

Safety and feasibility of extra-thoracic puncture technique of axillary vein for venous access during cardiac devices implantation

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Introduction

Cardiac leads implantation is mainly achieved by subclavian vein access. This is performed by the blind puncture technique relying on anatomical landmarks. The technique is generally safe, but, major complications such as pneumothorax, arterial bleeding, and lead crush by costoclavicular ligaments may occur.

To reduce these potential complications, extra-thoracic puncture technique was proposed. This approach is based on accessing the axillary vein at the site where it enters the thorax. It is achieved by aiming the Seldinger needle to the first rib on its outer surface under fluoroscopic guidance.

Methods and results:

We report our experience with this technique in patients who had undergone device implantation between the years 2001 and 2008. This cohort includes 947 patients, 275 had automatic implantable defibrillator implantation while 673 had pacemaker implantation. Clinical data and complications are presented in the table. All veins were accessed successfully but one that was blocked due to venous spasm. No lead crush cases were seen.

Conclusion:

Extra-thoracic puncture technique of axillary vein is feasible and safe for leads implantation.

947 Patients	
Age	72±12.36 years
Female/ Male	350 / 597
Single lead / Multiple lead	203/744
Complications	
Pneumothorax: 3 cases.	A 54 years old male patient with pneumothorax related to aortic valve surgery preceded pacemaker implantation.
	A 94 years old male patient developed pneumo-mediastinum with right sided pneumothorax three days after left sided pacemaker implantation.
	A 95 years old female developed left sided pneumothorax after puncturing the lung by the Seldinger needle which crossed the very soft first rib.
Venous spasm: 8 cases.	Seven of them were managed conservatively, one case lead to puncture the contra-lateral axillary vein.
Axillary vein thrombosis: 2 cases .	A 69 years old female patient with prior stroke, who undergone a pacemaker implantation.
Axillary artery puncture: 130 cases.	All were managed successfully by manual compression on puncture site