BUTTONHOLE CANNULATION

Bottomline:

- The buttonhole technique has been designed to increase the longevity of a native fistula, prevent aneurysm formation, facilitate the ease of cannulation and self cannulation with less pain, reduce the need for anesthetics, and reduce the incidence of missed cannulations and infiltrations, while providing an adequate blood flow to achieve optimal dialysis (Doss, Schiller and Moran, 2008:417; Ball, 2006:299-300).

- Suitability and requirement for buttonhole development will be made by the Nephrologist in consultation with the patient, the Vascular Access Nurse and the patient’s Primary Nurse.

- Such a technique may be required to prevent aneurysmal formation and when there is limited space for cannulation along the length of the AVF (Ball, 2006:299; Ball, 2005:613).

- Risk of infection is reduced if the buttonhole is well developed and the guidelines for buttonhole cannulation are strictly followed.

Limitations of practice

The RN or medication endorsed EN performing the procedure has successfully completed the buttonhole cannulation competency.

Documentation must be made on the Buttonhole Tracking Chart for every cannulation until the buttonhole/s have been successfully developed, noting the stage of development and the angle of the tunnel at each cannulation.

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Guideline for developing the buttonhole tunnel:

- The tunnel is to be created by preferably 1 cannulator and will take approximately 3 to 4 weeks to develop, sometimes as long as 6 weeks (Ball, 2006:300).

- The nominated cannulator/s will be identified at the top of the Buttonhole Tracking Chart.

- Careful assessment of the native fistula must be done prior to choosing the sites for the arterial and venous buttonholes.

- There should be at least 1 inch, preferably 2 inches, between the chosen arterial and venous sites.

- Sharp needles are used until the buttonhole sites change shape (see below).

- Indications for changing to a dull needle include:
  - A change in the buttonhole shape from a V to a U shape and then finally to a round hole
  - Formation of granular tissue and a ridge around the exterior of the arterial site.
  - A dimple appearance will appear around the venous site without the granulating tissue
  - A reduction in cannula resistance – the cannula should begin to slide or be ‘sucked’ into the tunnel

- Once the tunnel has been successfully cannulated using dull needles for approximately 2-3 weeks, cannulation may be performed by other staff members.

- If it becomes necessary for another staff member to cannulate the AVF before the buttonholes are developed, they should choose a site 2cm in below of the buttonhole to avoid any damage to the developing tunnels

Preparing the patient and accessing the buttonhole/s:

1. The patient is to wash his/her arm prior to cannulation with antimicrobial solution and dry well with a clean paper towel.

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2. Secure a normal saline soaked gauge to each buttonhole site for at least 10 minutes prior to removal of the scabs.
3. Cannulator to check the Vascular Care Plan or Buttonhole Tracking Chart for the direction and angle of the buttonholes.
4. Cannulator to check the bruit and thrill of fistula before attempting any cannulation, looking for any signs of infection or trauma, and report any abnormal findings to the Vascular Access Nurse.
5. **Do not use the buttonhole if there are any signs of trauma or infection.**
6. Ensure the patient’s arm is in the same position and well supported, as this can affect the ease of which the buttonholes can be accessed.
7. Apply tourniquet loosely to upper arm if required.
8. Put on your protective face shield or mask.
9. Wash hands and prepare equipment on trolley – refer to guidelines for cannulation of fistulas.
10. Perform hand wash and don sterile gloves.
11. Request patient to remove normal saline soaked gauzes.
12. Place sterile drape underneath cannulation limb.
13. Clean buttonhole sites with chlorexidine swab using a circular motion at each site – use a separate swab for each site. **Allow the antiseptic solution to dry naturally, do not wipe off.**
14. If required inject < 0.5ml Lignocaine under the skin intradermally below or to the side of each buttonhole, with the cannulator drawing back initially to ensure the needle is not in the access tunnel.
15. Remove the scab from each buttonhole site using a blunt 18G drawing up needle (**do not use a sharp needle to remove the scabs**).
16. Clean each buttonhole site again with chlorhexidine swab after the scabs have been removed (**allow the antiseptic to dry naturally**).
17. Using the non cannulating hand to stabilise the fistula, insert the dull buttonhole cannula gently into the tunnel at the angle noted on the care plan.
18. Each cannula should slide into their respective tunnel easily without undue force, and with well developed buttonholes the needles can actually be ‘sucked’ into the tunnel.
19. Once the cannulas have slid into place, secure each with tape and flush as per standard protocol for cannulation of fistulas.

**Troubleshooting:**

- If either of the buttonhole sites become problematic and difficulty arises advancing either of the dull needles, it is advisable to engage the original cannulator to re-establish the buttonhole tunnels for another 2 weeks.
- It is advisable for the cannulator and the patient to be rostered on the same shift during this process.
- The cannula can bounce off the fistula and this can be overcome by stabilising the fistula and using a gentle rotating motion to insert the dull needle.
- **Under no circumstances is undue force to be used when inserting dull needles into buttonholes.**
• Any signs of infection must be reviewed by the VAN and the Renal Registrar, a swab of the exit site must be taken and the patient commenced on antibiotics (refer to AVF infection flow chart policy). If cannulation must be done, cannulate an alternative site away from the buttonhole.

• The buttonhole site will be abandoned if an infection in the buttonhole is confirmed.

References:


