Surgical Management of Subaortic Stenosis

Alexander Weymann, MD,1 Bastian Schmack, MD,1 Christian Rosendal, MD,2 Matthias Karck, MD, PhD,1 and Gábor Szabó, MD, PhD1

A 63-year-old male patient with subaortic stenosis (Pmax 105 mmHg, Pmean 55 mmHg) and an aneurysm of the ascending aorta was referred to our hospital due to progressive angina pectoris. Transesophageal echocardiography demonstrated high and turbulent subaortic flow velocities. A calcified subaortic membrane was identified. The membrane was removed and the aneurysm was treated with a Bentall procedure. The patient recovered smoothly from surgery and was doing well 6 months after discharge.

Keywords: subaortic stenosis, transesophageal echocardiography, bentall procedure

Introduction

Subaortic stenosis is a very rare heart defect with a 1%–2% occurrence. In 70% of the cases, an isolated membrane is observed, which can result in a tunnel-like obstruction of the left ventricular outflow tract (LVOT).1 Even with additional cardiac defects, surgical correction is a generally successful approach.

Case Report

A 63-year-old male patient presented in our clinic, complaining of recent nocturia and progressive dyspnea accompanied by a retrosternal pressure pain. No heart rhythm disturbances were seen in the ECG. Coronary heart disease was ruled out.

The transesophageal echocardiography demonstrated a normal sized, slightly concentric hypertrophic left ventricle with good pump function without wall motion abnormalities. The top part of the septum directly underneath the aortic valve level was hypertrophic (ca. 16 mm) taking on a ring-like shape (Fig. 1A). The left atrium was remarkably enlarged. The thickened aortic valve presented markedly reduced separation. Upon further inspection, an aneurysm of the ascending aorta was detected with a diameter of 53 mm. A significant flow acceleration in the LVOT was seen, with a mean and maximal gradient respectively of 55 mmHg and 105 mmHg (Fig. 1B). The mitral valve showed a SAM phenomenon with slight regurgitation.

A Bentall procedure was performed using a mechanical conduit due to the ascending aortic aneurysm and a heavily calcified non-coronary sinus. The subvalvular membrane was resected (Fig. 2A) and the LVOT was enlarged through a deep septal myectomy underneath the right coronary sinus. The procedure was completed with a decalcification of the anterior mitral valve leaflet (Fig. 2B). The pathology report of the resected membrane revealed hyaline and myxoid changes as well as calcifications and subendocardial and perivascular interstitial fibrosis and clear signs of hypertrophy. The postoperative transesophageal echocardiography did not show any remaining LVOT flow acceleration or a SAM phenomenon. The patient’s LVOT widened significantly following the operation. The aortoseptal angle formed by the long axis of the ascending aorta and the plane of the ventricular septum also flattened postoperatively. As can be seen from the postoperative ECG, there were
no higher grade conduction abnormalities in comparison to the preoperative ECG (Fig. 3). Conventional anticoagulant therapy was initiated and the patient recovered smoothly from surgery.

Discussion

Subaortic stenosis is often presumed in young adults when a not clearly stenotic valvular morphology is found, even with echocardiographic imaging showing a high transaortic pressure gradient. The subaortic stenosis is generally formed by a fibrotic or muscular membrane in the LVOT. Careful echocardiographic examinations of the LVOT can map the obstruction’s exact position.

The initial postoperative results after relief of subaortic stenosis are satisfactory, even though the recurrence rate is well known with up to 28%.2–4 The reasons behind the high recurrence rate are not well understood,5 mainly due to the lesion’s unknown etiology, either congenital or acquired.2,3,6,7 Patients often become symptomatic later in life,8,9 not allowing a definite etiological statement to be made. A genetic predisposition has been discussed,10,11 showing that an abnormal aorto-septal geometry can cause cell proliferation with enhanced shear stress.5 The prognosis of the operation, altogether, is dependent on the morphological type and complexity of the lesion.

Conclusion

The subaortic stenosis can be treated successfully along with other cardiac defects. The extent of resection, with or without deep septal myectomy, should be defined according to the patient’s anatomy. The recurrence of subaortic stenosis is relatively high in complex cardiac defects. A regular follow up is indicated.

Disclosure Statement

None.
As can be seen from the postoperative ECG, there were no higher grade conduction abnormalities in comparison to the preoperative ECG.
References