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## A new, safe possibility for central venous access

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## Comments

This study identifies another reliable approach to the central veins, which may be used safely in intensive care unit (ICU) patients, provided the patients are carefully selected. The acceptably low rate of thrombosis (when compared with other routes of catheter insertion) means that the axillary approach should be considered when other routes of insertion are not possible. The authors do not comment on patient tolerance or comfort (with an axillary catheter in situ), an issue which may reduce the acceptability of such an approach. Although the authors have used this approach for pulmonary artery cannulation, this was not examined in the study.

## Introduction

Many vessels have been found to be suitable for access to the central venous circulation. The axillary vein has been found by the authors of this study to be suitable for such a purpose and associated with a very low complication rate. The axillary vein has been used for central venous access and pulmonary artery catheterisation for many years in their institution. However, patients with central venous catheters are at high risk of thrombosis and associated pulmonary embolism.

## Aims

To determine the rate of upper limb deep vein thrombosis secondary to axillary vein catheterisation in patients from the ICU population.

## Methods

This study was a prospective controlled trial involving 60 patients (from a tertiary care university center) who required central venous cannulation during the 13 month study period. Patients were excluded for a number of reasons, such as full-heparin anticoagulation, known hypercoagulable states and a prior history of deep vein thrombosis. The catheters were inserted using the Seldinger technique in aseptic conditions. Throughout the duration of the catheter placement, the patients were monitored for signs of upper limb thrombosis, thrombophlebitis, arm oedema, cyanosis and loss of distal pulses. The study patients all received deep vein thrombosis prophylaxis (once daily low-molecular-weight heparin). On removal of the catheter, all the patients had upper extremity phlebography to establish whether they had a deep vein thrombosis. These investigations were reported by radiology colleagues who were blinded to the clinical details of the patients. Each patient's uncannulated arm acted as a control.

## Results

Following placement of the axillary vein catheter, 10% (7 out of 60) were malpositioned in the right atrium. All of these were subsequently correctly repositioned in the superior vena cava. Only one patient had clinical signs of upper limb thrombosis and none had clinical evidence of pulmonary embolism.

The rate of axillary vein thrombosis on phlebography was 11.6% (7 out of 60), with 3.3% (2 out of 60) having complete thrombosis. Of the seven patients who had radiological evidence of thrombosis, five had the axillary vein cannula in position for more than 14 days. No patient who had the catheter inserted for less than 6 days had any evidence of upper limb thrombosis. The patients with axillary vein thrombosis were treated with intravenous heparin, and all recovered with no clinical sequelae.

## Discussion

The authors comment that this is the first prospective, controlled trial to examine the frequency of upper limb thrombosis, following axillary vein cannulation, in an ICU population. The authors stated that their rate of thrombosis was low (at 11.6%) for an ICU population at high risk for deep vein thrombosis for other reasons. After jugular vein cannulation, the thrombosis rate is quoted as approximately 10%, which compares favorably with the rate following the axillary vein approach. Due to the higher rate of thrombosis following catheter insertion for more than 14 days, the authors suggest that the catheters should be removed after 2 weeks.

The authors also comment that this study highlights the need to find optimal deep vein thrombosis prophylaxis, in order to reduce the incidence of thrombus formation and pulmonary embolism in the ICU population.

## References

1. Martin C, Viviani X, Saux P, Gouin F: Upper-extremity deep vein thrombosis after central venous catheterization via the axillary vein. *Crit Care Med.* 1999, 27: 2626-2629.