

BSUH Haematology Department

Standard operating procedure (SOP) / Competency:

Removal of tunnelled and cuffed Central Catheter

(Hickman/ Groshong line) using cuff dissection

| | |
|--------------------------------|---|
| Version: | v1.0 |
| Category and number: | Departmental SOP |
| Approved by: | Haematology Dept Governance Group; IV Team |
| Date approved: | March 2020 |
| Author(s): | Stephanie Faber, Trainee Advanced Clinical Practitioner, Haematology; Dr Victoria Tindell, Consultant Haematologist; Dr Neil Iggo, Consultant Nephrologist |
| Name of responsible committee: | Haematology Dept Governance Group |
| Name of responsible clinician: | Dr Timothy Corbett |
| Date issued: | March 2020 |
| Review date: | March 2022 |
| Target audience: | Haematology advanced nurse practitioner; IV team specialist nurses (Also potentially renal advanced nurse practitioners or dialysis- access specialist nurses if recruited) |
| Accessibility | Word Document |
| Linked documents | CVC Policy – c026 PGD - Lidocaine for PICC Insertion (pending update to include this procedure) |

Contents

| | |
|--|----|
| Introduction | 3 |
| Statement | 3 |
| Patient assessment | 4 |
| Infection control | 4 |
| Safe environment | 4 |
| Consent..... | 5 |
| Local anesthetic administration | 5 |
| Positioning of the patient..... | 5 |
| Tunneled CVC removal procedure..... | 6 |
| Wound closure..... | 7 |
| Documentation for audit purposes | 8 |
| Complication management..... | 8 |
| Training..... | 9 |
| Appendix 1 | 10 |
| Competency assessment form | 10 |
| Appendix 2 | 12 |
| Tunneled Central Line removal log | 12 |
| Appendix 3 | 13 |
| Patient assessment form | 13 |
| Appendix 4 | 14 |
| Community Nurse Letter (suture removal)..... | 14 |
| Appendix 5 | 15 |
| Annual Self-Assessment Certificate..... | 15 |

Introduction

A Tunneled, Cuffed Catheter (Hickman / Groshong) is a central venous catheter used for medium to long-term intravenous therapy. The catheter is tunneled sub-cutaneously prior to entering the vein at the subclavian or jugular vein. A cuff which surrounds the line (Dacron cuff) is situated within the subcutaneous tunnel to aid engraftment therefore improving the security of the device whilst also providing a barrier to micro-organisms from entering the venous system. The removal of a tunneled, cuffed CVC requires dissection around the Dacron cuff to remove the line. This is indicated if -

- proof or suspicion of line infection;
- catheter breakage;
- embolism;
- end of treatment / no longer required.

In the Haematology dept. at Brighton and Sussex University Hospitals NHS Trust (BSUH) the advanced nurse practitioner embarking on performing this skill must follow the SOP and allow a period of training and supervision by a competent medical practitioner with a minimum of 5 supervised procedures (Appendix 1).

Statement

Hickman / Groshong line removal will only be carried out by an advanced nurse practitioner (ANP) who has completed the assessment competency and the supervised practice log (Appendix 2) in the removal of tunneled catheter within Brighton and Sussex University Hospital NHS Trust.

All planned referrals for Hickman/ Groshong line removal will be booked into a specific procedure appointment via the Haematology Day Unit booking system. If a patient is unable to attend the Haematology Day Unit, removal can take place within the in-patient setting. Urgent removal referrals can be made directly to the ANP who are able to perform this procedure.

Patient assessment

A patient assessment should include the following:

- Rationale for removal
- History of any complications which developed during the dwell time of the catheter.
- Assessment of allergies
- Medication history
- Bleeding history
- Relevant medication – warfarin, low molecular weight heparin (LMWH)
- Blood tests – FBC and INR
- Platelets count to be above 50. INR to be below 1.5 in order for procedure to go ahead (Bishop et al 2007).
- If INR above 1.5 warfarin to be stopped for 2 days prior to removal then repeat, and discussion with the treating clinician as to any bridging requirements (Bishop et al 2007).
- LMWH therapeutic dose: procedure not to take place within 24 hours of administration.
- LMWH prophylactic dose: procedure not to take place within 12 hours of administration.
- IV unfractionated (UFH) heparin - procedure not to take place within 6 hours of heparin infusion being stopped, and repeat APTT checked to ensure this has normalized.

A patient assessment document must be completed prior to the procedure (appendix 3)

Infection control

Hickman removal will be performed using aseptic technique which includes the use of: Apron, sterile gloves, sterile towel and sterile equipment.

Chlorhexidine 2% in alcohol will be used for skin preparation and left to dry prior to removal.

Safe environment

- A safe environment surrounding the bed will be provided prior to the procedure
- Oxygen and suction equipment must be in place and accessible during the procedure
- Sharps will be disposed of immediately into a sharps bin
- Tunneled catheter removal can be performed by a single practitioner

Consent

Written consent must be gained from the patient prior to catheter removal. An explanation of the procedure and the possible complications must be given prior to gaining consent.

Local anesthetic administration

Lidocaine 1% solution for subcutaneous infiltration is used at the cut down site of 0.5ml to 2ml
Single doses of Lidocaine for local anesthesia should not exceed 4.5 mg/kg (or 200 mg) in adults.
<https://www.medicines.org.uk/emc/product/6281/smpc>

Any local anesthetic should be prescribed or administration via PGD when available

N.B. consider using Xylocaine 1% with adrenaline if concerns of bleeding risk
<https://www.medicines.org.uk/emc/product/2396/smpc>

Administer the lowest effective dose. The dosage should be adjusted according to the response of the patient and the site of administration.

The administration of lidocaine must be preceded by a withdrawal technique to verify that a vessel had not been inadvertently punctured.

Adverse symptoms relating to the use of lidocaine may be delayed post administration, therefore each patient must be observed for 20 minutes post injection.

Administration of lidocaine:

- Place the orange (25 gauge) needle into the subcutaneous tissue and withdraw on the plunger to verify that the needle is not in a vein
- First raise a fine bleb and inject slowly into the subcutaneous space around the cuff
- Test the effectiveness with the tip of the blade prior to cutdown.

Positioning of the patient

The patient should be positioned comfortably lying on the back or up to 30 degrees incline
Post procedure the patient should lie in the supine position for 30 minutes (Kim et al 1998).

Tunneled CVC removal procedure

Equipment needed

Dressing pack
Fenestrated drape
Cut down kit (sterile gauze, sterile scissors, forceps x 2
1 x pairs of sterile gloves
Scalpel
Chlorhexidine surgical 2% in alcohol
Sterile occlusive dressing
Lidocaine 1% / Xylocaine 1 % with adrenalin
5 ml syringe
Green needle
Orange needle
Sutures: 3/0 or 4/0 non absorbable reverse cutting needle or steri-strips

Procedure

- Tunneled catheter removal must be completed using a strict aseptic technique
- Disconnect any infusions
- Position the patient
- Cleanse the site with chlorhexidine solution in alcohol
- Identify the location of the cuff on the chest wall
- Infiltrate over, to the side and beneath the cuff with 2% lidocaine or Xylocaine 1% with adrenalin (1-10mls) using orange needle
- Using a scalpel, make a small incision over of the cuff (careful positioning of the incision avoids accidentally severing the catheter)
- Use a blunt dissection method with mosquito artery forceps to expose the cuff from the tissues
- Once the cuff is free from the surrounding tissues, clamp the catheter above the cuff and cut the catheter below the cuff in order to pull the lower part of the catheter via the original skin exit site

BSUH Haematology Dept.

SOP / Competency Document for Cuffed Central Catheter Removal

- If the cuff is placed within 1 cm of the exit site , cut along the exit site to expose the cuff for dissection

- As the catheter is removed, apply gentle pressure at the venotomy site at the neck, this pressure should be applied for 5 min in order to aid haemostasis.
- Insert skin sutures at the cuff dissection site or apply steri-strips if haemostasis is complete
- Cover the site immediately with gauze and occlusive dressing
- Inspect the catheter to ensure that it is complete
- Dispose of all sharps into sharps bin immediately

Post procedure

- The patient should remain in the supine position for 10-15 minutes post procedure.
- Document the procedure in the medical notes
- Sutures and dressing to remain in situ for 7 days

Wound closure

The suture of choice for the procedure is a monofilament non absorbable suture that is either 3.0 or 4.0 in size according to the UPS sizing. This suture is a solid suture that will require 5 throws per suture. The completed knot will rest on the side of the wound. The needle should be a reverse cutting, round or straight, 3/8th circle needle between 19 and 24mm in length. If haemostasis is complete from the incision site, steri-strips may be used as replacement for suturing.

Procedure for suturing:

- Remove the needle and suture from the packaging using the needle holder.
- Release the memory from the suture by holding the suture taught at it's full length
- Start at the centre of the incision and work out towards the edges, suturing ½ cm apart.
- Pass the needle through each side of the wound and apply 2 throws.
- Ensure the knots are to one side of the incision
- Cut the excess suture with a scissors

Care must be taken to avoid needle stick injury.

The Sutures will require removal in 7 days

A referral will be made to the community nurse or local surgery practice or at the Haematology Unit for suture removal. A referral letter will be given to the patient detailing the procedure, the number of sutures and the date for suture removal (appendix 4).

Alternative wound closer:

BSUH Haematology Dept.

SOP / Competency Document for Cuffed Central Catheter Removal

Steri-strips can be used at the site for the closure of small incisions and if there is complete haemostasis.

Documentation for audit purposes

The documentation in the notes must include the following: Any adverse events, amount of local anesthetic used, position of the patient during procedure, number of sutures placed at the cut-down site.

Complication management

- Air Embolus

Air embolus occurs when air enters the venous system. This can lead to low cardiac output, tissue hypoxia potentially culminating in shock and death. Symptoms of air embolus include: dyspnoea, tachycardia, cyanosis, jugular venous distension and hypotension.

Emergency treatment involves placing the patient in a steep trendelenburg and left lateral position (Thielen 1990). 100% O₂ to be administered and continued until symptoms have eased. Emergency bleep the medical team.

- Catheter fracture

In the event of a catheter fracture the line may rest in the subcutaneous tunnel. Applying pressure at the site of the tunnel may avoid further catheter displacement and minimize the risks of air embolus. Seek medical support and refer the patient to interventional radiologist / cardiothoracic surgeons.

- Dislodgment of a thrombus or fibrin sheath

Patients who exhibit symptoms of a pulmonary embolus must be treated with oxygen therapy and the medical team must be contacted immediately.

- Haemorrhage / bruising

Any excessive bleeding at the site must be reported to the medical team, the haematologist on duty and pressure applied.

Training

| | |
|--|---|
| Type of Training | Training required and defined. |
| Method of competency assessment | <p>Initial Training: Nurse Training is completed as part of the Haematology /Oncology Local Competencies; Supportive Care Extended Role, Competency Observed Practice by trained medical staff</p> <p>Annual Renewal: All nursing staff signed off to perform the tunnelled and cuffed CVC removal procedures must submit the following self-certification of competency annually in order to be allowed to continue carrying out procedures. Appendix 5</p> |
| Who is to perform this training | Designated medical practitioner (haematology consultant or haematology registrar) |

Appendix 1

Competency assessment form

The Removal of Tunnelled, Cuffed Catheter – Competency

The procedure of removal of a Tunnelled Cuffed Catheter (Hickman/ Groshong) can only be performed by practitioners who have evidence of supervised practice and completed the competency as well there is a need for this specialist training within the department / directorate. Competency must be attained prior to any practitioner being able to perform the procedure unsupervised.

Name of practitioner:

The practitioner must complete a minimum of 8 full procedures with full supervision prior to undertaking a formal assessment.

The practitioner must demonstrate the following:

| Practice | Competency demonstrated |
|---|--------------------------------|
| The importance of identifying the patient's relevant history and patient assessment | |
| The importance of the history of the Hickman /Groshong catheter | |
| The request and interpretation of pre-procedural blood sampling | |
| Obtaining patient consent | |
| Explanation of the procedure to the patient | |
| The understanding of the risks of Hickman removal and the measures to be taken to prevent the complications: Air embolus Migration Infection Bleeding | |
| Position of the patient in the Trendelenburg position during removal | |

BSUH Haematology Dept.
SOP / Competency Document for Cuffed Central Catheter Removal

| | |
|--|--|
| Administers lidocaine injection correctly and identifies the risks and maximum dose | |
| Carries out the procedure with precision, safely and correctly according to the policy | |
| Suture technique | |

Competency passed: Yes No

Date of competency assessment:

Assessor: Name: Signature:

Signature of practitioner:

Questions

1. What is the cut off figure for platelet level prior to removal?

2. Describe the preparation that should take place in respect to the environment prior to removal?

3. Where should the incision (after locating the cuff of the catheter) be made over?

4. What action must you take when the distal part of the catheter is removed from the vein?

BSUH Haematology Dept.
SOP / Competency Document for Cuffed Central Catheter Removal

5. What measures should you take if you suspect a patient is experiencing an air embolus?

6. What would be your initial management of a catheter migration?

Appendix 2

Tunnelled Central Line removal log

| Date | Patient ID | Comment | Supervised by / signature |
|------|------------|---------|---------------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Appendix 3

Patient assessment form

Hickman removal

Name:

Address:

Hosp. No:

Consultant: Diagnosis:

Date of birth:

Tel number:

Date of removal:

Fbc requested: Yes No

Fbc result:

Hb: Wbc:

Neuts: Platelets:

Patient on warfarin: Yes No

INR requested: Yes No INR result:

Coag screen result:

Relevant PMH:

Bleeding history:

Allergies:

Date hickman placed : How long has the hickman been in place:

Reason for removal:

Consent form signed:

Date of suture removal:

GP number: DN number:

DN contacted: Yes No Arrangement for surgery: Yes No

BSUH Haematology Dept.
SOP / Competency Document for Cuffed Central Catheter Removal

Surveillance form completed date:

Appendix 4

Community Nurse Letter (suture removal)

Date:

Patient:

| |
|---------------|
| Addressograph |
|---------------|

Dear Community Nurse/Practice Nurse,

The patient named above has had a Hickman / Groshong catheter removed on

Please could you visit on to remove the sutures from the site

on the chest. The patient has..... sutures in situ.

Thank you

Signature:

Name:

Position:

Appendix 5

Tunnelled and Cuffed Central Catheter (Hickman/ Groshong line) Annual Self-Assessment Certificate

Name:

In the last year I have completed / removed tunnelled and cuffed central catheters and I feel confident / competent to continue performing the procedures as trained

I have read the most recent version of the local standard operating procedure in the removal of tunnelled and cuffed central catheter. I have completed the mandatory infection prevention training.

Ward/Area:

Date:

Job Role: