



## MALPOSITIONED RIGHT SUBCLAVIAN VEIN CATHETER INTO CONTRALATERAL SUBCLAVIAN VEIN-A CASE REPORT

Deepak Sharma, Ritu Goyal

Assistant Professors, Department of Anesthesiology & Critical Care  
Subharti Institute of Medical Sciences Meerut, Uttar Pradesh

Correspondence: Deepak Sharma, 30 New X Block, Subharti Medical College, Meerut (U.P.)

E mail: [deepoksy2004@yahoo.com](mailto:deepoksy2004@yahoo.com)

Phone No.: 9917191839

**About The Author:** Dr. Deepak Sharma, MD in Anaesthesiology, is working as Assistant Professor at Subharti Institute of Medical Sciences, Meerut, India. The author has been felicitated with Anand chandavaker award at Mumbai. He is credited with designing of an adapter for placing ECG guided central venous catheterization. Author's other field of interest being regional anaesthetic techniques and intensive care unit.



**Abstract:** Central venous access is a common emergency procedure. Because of time constraint during emergency, these catheters are inserted without the use of imaging technique. We present a case with unusual placement of right subclavian vein catheter into contralateral subclavian vein when inserted through infraclavicular approach.

**Key Words:** Subclavian vein (SCV), Infraclavicular approach, Malposition

**Introduction:** Malposition of central venous catheter is well known technical complication. Its incidence during Subclavian vein puncture is reported to vary from 1.8%<sup>1</sup> to 9.3%<sup>2</sup>. Commonly Right SCV gets malpositioned to ipsilateral internal jugular vein<sup>3</sup>. Malpositioning into contralateral SCV is very unusual. We report an unusual right SCV catheter malpositioned into contralateral SCV.

**Case Report:** A 20 year old male sustained blunt abdominal trauma in high speed motor vehicle accident. Examination showed altered consciousness, pale with unpalpable peripheral pulse (heart rate 140/min), unrecordable blood pressure. On palpation abdominal examination showed tense & tenderness. 4 needle abdominal paracentesis aspirated frank blood.

He was immediately shifted to emergency operation theatre for laparotomy. Peripheral venous access was not possible due to circulatory shutdown. Central venous access was planned. Patient was breathing spontaneously 100% oxygen with face mask, head turned to left side. Right subclavian vein was punctured blindly with conventional technique through infraclavicular approach with needle bevel pointing caudal. CVC was inserted using Seldinger method. Backflow of nonpulsatile blood confirmed intravenous



position. A 7F 20cm triple lumen catheter (certofix B Braun) threaded 15cm mark at skin. Check X-Ray was not possible at that moment. General anaesthesia was induced. Laparotomy revealed long ragged tear in right lobe of liver which was repaired. Haemodynamics was maintained intraoperatively.

Postoperative, he was shifted to intensive care unit & kept on mechanical ventilator. Portable chest X-Ray was ordered which revealed malpositioned right subclavian vein catheter into contralateral subclavian vein (Fig). The fluid infusion was terminated immediately & catheter was repositioned correctively through right internal jugular vein.

### Discussion

Central venous catheterization(CVC) is commonly performed procedure in emergency situation, major operation, intensive care monitoring. Immediate, procedural complication of this procedure include pneumothorax, inadvertent arterial puncture, hematoma, air embolism, perforation of vessel wall, arrhythmias, brachial plexus injury & catheter malposition<sup>4</sup>.

Although it has remained subject of debate for long, increasing evidence has shown that correct tip placement is of paramount importance for safe & effective use of central line. Incorrect position of CVC tip is defined as tip not located in SVC, catheter loops within the vessel & tip being in right atrium. Some authors define tip malposition as angle of incidence against the wall of vessel making an angle of  $>40^{\circ}$  increases the possibility of perforating the vein<sup>5</sup>.

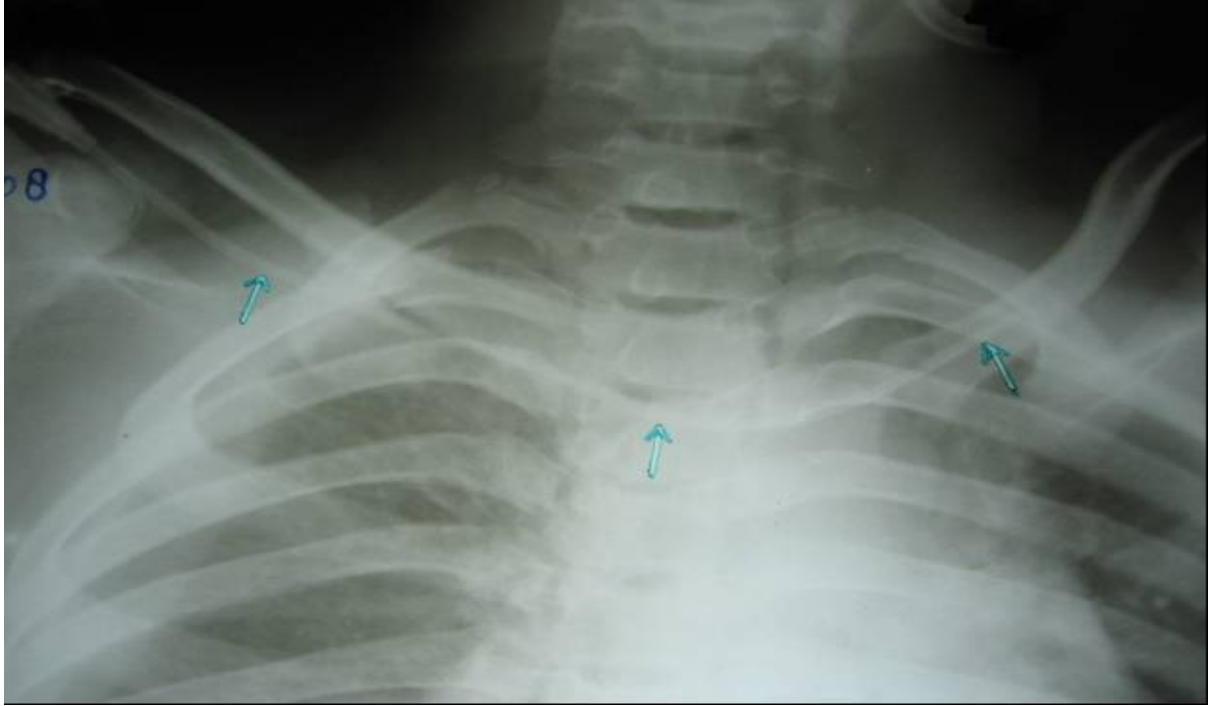
In our case, the guidewire inserted in right SCV passed through right brachiocephalic, instead of proceeding towards superior vena cava (SVC), entered into left brachiocephalic, finally positioned into left SCV. We feel that such passage of guidewire could be because of change in the orientation of J – tip of guidewire during the procedure, excessive length of guidewire inserted & the venous route selected for puncture.

Some authors use formulas based on height to limit the depth of insertion but it has been noted that in such cases the chances of malposition are as high as 48% requiring repositioning<sup>6</sup>. The advantage of real time ultrasound guided CVC insertion is that it provides visualization of vein and its anatomical variation, improves success rate and decrease the number of venipuncture attempts & complications associated with it however it does not guide the subsequent positioning of catheter tip<sup>7</sup>.

Recently it has been observed in a study that ECG monitoring when performing the procedure can place the CVC tip in correct position in 92% of cases while monitoring change in configuration of 'p' wave<sup>6</sup>.

In conclusion, correct placement of the central venous catheter is an essential prerequisite for accurate monitoring of CVP and long-term use of catheter. Though SCV cannulation has remained blind technique for long based upon topographical landmark, other

alternatives to guide CVC tip advancement during the procedure are evolving like endocavitary ECG which can guide correct placement of catheter in superior vena cava.



**Chest roengogram depicting Right SCV catheter malpositioned  
Into contralateral SCV(arrow).**

### References

1. Iovino F, Pittiruti M, Buononato M, et al. Central venous catheterization: complications of different placements. *AnnChir* 2001; 126:1001-6.
2. Ruesch S, Walder B, Tramer MR. Complications of central venous catheter: internal jugular versus subclavian access A systemic review. *Critical care Med* 2002; 30:454-460.
3. Ambesh SP, Pandey JC, Dubey PK. Internal jugular vein occlusion test for rapid diagnosis of misplaced subclavian vein catheter into the internal jugular vein. *Anesthesiology* 2001; 95:1377-9.
4. Morales JP, Salter R, Sandhu C, et al. Preventable fatal procedural complication of a tunneled central venous catheter insertion. *Case Rep Clin Pract Rev* 2005; 6 : 113-117.
5. Gravenstein N, Blackshear RH. In vitro evaluation of relative perforating potential of central venous catheters: comparison of materials, selected models, number of lumens, and angles of incidence to simulated membrane. *J Clin Monit* 1991; 7:1-6.
6. Anish M Joshi, Guruprasad P Bhosale, Geeta P Parikh. Optimal positioning of right-sided internal jugular venous catheters: Comparison of intra-atrial electrocardiography versus Peres' formula. *Ind J Crit Care* 2008; 12: 10-14.
7. Rothschild JM. A systemic approach to teaching insertion of a central venous line. *Arch Surgery* 1999; 134:738-740