Trans-jugular approach for permanent pacemaker implantation in octogenarian

Alexander Edo Tondas
Rido Mulawarman
Muhammad Hatta

Introduction: In an attempt to implant a permanent pacemaker, the internal jugular vein access can serve as a bail out technique when the conventional subclavian/axillary/cephalic veins are not available.

Methods: Our case report described a single chamber pacemaker implantation in an octogenarian using trans-jugular approach without surgical cut-down of the internal jugular vein.

Result: A 83-year-old man was referred from another province to our center with complaints of chest pain 3 days before admission. He also had several repeated episodes of syncope since 5 months ago, most frequent 10 days before hospitalization, up to 8 times of fainting in a day. Previous history of hypertension was noted but he denied having diabetes mellitus. ECG showed total AV block (TAVB) with junctional escape of 35x/minute. Laboratory findings revealed normal cardiac enzyme level, and echocardiography exam showed normal LV contractility (LVEF>55%) without regional wall motion abnormality which excluded acute coronary syndromes. Coronary angiography only demonstrated non significant coronary disease, implying a TAVB with degenerative origin. A single chamber permanent pacemaker implantation was planned, after temporary pacemaker backup. An initial attempt to access the left axillary vein failed due to vein collapse and an apparent stenosis in the proximal part. Cephalic vein isolation was not tried due to an apparent severe stenosis and irregularities from venography result. Subclavian puncture resulted in air inside the syringe that indicated a risk of pneumothorax was imminent, luckily the oxygen saturation did not drop. The right deltopectoral area was prepared, but venography from this side showed a large thrombus causing a near total occlusion of the axillary vein. Therefore we tried to puncture the internal jugular vein (IJV) using Seldinger technique without cut down. A guide wire was inserted to the puncture needle until it reached the IVC and the needle was removed. A 7F peelaway sheath was inserted then the pacemaker lead was directed and fixed to the right ventricular apex. The access site was blunt dissected and a smaller pocket was created to fit the sleeve which was then stitched. Another standard pocket was created on the right deltopectoral area. From this pocket we tunneled the skin using arterial forceps above the clavicle up to the jugular access site and grabbed the lead connector tip, then pulled it into the deltopectoral pocket. Lead test were acceptable: R wave of 17.1 mV, current 1.4 mA, impedance 619 Ω and threshold of 0.8V. Pneumothorax was not seen from the next day chest X-ray, and therefore the patient was discharged safely on the third day after procedure.

Conclusion: In urgent situation where the upper limb veins cannot be accessed, the internal jugular vein can be an alternative approach for permanent pacemaker implantation, without a surgical cut down or extensive dissection for tenneling.