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Case Report

Single Stage Aortic Valve Replacement and Splenectomy in a Patient with Severe Aortic Stenosis

Rezayat Parvizi, MD, Rasoul Ibrahim Abdulrahman, MD*, Rezvaneh Salehi, MD, Ghader Shah Mohamadi, MD

Cardiovascular Research Centre, Tabriz University of Medical Sciences, Tabriz, Iran.

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Abstract

Splenomegaly-induced thrombocytopenia is fully described in hematological and surgical literature, but its association with severe aortic stenosis is rare. We present a case of severe aortic valve stenosis with severe splenomegaly-induced thrombocytopenia in which aortic valve replacement was done with a number 23 homograft and splenectomy was performed after the end of cardiopulmonary bypass. Platelet count turned to normal value post-operatively, and the patient spent an ordinary convalescence period and was discharged from the hospital without any complications.

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Introduction

Acquired abnormalities of platelets may be quantitative or qualitative, although some patients have both types of defects. Quantitative defects may be a result of the failure of production, shortened survival, or sequestration. The latter is an important cause of thrombocytopenia and usually involves the sequestration of platelets in an enlarged spleen from any cause (portal hypertension, sarcoidosis, lymphoma, or Gaucher's disease). The total body platelet mass is essentially normal in patients with hypersplenism; however, a much larger fraction of the platelets than normal are in the enlarged spleen, in which case splenectomy is indicated to correct the thrombocytopenia. (Except in thrombocytopenia caused by portal hypertension).[1, 2]

The presence of concomitant severe aortic valve stenosis with splenomegaly-induced thrombocytopenia, which necessitates aortic valve replacement, is rare. No clear guideline exists for the pre-and post-operative management of patients undergoing cardiac surgery in the hematological and surgical literature, and this condition has profound implications in patients undergoing cardiac surgery with the aid of cardiopulmonary bypass, where heparin is used for anti-coagulation.[3-5] This dilemma is further complicated in the setting of a young patient undergoing aortic valve replacement, in which the insertion of a mechanical prosthesis would be the procedure of choice. This requires life-long anticoagulation with Warfarin, which can predispose the patient to catastrophic bleeding; using a tissue valve will subject the patient to multiple redo operations in the patient's lifetime.

Case report

A 22-year-old woman was referred to our cardiac center for the consideration of aortic valve replacement. She had been diagnosed with severe aortic valve stenosis seven months previously. The aortic valve was bicuspid, and there was no significant associated left ventricular hypertrophy. She had peptic ulcer disease, iron deficiency anemia, and regular menstruation history. The patient's complaint was fatigue,

*Corresponding Author: ***Rasoul Ibrahim Abdulrahman,*** *Assistant Professor of Cardiac Surgery, Department of Cardiothoracic Surgery, Cardiovascular Research Centre, Tabriz University of Medical Sciences, Tabriz, Iran. 51665/404. Tel: +98 411 3373919. Fax: +98 411 3344021. E-mail: dr_rasol@yahoo.com.*

dyspnea, and palpitation, and auscultation revealed systolic murmur. There was huge splenomegaly on abdominal palpation.

Biochemical findings were anemia (Hb = 8) and thrombocytopenia (platelet count = 50,000). Electrocardiography showed mild ventricular hypertrophy, and chest radiography was normal. Echocardiography revealed that the aorta was dilated, the aortic valve was calcified, the bicuspid leaflets had moderate aortic stenosis, and there was moderate to severe aortic regurgitation. The diameters of the annulus, sino-tubular junction, and the proximal ascending aorta were19, 30, and 32mm, respectively, and the dilated part of the aorta was 40mm. In addition, left ventricular ejection fraction was 60 % (Figure1).

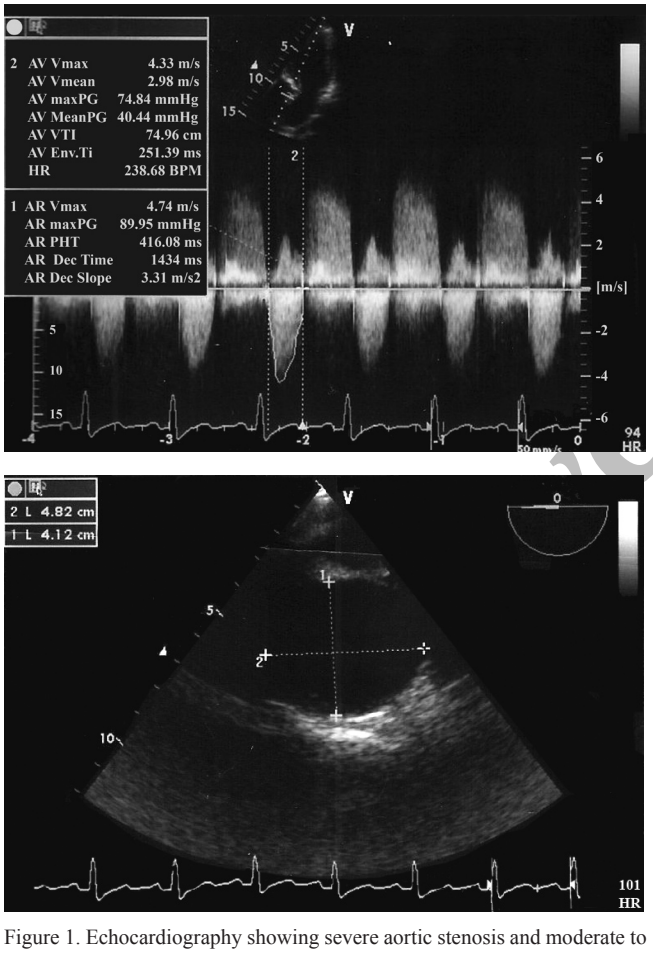

Figure 1. Echocardiography showing severe aortic stenosis and moderate to severe aortic regurgitation

AV, Aortic valve; V max, Velocity maximum; V mean, Velocity mean; Max PG, Maximum pressure gradient; Mean PG, Mean pressure gradient; VTI, Velocity time integral; Env Ti, Envelope time; HR, Heart rate; AR, Aortic regurgitation; PHT, Pressure half time; Dec Time, Deceleration time; Dec Slope, Deceleration slope

After median sternotomy and pericardiectomy, cardiopulmonary bypass was initiated and the severely calcified stenotic bicuspid aortic valve was replaced with a number 23 homograft using the mini root technique. At the end of cardiopulmonary bypass, the median sternotomy incision was extended to the above umbilicus; and the layers were closed anatomically after splenectomy.

Discussion

The presence of concomitant severe aortic valve stenosis and splenomegaly is not common. We believe that open heart surgery valve replacement and splenectomy can be successfully performed simultaneously in a patient with thrombocytopenia and severe aortic valve stenosis. In our patient, splenectomy was performed at the end of cardiopulmonary bypass for aortic valve replacement with good results. There was no post-operative complication, and the patient had ordinary convalescence with a normalized platelet count.

The decision to choose a mechanical versus tissue prosthesis in young thrombocytopenia patients with aortic valve stenosis is not an easy one. Laboratory investigations and/or markers can determine whether a patient is more prone to bleeding or to thrombosis, so clinical strategy needs to be tailored on the basis of the clinical presentation of thrombocytopenia and the risks and benefits of the treatment options available.[4, 5]

Conclusion

It is advisable that splenomegaly be addressed at the time of open heart valve surgery and not during staged operation inasmuch as it can avert secondary operation, eliminate the cause of thrombocytopenia, return normal platelet count immediately after surgery, and confer liberal decision to choose the prosthesis without the fear of thrombocytopenia complications. Meanwhile, it is possible to decrease the disadvantage of bleeding complications of one-stage operation by meticulous dissection, proper hemostasis, reversing heparin at the end of the procedure, and justifying the use of coagulating factors.

References

1. Seymour I. Schwartz SI. Role of splenectomy in hematologic disorders. World J Surg 1996:20:1156-1159.
2. Tefferi A, Murphy s. Current opinion in essential thrombocythemia: pathogenesis, diagnosis, and management. Blood Rev 2001;15:121-131.
3. Sato Y, Yokoyama H, Watanabe M, Hamada O. A surgical case of aortic valve replacement in patient with chronic idiopathic thrombocytopenic purpura. Fukushima J Med Sci 2004;50:29-35.
4. Mori Y, Hadama T, Takasaki H, Oka K, Shigemitsu O, Miyamoto S, Kimura T, Anai H, Tanaka K, Uchida Y. Aortic valve replacement and splenectomy in a patient with chronic idiopathic

thrombocytopenic purpura: preoperative management with high-dose gamma-globulin. Heart Vessels 1991;6:121-124.
5. Ahmed K, Vohra HA, Milne A, Langley SM. Aortic valve replacement in a young patient with essential thrombocytosis. J Cardiothorac Surg 2008;3:5.