

**Ventricular septal defect associated with aortic valve prolapse: an echocardiographic study.**

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**Objectives:**

Ventricular septal defects (VSD) can be associated with aortic valve prolapse (AVP) with or without regurgitation. Aortic valve prolapse may be due to both lack of leaflet support and Venturi's phenomenon. There is a great diversity in the literature about the anatomic type of the VSDs associated with AVP. The objective of the study was then to assess the anatomy of the VSD on echocardiography.

**Methods**

From 2009 to 2017, 51 consecutive patients with VSD complicated by AVP were admitted for surgery. We screened retrospectively all preoperative echocardiographies in double-blind test. We analyzed the anatomic type of the VSD according to ICD-11 classification and looked for outlet septum malalignment, the nature of the prolapsed aortic leaflet, the severity of aortic regurgitation and other complications (subaortic membrane, right ventricular stenosis).

**Results**

The VSD was central perimembranous (pm) in 23 patients (45%), outlet with malalignment in 21 (41%) and outlet juxta-arterial in 7 (13.7%). We found a significant difference between the initial diagnosis and the final one after reviewing echography in double-blind test: among the 23 VSD initially described as central pm, eleven were reclassified as outlet VSD, and one outlet VSD was reclassified as central pm ( $p < 0.001$ ). Aortic valve prolapse involved the right aortic cusp in 98% of patients. Aortic regurgitation was severe in 2 patients, moderate in 5, mild in 24 and trivial or absent in 20. Outlet VSDs were significantly more often associated with aortic regurgitation ( $p = 0.036$ ). Subaortic membrane was found in 8 patients (15.6%), 6 with outlet and 2 with central pm VSD ( $p = 0.001$ ). Right ventricular obstruction was found in 8 patients (15.6%).

**Conclusion**

Aortic valve prolapse complicates indifferently central pm and outlet VSD. However, aortic insufficiency is more frequent in outlet VSD. The accurate echocardiographic diagnosis of the anatomic type of the VSD is difficult and multiple views are necessary.