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Research Article

**COMPARATIVE STUDY TO SUCCESS RATE BETWEEN
SUPRACLAVICUAR AND JUGULAR APPROACH FOR
SUBCLAVIAN VEIN PUNCTURE**¹Aman Ali, ²Dr. Sibtain Ali Hashmi, ²Dr. Hasnain Abbas Naqvi¹Holy Family Hospital Rawalpindi²Government General Hospital Ghulam Muhammadabad, Faisalabad**Abstract:**

PURPOSE: This study is designed to compare the success rate of needle subclavian punching from the internal jugular vein and the complications of the supraclavicular approach. Central venous catheter subclavian (Supraclavicular or infraclavicular) internal jugular or femoral can be made from each of the advantages and disadvantages.

Place and Duration: The study was conducted in mayo Hospital Lahore, cardiology Department for 1-year period from July 2016 to July 2017.

Methods: Approximately one hundred and twenty consecutive patients, 6 in each group, required central venous catheterization. Alternate patient internal jugular (IJ) and subclavian (SC) were placed in groups. In both groups, strength and catheter malposition in catheter flexion, arterial puncture pneumothorax, complications such as tooth and successful procedure were compared according to frequency in three interventions.

RESULTS: The IJ (21 males and 42 females) had an average age of 41.77 + 15.05 years and the SC group (17 males and 46 females) had a mean age of 38.67 + 17.14 years. The procedure was successful in 53 (84.1%) patients in the SC group and IJ 55 (87.3%) in the patients. The difficulty of creating a catheter abnormal position sequence and catheter circulation produces an almost similar frequency in both groups. procedure was complicated by arterial puncture in five (7.93%) patients and 3 IJ (4.76%) patients in the SC group. Pneumothorax group IJ 2 (3.33%) occurred in the patient and 1 (1.59%) in the SC group. Both groups were similar according to all these findings.

Conclusion: The success rate of supraclavicular subclavian approach is similar to that of internal jugular venous puncture for perforation and central venous catheterization complications.

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INTRODUCTION:

Central venous catheterization is a common procedure performed in intensive care units for operation chambers and fluid resuscitation, hemodynamic control, transvenous cardiac stimulation, and hemodialysis access. The central venous line is particularly useful for long-term total parenteral nutrition and the application of large volume solutions for hemodialysis. Possible routes for central venous catheterization are internal jugular vein, subclavian vein, and femoral venules. Since the pneumothorax associated with this technique is less likely, most anesthesiologists prefer the internal jugular rather than other routes. However, it continues to be a common complication of accidental arterial puncture. The femoral route is avoided due to the possibility of further infection. The subclavian vein is accessible by supraclavicular or infraclavicular approaches. Because of the infraclavicular approach to the subclavian vein, Supraclavicular approach is less fortunate than pneumothorax and arterial puncture because the Supraclavicular subclavian vein approach is prevented from increasing the risk of pneumotorax which provides an excellent route. The internal jugular approach can serve as a good alternative. Even some texts refer to central venous catheterization as the easiest approach. The supraclavicular approach also describes the reference points, the anatomical fixed points because of the cardiopulmonary resuscitation, which is particularly useful for the shortest distance between the correct path, if the supraclavicular approach can be performed to pierce the skin and vein and right subclavian vein on the right side. However, the subclavian venous supraclavicular approach, despite its theoretical superiority, is not routinely implemented. Many comparisons of supraclavicular and infraclavicular approaches of the subclavian venous have been made. There are, however, few studies comparing the Supraclavicular approach to the internal jugular and subclavian plexus for central venous line placement. We designed this study to compare the most commonly used method, the most forgotten method, to compare the supraclavicular approach of the inner jugular, the subclavian venous.

MATERIALS AND METHOD:

This is a comparative study. The study was held at Mayo Hospital, Lahore from July 2016 to July 2017. After the patient's investigation and ethics committee approval and the informed consent of each patient or close relative, 120 patients who needed central venous catheterization for any indication in anesthesia or intensive care unit were included in the study. Alternative patients were placed in the internal

jagular (IJ) and subclavian (SC) groups, each with 60 patients. The size of the sample was calculated as 7% of the expected complication in the IJ group and 1.7% in the SC group. We use an accuracy of 2% 5% and a confidence level of 95%. The data were collected for the following variables: name, age, gender, hospital registry number, number of interventions, complications, catheterization success and alternative pathway use in case of failure. Every puncture was considered an attempt. The following are described as complications related to catheter insertion: threading strength, catheter malposition, catheter obstruction, arterial puncture, and pneumothorax. Portable chest radiographs were taken immediately after the procedure to assess the position of the catheter and to detect other complications. All collected information was entered and analyzed using SPSS version 10.0. Continuous variables were presented as age, mean + SD and were compared in two groups using independent sample T-test. All qualitative variables were presented as frequency and percentage, and were compared using a square test. $P < 0.05$ was considered significant.

PROCEDURE

The procedure was performed under local anesthesia and with the patient using the aseptic technique with supine, experienced anesthesia or placement with more experience, Trendelenburg side with 15 degrees opposite side of light. 10 For the supraclavicular approach, when possible, the lateral margin of the sternocleidomastoid muscle was used as an insertion point just above the clavicle. When not well separated, the clavicle was used as an insertion point in the middle and middle thirds. A 22-gauge chisquare Pearson test was used to place a Fisher Exact test needle oriented toward the counter-tip of the opposite breast that bisected the sternocleidomastoid-to-clavicular angle by 10 degrees in the horizontal plane. Lt; / RTI & gt; After each pass, the syringe barrel rises a few degrees. Each intervention was performed slowly with a continuous aspiration of constant application. If the first pass was not successful, subsequent attempts were made by placing the needle in a subcutaneous position and entering again at a new angle. After positioning the vein with the finder, the direction and depth were marked and the appropriate needle was placed. The modified Seldinger technique was used to place the catheter. After insertion of the guide wire, the catheter was placed in place with a normal saline after aspiration and was relieved. The fixation was done at 12 cm with silk sutures and dry sterile bandage was used to close the insertion point. Topographical markers used for internal jugular approach Civetta *et al*. 12 entry point is placed along

a path parallel to the anterior border of the sternocleidomastoid muscle, 5 cm above the medial side of the collarbone, 1 cm medial to the sternocleidomastoid muscle with needle 300 at an angle to the coronal plane of 22 gauge long needle finder.

After each passage was placed, the sternocleidomastoid to clavicular angle similar to the technique described by Yoffa 10 degrees on the horizontal plane, and a needle dividing the inverted breast with a head, rose barrel syringe at some grades. Each intervention was performed slowly with a continuous aspiration of light. If the first pass was not successful, subsequent attempts were made by placing the needle in a subcutaneous position and entering again at a new angle. After positioning the vein with the finder, the direction and depth were marked and the appropriate needle was placed. The modified Seldinger technique was used to place the catheter. After insertion of the guide wire, the catheter was placed in place with a normal saline after aspiration and was relieved. The fixation was done at 12 cm with silk sutures and dry sterile bandage was used to close the insertion point. Topographical markers used for internal jugular approach Civetta et al. entry point is placed along a path parallel to the anterior border of the sternocleidomastoid muscle, 5 cm above the medial side of the collarbone, 1 cm medial to the sternocleidomastoid muscle with needle 300 at an angle to the coronal plane. A 22 gauge needle was inserted to position the vessel. After finding the location of the vein with the finder, the direction and depth are marked and the right needle is placed. The rest of the procedure was the same as described above for the supraclavicular approach. If both techniques were accidentally punctured, the needle was extirpated and the pneumatic pressure was applied for at least 5 minutes. If arterial pneumonia occurs or ven fails in three attempts and is labeled as unsuccessful, an alternative route is used. When the catheter passes easily and aspiration produces a free return of venous blood, it is assumed that the central

catheter is successfully placed in up to 3 procedures without any complications.

RESULTS:

One hundred twenty-six patients were studied in each group (SC and IJ). Demographic data are summarized in Table I. The procedure was successful in three interventions in 87.3% of patients in group IJ and 84.1% of patients in group SC (Table II). In all unsuccessful cases, the alternative route has been successfully used for central venous catheterization. The complication rates in both groups are summarized in Table III and are similar.

Table 1: Demographic data.

Characteristics	Group IJ (n=63)	Group SC (n=63)	P Value
Age in years (mean ± SD)	41.77 ± 15.05	38.67 ± 17.14	0.056
Gender	Male n(%)	21 (30)	0.56
	Female n(%)	42(70)	

Table 2: Success Rate in 2 groups.

Characteristics	Group IJ (n=63)	Group SC (n=63)	P Value
Overall Success n(%)	55 (87.3)	53 (84.1)	0.306*
Success in 1 st attempt n(%)	40 (63.5)	43(68.1)	1.0*
Success in 2 nd attempt n(%)	11(17.5)	8(12.7)	0.617*
Success in 3 rd attempt n(%)	4(6.3)	4(6.3)	1.0*
Alternate route use n(%)	8(12.7)	10(15.9)	0.806*

DISCUSSION:

Our study at the sinus center showed that the supraclavicular approach to the subclavian venous pouch is as safe as the internal jugular venous puncture for central venous catheterization. This is consistent with the previous study by Muhm et al., which found that strength was as safe as other techniques. Ruesch et al. meta-analysis, there was no significant difference in complication rates between the internal jugular vein puncture and the subclavian vein puncture except for the slightly higher arterial puncture risk with the internal jugular approach. These findings are mostly suitable for our results. However, no significant differences in arterial puncture frequency were found between these two approaches (Table 3).

Table 3: Comparison of Complications with two different approaches.

Complication	Group IJ (n=63)	Group SC (n=63)	P value *
Difficulty in threading n(%)	4 (6.35)	3 (4.76)	0.698
Catheter Malposition n(%)	1 (3.37)	3 (4.76)	0.648
Catheter kinking n(%)	3 (4.76)	3 (4.76)	1.0
Arterial puncture n(%)	3 (7.86)	3 (4.76)	0.466
Pneumothorax n(%)	1 (3.35)	1 (3.59)	0.559

Biffi et al. also found insignificant differences in complication rates between subclavian and jugular approaches. A meta-analysis revealed no significant difference in complication rates between the supraclavicular approach to the subclavian vein and internal jugular venous perforation. The results of this meta-analysis are consistent with our work. Different studies have shown a success rate of 79-100% with supraclavicular approach. Our study showed a 84% success rate with a supraclavicular approach that was very similar to that reported in the literature.

CONCLUSION:

The supraclavicular approach to the subclavian venous pottine has a similar success rate to that of the internal jugular vein for central venous catheterization. With these two approaches, complication rates are not significantly different. The choice of central venous access site and approach should depend on the conditions of the patient and on the experience of the operator.

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