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Letter to the Editor

We sent this Letter to Dr van Beek and his colleagues, but they chose not wish to respond – Robert H Anderson (Editor).

Dear Sir,

Re: Systematic placement of left-sided pacing leads as an appealing option for cardiac resynchronization as treatment of congestive cardiac failure in children dependent on chronic cardiac pacing

We read with great interest the article from Van Beek et al.,[1] describing the benefits of cardiac resynchronisation in children with myocardial dysfunction as a consequence of cardiac pacing. Interestingly, we have recently described[2] a similar pathophysiologic condition in a patient with congenitally complete heart block. The patient, as a neonate, had required insertion of an epicardial VVI pacemaker on the right ventricular free wall. From the age of 9 months she developed a severe failure to thrive, and aged 19 months, she was seen by us with signs of severe global cardiac failure. The control of pacemaking was unremarkable. Echocardiography showed severe left dilated cardiomyopathy, with a shortening fraction of less than 10%, global diastolic dysfunction, and moderate mitral regurgitation. A comprehensive aetiological screen being negative, we hypothesized that she had a cardiomyopathy linked to the maternal collagenopathy. The cardiac failure being refractory to maximal medical treatment, we inserted a lead at the apex of the left ventricle for VVI pacing, since it was impossible to achieve atrioventricular synchronization by dual chamber pacemaking because of the dimensions of the generator. Signs of cardiac failure disappeared in spectacular fashion over a few days, and the child radically improved her quality of life. Postoperative echocardiography documented a left ventricle of nearly normal size, with normal systolic and diastolic function, non-paradoxal motion of the ventricular septum, and trivial mitral regurgitation. Right-sided pacing, in both DDD or VVI modalities, although remaining the method of choice, has been shown to induce inadequate haemodynamic performance, with vicious remodelling of both ventricles, which might induce dilated cardiomyopathy.[3,4] It is currently recognized that patients with cardiac dysfunction may benefit from resynchronization[5], which is usually achieved by the insertion of dual-chamber atrioventricular leads, or three-lead techniques, but this is often impossible in small patients. Alternatively, achieving apical left, rather than right, ventricular pacing may have many advantages, particularly when the leads are inserted at the left ventricular apex, which appears to ensure synchronous activation of the left ventricle.[3,4,6,7] In the absence of possible atrioventricular or interventricular re-synchronization, insertion of VVI pacemaker leads on the left ventricle appears to be more satisfactory than right-sided pacing.

Taking into account the potential benefits of epicardial pacing of the apex of the left ventricle in patients with congenital heart block, mostly when associated with a secondary cardiomyopathy, it is tempting to consider systematically inserting single or double-lead epicardial pacemakers on the left side of the heart by mini-thoracotomy, rather than on the anterior wall of the right ventricle, since left-sided pacing may prevent subsequent development of a pacing-related cardiac dysfunction.

Eduardo da Cruz, Yacine Aggoun, Cécile Tissot, and Maurice Beghetti

References

1. Van Beek E, Backx A, Singh S. Cardiac resynchronization as therapy for congestive cardiac failure in children dependent on chronic cardiac pacing. Cardiol Young 2006; 16: 187–189.
2. Tissot C, Aggoun Y, Rimensberger P, et al. Left ventricular epicardial VVI pacing for a congenital complete heart block with severe myocardial dysfunction: shall epicardial pacing wires be positioned left? Int J Cardiol 2006 (In press).
3. Karpawich PP, Mital S. Comparative left ventricular function following atrial, septal, and apical single chamber heart pacing in the young. Pacing Clin Electrophysiol 1997; 20: 1983–1988.
4. Navia JL, Atik FA, Grimm RA, et al. Minimally invasive left ventricular epicardial lead placement: surgical techniques for heart failure resynchronisation therapy. Ann Thorac Surg 2005; 79: 1536–1544.

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5. Janousek J, Tomek V, Chaloupecky V, Gebauer RA. Dilated cardiomyopathy associated with dual-chamber pacing in infants: improvement through either left ventricular cardiac resynchronisation or programming off allowing intrinsic normal conduction. J cardiovasc Electrophysiol 2004; 15: 470–474.
6. Dodge-Khatami A, Kadner A, Dave H, Rahn M, Pretre R, Bauersfeld U. Left heart atrial and ventricular epicardial pacing through a left lateral thoracotomy in children: a safe approach with excellent functional and cosmetic results. Eur J Cardiothorac Surg 2005; 28: 541–545.
7. Vanagt WY, Verbeek XA, Delhaas T, et al. Acute hemodynamic benefit of left ventricular apex pacing in children. Ann Thorac Surg 2005; 79: 932–936.

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