

Single pulmonary cusp agenesis first detected by computed tomography reconstruction

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Running head: Pulmonary cusp agenesis

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Abstract

Congenital absence of one pulmonary valve cusp with normal morphology of the other two cusps is a very rare finding. In this unusual case we present the first images of 3-dimensional pulmonary valve reconstruction as a useful tool for preoperative evaluation of pulmonary valve anatomy.

A 46 years old male patient presented pulmonary valve (PV) regurgitation and left pulmonary artery (PA) aneurysm. Preoperative computed tomography (CT) confirmed a 50x65 mm left PA aneurysm, normal pulmonary annulus (25 mm) and normal pulmonary trunk (35 mm) (Figure 1 A-B). Multiplanar reformation

(Figure 2A, arrow), virtual angiography (Figure 2B), and volume rendering reconstruction (Figure 2 C-D) showed the complete absence of the left-posterior pulmonary valve cusp. The other two cusps appeared normal. At surgical inspection radiological findings were confirmed. Insufficient PV was excised (Figure 3A) and replaced with a 23 mm Inspiris Resilia bioprosthesis (Edwards Lifesciences, CA, USA). Pulmonary reductive elliptical left arterioplasty was also performed. Microscopic examination showed only a mild focal myxoid degeneration of two pulmonary cusps, otherwise normal (Figure 3B). Postoperative course was uneventful. Agenesis of one PV cusp with normal morphology of the other two cusps, is a very rare finding.^{1,2} In the only two cases previously reported, patients became symptomatic and were operated at a younger age (21 and 16 years old) than our patient. Differently from our case, both previous patients presented also aneurysm of pulmonary trunk. In the current era, CT 3-dimensional reconstructions could be determinant for diagnosis and may represent a very useful technique for optimal preoperative evaluation of PV morphology.

Authors' contribution:

Giovanni A. Chiariello: drafting article

Olivier Vahdat: data collection

Eric Bruguere: Images

Issam Abouliatim: supervision and approval

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FIGURE LEGENDS:

FIGURE 1: 2 and 3-dimensional reconstruction showing the aneurysm of the left pulmonary artery.

FIGURE 2: Multiplanar reformation (A), virtual angiography (B), and volume rendering reconstruction (C and D) showing the congenital absence of the left posterior pulmonary valve cusp (white arrow in Figure 2A).

FIGURE 3: Surgical specimen of the pulmonary valve removed (A), and microscopic examination (B).



