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Central London
Intestinal Failure Partnership

GUIDELINE FOR MANAGEMENT OF UPPER LIMB CENTRAL VENOUS CATHETER-RELATED THROMBOSIS IN ADULT INTESTINAL FAILURE PATIENTS

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This document aims to provide guidelines for the management of upper limb central venous catheter-related thrombosis in adult intestinal failure patients.

A. Summary

1. This document provides practice guidelines to assist medical, radiology, nursing and pharmacy staff to ensure that all patients with upper limb venous catheter-related thrombosis are properly diagnosed and managed in line with national and internationalrecommendations.

B. Introduction

2. Central venous catheters, peripherally inserted central catheters and venous access devices play important role in IF patients' care.
3. Their use is not without complications. Although the risk of pulmonary embolism as a consequence of catheter-related thrombosis is low, fatal pulmonary emboli had been reported.
4. These guidelines are intended to provide best practice and evidence-based guidelines on the management of venous catheter-related thrombosis.

C. Objectives

5. To promote good practice and consistency in diagnosis and investigation of upper limb catheter-related thrombosis. This includes the best practice recommendations for radiological diagnosis.
6. To promote good practice in management and anticoagulation use in adult patients with upper limb catheter-related thrombosis.

D. Scope

7. Central venous catheters covered in this guideline include: Non-Tunnelled CVCs, Tunnelled CVCs (Hickman lines), Implantable Ports (Portacaths) and PICCs (Peripherally Inserted Central Catheters).

E. Definitions

8. Upper limb deep venous thrombosis – venous thrombosis affecting brachial, axillary, subclavian and more proximal veins

9. Upper limb superficial venous thrombosis – venous thrombosis affecting basilic or cephalic veins only.

F. Diagnosis of venous catheter-related thrombosis

10. Catheter-related thrombosis should be suspected if:

    a. Central venous catheter is malfunctioning despite proper use of thrombolytics with failure to withdraw from or infuse into the cathete).

    b. Patient develops any symptom suggestive of venous thrombosis in presence of venous catheter or venous port such as pain, oedema of the corresponding upper limb, face or neck, induration and erythema around the vein course.

11. Two thirds of cases are asymptomatic and to make the diagnosis a high index of suspicion is required.

    a. Catheter malfunction may be due to mechanical causes:

    b. Presence of clotted blood in the catheter

    c. Kinking of the catheter

    d. Tight suturing

    e. The position of the catheter in relation to the venous wall.

    f. Catheter obstruction caused by medications or particles from parenteral nutrition.

12. It may not be possible to differentiate between mechanical causes of venous catheter malfunction or occlusion by a thrombus, based on clinical grounds only.

G. Imaging

13. Duplex ultrasound is the imaging modality of choice to screen for catheter-related thrombosis. It is easy to perform and non-invasive. Compression ultrasound has a sensitivity of 97% and specificity of 96% in diagnosing symptomatic upper-limb DVT. (2) Non-compressibility of the vein with or without intraluminal thrombus is a major criterion for diagnosis. (3)

14. It may be challenging to visualise thrombi in the proximal subclavian or innominate veins with duplex ultrasound. This is due to the fact that these veins are shadowed or obscured by the sternum and clavicle. Additional imaging modality may be required if the clinical suspicion index of thrombosis in these veins is high.

15. Additional imaging: If the duplex ultrasound was negative but the clinical suspicion is high, contrast CT venography is the gold standard. (4) Radiological and contrast-related complications should be considered carefully before subjecting the patient to contrast venography. Additional imaging with magnetic resonance imaging MRI should be discussed on an individual basis.

H. Management of venous catheter-related deep venous thrombosis

Venous catheter removal/non-removal

16. After diagnosis, a decision whether to remove or to keep the catheter should be made.

17. It is NOT recommended to remove the central venous access catheter if all the following criteria apply:

    a. The venous catheter is still required and functioning.

    b. The catheter is well positioned (the tip of the catheter should be in the superior vena cava or right atrium for upper limb CVC).

    c. There is no evidence of CRBSI.

    d. The patient can be treated with anticoagulation.

    e. Symptoms are improving after 48 hours of anticoagulation (2, 5)

    f. The venous catheter-related thrombosis is not life threatening.

18. If the catheter is to be removed, consideration should be given to anticoagulation with therapeutic dose low molecular weight heparin (weight appropriate) for 3-5 days prior to removal, if clinical circumstances permit (4). This is to cover the duration of increased risk of embolization.

19. If anticoagulation is not feasible e.g. due to thrombocytopenia, then the line may be removed immediately.

20. The decision to keep or remove the catheter should be discussed with the patient and documented in patient's medical records.

Catheter occlusion

21. If the catheter is occluded due to intraluminal clot without symptomatic thrombosis, it is recommended to use urokinase 5000 units in 2 ml in each lumen to unblock the central line.

Anticoagulation for venous catheter-related deep venous thrombosis

22. Therapeutic anticoagulation is indicated in upper limb deep vein thrombosis affecting axillary and or more proximal veins. (6, 7)

23. For venous thrombosis affecting the brachial vein, therapeutic anticoagulation is recommended in symptomatic cases, with or without catheter removal. (6, 7)

24. Factors to consider before commencing anticoagulation:

    a. Diagnosis of cancer or any prothrombotic status

    b. Presence or absence of contraindications for therapeutic anticoagulation.

    c. Preservation or removal of the venous catheter.

25. Patients should continue therapeutic anticoagulation to complete at least 3 months total following removal of the venous catheter/device.(2, 8)

Choice of anticoagulation for catheter related thrombosis

26. Cancer patients: LMWH recommended

27. Non-cancer IF patients: can be treated with a direct acting oral anticoagulant (or LMWH if IF patient has short bowel syndrome or bowel obstruction that would make adequate/consistent oral absorption unreliable. Discuss with Haemostasis SpR.

Dose of low molecular weight heparin (LMWH)

28. Weight appropriate dose of LMWH is recommended (e.g. 200 units/kg dalteparin s.c OD). This should be ‘dose banded’.

29. If patient’s weight is < 36 kg or >110 kg, creatinine clearance is < 30 ml/min or if there is thrombocytopenia (platelets <100), discuss with the Haemostasis SpR.

30. If the thrombosis occurred whilst on therapeutic anticoagulation, discuss with Haemostasis SpR.

Duration of anticoagulation

31. Anticoagulation is recommended for at least 3 months for upper limb deep venous thrombosis (2,8).

32. After 3 months, if the line is still in situ, consider:

    a. Reducing the intensity of anticoagulation to standard VTE thromboprophylaxis for patients who were NOT receiving thromboprophylaxis at the time the thrombosis was diagnosed. The choice of agent (LMWH, warfarin, DOAC) depends on the clinical situation.

b. Changing to higher intensity VTE thromboprophylaxis for patients who WERE receiving standard VTE thromboprophylaxis at the time the thrombosis was diagnosed. A higher intensity thromboprophylactic dose provides more than standard intensity. thromboprophylaxis but less than a routine therapeutic anticoagulation dose. The dose may depend on weight. Discuss with haemostasis SpR.

Thromboprophylaxis for future central venous catheters

33. Patients with a previous catheter-related thrombosis should have secondary thromboprophylaxis for future central venous catheters.

34. Patients who have previously developed catheter-related thrombosis whilst on standard intensity thromboprophylaxis should be considered for higher intensity thromboprophylaxis for any future lines.

35. There is no evidence to support the use of routine (primary) thromboprophylaxis in patients with indwelling venous catheter without a history of catheter-related thrombosis.

Catheter-directed thrombolysis

36. According to International guidelines (6), catheter-directed thrombolysis may only be considered in patients who fulfil all the following criteria:

    a. Severe symptoms

    b. Extensive thrombus involving most of the subclavian and the axillary veins

    c. Symptoms of < 2-3 weeks

    d. Good functional status

    e. Expected life expectancy of one year or more

    f. Low risk of bleeding.

37. Discuss such patients with Interventional Radiology and haematology.

Management of PICC line-related superficial venous thrombosis (cephalic and basilic veins)

38. There is little evidence to guide management.

39. Anticoagulation is suggested in patients with lower limb superficial vein thrombosis who are at risk for deep vein thrombosis (7), (11). Extrapolating from these data, it would be reasonable to also consider anticoagulation for patients with upper limb superficial vein thrombosis who are at risk for deep vein thrombosis (e.g. superficial thrombosis in proximity to the deep veins, PICC line remaining in situ).

40. We suggest **6 weeks of intermediate intensity anticoagulation** under these circumstances (i.e. less than full therapeutic dose, but more than routine prophylactic dose). Discuss with the Haemostasis SpR on re choice of agent and dosing.

    a. As with UL-CVC associated deep venous thrombosis, it is NOT recommended to remove the PICC line if all of the following criteria apply:

    b. The venous catheter is still required and functioning.

    c. The catheter is well positioned (the tip of the catheter should be in the superior vena cava or right atrium for upper limb CVC).

    d. There is no evidence of catheter-related infection.

    e. The patient can be treated with anticoagulation.

    f. Good resolution of symptoms with treatment can be demonstrated.

41. If the PICC line remains in situ, consider ongoing thromboprophylactic dose anticoagulation.

42. Refer to paragraphs 33-35 regarding thromboprophylaxis for future central venous catheters.

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