



Ultrasound-Guided Subcutaneous Tunneling of Femoral Central Catheters in Pediatric Patients: An Innovative Nursing Practice



Cintia Riograndense¹, Andréia Sousa Amorim Oliveira¹, Isabel de Abreu Esteves¹, Isadora de Mendonça e Custódio¹, Átila Daiane Schtshcerbyna¹, Marina Coelho de Oliveira¹, Laura Maggi da Costa¹.

¹Hospital Moinhos de Vento (Infusion Therapy and Vascular Access Team)



Introduction:



Prolonged central venous access is essential for pediatric patients requiring extended intravenous therapy. When upper limb veins are exhausted due to thrombosis, superior vena cava syndrome, or clinical limitations, alternative access routes must be considered. Femoral Inserted Central Catheters (FICC) offer a safe and effective solution, but their use is less frequent due to concerns about infection and thrombosis. Ultrasound guidance and subcutaneous tunneling performed by specialized nurses can enhance safety, ensure accurate tip placement, and reduce complications.

Methods:



This report describes the experience of a specialized nursing team at Hospital Moinhos de Vento performing ultrasound-guided femoral catheterization with subcutaneous tunneling between March 2023 and April 2025. Thirty-three pediatric patients with contraindications to upper limb puncture were included. Catheter tip positioning, clinical outcomes, and complications were systematically recorded. The procedure involved real-time ultrasound identification of the femoral vein, percutaneous puncture, and subcutaneous tunneling to the distal leg area ("green zone"). All insertions were conducted exclusively by trained nurses.



Results:

Among the 33 cases, tip positioning was achieved in the inferior vena cava (n=22), common iliac vein (n=4, due to progression difficulty), and right atrium (n=7, subsequently repositioned). Of the catheters, 26 were removed after therapy completion, 2 remain in use, and 4 patients died from underlying conditions unrelated to the catheter. Only 1 patient experienced complications (thrombosis and catheter-related bloodstream infection). There were no insertion failures.



Conclusion:

Ultrasound-guided femoral catheterization with subcutaneous tunneling performed by specialized nurses is a safe, effective, and innovative approach for providing central venous access in pediatric patients with exhausted upper limb veins. This technique expands vascular access options, minimizes complications, and highlights the critical role of specialized nursing in advanced vascular procedures. The findings support broader implementation of nurse-led femoral central catheter protocols in pediatric care.

Conflict of Interest: None.

Keywords: Femoral central catheter; Pediatric nursing; Ultrasound-guided vascular access; Subcutaneous tunneling; Alternative venous access.