

LETTER TO THE EDITOR / *Cardiovascular imaging*

## CMR detection of membranous ventricular septal aneurysm causing ventricular tachycardia



**Keywords** Ventricular septal aneurysm; Ventricular tachycardia; Congenital abnormalities

### Clinical vignette

A 56-year-old man collapsed while on holiday and with loss of consciousness for 30 seconds. On admission to hospital, the electrocardiogram alternated between a nodal rhythm with pauses up to 2.7 seconds and a significant first-degree atrioventricular block (PR interval 321 ms). A transthoracic echocardiogram suggested a perimembraneous ventricular septal defect (VSD). Coronary angiography demonstrated a long segment of proximal LAD disease, which was stented. Given the significant symptom at presentation, and the demonstrated arrhythmia, a MRI compatible dual chamber permanent pacemaker (PPM) was implanted. The patient was discharged home, well, one day later.

Three months later, he re-presented with an episode of light-headedness, which was exacerbated by exercise. An interrogation of his PPM showed two episodes of non-sustained monomorphic ventricular tachycardia (MMVT), with differing morphologies, which were reproducible on exercise treadmill testing.

A cardiac magnetic resonance scan (CMR) (Siemens Aera1.5T) was performed and images analysed using CMR 42 software (Circle CVI, Calgary) demonstrated a large ventricular septal aneurysm with a small perimembraneous VSD (Fig. 1A and B). There was a small left to right shunt visualized through the VSD without any significant LV-RV SV difference. Right ventricular volumes were mildly increased with preserved RV function. Late images following intravenous gadolinium showed increased uptake in the septal aneurysmal region, due to the fibrous nature (Fig. 1C). These findings were felt to be consistent with a congenital ventricular septal aneurysm, which have been shown to be an independent driver of arrhythmia [1].

### Discussion

Membranous ventricular septum aneurysm (MVSA) is an uncommon cardiac abnormality primarily associated with the spontaneous closure of a small membranous ventricular septal defect in childhood [2,3]. Surgical correction of a ventricular septal aneurysm may be required when haemodynamic abnormalities and other aneurysm-related complications are evident [4,5].

### Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.



**Figure 1.** A + B. Four chamber (A) and short axis (B) SSFP cines demonstrating large ventricular septal aneurysm. C. CMR late gadolinium enhanced images showing increased uptake in the septal aneurysm.

**References**

- [1] Graffigna A, Minzioni G, Ressa L, Vigano M. Surgical ablation of ventricular tachycardia secondary to congenital ventricular septal aneurysm. *Ann Thorac Surg* 1994;57:9214.
- [2] Choi M, Jung JI, et al. Ventricular septal aneurysms in adults: findings of cardiac CT images and correlation with clinical features. *Acta Radiol* 2011;52:619–23.
- [3] Loukas M, Shane Tubbs R, Louis Jr RG, Curry B. Pseudoaneurysm of the membranous septum: case report and review of the literature. *Surg Radiol Anat* 2006;28:564–8.
- [4] Bian C, Ma J, Wang J, Xu G, Jiang J, Yao S, et al. Perimembranous ventricular septal defect with aneurysm: two options for transcatheter closure. *Tex Heart Inst J* 2011;38(5):528–32.
- [5] Yilmaz AT, Ozal E, Arslan M, Tatar H, Ozturk OY. Aneurysm of the membranous septum in adult patients with

perimembranous ventricular septal defect. *Eur J Cardiothorac Surg* 1997;11(2):307–11.

T.M. Murphy\*, D.F. Waterhouse, V. Maher,  
R. O'Hanlon  
*Blackrock Clinic, Center for Cardiovascular  
Magnetic Resonance, Rock Road, Dublin, Ireland*

\* Corresponding author.

*E-mail address:* [Theodoremurphy@me.com](mailto:Theodoremurphy@me.com)  
(T.M. Murphy)

<http://dx.doi.org/10.1016/j.diii.2014.12.009>

2211-5684/© 2015 Éditions françaises de radiologie. Publié par Elsevier Masson SAS. Tous droits réservés.