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ULTRASOUND-GUIDED VENOUS AXILLARY ACCESS VERSUS STANDARD FLUOROSCOPIC TECHNIQUE FOR CARDIAC LEAD IMPLANTATION ZEROFLUOROAXI RANDOMIZED TRIAL

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Background: Axillary vein puncture (AVP) and cephalic vein surgical cutdown are recommended in international guidelines because of their low risk of pneumothorax and chronic lead complications. Directly visualizing and puncturing the axillary vein under ultrasound guidance reduces radiation exposure, provides direct needle visualization, and lowers periprocedural complications. Our hypothesis is that ultrasound-guided axillary access is safer and more feasible than the standard fluoroscopic technique. **OBJECTIVES** The purpose of this study was to assess the efficacy and safety of ultrasound-guided axillary venous access during cardiac lead implantation for pacemakers (PMs) and implantable cardioverter-defibrillator (ICD) implantations.

Methods: Patients were randomized in a 1:1 fashion to either axillary venous access under fluoroscopic guidance or ultrasound-guided axillary venous access. The composite outcome, including pneumothorax, hemothorax, inadvertent arterial puncture, pocket hematoma, pocket infection, lead dislodgement, and death, was evaluated 30 days after implantation.

Results: We randomized 270 patients into 2 groups: the standard group for fluoroguided AVP (n 134) and the experimental group for ultrasound-guided AVP (n 136). No disparities in baseline characteristics were observed between the groups. The median age of the patients was 81 years, with women comprising 41% of the population. The majority of patients received single- and dual-chamber PMs (87% vs 88%; P 1.00), and slightly over 10% in both groups received ICDs (13% vs 12%; P 0.85). In total, we placed 357 leads in PMs and 48 leads in ICDs. Among these, 295 leads were inserted via axillary vein access and 110 via cephalic vein access. Notably, the subclavian vein was never used as a vascular access. The composite outcome was lower in the ultrasound group according to intention-to-treat analysis (OR: 0.57; 95% CI: 0.33-0.99; P 0.034). The main difference within the composite outcome was the lower incidence of inadvertent axillary arterial puncture in the experimental group (17% vs 6%; P 0.004). The ultrasound group also exhibited lower total procedural x-ray exposure (10,344 mGy cm² vs 7,119 mGy cm²; P 0.002) while achieving the same rate of success at the first attempt (61% vs 69%; P 0.375).

Conclusions: Ultrasound-guided AVP is safer than the fluoroscopy-guided approach because it achieves the same rate of acute success while maintaining low total procedural radiation exposure. Ultrasound AVP should be considered the optimal venous access method for cardiac lead implantation.

Ultrasound Guided Axillary - Access vs Standard Fluoroscopic -Technique for Cardiac Lead Implantation

