Three-Tesla cardiac magnetic resonance imaging in a Marfan patient with asymptomatic aortic dissection

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The cardiovascular complications of Marfan syndrome include aortic dilation and dissection. These constitute the main cause of death. High-field cardiac magnetic resonance has theoretical advantages in terms of a higher spatial resolution, signal-to-noise ratio and acquisition time in relation to the widely used 1.5-Tesla scanners. However, there are only a few reports on the cardiovascular applications of 3-Tesla magnets. A 48-year-old white man with documented Marfan syndrome and a history of surgical mitral valve replacement refused follow-up after cardiac surgery performed 4 years previously. During this period of time he did not complain of any symptom related to aortic dissection or cardiac failure. The 3-Tesla magnetic resonance images showed aortic root dilation with a diameter of 60 mm; the ascending aorta was also dilated, with evidence of an intimal flap originating below the left subclavian artery and extending to the abdominal aorta (Figs. 1A and 2). The left atrium and ventricle were also dilated (Figs. 1B and 1C) and moderate aortic regurgitation was present. The patient was therefore referred for further cardiac surgery. He had a successful Bentall procedure and mitral

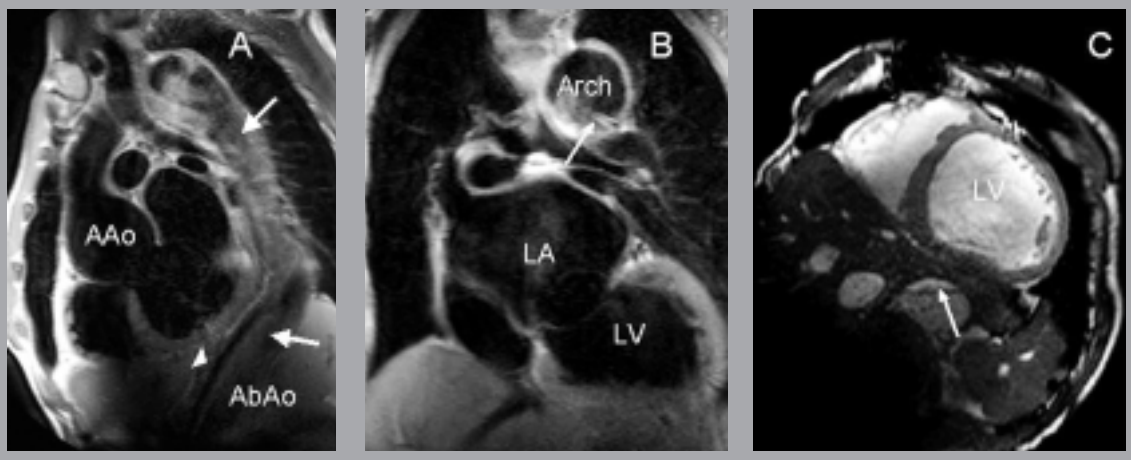

Figure 1. A: *ECG-triggered black-blood proton density-weighted magnetic resonance image showing an aneurysm of the ascending aorta (AAo) with involvement of the sinus segment and the presence of a type B aortic dissection with extension to the abdominal aorta (AbAo); the signal is visible within the false lumen due to flow turbulence* (arrow)*; on the other hand, the true lumen is void of flow* (arrowhead). B: *this image clearly depicts the intimal flap* (arrow) *within the aortic arch (Arch) and abnormal enlargement of the left atrium (LA) that has a diameter of 9.8 cm.* C: *balanced fast-gradient echo with retrospective cardiac gating showing enlargement of the left ventricle (LV) (end-diastolic diameter 9.6 cm) and the extension of the intimal flap* (arrow) *to the abdominal aorta.*

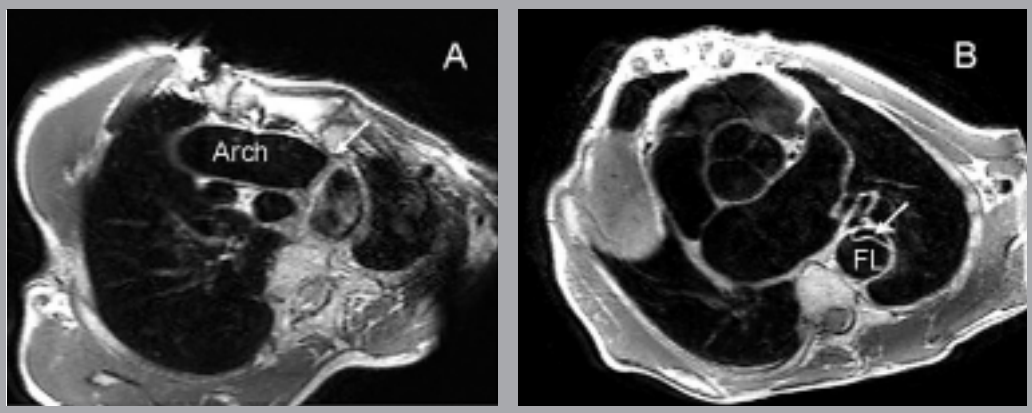

Figure 2. A *and* B: *oblique transverse proton density-weighted magnetic resonance images obtained with cardiac-gated double inversion recovery fast spin-echo sequence at different levels through the thorax. The dissection* (arrow) *begins at the last segment of the aortic arch (Arch); at a more caudal level it may be seen that the false lumen (FL) is much larger than the true one.*

valve annulus repair for a periprosthetic leakage which was the cause of atrial dilation. This case demonstrates that high-field magnetic resonance imaging for the detection of aortic dissection is extremely accurate: it allows identification of the intimal flap and of the site of tear, but also of associated abnormalities such as aortic regurgitation and left chamber enlargement. Moreover, it must be stressed that aortic dissection in Marfan syndrome may be asymptomatic and a vigilant follow-up is mandatory for such patients.