Bail-out internal jugular vein approach in permanent pacemaker implantation

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Introduction: Permanent transvenous cardiac pacing is usually accomplished through the upper limb subclavian veins via extra thoracic puncture. Subclavian crush is a potential problem with intra-thoracic percutaneous subclavian vein access. In the presence of subclavian occlusion, several other vascular access options exist which include the internal jugular veins.

Methods: 69 years male with chronic kidney disease with symptomatic sick sinus syndrome was implanted DDDR pacemaker. An intra-thoracic left subclavian puncture was done in view of chronic occlusion of extra-thoracic left subclavian vein. One month post procedure, patient developed subclavian crush syndrome with rise of pacing threshold of atrial and ventricular lead (5.0@0.4 and 4.5@0.4msec respectively). Reimplantation of fresh leads through repeat intra-thoracic left subclavian puncture was avoided. Contralateral access was not considered in view of right AV fistula. Attempts to open subclavian occlusion through antegrade and retrograde routes were unsuccessful. As a bailout procedure, percutaneous left internal jugular vein punctures were made and screw in leads were implanted in right atrial appendage and RV low septum locations. The lead were secured by tying the suture sleeve to the sterno-cleido-mastoid muscle. A set of haemostat forceps was used to create a tunnel subcutaneously using blunt dissection from jugular puncture site towards the superior aspect of the clavicle. The forceps were directed under the clavicle hugging close to the posterior and inferior surface of the clavicle to exit into the infraclavicular pocket while dividing the muscle layers. A guide wire followed by a sheath was first passed through this tract. The proximal end of the pacing leads were secured with a silk suture and were then pulled through the tissue tunnel with the sheath to protect the lead one after the other. The proximal end of the leads were thus tunneled beneath the clavicle into left pre-pectoral pocket and attached to the pulse generator. There were no vascular or other complications.

Result: At follow-up electrical parameters remained stable.

Conclusion: Internal jugular vein approach is safe, feasible and may be considered in patients where subclavian access is not available.