CENTRAL VENOUS OCCLUSION RECANALIZATION USING A RF POWER WIRE

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CHIEF COMPLAINT & HPI

Chief Complaint and/or reason for consultation

• Right upper extremity pain and swelling.

History of Present Illness

• 49-year-old man with end-stage renal disease on hemodialysis with right upper extremity radiocephalic AV fistula complicated by subclavian vein and brachiocephalic vein occlusion status post unsuccessful central recanalization.

The patient is referred for follow-up AV fistulography and attempted central outflow vein recanalization and stent placement.
RELEVANT HISTORY

Past Medical and Surgical History
• DM
• ESRD with right upper extremity fistula
• HTN
• CAD

Family & Social History: Noncontributory

Allergies: NKDA
DIAGNOSTIC WORKUP

Physical Exam

• Moderate right upper extremity swelling.
• Strong pulsatile thrill within the outflow cephalic vein
DIAGNOSIS

- Central venous occulsion (CVO)
Images A and B: Right upper extremity AV Fistulogram reveals complete occlusion of the right brachiocephalic and right subclavian veins with collateral formation in the right neck. Contrast injection through the right internal jugular vein also demonstrated occlusion of at the level of the clavicle with central venous drainage via a prominent supraclavicular clavicle draining into the left brachiocephalic vein. No direct connection to the patent portion of the right subclavian vein was identified.
Image A: Through the right upper extremity access, a peripheral subclavian vein was accessed and the right internal mammary vein was selected.

Image B: Right common femoral vein access was obtained and a wire was advanced centrally into the right superior vena cava. Superior venacavogram demonstrated wide patency of the central left brachiocephalic vein and the superior vena cava. Right brachiocephalic vein was occluded.
INTERVENTION: RF POWERWIRE RECANNULATION

Image A: From below, a loop was deployed within the peripheral SVC at its confluence with the left brachiocephalic vein.

Image B: A SOS 2 selective catheter was advanced over a wire from the RUE access and positioned with its distal tip in the proximal right internal mammary vein aiming medially. A RF PowerWire was advanced through the SOS 2 selective catheter into the right internal mammary vein aiming at the indwelling loop snare within the SVC.
1). By what mechanism does the RF PowerWire guidewire cross occluded blood vessels?

A: RF guidewire uses vibrations to cause vessel plaque to dissolve.

B: RF guidewire is unable to cross tight regions of stenosis.

C: Stiff shaft and tip punctures a small channel through vessel occlusion.

D: Radiopaque tip delivers RF energy to vaporize a channel through occlusions with minimal trauma to surrounding tissue.
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- Uses RF energy to facilitate crossing totally occluded peripheral vessels that are difficult to cross with a standard recanalization crossing techniques.

- Flexible, shaft with a stiff proximal end.

- Radiopaque tip delivers RF energy to vaporize a channel through occlusions with minimal trauma to surrounding tissue.

CONTINUE WITH CASE
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CONTINUE WITH CASE
INTERVENTION: BALLOON ANGIOPLASTY OF RECANALIZATION TRACK

Images A and B: Serial dilatation of the recanalized tract between the right internal mammary vein and the superior vena cava was performed with angioplasty balloon. Contrast injection demonstrated brisk central venous flow from the right subclavian vein, through the proximal internal mammary vein into the superior vena cava.
INTERVENTION: STENT PLACEMENT

Images A and B: A self-expanding SMART nitinol stent was advanced over the wire and positioned within the recanalized tract. The stent was deployed and postdilated with angioplasty balloon.
SUMMARY: SUCCESSFUL CVO RECANALIZATION USING RF POWERWIRE

Image A: Pre-intervention fistulogram demonstrating chronic occlusion of the subclavian vein and brachiocephalic vein with filling of multiple supraclavicular collateral veins.

Image B: Successful right-sided central recanalization utilizing RF wire with placement of a self expanding nitinol stent within the recanalized tract. Supraclavicular collaterals no longer identified.
CLINICAL FOLLOW UP

• Patient reported complete resolution of symptoms.
• Physical examination revealed no swelling of right upper extremity.
• Arteriovenous shunt functioning well.
REFERENCES & FURTHER READING


