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Intraventricular septal hematoma as a complication of left bundle branch pacing: A case report of evolution of hematoma after conservative treatment

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Intraventricular septal (IVS) hematoma is a very rare complication of invasive cardiac procedures, but its incidence may increase due to the growing popularity of conduction system pacing (CSP) [1, 2]. CSP is a more physiologic mode of ventricular stimulation compared to classic right ventricular pacing [3]. Thus, in many cases CSP is preferred over the standard approach. It is important that cardiologists are aware of the differences with this new mode of pacing, including potential complications [4].

We present a case of a 59-year-old male patient who underwent pacemaker implantation due to third degree atrio-ventricular block. Prior to the onset of atrio-ventricular conduction disturbances, left posterior hemiblock and right bundle branch block were present. The patient had actively participated in triathlons for many years and expressed a strong desire to return to sports after treatment. A Selectra 3D-65-39 sheath and a Solia S 60 cm electrode (Biotronik SE & Co, Berlin, Germany) were used. The electrode was screwed into the IVS three times, achieving left bundle branch pacing after the third attempt. Shortly after confirming the proper placement of the electrode, the patient reported severe chest pain. This raised a suspicion of septal hematoma due to electrode’s migration. As the both the hematoma and chest pain

worsened, the position of the electrode was changed. The new position was adjusted to accommodate the growing hematoma. Eventually, deep septal stimulation was successfully achieved. An atrial lead (Solia S 53) was implanted according to the standard procedure.

Transthoracic echocardiography showed a massive IVS hematoma after the procedure (Figure 1A–B). Due to the symptoms and dynamic changes in troponin levels, we diagnosed the patient with myocardial infarction and coronary angiography was performed (Figure 1C). Contrast extravasation was observed from 2 small branches of the first septal artery, with no pathology in the main trunk of the left anterior descending artery. Due to the lack of hematoma growth in repeated transthoracic echocardiography examination, the patient was considered for conservative treatment. After a few hours the patient reported only mild chest pain, but hypotension and multiple ventricular extra beats were observed. Both hypotension and ventricular ectopy resolved on the fourth day of follow-up as the hematoma decreased. The patient was discharged from the hospital on the following day. After approximately 8 weeks, no hematoma was observed on transesophageal echocardiography, with good wall motion and only slightly increased echogenicity of the right ventricular part of the IVS (Figure 1D–F).

IVS hematoma after pacing lead implantation is a potentially life-threating complication. In our patient, in the absence of other causes (left ventricular ejection fraction remained preserved), the reduction in right ventricular volume and right ventricular outflow tract lumen were considered a contributing factor to hypotension. Eventually, our patient returned to sports. He reports that the results in running and cycling are now better than before the procedure, suggesting that conduction disturbances were exacerbated with exertion earlier before he reported to the doctor. It is hard to know whether years of sports participation through adaptive remodeling of the left ventricle and increased vascularization of intraventricular septum may have played a role in the onset of the complication. Available data are inconclusive on this issue. However, operators should note the potentially increased peri-procedural risk in this group of patients.

Article information

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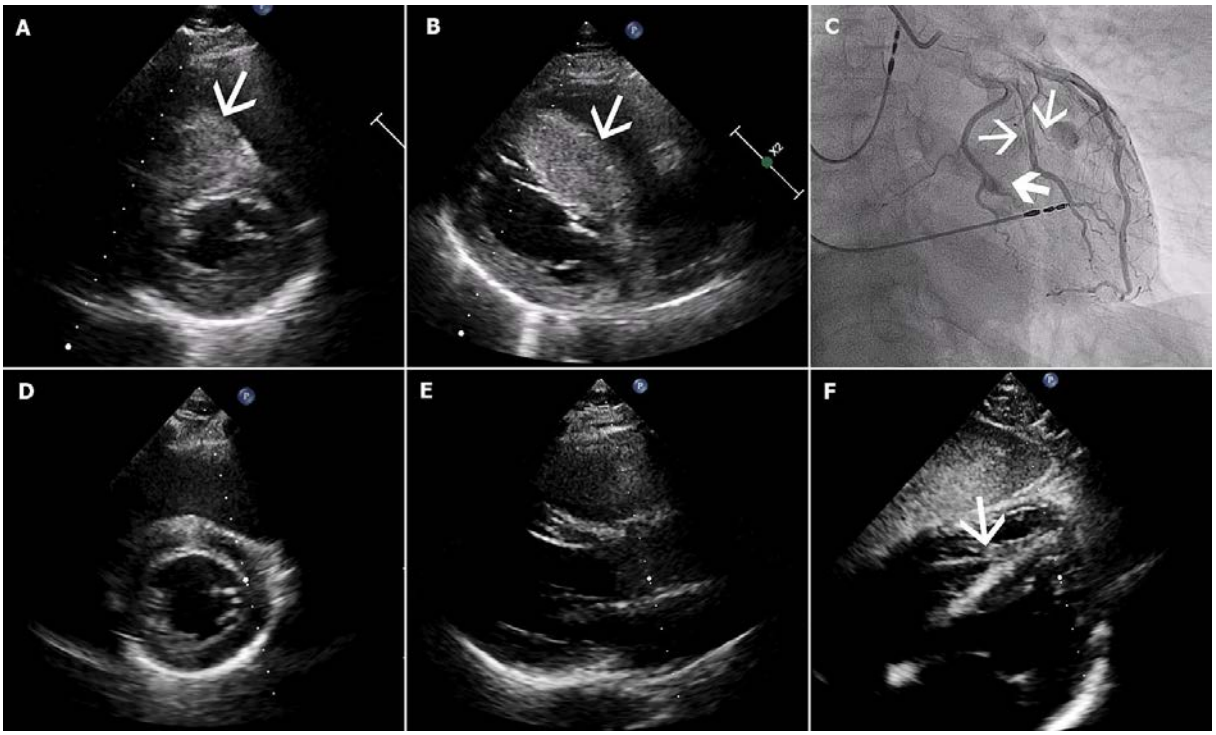

Figure 1. A. Transthoracic echocardiogram (TTE), parasternal short axis view immediately after pacemaker implantation (arrow indicates the intraventricular septum [IVS] hematoma). **B.** TTE, parasternal long-axis view immediately after pacemaker implantation (arrow indicates the IVS hematoma). **C.** Coronary angiogram, right anterior oblique caudal view (thin arrows indicate extravasation of contrast from two small branches of the first septal artery, thick arrow indicates lagging contrast in the IVS. **D.** TTE, parasternal short axis view 8 weeks after pacemaker implantation. **E.** TTE, parasternal long axis 8 weeks after pacemaker implantation. **F.** TTE, substernal view (arrow indicates the Solia S 60 electrode)