

# Top Tips for Managing Central Vein Thrombosis in Patients Receiving Parenteral Support

Jeremy Nightingale, Simon Lal, Simon Gabe and the BIFA committee

Central vein thrombosis (CVT) is a serious problem for patients in whom central venous access is vital for their nutritional support. It must be recognised and, if acute, treated as a medical emergency. Impending loss of venous access is a reason to be considered for a small bowel transplant.

## Key points

1. Treatment of CVT depends on the chronicity of the condition, the underlying cause and the clinical presentation.
2. Acute CVT is a medical emergency requiring an urgent Doppler ultrasound and/or CT venogram.
3. For acute CVT, thrombolysis can be given via a separate catheter directly into the clot (catheter-directed thrombolysis). This should be performed by a specialist vascular interventional radiologist with the appropriate expertise. Treatment within 14 days may prevent later venous stenosis/occlusion.
4. Chronic venous occlusion may be treated with venoplasty with or without placement of a venous stent.
5. Long-term anticoagulation must be considered, with any decision to cease determined on a case-by-case basis involving discussions with an expert in intestinal failure/parenteral support.
6. The cause of the thrombosis should be investigated. A catheter tip in the upper SVC or brachiocephalic veins is the most common association.
7. When 2 of the 4 major supra-diaphragmatic veins have been lost there should be consideration for a small bowel transplant.

## Explanations

- A.** CVT occurs at a frequency of 0.06-0.12/1000 catheter-days.

Its pathogenesis is multifactorial and includes: a) vessel injury (+/- subsequent venous stasis) during/following catheter insertion; b) damage to the endothelium caused by the infusion of parenteral nutrition that has a very high osmolality; c) mechanical rubbing of the catheter against the vessel wall. Patients with a superior vena cava (SVC) thrombosis usually present complaining of a sensation of a swollen erythematous head, a positional headache and swollen arms. On examination distended non-pulsatile jugular veins may be noted and, if chronic, there may be venous collaterals over the upper chest wall. A brachiocephalic thrombosis may present with unilateral swelling with or without facial symptoms. If collaterals have already formed then symptoms may be minimal or even absent.

- B.** Home parenteral support requires long-term and safe venous access. This is usually performed with a tunnelled catheter with its tip positioned at the right atrial/caval junction. A loss of venous access is catastrophic for these patients and, therefore, if suspected then the patient should undergo urgent radiological investigation and treatment.
- C.** In acute cases of CVT, a thrombolysis cannula (with many side holes) may be inserted under radiological guidance into the clot and a thrombolytic agent continuously infused (e.g. tPA), with repeat venography at 24 hours and every 1-2 days till the clot has lysed. 24 hours after the clot has been lysed the catheter may be removed and a new one inserted on the other side (usually when anticoagulation has been temporarily stopped). Unfractionated heparin is used initially as a bridge until full oral anticoagulation, usually with warfarin, is achieved. Early treatment should, in most cases of acute thrombosis, restore venous patency. This must be confirmed with repeated venography.
- D.** For patients with CVT/stenosis, it may be possible to balloon dilate the stricture and insert a stent. The relative benefits and risks should be discussed with interventional radiology.
- E.** Long-term anticoagulation with warfarin (Target INR 2.0-3.0), if residual bowel anatomy allows for sufficient absorption, is recommended. However, regular low molecular weight heparin injections may be needed if warfarin is not adequately absorbed or is giving rise to variable INRs (NB. Blood for INR should not be taken immediately after a lipid containing parenteral nutrition). For patients who have a venoplasty and/or stent placed then antiplatelet agents are recommended for 3-6 months after the procedure and then the patient should be anticoagulated.
- F.** While a misplaced proximal catheter tip is the most common reason for CVT, other causes need to be considered such as associated catheter related sepsis, high osmolality feed or the patient having a thrombotic tendency.
- G.** Loss or impending loss of vascular access is a reason to consider a patient for a small bowel transplant.

## Suggested reading

- Cuerda C, Naji Y. Central vein thrombosis. In Intestinal Failure 2nd Edition Springer (in press).
- Cadman A, Lawrance JA, Fitzsimmons L, Spencer-Shaw A, Swindell R. To clot or not to clot? That is the question in central venous catheters. Clin Rad. 2004; 59: 349-355.