**IMAGE IN CARDIOLOGY**

**Anomalous insertion of the papillary muscle in a patient with sickle cell disease: A normal variant with no left ventricular outflow obstruction**

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**Introduction**

Abnormalities of the papillary muscle (PM) are a rare disorder that has been described in patients with hypertrophic cardiomyopathy1–3 or cardiac amyloidosis causing significant left ventricular outflow tract (LVOT) obstruction. These anomalies are often challenging to diagnose with 2D echocardiography, and real-time 3D echocardiography (RT3D) facilitates the diagnosis by providing accurate imaging and delineation of the spatial relationship between the cardiac structures.

**Case report**

A 43-year-old black African woman, asymptomatic at presentation (blood pressure 105/71 mmHg, heart rate 82 bpm, body surface area 1.52 m²), diagnosed with sickle cell disease, was investigated for pulmonary hypertension in our department. Echocardiography was requested for the assessment of cardiac function and estimation of pulmonary artery pressures.

Full 2D and 3D transthoracic echocardiography (TTE) was performed and 3D images were acquired and analyzed using Philips Qlab offline analysis software. The echocardiogram revealed a dilated left ventricle (LV) with normal wall thickness and good global systolic function.

In parasternal long-axis 2D view, the anterolateral PM appeared in an unusual position, and in short-axis view and apical 4 chambers view (Figure 1) it was clearly inserted lower than normal. A complete Doppler assessment revealed no high velocity or turbulent flow pattern and no significant LVOT or intracavitary gradient was identified.

3D echocardiography clearly showed the lower insertion of the PM and the hypertrophied chordae (Figure 2).

A follow-up echocardiography study was recommended to assess left ventricular hypertrophy but the patient died a few months later due to a subarachnoid hemorrhage. No post-mortem was performed.

**Discussion**

Anomalous insertion of PMs not causing LVOT obstruction is a rare abnormality.1–4 RT3D is being increasingly used in the
anomalous insertion of PMs not causing LVOT obstruction reported in the literature.

Ethical disclosures

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data and that all the patients included in the study have received sufficient information and have given their informed consent in writing to participate in the study.

Right to privacy and informed consent. The authors have obtained the informed consent of the patients and/or subjects mentioned in the article. The author for correspondence is in possession of this document.

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this investigation.

Conflicts of interest

The authors have no conflicts of interest to declare.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version, at doi:10.1016/j.repc.2012.03.004.

References