EP CASE REPORT

# Vertebral osteophyte as an unexpected cause of atrial substrate modification in atrial fibrillation

**Bara Mandoorah[1]*, Mathieu Granier[1,2], and Jean Luc Pasquié[1,2]**

[1]Département de Cardiologie, CHRU Montpellier, 371 Avenue du doyen Gaston Giraud, 34295 Montpellier, France; and [2]PHYMEDEXP, CNRS, INSERM, Univ. Montpellier, CHRU Montpellier, Montpellier, France

*Corresponding author. Tel: +33 467336187; fax: +33 467336178. *E-mail address*: bara.mandoorah@gmail.com

A 83-year-old patient with a 1-year history of drug refractory paroxysmal atrial fibrillation was admitted to our electrophysiology laboratory for wide area circumferential catheter ablation of pulmonary veins (PVs).

His past medical history was chronic osteoarthritis and arterial hypertension. Before ablation procedure, we integrated the image of contrast enhanced cardiac computed tomography (CT) with the electroanatomic mapping system using CARTO VISITAG™ Module (Biosense Webster, La Jolla, CA, USA). Surprisingly, two separate depression zones were noted, one on the anterior wall of the left atrium (volume = 162 mL) corresponding to the aortic root (40 mm diameter measured by transthoracic echography and CT scan), while the other was on the posterior wall caused by a huge protruding thoracic vertebral osteophyte (*Figure 1*).

Only the right superior PV showed evidence of PV connections. Unexpectedly, we observed fractionated, low-voltage signals in the two mentioned zones using a high-density mapping Pentaray® catheter (Biosense Webster, La Jolla, CA, USA). No fragmented signals were found outside the compression areas (3080 points for the CARTO map). These areas of slow conduction velocity (black dots) are represented by colours in isochronal map (*Figure 1*) and may be due to chronic compression by anatomical structures (aortic root and vertebral osteophyte). Atrial compression by osteophytes,[1,2] and the potential role of extrinsic compression in atrial fibrillation incidence[3] had already been reported. However, the present manuscript expands this notion by suggesting a role of compression by extracardiac anatomical structures in the pathogenesis of atrial fragmented potentials in atrial fibrillation.

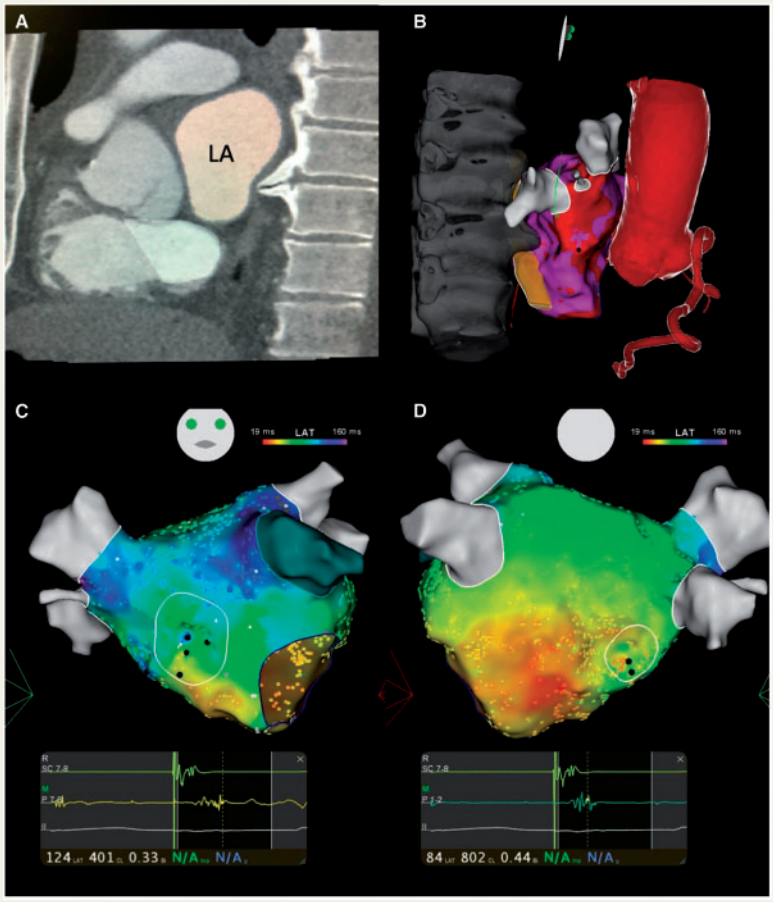


**Figure 1** (*A*) Enhanced contrast CT scan showing a large vertebral osteophyte compressing the posterior wall of the left atrium (LA). (*B*) Lateral view of the integrated CT scan image with the electroanatomic mapping system showing the osteophyte protruding into the LA posteriorly and the aortic root anteriorly. (*C*) Isochronal maps. The white circles represent the compression areas facing the aorta anteriorly and the black dots inside tag the fragmented potentials in the mentioned zones reported in the lower images. (*D*) Isochronal maps. The white circles represent the compression areas facing the osteophyte posteriorly and the black dots inside tag the fragmented potentials in the mentioned zones reported in the lower images.

## References

1. Tzikas S, Triantafyllou K, Papadopoulos C, Vassilikos V. A case of a paracardial osteophyte causing atrial compression. *Case Rep Med* 2016;**2016**:4325830.
2. Haghbayan H, Coomes EA, Cheema NA. External left atrium compression by spinal osteophytes. *Lancet* 2018;**392**:e12.
3. Niloy A, Morales-Mangual C, Gunsburg M, Rosen Y. Association between left atrial compression and atrial fibrillation: a case presentation and a short review of literature. *J Atr Fibrillation* 2016;**9**:1458.