

LETTER TO THE EDITOR

CEPHALIC VEIN ACCESS - A FEASIBLE, SAFE AND EFFECTIVE METHOD FOR DEVICE IMPLANTATION

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Dear Editor,

We would like to congratulate Shah *et al* in contributing their work, “Permanent pacemaker implantation through axillary vein approach” published in recent issue of JAMC (2017; 29(2):241–5). It is commendable to note that 800 permanent pacemakers (PPM) were implanted in a single centre, with axillary veins access for pacing leads in most cases.

The cardiac device implantation in Pakistan has seen a surge in recent years due to variety of reasons. One of the fundamental steps in PPM implantation is selection of site of venous access. Traditionally subclavian vein has been used for access but has several drawbacks with higher complication rates such as, pneumothorax, lead insulation erosions and lead fractures.<sup>1-4</sup> The axillary and cephalic route of access are alternate options that can be considered and are well described in literature.<sup>5-8</sup>

In the reported series of 800 devices, one wonders whether the authors have considered cephalic vein access an alternative option. This would not only negate risk of potential pneumothorax, but would also reduce fluoroscopy time for access, and eliminate need for use of contrast to identify the axillary vein.<sup>3,8,9</sup> Fluoroscopy times mentioned of less than 10 min in this series are still very high where currently for single or dual chamber PPM implantations where fluoroscopy time of less than 5 min are generally achieved.<sup>3,10</sup> There is understandably, a learning curve required to gain skills in non-subclavian accesses and reduction of fluoroscopy times.<sup>3,10</sup>

In our institution, we regularly use cephalic vein access as first choice for brady systems as well as standalone defibrillator implants to eliminate risk of pneumothorax<sup>11</sup>, avoid use of contrast and prolonged fluoroscopic time as access is achieved under direct vision.<sup>3</sup> This also helps spare the axillary and subclavian veins for future use for device upgrades and system revisions. Diabetes, ventricular dysfunction, male gender are associated with an increased likelihood of a successful implant using the cephalic vein.<sup>5</sup> There can be significant variations in upper limb venous anatomy which necessitates use of alternative venous access.<sup>12</sup> In a good sized cephalic vein pacing lead can directly be fed through, avoiding use of peel away sheaths. However, for a beginner (and in case of small sized cephalic veins) its best to use wide bore venoflon and hydrophilic wire to cannulate the vein and then pass peel

away sheath over the guide wire.<sup>13</sup> This helps achieve successful use of cephalic vein in majority of cases for pacing lead placement. Complex devices including CRT and CRTD have been successfully implanted using cephalic veins and with fluoroscopy times averaging 5 min for single and dual chamber pacemakers<sup>3,10</sup>, while for complex devices average fluoroscopy times of 20 minutes has been described in literature<sup>3</sup>. Axillary vein access can be performed without contrast when accompanied by cephalic vein access by using guidewire or by using the 1st rib and clavicle junction as an anatomical marker for axillary vein.<sup>6,14,15</sup> The axillary vein access is achieved either medially over the first rib-clavicle junction or laterally. The lateral approach is common in North America and medial approach in Europe. The lateral approach could potentially increase the lead fracture risk in young physically active individuals. In our experience, axillary vein access can be achieved, in at least 50% of the cases, without use of contrast. Contrast agent can be used if unable to locate the vein using methods described above or if complications such as pneumothorax are to be avoided at all costs or where system upgrades are to be undertaken with pre-existing leads and vein patency is to be determined.

It is very important that trainees in complex device implants learn all these access options and maintain competency in all three routes but it is natural to develop a personal preference. In addition, clinical situation in a patient may dictate the access route for safe and efficient achievement of goal of device implant. Cephalic access is the safest option in vast majority of the situations and should be preferred over other options for safe device implant and improved patient care.

**Table-1: Comparison of cephalic vein and axillary vein access**

	Cephalic vein access	Axillary vein access
Assisting venous access	Assist axillary vein and subclavian vein access without contrast	N/A
Bleeding Risk	Haemostasis secured under direct vision	Increased bleeding risk in anticoagulated patients
Contrast Use	No contrast needed	Contrast may be required
Fluoroscopy time	Reduced	Increased
Risk of Pneumothorax	None	Small
Risk of Lead fracture	None	Small with lateral punctures

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