

Chapter 6

Comparative Analysis of 2D USG Technique and Landmark Technique for Right Internal Jugular Vein Cannulation

Vithal K. Dhulkhed

Krishna Vishwa Vidyapeeth, India

N. V. Kanase

Krishna Institute of Medical Sciences, India

P. B. Jamale

Krishna Institute of Medical Sciences, India

Nagham Mahmood Aljamali

University of Kufa, Iraq

ABSTRACT

The technique selected for “Central Venous Catheterization [CVC]” is crucial in the field of medical procedures. In order to catheterize the right internal jugular vein, this study compares the efficacy of the landmark technique versus the 2D “ultrasound-guided [USG]” technique. This investigation focuses on patient outcomes, safety, and efficiency. This study compared the effectiveness and safety of two methods for CVC in the right internal jugular vein: the landmark technique and the 2D USG technique. In a clinical context, this study employed a prospective observational research design with 125 participants. Based on clinical judgment, patients were randomised to either the landmark technique group or the 2D USG technique group. This study evaluated the duration needed for a successful catheterization, the number of tries needed, and the complications that can arise from the process, such as

INTRODUCTION

A common technique in many different clinical settings, CVC is essential to patient care. It entails inserting a catheter into a large vein, usually the femoral, subclavian, or internal jugular veins. Numerous medical procedures, such as the delivery of fluids, medication, and hemodynamic monitoring, depend on this process (Troianos et al., 2011). Patient results can be greatly impacted by the CVC method and access site selection. This study's introduction will give a thorough summary of the significance of CVC, the evolution of techniques over time, and the justification for the current investigation that compares the landmark technique and the 2D USG technique for right internal jugular vein catheterization (Frankel et al., 2015).

Value of CVC

Because they offer dependable and direct access to the central venous system, central venous catheters, also referred to as central lines or central venous access devices, are frequently utilised in therapeutic settings. These catheters serve a range of clinical purposes in diverse clinical settings, such as hemodialysis, critical care units, and surgery. Large central veins can be accessed to facilitate the quick and effective delivery of vital drugs, fluids, and blood products, as well as the monitoring of hemodynamic parameters. Therefore, CVC is an essential technique for the management of patients who are severely ill or have complex medical conditions (Maitra et al., 2020).

A common site for CVC is the right internal jugular vein, which offers a somewhat straight passage to the superior vena cava. This decision is grounded in the idea of reducing the amount of challenges and issues that may arise from the catheter's initial insertion point to its ultimate destination. Reducing resistance during catheter advancement, lowering the likelihood of problems, and preserving patient comfort and mobility are some benefits of utilising the right internal jugular vein (Brass et al., 2015).

Nevertheless, the advantages of CVC must be evaluated against any possible risks and side effects. Serious side effects include arterial puncture, hematoma formation, pneumothorax, carotid artery puncture, haemorrhage, catheter malposition, and thrombosis are possible outcomes. Complications may result in higher rates of morbidity, longer hospital stays, and more expensive medical care. These factors make improving the CVC procedure a top priority in the medical field (Bowdle, 2014).

Techniques' Historical Development

CVC has a long history, having been developed as a central venous pressure measurement technique in the early 20th century. For many years, the main approach was the landmark technique, which depended on anatomical landmarks and the experience of the physician to put the catheter. Nevertheless, a number of issues have been linked to this method (Tercan et al., 2002).

One potentially fatal consequence of employing the landmark technique is unintentional artery puncture. Complications from arterial puncture include hematomas, pseudoaneurysms, and excessive bleeding. Furthermore, there is a considerable danger associated with carotid artery puncture due to the possibility of major neurologic problems and sequelae. Another serious issue related to the landmark approach is pneumothorax, which is brought on by an unintentional pleural puncture. When a pneumothorax occurs, chest tube insertion is necessary as soon as possible. The patient may have discomfort and infection as a result of hematoma formation at the insertion site. Any invasive operation has some risk of infection,

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