CASE REPORT

SUPERIOR VENA CAVAL OBSTRUCTION AFTER PACEMAKER IMPLANTATION

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ABSTRACT

Transvenous pacing is a relatively safe treatment with a low complication rate. However serious thromboembolic complications can occur. Superior vena cava obstruction syndrome is generally rare after pacemaker implantation. Usually most patients remain asymptomatic because of the development of an adequate venous collateral circulation. Venous obstruction often first becomes apparent during pacemaker lead revision. In this report, we present a case of pacemaker associated superior vena caval obstruction syndrome.

KEY WORDS: Superior vena cava; Syndrome; Pacemaker.

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INTRODUCTION

Although transvenous pacing is a relatively safe treatment with a low complication rate, serious thromboembolic complications have been reported to occur in 0.6% to 3.5% of cases. Superior vena cava obstruction (SVCO) syndrome is generally an uncommon but serious complication occurring in <0.1% of patients of pacemaker implantation. Fortunately, most patients remain asymptomatic and subclinical because of the development of an adequate venous collateral circulation. Venous obstruction often first becomes apparent during pacemaker lead revision, when difficulty in passing the new pacing lead is encountered. In this report, we present a case of pacemaker associated superior vena caval obstruction syndrome and a brief review of literature.

CASE REPORT

A 64 year old male presented with history of recurrent swelling of the neck and face for two months, mainly noticed in the morning time which resolved later in the day (Figure 1).

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Figure 1: Showing swelling of face and neck with distended veins on the upper chest due to superior vena caval obstruction.

He was also feeling tightening spasm in her neck for the same duration. He denied any shortness of breath, chest pain or cough. Clinical examination showed minimal oedema of the face and prominent superficial veins of the chest wall and non-pulsatile engorged neck veins. He had a history of dual chamber pacemaker insertion 12 years ago for complete heart block in an outside hospital. Because of delayed

infection of the pacemaker site, pacemaker was re implanted on left side two years ago. Old leads can not be removed. In new pacemaker only ventricular lead had been introduced, atrial lead could not be introduced. There was no significant past history.

Computed tomography (CT) of the chest was performed first. There was no extrinsic compression of the superior vena cava and there was suggestion of thrombotic obstruction of SVC. An arm venogram confirmed SVC obstruction, with severe stenosis at the right subclavian vein and partial obstruction of left subclavian vein with multiple collaterals. (Fig. 2,3)

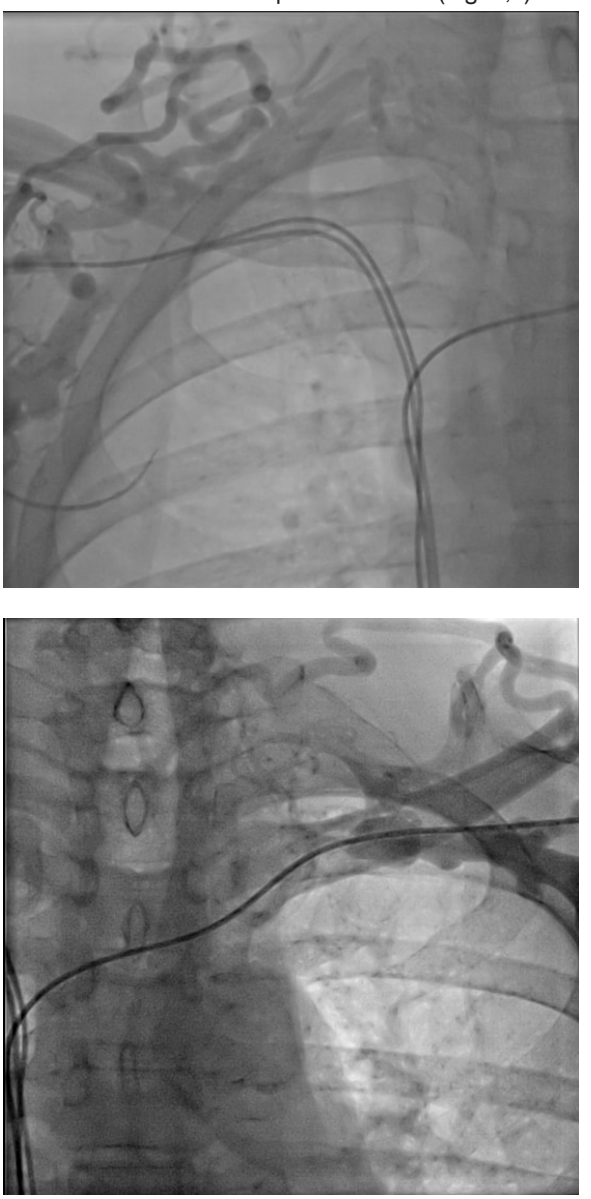

Figure 2&3: Arm venogram showing SVC obstruction, with severe stenosis at right subclavian vein and partial obstruction of left subclavian vein with multiple collaterals.

The patient was started on oral anticoagulant therapy (Tab Warfarin 4 mg once daily) and is doing well in follow-up.

DISCUSSION

SVC thrombosis with or without stenosis from the pacemaker leads was described by Kosowsky and Barr in 1972.[1] The incidence of this condition has been reported in the literature range from 1 in 650 patients to 1 in 3100 patients.[2]

The pathogenesis of the SVC stenosis in pacemaker implanted patients is thought to be from endothelial disruption caused by repeated trauma from the leads and it usually occurs above the right atrium.[3] Deposition of fibrin on the surface of the leads can result in vessel wall inflammation, fibrosis, and thrombus formation and eventually these changes lead to venous stenosis and occlusion. Lead infection and retained leads increase the risk of thrombosis, stenosis and subsequent SVC syndrome. Lead material, calibre, and access site either by subclavian or cephalic did not have any impact on stenosis formation.[4,5] Stenosis due number of leads varies, but only one study report that increasing number of leads had been associated with more stenosis formation.[6]

The most common clinical presentations are neck, facial and upper extremity swelling secondary to obstruction of blood flow in the SVC. Other commonly reported symptoms are dyspnoea on exertion, orthopnoea, headache, dizziness and visual changes. Head and neck swelling and chest wall venous collaterals are most commonly seen on clinical examination. However in most of the patients with pacemakers, swelling presents insidiously because of chronic process and the development of adequate collaterals. Because of high association of SVC syndrome with malignancy, a thorough history and physical examination should be performed in all cases. Venography is considered to be the gold standard for diagnosing venous obstruction,[7] and is required before and after the vascular intervention. Spiral CT venography is also very helpful in diagnosing chest vein stenosis.[8,9] Magnetic resonance angiography (MRA) may also be considered when contrast venography is contraindicated.

Anticoagulation and thrombolytic agents are used for pacemaker induced venous thrombosis. It helps in maintaining the patency of venous collaterals and reduces thrombus propagation. Low molecular weight or unfractionated heparin is used along with warfarin, until the INR is in the therapeutic range (2 to 3). Warfarin is used for 3-6 months after the episode of thrombosis. Multimodal approach is evolving recently, which consists of heparinization, transcatheter thrombolytic therapy, followed by a minimum of three months of warfarin and balloon angioplasty for treatment of residual stricture.[10]

CONCLUSION

SVCO in patients with transvenous pacing leads, although rare, is a well recognized complication. SVCO can interfere with intravenously administered therapy, monitoring of central venous pressure and revision of a pacemaker lead. With growing elderly population and increasing number of procedures performed, more and more people with permanent pacemaker are likely to be encountered in clinical practice. One should carefully look for thromboembolic complications during follow-up in patients with transvenous pacemaker leads, as it has implications for future management and carries significant morbidity and mortality.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

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Data collection, analysis & interpretation:	PKC, BM, PS, SKN
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