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Case Report

Thinking Outside the Box: The Mid-Thigh Femoral Vein Central Venous Catheter

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Background

Chronically ill patients with multiple comorbidities such as bilateral upper extremity thrombosis, arteriovenous fistula', pacemaker/defibrillators, central venous occlusion, and musculoskeletal contractions are some of the most challenging when it comes to venous access. Sonographic assessment of these patients often reveals the common femoral vein to be the optimal site for cannulation. However, as the common femoral vein resides close to the inguinal fold and is in proximity to hair, urine and feces, it is suboptimal for device care and maintenance. The 2011 Center for Disease Control recommendations state, "Avoid using the femoral vein for central venous access in adult patients Category 1A [1]." Yet for some of the most vulnerable patients, the femoral site represents the only viable location for central venous access.

Objective

In patients with limited upper extremity venous access, describe insertion of femoral central venous catheters in the mid-thigh region.

Case Report

A 64-year-old male with a past medical history of a ruptured arterio-venous malformation status post craniotomy and ventricular peritoneal shunt, tracheostomy, colostomy, severe contractures, and a feeding tube presented in septic shock. Emergency room physicians placed a triple lumen central venous catheter in the internal jugular vein. Following stabilization, the vascular access team was consulted to replace the emergent catheter as it lay in close proximity to the tracheostomy and beard hairline, raising concerns for infection. The axillary veins were first assessed by ultrasound assessment and found to be of poor caliber, increasing the risk for Deep Vein Thrombosis (DVT). Severe upper extremity contractures exclude the option of inserting a peripherally inserted central catheter. Ultrasound assessment of the right lower extremity in the mid-thigh region distal to the inguinal fold demonstrated a large caliber femoral vein at a depth of 3cm. Starting the needle 3cm behind the ultrasound probe, the modified Seldinger technique was used to create a 6cm subcutaneous needle tunnel to the femoral vein. Following placement of a 0.018cm guide wire, a zero-transition 10cm dilator/sheath was introduced to avoid a skin incision. A 55cm double lumen antimicrobial/anti-thrombogenic catheter (ARROW) was placed through the sheath and guided to the location of the inferior vena cava/right atrium over an 80cm guide wire. Terminal tip position was confirmed via a tip navigation system. The insertion site was sealed with a skin adhesive and a chlorhexidine impregnated sponge. The catheter was secured with a stabilization device and covered with a transparent membrane dressing (Figures 1,2).

Figure 1: Original left internal jugular vein triple lumen catheter.

Figure 2: Right mid-thigh femoral vein double lumen catheter placed in the same patient.

Discussion

Securing reliable vascular access in patients with compromised upper extremity, thorasic and cervical vasculature is challenging. Although the femoral vein is often considered suboptimal, it is sometimes the only site available and use has been reported in the literature for myriad indications. For instance, Shaldon and colleagues described use of the femoral vein for hemodialysis in the 1960s [2]. Similarly, low rates of complications after placing femoral vein ports in patients with cancer and obstruction of the Superior Vena Cava (SVC) have been described by several authors [3,4]. In a recent case series of 125 patients, one of our authors reported on use and outcomes of catheters placed in the mid-thigh route in patients with challenging vascular access, finding low rates of infectious and non-infectious complications [5].

Compared to the traditional femoral site over the inguinal area, the mid-thigh site offers several advantages. First, by avoiding the chest, potentially lethal complications including tension pneumothorax and injury to the great vessels is avoided. Second, cannulating a large caliber vein such as the femoral increases allows for a large catheter to vein ratio, a factor known to protect against DVT [6]. Finally, the mid-thigh region provides a flat surface away from the groin, facilitating securement, care and maintenance of the device.

The mid-thigh femoral position may be considered for patients with: (a) an arteriovenous fistula or need for preservation of the upper extremity vasculature; (b) bilateral mastectomy, (c) implanted chest devices, (d) musculoskeletal contractures and (e) occlusion or stenosis of the SVC. An ultrasound assessment of the femoral vein and lower extremity Doppler should be performed to ensure absence of thrombosis or an inferior vena cava filter before attempting placement at this site. Relative contraindications include: (a) ambulatory patients (to avoid catheter migration), (b) lower extremity DVT, and (c) ipsilateral renal transplant (as impairment of venous outflow could jeopardize the graft).

When other options are not apparent, clinicians should consider exploring the mid-thigh region and the femoral vein for central venous access.

References

1. O'Grady NP, Alexander M, Burns LA, Dellinger EP, Garland J, et al. (2011) Guidelines for the prevention of intravascular catheter-related infections. Clin Infect Dis 52: e162-193.

2. Shaldon S, Silva H, Rosen SM (1964) Technique of Refrigerated Coil Preservation Haemodialysis with Femoral Venous Catheterization. Br Med J 2: 411-413.

3. Wolosker N, Yazbek G, Munia MA, Zerati AE, Langer M, et al. (2004) Totally implantable femoral vein catheters in cancer patients. Eur J Surg Oncol 30: 771-775.

4. Goltz JP, Janssen H, Petritsch B, Kickuth R (2014) Femoral placement of totally implantable venous power ports as an alternative implantation site for patients with central vein occlusions. Support Care Cancer 22: 383-387.

5. Ostroff M, Moreau N, Ismail M (2018) Review and Case Studies of Midthigh Femoral Central Venous Catheter Placement. J Assoc for Vasc Access 23: 167-175.

6. Nifong TP, McDevitt TJ (2011) The effect of catheter to vein ratio on blood flow rates in a simulated model of peripherally inserted central venous catheters. Chest 140: 48-53.