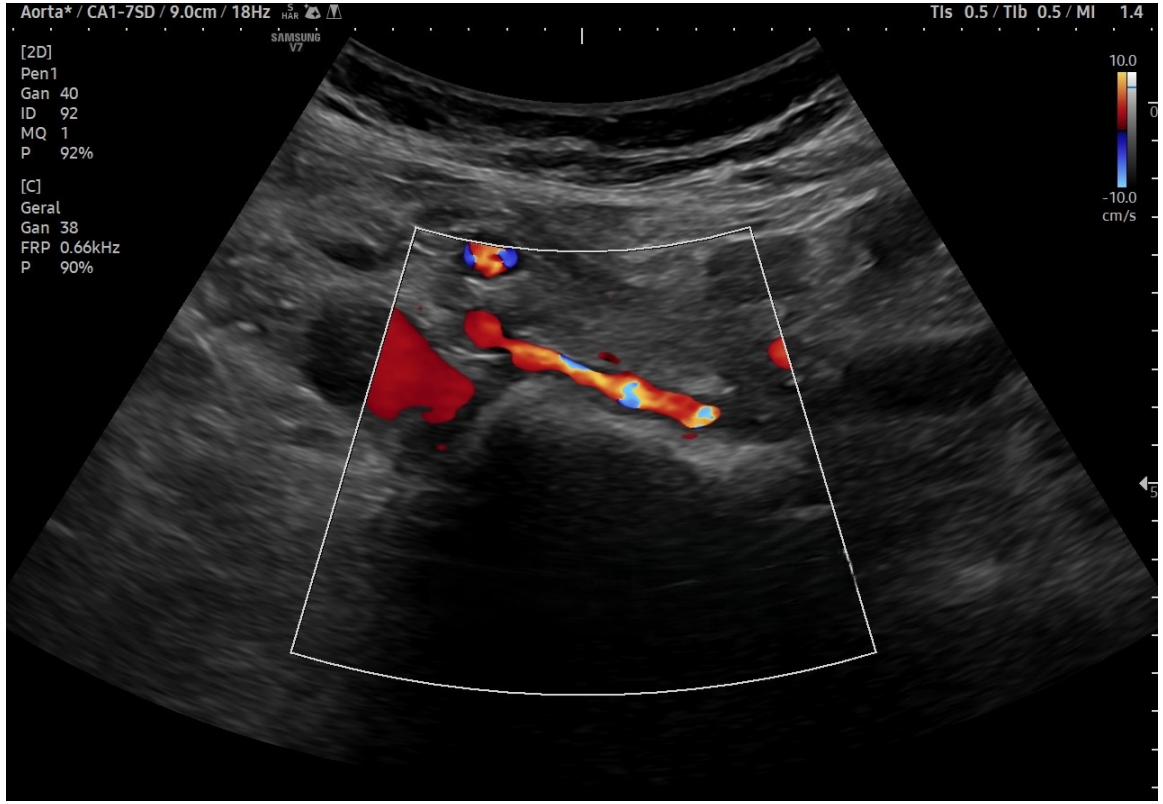


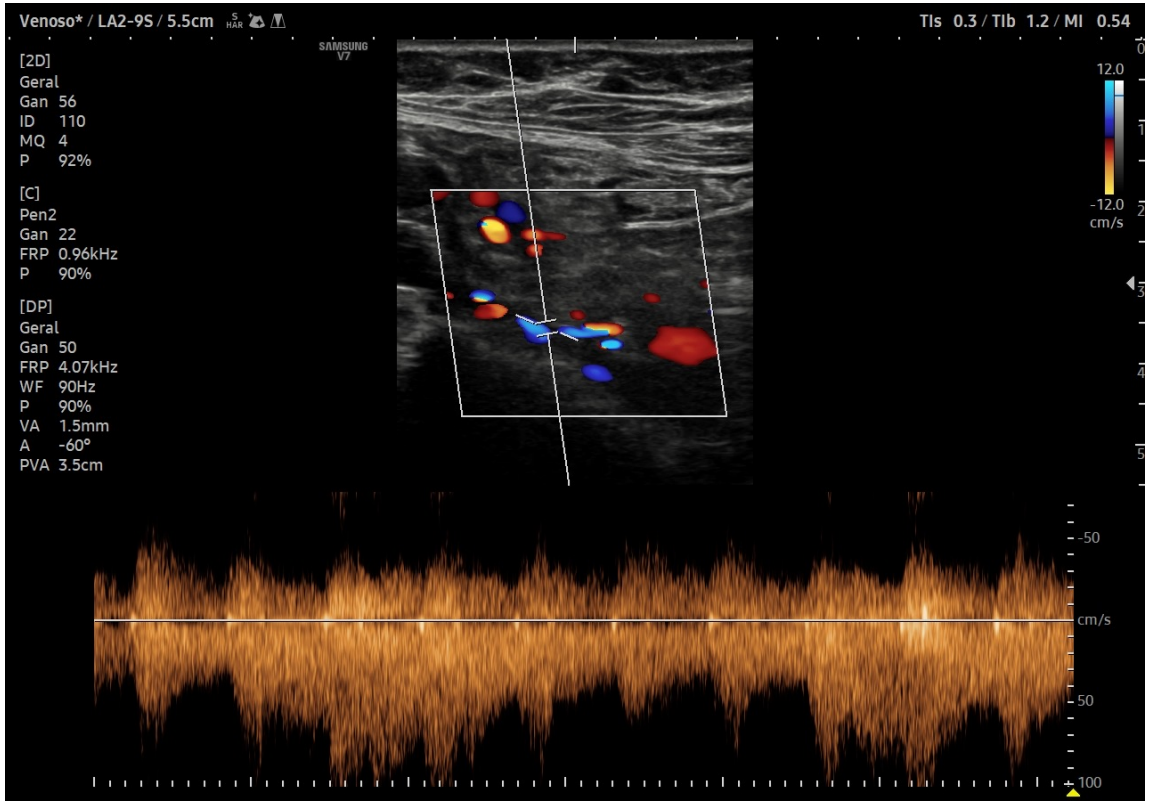
The stent migrated in the IVC. There is a significant reduction in its diameter at the distal end just under the right CIA.



The stent is almost completely positioned in the IVC. Compatible with stent planning error and stent migration.

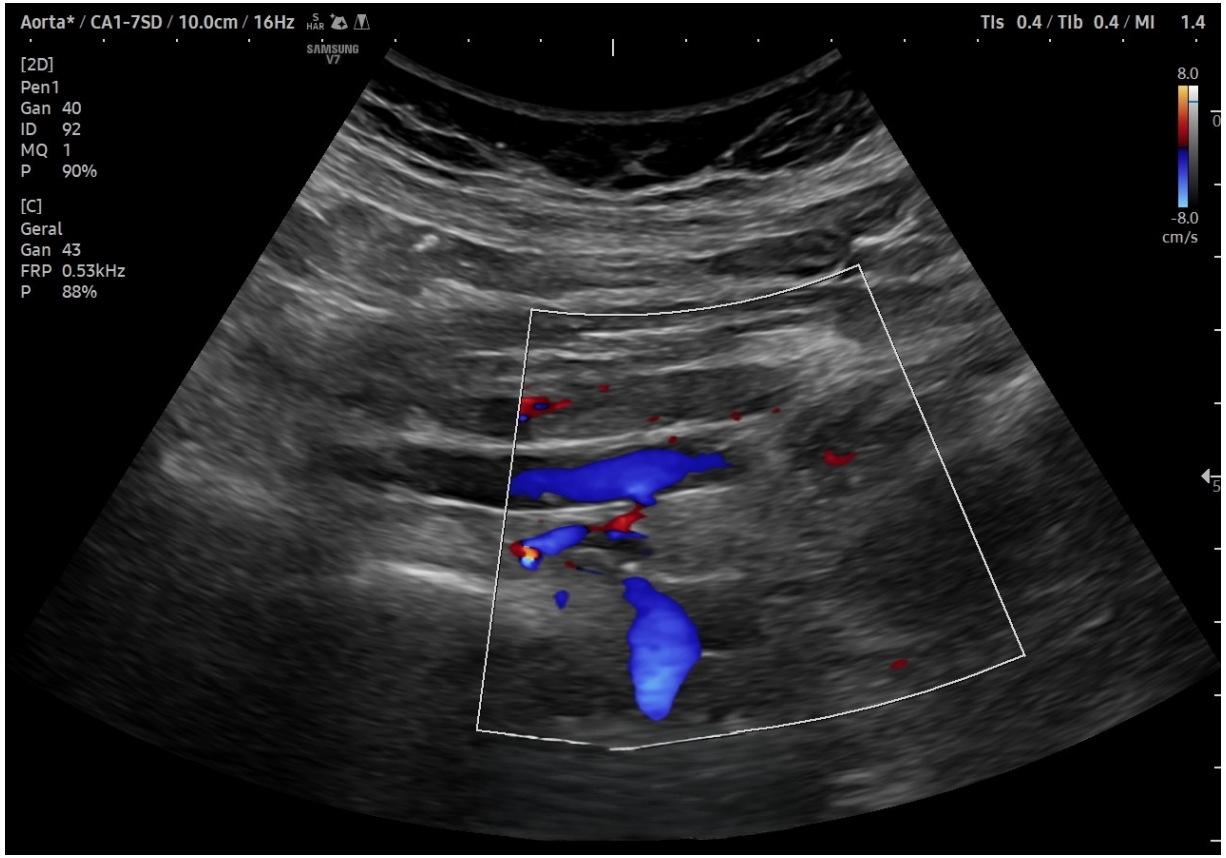
LCIV stenosis distal to the stent

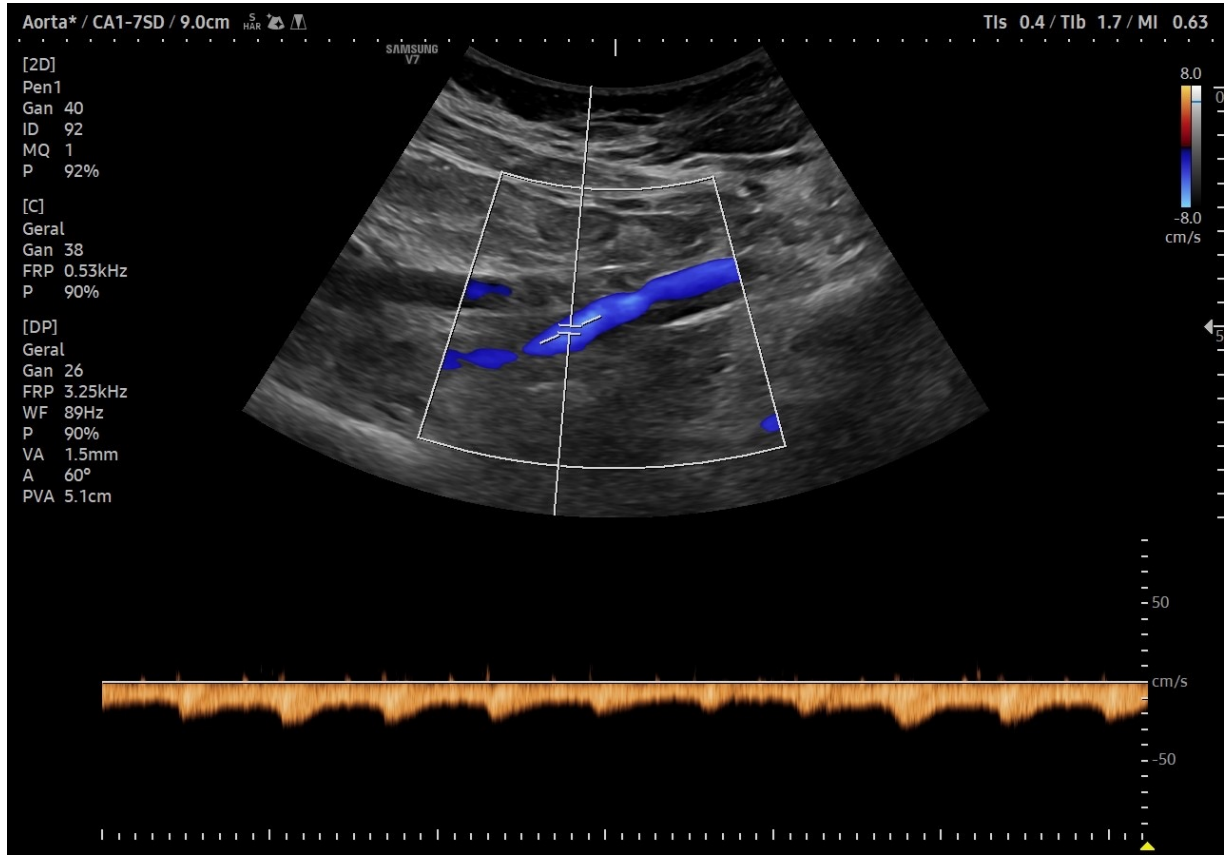




Wall thickening with reduction in the luminal diameter of the LCIV

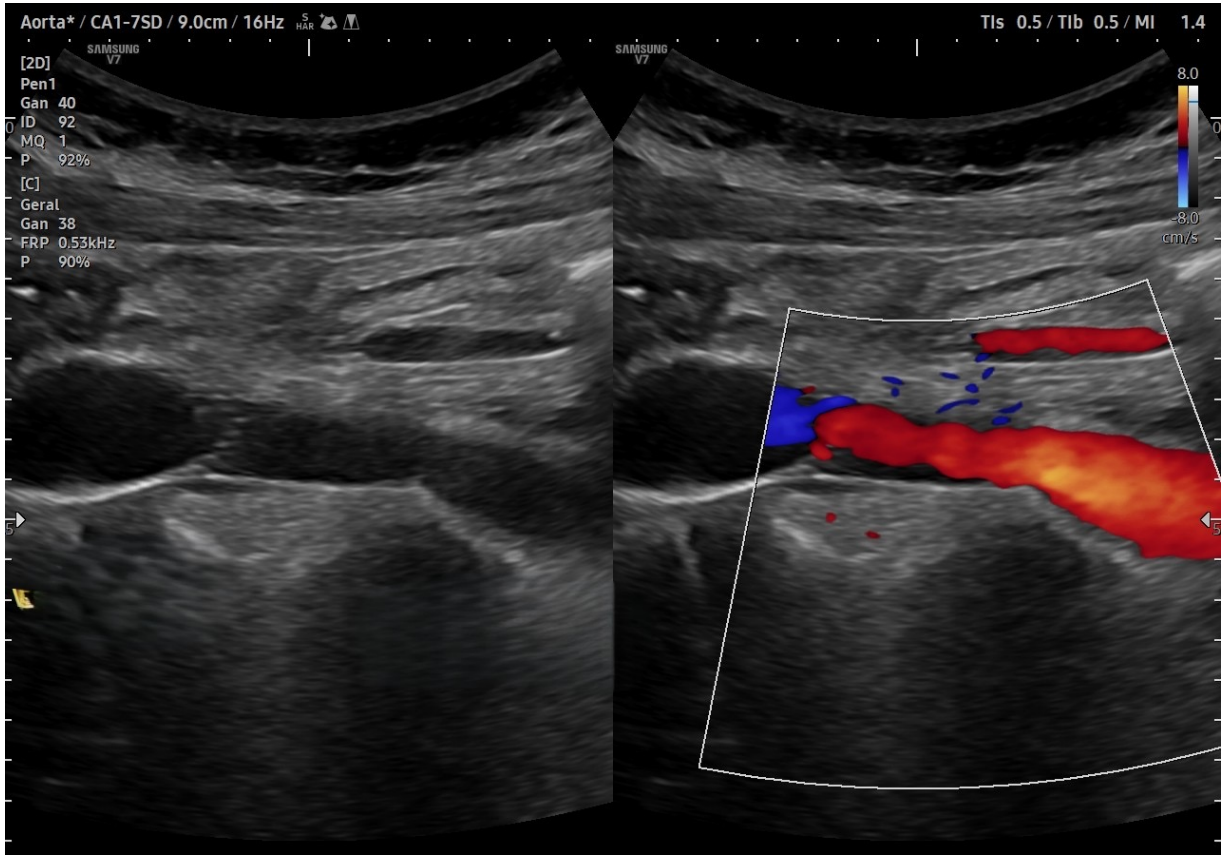
High flow velocity in the LCIV



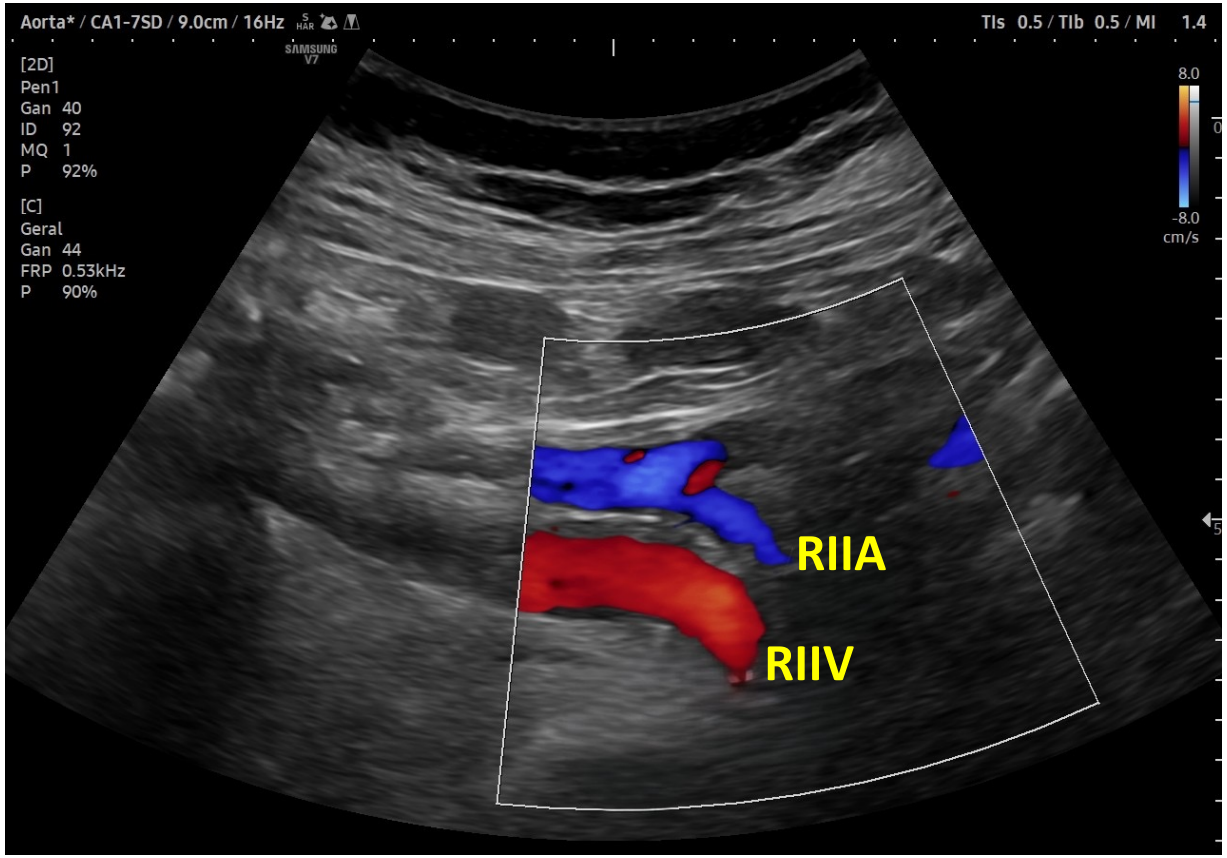


Reversed flow in the LIIV. Red color is seen in IIV but here is blue like in the IIA.

Phasic flow in the LEIV

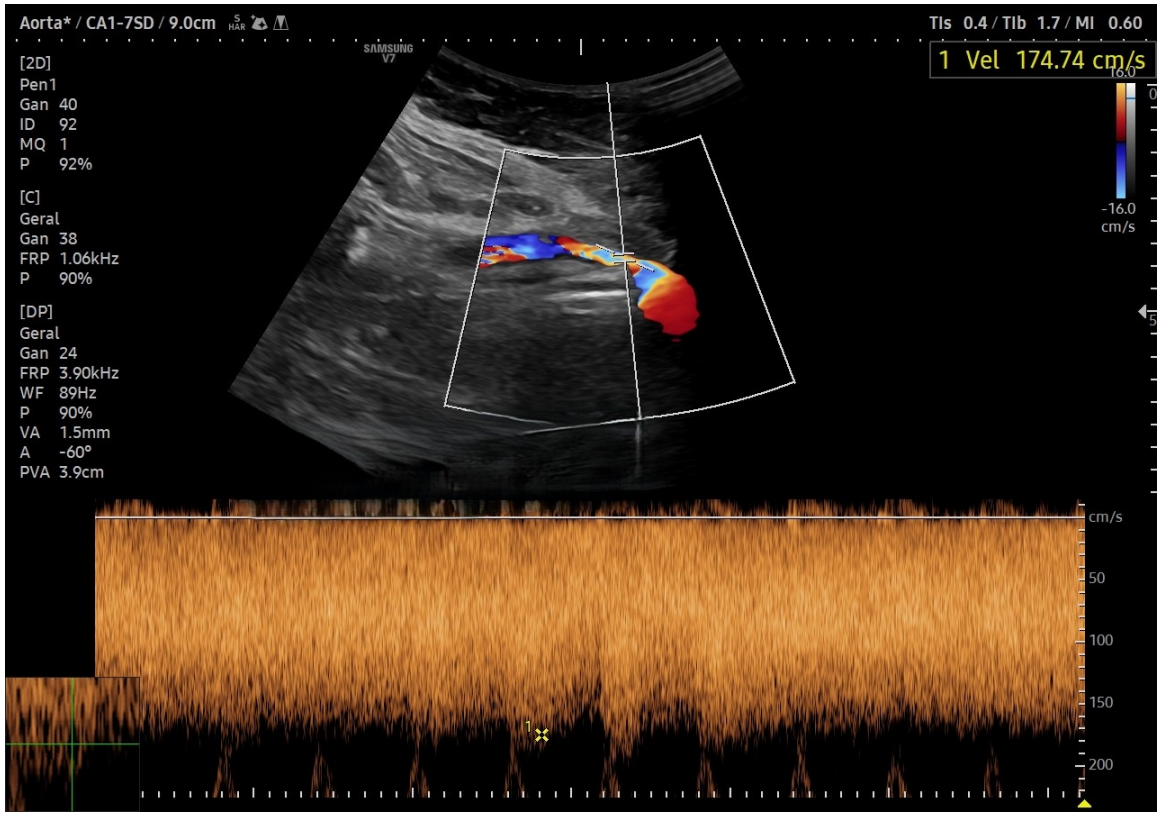


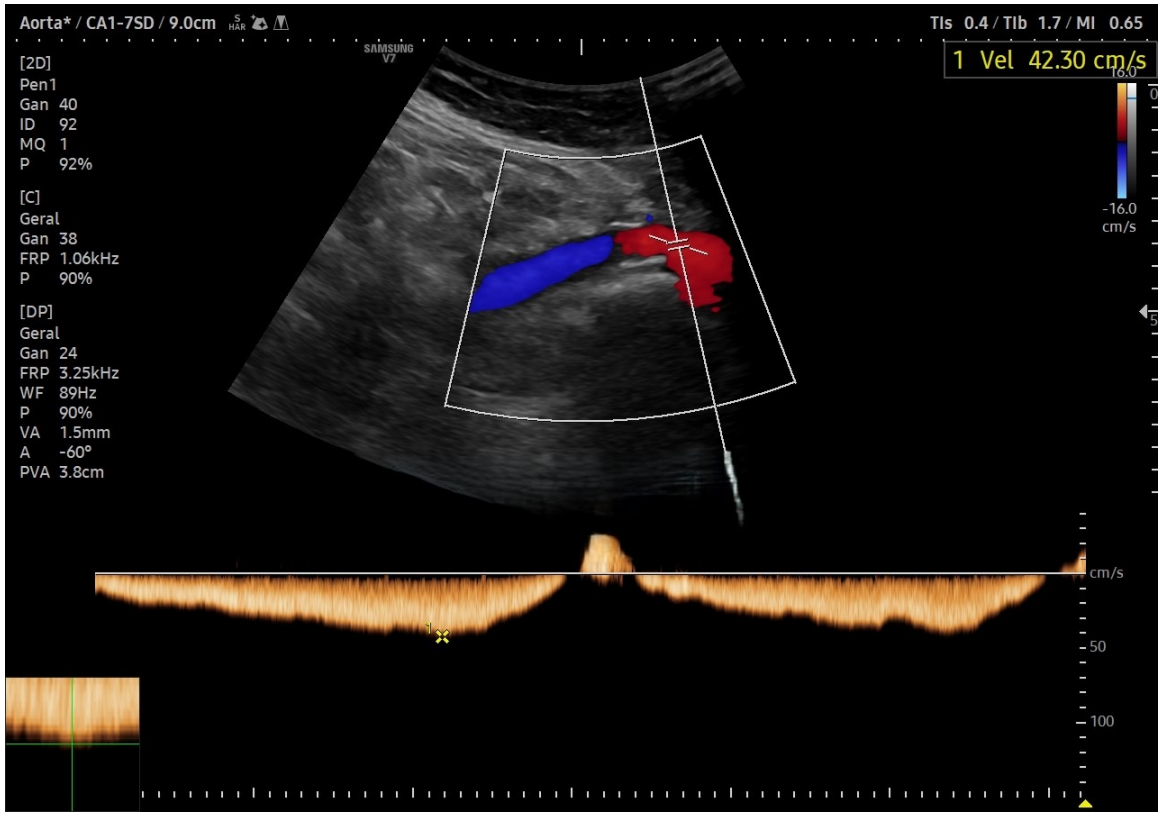
Confluence of the RCIV into the IVC passing through the stent



Normal flow direction in the RIIV

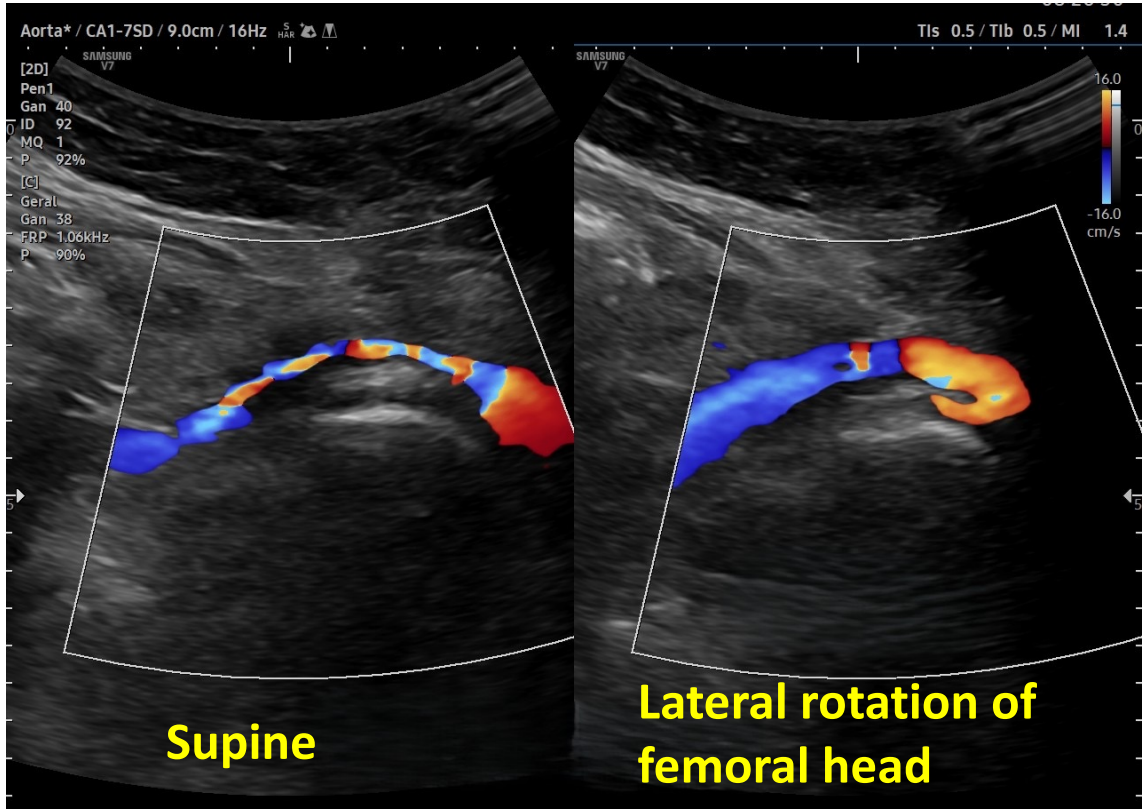
Positional stenosis of the transition between the EIV and CFV by the inguinal ligament was identified

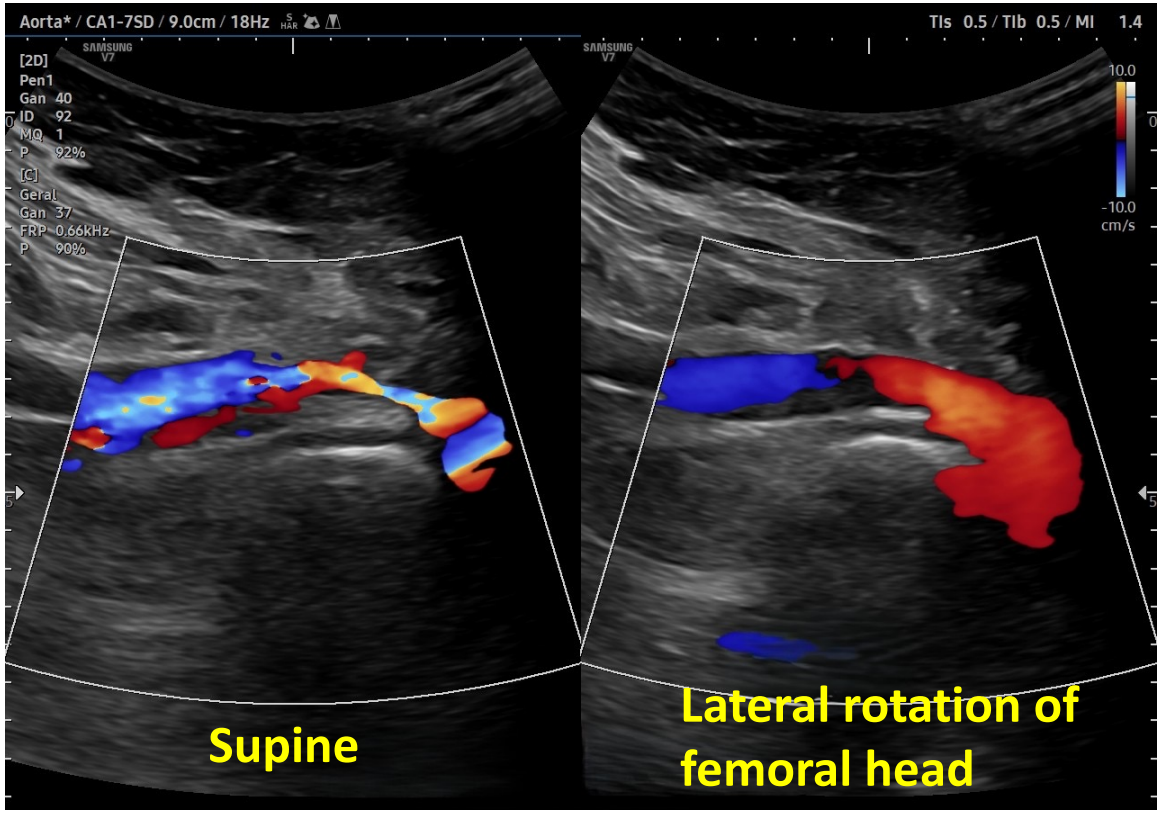




High flow velocity at rest and normal flow after lateral rotation of the femoral head

Additional finding of bilateral positional stenosis of the transition between the EIV and CFV by the inguinal ligament was identified





Patient in supine position at rest and after lateral rotation of the femoral head

Venous stent migration

Most likely to occur

- -Short length ≤ 60mm
- -Smaller diameter ≤ 14mm
- The combination of both being most common

Reasons

- -Inaccurate vessel measurement
- -Inadequate oversizing
- -Inaccurate positioning

Other things to consider

- -Stent design
- -Obstruction type, location and length

Sayed MH, Salem M, Desai KR, et al. A review of the incidence, outcome, and management of venous stent migration. J Vasc Surg Venous Lymphat Disord. 2022;10:482-490. doi: 10.1016/j.jvsv.2021.07.015

US Food & Drug Administration. MAUDE - manufacturer and user facility device experience database. Accessed June 7, 2023. https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfMAUDE/results.cfm

Vein stent migration and how to avoid it

Labropoulos N. JVS-VL 2022;10:491

Overestimation of vein obstruction occurs in patients that are not well hydrated leading to inappropriate stent placement and undersizing.

Nontthombotic vein stenosis is diagnosed with the patients being in the supine position. However, when the patient is placed on standing or sitting the stenosis is reduced or disappears. We have also observed this in our ongoing study.

Measuring the vein diameter during systole (Smallest diameter in the cardiac cycle) leads to stenosis overestimation.

Patients have symptoms when they stand or walk. Placing stents for 50% area stenosis which is equivalent to 29% diameter reduction in nontthombotic lesions is not appropriate.

Given that such lesions are expected to produce less obstruction in the standing position migration is more likely to occur particularly if short stents with ≤14mm diameter are placed.

Vein stent migration and how to avoid it

Labropoulos N. JVS-VL 2022;10:491

Balloon and other endoluminal material/devices should be negotiated through the stented area with caution.

Rigorous training and experience are necessary in understanding disease process and management of such patients.

Establishment of robust venous registries as suggested by the authors will be another way to enhance our knowledge and reduce stent migration.

Improvements are needed on stent design to accommodate the conditions and characteristics of the veins in different areas of the body.

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