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AV FISTULA, AN UNUSUAL COMPLICATION OF PACING

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ABSTRACT

Arteriovenous fistula formation is a known complication of procedures involving major vessels like placement of pacing leads and dialysis catheters. Here we are reporting such an occurrence following temporary and subsequent permanent pacemaker implantation in a case of paroxysmal atrial fibrillation with varying block. Persistent features of congestive heart failure and appearance of a new murmur led us to suspect formation of an arteriovenous fistula. Subsequent angiography revealed a fistulous communication between left vertebral artery and paravertebral venous plexus which drained to a dilated left innominate vein. We thereby recommend a thorough physical examination of such patients who present with features of progressive high output failure or other unexplained symptoms after procedures involving major vessels, to rule out the possibility of an iatrogenic AV fistula..

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INTRODUCTION

Arteriovenous fistula formation is a known complication of procedures involving major vessels like placement of pacing leads and dialysis catheters. When pacemaker leads are first inserted in a vessel, thrombus formation occurs, which subsequently organizes. Over time, fibrosis continues along the lead, predominantly in areas that are in contact with the vascular endothelium and endomyocardium. These changes are basically inflammatory in nature. This process can extend to nearby arteries, which when canalized can form arteriovenous fistulas. Also, at the time of insertion, a lead might inadvertently follow a route across an arterial vessel before ending in the vein, which predisposes the patient to AVF formation. This usually happens close to the puncture site, thereby involving the subclavian vessels. Here we are reporting such an occurrence involving vertebral vessels and innominate vein (Fig.1).

The case

Our patient a 57 year old male presented to us with history of giddiness and fall sustaining injury. He was a known case of type II diabetes mellitus and hypertension on regular treatment. His clinical examination showed an irregular heart rhythm with features of congestive heart failure in the form of pedal edema and lung congestion. ECG showed atrial fibrillation with fast ventricular rate. Echocardiography revealed normal left ventricular function. Holter showed paroxysmal atrial fibrillation with pause of more than 2.8

seconds. Permanent pacemaker was implanted under cover of temporary pacing and patient was discharged after stabilizing him on anti-arrhythmic and anti-failure treatment. After one month the patient came back with persistent atrial fibrillation and pulmonary edema. His anti-arrhythmic drug was changed and diuretic dose was enhanced which led to relief of his symptoms. After 3 months he was readmitted with features of congestive heart failure. This time a new systolic murmur was noted in the pulmonary area radiating to the left side of neck. CT Angiography revealed presence of an arterio-venous fistula between vertebral venous system and internal jugular vein.

He was referred to higher cardiovascular centre for corrective surgery. Angiography done there delineated a fistulous communication between V2 segment of left vertebral artery and paravertebral venous plexus at C7 level which drained to a dilated left innominate vein (Fig. 2). A fluenc stent graft was deployed in Lt vertebral artery and post-deployment balloon dilatation was done for wall apposition (Fig 3). Persistent AV shunting in check angiogram required deployment of another wall graft- endoprosthesis. Check angiogram showed significant reduction in AV shunting with forward flow in left V2 segment on left VA injection (Fig4). Subsequently his CHF symptoms improved and sinus rhythm was restored. The bruit in left side of neck gradually diminished and eventually subsided.

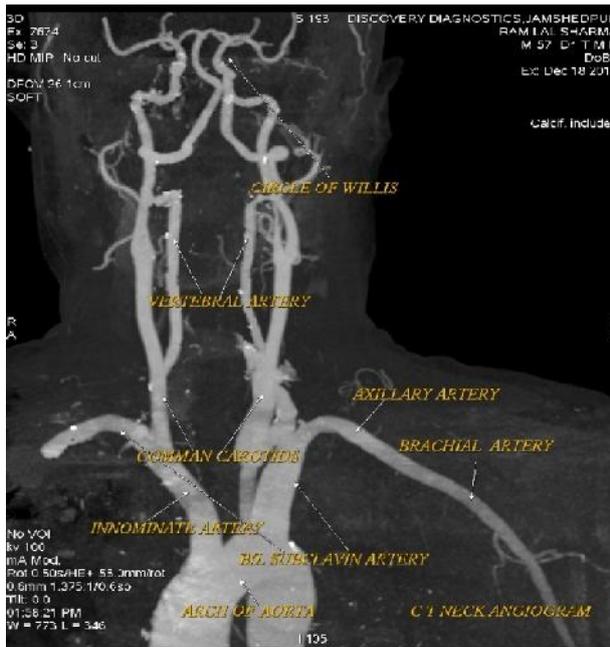


Fig. 1

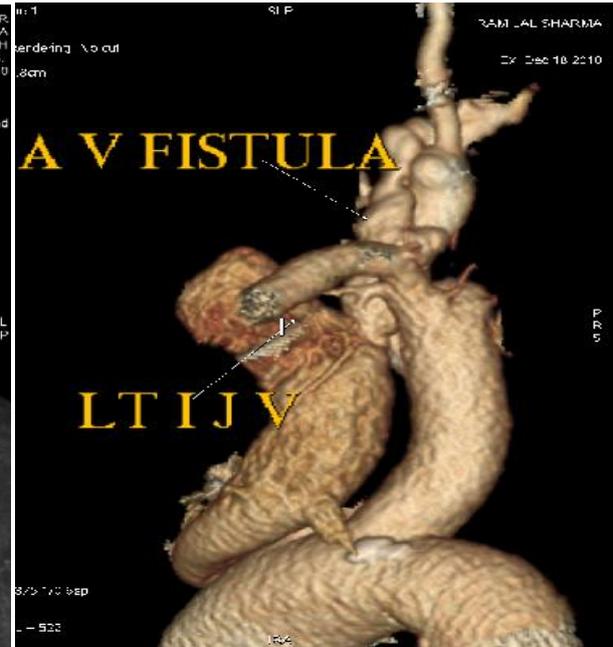


Fig. 2

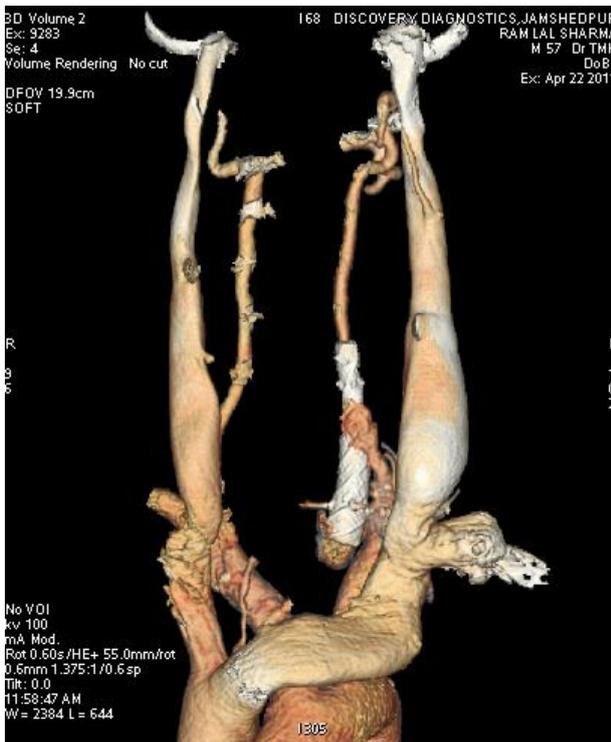


Fig. 3

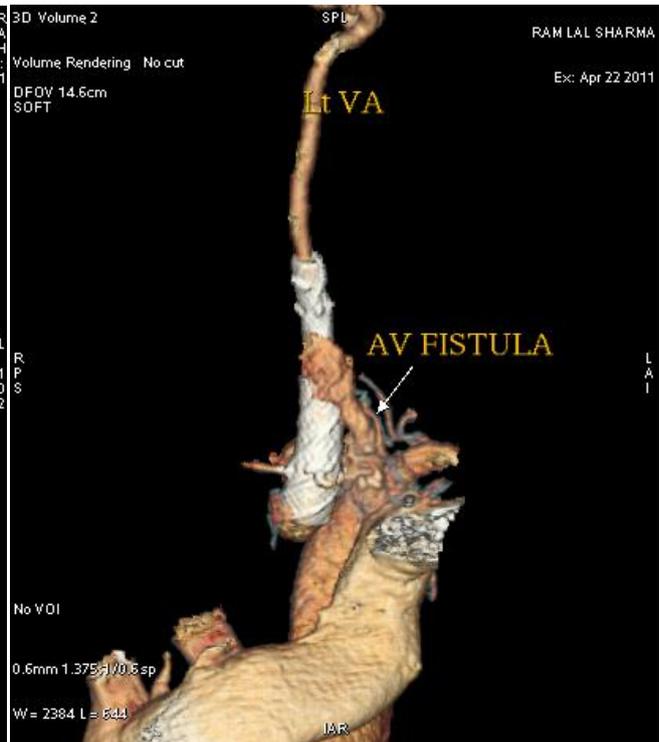


Fig. 4

DISCUSSION

The incidence of AVF following pacemaker lead insertion is unknown, but it is an uncommon adverse event with a broad clinical presentation. It might involve no symptoms, might cause late onset of mild symptoms, or might even result in sudden severe clinical deterioration that leads to death. It is most frequently reported after laser assisted lead extraction. Presentation of a new murmur or symptoms and signs of high output cardiac failure or worsening of low output cardiac failure should alert the physician to the possibility of an A-V fistula in a patient who has undergone laser lead extraction, even if there was no immediate postoperative complication [WalidAlayadhi, 2009]. Therefore, postoperative follow-up should be mandatory.

Most of the cases in literature required placement of stents across the feeding vessel, barring a few cases where spontaneous closure has been reported [Zullo MA, 1991]. Endovascular stenting is a reasonable alternative to coil embolization or surgical repair of an AVF that results from laser lead extraction [Azpurua FE, 2012]. There is only one more report of iatrogenic AV fistula formation during temporary pacing [Stanley G, 1991] as in our case (temporary pacemaker lead was inserted through left side). To the best of our knowledge, we have reported the first case in which an AV fistula is iatrogenically created involving vertebral system of vessels. We thereby recommend a thorough physical examination of such patients who present with features of progressive high output failure or other unexplained symptoms

after procedures involving major vessels, to rule out the possibility of an iatrogenic AV fistula and send them to proper centers where corrective measures can be taken.

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