AN ALTERNATIVE APPROACH TO PERMANENT PACE MAKER IMPLANTATION

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Abstract:
Subclavian Vein is the commonest vessel used to access right sided cardiac chambers during permanent cardiac pacing. When implantation via this vein is not possible or contraindicated, the majority of patients undergo thoracotomy and epicardial lead placement. However, a femoral vein approach offers a less invasive option that is associated with lower morbidity compared to epicardial lead placement. Despite this, there is very limited literature on femoral pacing. This technique of permanent pacemaker implantation has been used since the early 1980s. This case report is about permanent pacemaker implantation through femoral vein in a patient with contraindication to usual subclavian approach.

Keyword:
Venous access for permanent pacing, Femoral approach for pacing, Alternative to epicardial pacing

The Patient:
Our patient is a 52 year old lady with diabetes mellitus who presented with recurrent episodes of syncope in February 2007. Her ECG showed complete heart block. During permanent pacemaker implantation, lead placement through the subclavian vein was difficult as she had persistent left superior vena cava draining into coronary sinus and stenosis of the right subclavian vein [6 mm]. She was also found to have pyopericarditis which was treated with appropriate antibiotics. She underwent thoracotomy and epicardial lead placement. She presented with giddiness in January 2009 and was found to have end of life of pacemaker pulse generator. It was replaced in January 2009. Within 7 months she again presented with similar symptoms and was found to have loss of capture. Hence it was decided to place ventricular lead through femoral vein.
Procedure:
Preparation and draping of the skin was done with usual precautions. A horizontal incision was made between the right inguinal ligament and groin crease and extended to the deep fascia. Homeostasis in the superficial layers was secured. The femoral vein was cannulated with a modified Seldinger technique. A standard dilator and split sheath system was inserted for the introduction of a pacing lead. A pacemaker lead which was 85 cm in length was inserted and advanced through the tricuspid valve to the endocardial surface of right ventricular apex under fluoroscopic guidance. It was fixed using active fixation technique. The distal end of the lead was secured by sutures proximal to femoral vein puncture. The pulse generator pocket was created superficial to deep fascia, proximal to the incision. This was the same plane as used in prepectoral generator placement. With the generator in situ, mouth of the pocket was closed with a series of interrupted non absorbable sutures. These oppose the deepest layers of the tissue overlying generator to the deep fascia caudal to the pocket. It is important to limit the possibility of subsequent gravity dependent migration of the device to the groin crease, where it can cause discomfort with hip flexion or adopt a horizontal position and tend to erode. The deep layers and skin were closed in usual manner. The procedure time was 1 hr. The patient was in bedrest for 48 hours and then gradually ambulated. Intravenous antibiotics were given for 5 days with the first dose before the procedure. There were no peri procedural complications. The patient is doing well and is on regular follow up.

Epicardial and temporary femoral pacing leads.
Discussion:
Although this approach has been mentioned in the literature since 1980, it is not frequently used. It is a safe alternative approach for permanent pacemaker implantation in patients with contraindications or difficult access to subclavian approach.

Indications for permanent pacing via femoral approach:
1. Previous infection in SVC leads
2. Burns to anterior chest
3. Painful pacemaker pocket
4. Abnormal anatomy
5. Recurrent erosion
6. Multiple leads in SVC
7. Mastectomy/radiotherapy

Subclavian obstruction diagnosed on venography has been reported to occur in 28-44% of patients with pectoral implants. But clinically only 1-6% of patients have features of venous obstruction. Due to this, many patients undergo implantation on the contra lateral side when new leads are required and venous obstruction can occur at this site also. Thus venous obstruction is the main indication for femoral permanent pacing.

Permanent pacing via femoral approach is currently performed in a limited number of centers worldwide. The underutilization of this approach may be due to the fear of possible complications of transfemoral pacing. The largest data available on femoral pacing is from series using temporary femoral pacing. These data have shown it to be a safe procedure.

A series by winstein et al. examined 100 consecutive cases of temporary pacing via this route and found minimal complications. There were no cases of thrombophlebitis, venous embolism, obstruction. Only two possible cases of infection were seen. In another series of 80 patients, phlebitis was seen in 6.3%. The largest series by Ellestad et al. published in 1989, included 90 patients who had 95 pacemakers implanted. Atrial lead displacement was the major complication occurring in 21% of implanted leads (one of these was an atrial perforation). This occurred despite the use of active fixation atrial leads and the use of long leads (85 cm). No patients developed clinical signs or symptoms of lower limb or inferior vena cava obstruction. Phlebitis was not observed, despite its high occurrence (6-3%) seen with temporary pacing leads.

Conclusion:
Implantation of transvenous femoral permanent pacemaker leads is a safe and feasible alternative when endocardial pacing via the subclavian is not possible or contraindicated. Insertion of a femoral permanent pacemaker should be the first choice for patients in whom the conventional approach is not possible.

References:


