

# CIRA Case of the Week

## November 2016

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Case courtesy of Drs. Nicolás Martínez and  
David Valenti  
McGill University

# Clinical History

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- 23 year old woman
- History of lymphoma and radiotherapy as a teenager, more than 8 years ago, in complete remission, not on active therapy
- Clinical SVC syndrome, gradually worsening over last 3-5 years, now quite lifestyle-limiting, unable to do any sporting or physical activities
- SVC Syndrome:
  - Dyspnea, facial swelling, head fullness, cough, arm swelling, chest pain, dysphagia, orthopnea, distorted vision, hoarseness, stridor, headache, nasal stuffiness, nausea, pleural effusions, and light-headedness

# Computed Tomography

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# Computed Tomography

- Findings:
  - Complete occlusion of the right brachiocephalic vein
  - The azygos vein enlarged, acting as a collateral



# Procedure

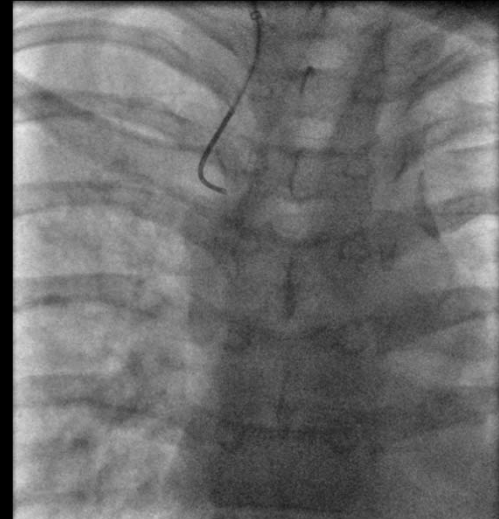
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- **Sharp recanalization of an occluded right brachiocephalic vein post-radiotherapy treatment**

# Procedure

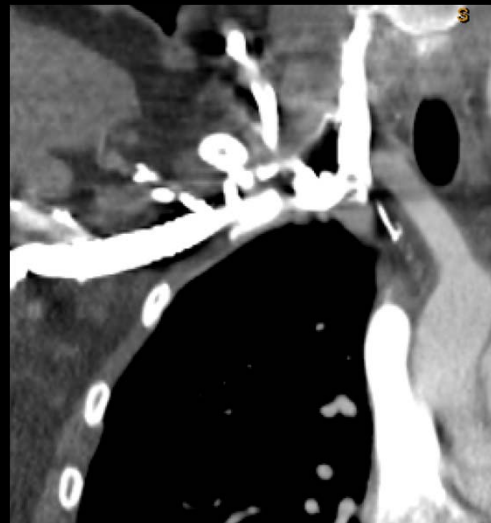
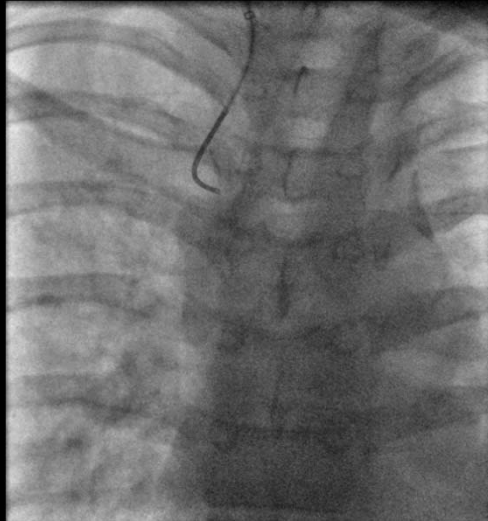
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- The right internal jugular vein was accessed followed by placement of a sheath
- Venography was performed, confirming the occlusion



# Procedure

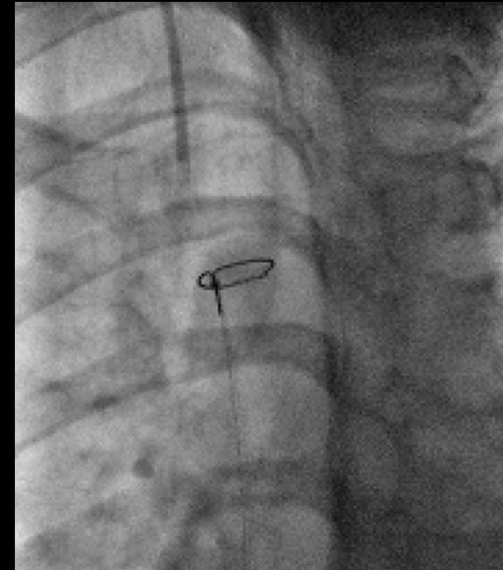
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# Procedure

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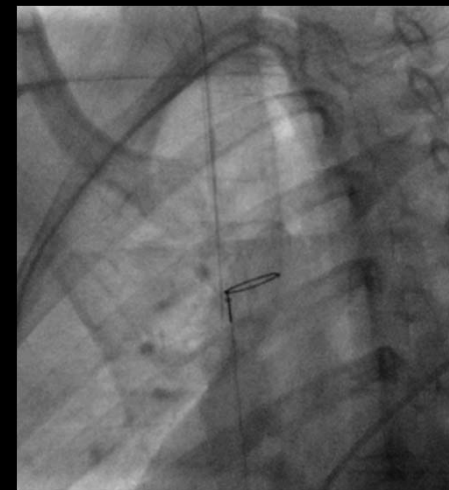
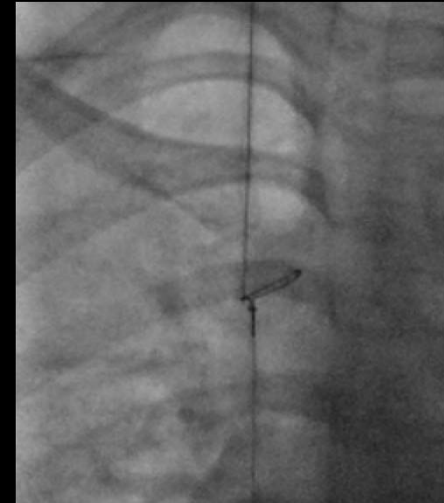
- A 5 Fr sheath was advanced to the most caudal end of the open internal jugular vein
- A right femoral access was performed and a 9 Fr sheath was introduced
- A loop snare system was advanced through the femoral sheath and the loop snare was deployed in the most cranial aspect of the superior vena cava



# Procedure

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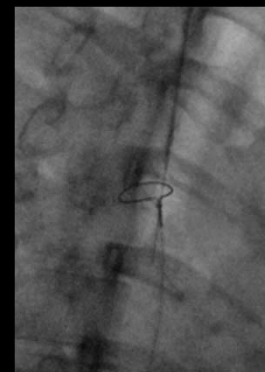
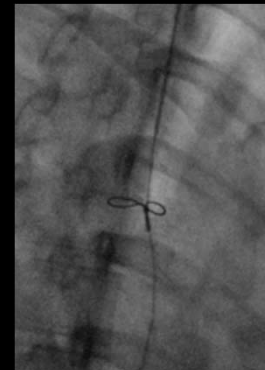
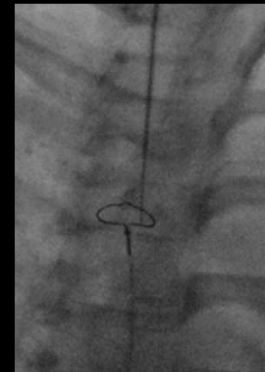
- A 22G Chiba needle was advanced into the sheath and an attempt was made to cross the obstructed segment
- It was not possible to aim the needle into the loop-snare, 2 or 3 attempts were made unsuccessfully



# Procedure

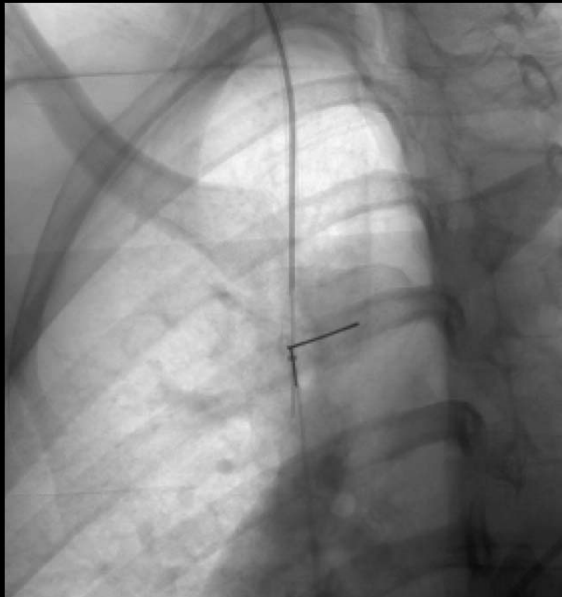
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- An 18G Chiba was used, it was pre-curved to give more directional control and advanced into the sheath
- Using the 18G Chiba as a co-axial guide needle, the 22G needle was successfully aimed into the loop-snare



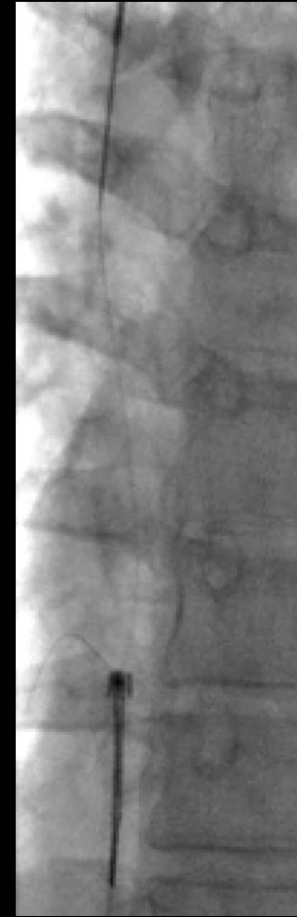
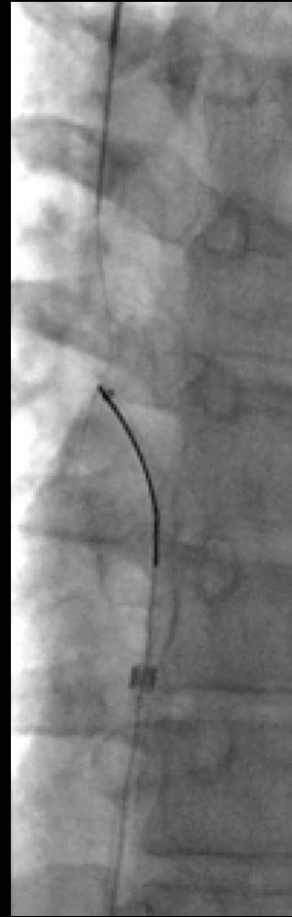
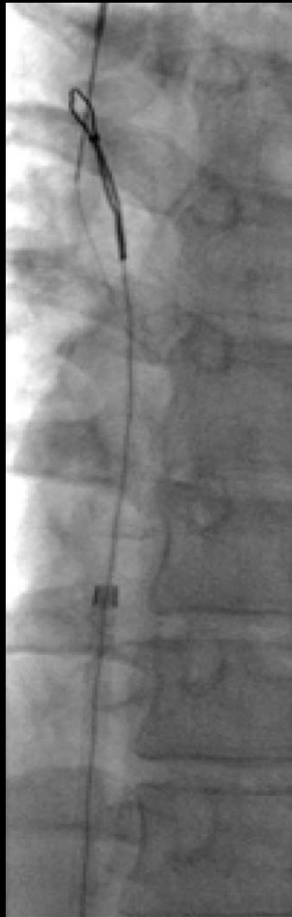
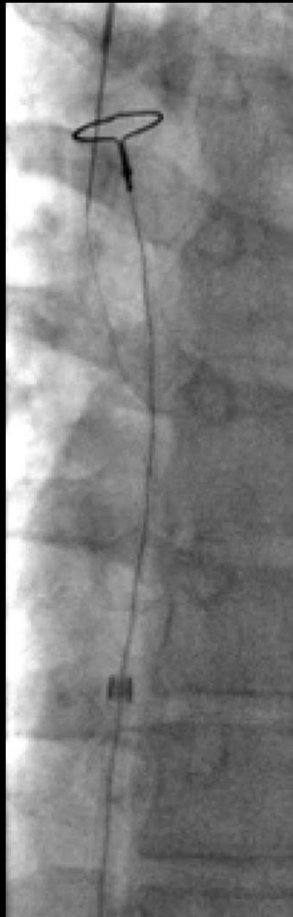
# Procedure

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# Procedure

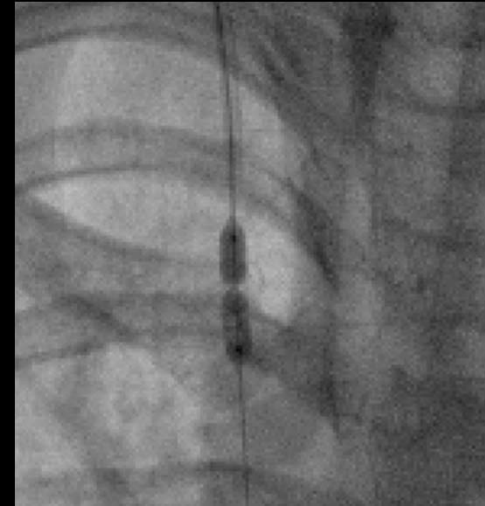
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# Procedure

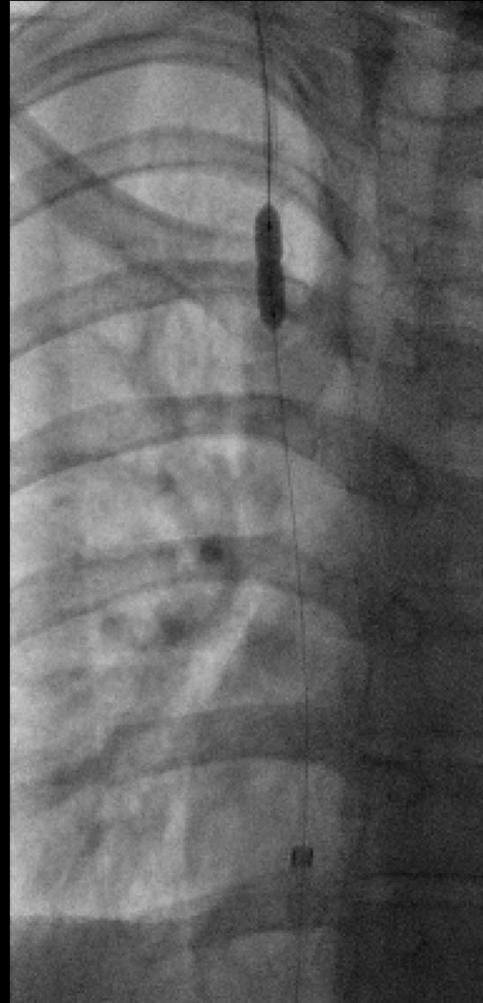
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- A 5 mm x 2 cm Sterling angioplasty balloon was advanced over the wire
- The tract between the two veins was dilated



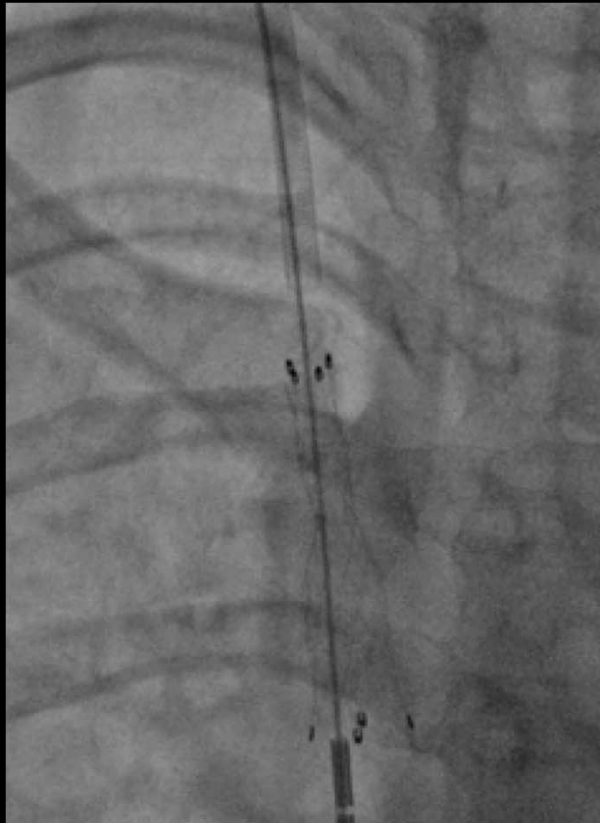
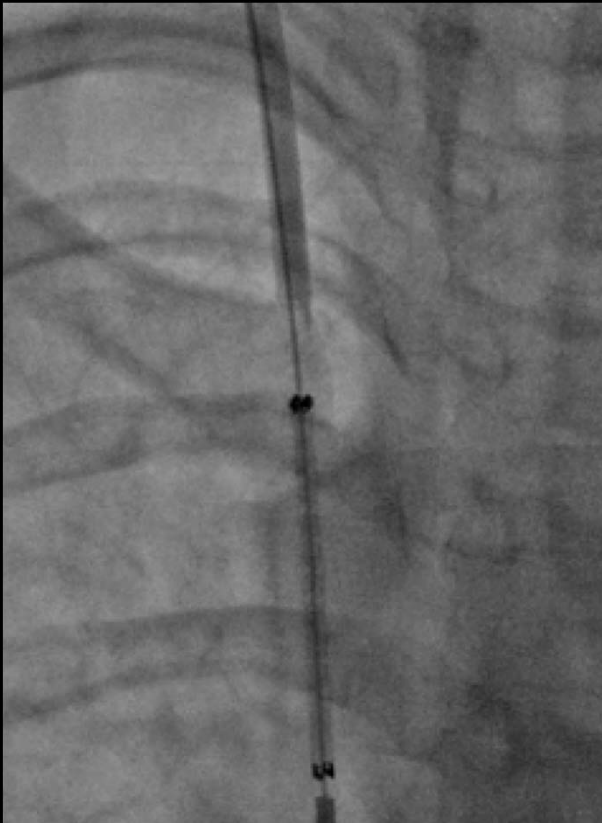
# Procedure

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# Procedure

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# Procedure

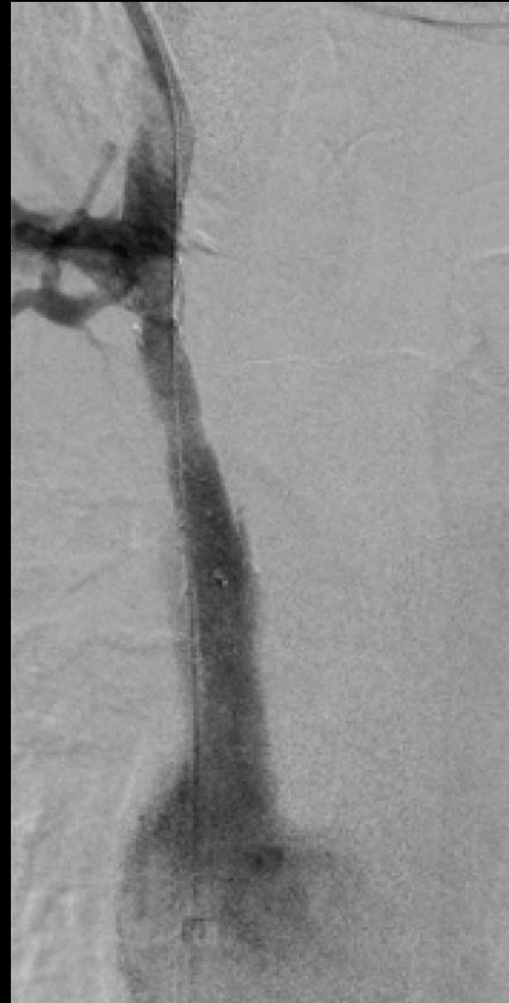
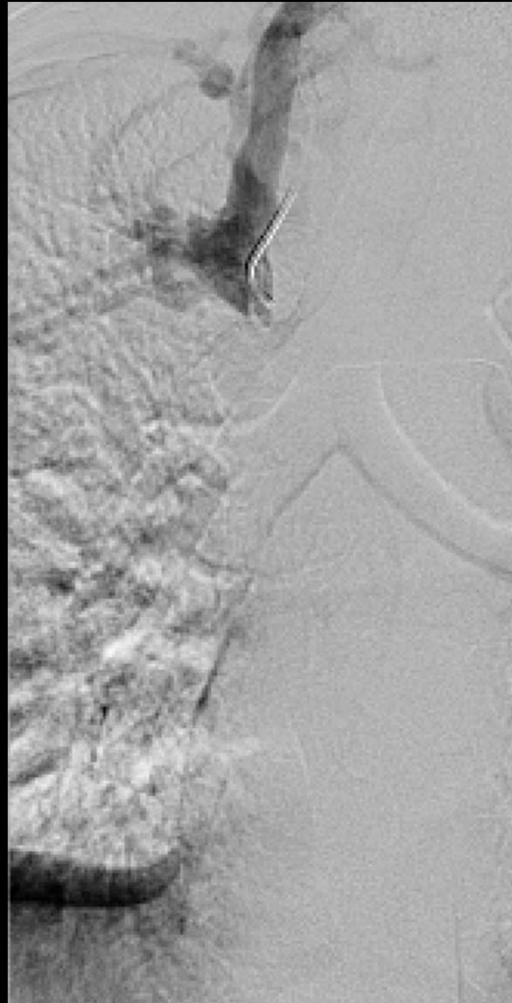
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- An angioplasty was performed in the tract between the two veins and eventually a covered stent was deployed



# Procedure

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# Discussion

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- We report the case of a patient in whom we used a Chiba needle to create a path through an acquired right brachiocephalic vein occlusion after radiotherapy treatment

# Discussion

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- Etiology of central venous stenosis:
  - Benign disease
    - Deep vein thrombosis
    - Benign external compression
  - Hemodialysis and other central catheters
  - Malignancy-related causes

# Discussion

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- Central venous occlusion is a common complication in hemodialysis patients and may cause ipsilateral arm or neck swelling due to elevation of venous pressure
- Central thoracic vein obstruction can result in extensive edema of the upper extremities and cause painful swelling of the limb

# Discussion

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- Treatment:
  - Endovascular method is preferred as therapeutic alternative to open surgery because is less invasive
- Endovascular approach:
  - Attempt to cross with guidewire and catheter
  - Alternative: recanalization attempt with PowerWire (RF-tipped guidewire)
  - If this is not possible, sharp puncture might be necessary

# Discussion

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- Complications
  - Hemothorax
  - Hemomediastinum
  - Pneumothorax

Small needle puncture of a central venous occlusion in a hemodialysis patient that could not be traversed by a conventional technique  
Use of a Puncture Needle for Recanalization of an Occluded Right Subclavian Vein Himanshu Gupta, Timothy P. Murphy, Gregory M. Soares.  
Cardiovasc Intervent Radiol. 1998 Nov-Dec;21(6):508-11.

# Conclusion

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Careful planning and technique can avoid potentially serious complications in patients who are refractory to traditional techniques in central venous occlusion.

# References

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- Percutaneous reconstruction of chronic total occlusion of brachiocephalic vein using transeptal needle in dialysis-dependent patient. Malik AK, Bhalla N, Goel A, Prakash S. Cardiovasc Interv Ther. 2016 Apr;31(2):136-9.
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- Small needle puncture of a central venous occlusion in a hemodialysis patient that could not be traversed by a conventional technique. Shiro Miyayama, Tetsuya Minami, Kazuto Kozaka, Yasuyuki Ushiogi. Cardiovasc Interv and Ther (2014) 29:261–265
- Use of a Puncture Needle for Recanalization of an Occluded Right Subclavian Vein Himanshu Gupta, Timothy P. Murphy, Gregory M. Soares. Cardiovasc Intervent Radiol. 1998 Nov-Dec;21(6):508-11.

# Sharp Recanalization of an occluded right brachio-cephalic vein post radiotherapy treatment

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