

Balloon Valvotomy for Severe Aortic Stenosis in an Infant

S.S. Kothari
R.K. Kumar
A. Saxena
H.S. Wasir

Severe valvular aortic stenosis (AS) is one of the congenital heart diseases that may require intervention during infancy(1). Surgical valvotomy (performed under cardiopulmonary bypass) has, until recently, been the only method by which the aortic valve gradients could be reduced. Balloon aortic valvotomy (BAV) has now emerged as an attractive alternative(2,3). Despite the availability of the balloon valvotomy technology in our country, experience with balloon aortic valvotomy has been limited to older children with valvular AS(4). We report the successful application of BAV in an infant (age 4 months) with severe valvular AS.

From the Department of Cardiology, Caixliothonic Sciences Centre, All India Institute of Medical Sciences, New Delhi 110 029.

Reprint requests: Dr. S.S. Kothari, Assistant Professor, Department of Cardiology, Cardiothoracic Sciences Centre, All India Institute of Medical Sciences, New Delhi 110 029.

*Received for publication: February 12, 1993;
Accepted: September 1, 1993*

Case Report

A 4-month-old male infant presented to our institution with excessive sweating during feeds and frequent episodes of respiratory infection since the age of 1 month. On examination the child appeared well nourished (Weight 6 kg). He was tachypneic with feeble pulses. The liver was not enlarged. Cardiovascular examination revealed cardiac enlargement, constant ejection click and an ejection systolic murmur of aortic stenosis. Severe left ventricular hypertrophy was recorded in the ECG and the chest A'-ray showed cardiac enlargement. Two dimensional echocardiography revealed an enlarged hypertrophied left ventricle with normal function and a bicuspid aortic valve with systolic doming. A gradient of 100 mm Hg was recorded on Doppler examination.

An informed written consent was obtained for BAV. The baseline hemodynamic data suggested severe valvular AS with an aortic valve gradient of 110 mg Hg (*Fig. 1*). Details of the BAV technique have been published previously(5). We dilated the aortic valve using a 10 mm balloon (annulus size 10 mm) mounted on a 5 french catheter (Meditech inc) passed percutaneously via the right femora] artery. The final gradient across the aortic valve was 50 mm Hg (*Fig. 1*). The procedure was uneventful except for transient asystole and apnea during balloon inflations.

Following the procedure, there was transient loss of pulses in the right lower limb. This necessitated the use of streptokinase (bolus of 1,000 units/kg IV followed by infusion of 1,000 units/kg/h) for a period of 16 hours after which the pulses returned. At the time of discharge the pulses in the right lower limb were palpable but reduced in comparison to the left.

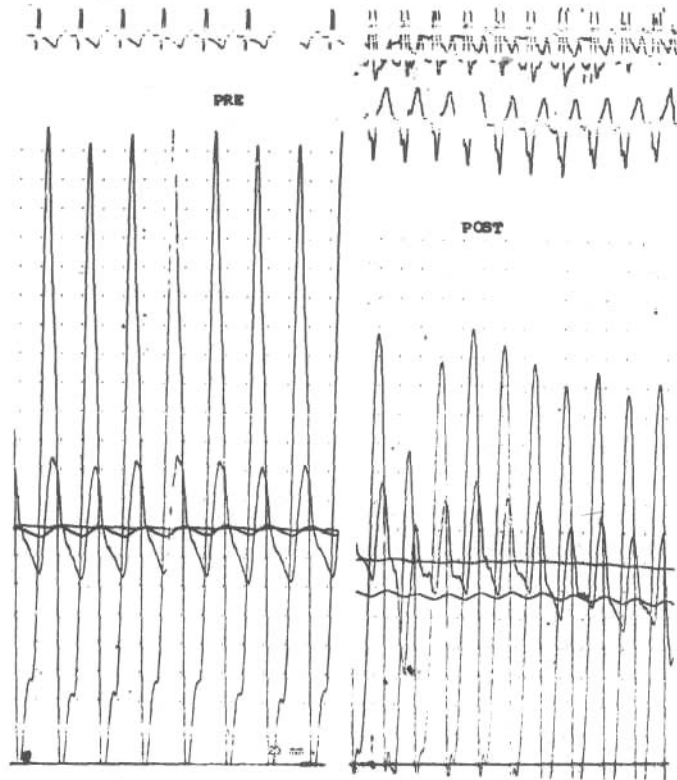


Fig. 1. Simultaneous tracings of left ventricular and aortic pressures obtained during cardiac catheterization before (pre) and after (post) balloon aortic valvotomy. Each square represents a pressure of 10 mm Hg starting from a baseline of 0.

Discussion

Surgical valvotomy in neonates and infants is associated with high morbidity and mortality(1). Balloon valvotomy is an attractive alternative and produces comparable results(3,5). Although balloon dilatation of aortic stenosis has been widely reported, experience with the technique in infants is limited. This is mainly due to non-availability of balloons mounted on a smaller shaft, until recently. Advances in technology have made BAV possible even in neonates through umbilical artery catheterization(7). Compli-

cations with the procedure are, however, frequent in infants. They include death from aortic injury, aortic regurgitation (AR), transient or permanent loss of pulses and bleeding from the puncture site(3). Results are quite unsatisfactory in patients with unicuspid valves(6). While major complications can be minimized by using balloons of appropriate size (balloon-aortic annulus ratio of 1), arterial injury can be reduced by using balloon catheters with small shaft diameters (5 French). Using an appropriate sized balloon (balloon-annulus ratio 1:1) the aortic valve

gradients were reduced from 110 to 50 mm Hg in the patient reported here (*Fig. 1*).

The major hurdles to extensive application of balloon dilatation technology in infants in India include the limited availability of hardware and expertise for interventions in this age group. Further, a number of infants in our country with lesions amenable to early intervention may escape timely attention. We believe that this technique is particularly promising in the Indian context because of its relative simplicity and low cost as compared to operative treatment.

REFERENCES

1. Fyler DC. Aortic outflow abnormalities. *In: Nadas Pediatric Cardiology*. Ed. Fyler DC. Philadelphia, Hanley and Belfus, 1992, pp 493-512.
2. Allen HD, Driscoll DJ, Fricker FJ, *et al*. Guidelines for pediatric therapeutic cardiac catheterization. *Circulation* 1991, 84: 2248-2257.
3. Rocchini AP, Beekman PN, Shachar GB, Banson L, Shwartz D, Kan JS. Balloon aortic valvuloplasty. Results of the valvuloplasty and angioplasty of congenital anomalies registry. *Am J Cardiol* 1990, 65: 784-789.
4. Shrivastava S, Das GS, Dev V, Sharma S, Rajani M. Follow up after balloon valvuloplasty for noncalcific stenosis. *Am J Cardiol* 1990, 65: 250-252.
5. Shrivastava S, Das G, Radhakrishnan S, Mukhopadhyaya S, Rajani M. Percutaneous balloon valvuloplasty for valvular aortic stenosis. *Indian Pediatr* 1988, 25: 821-826.
6. Stroller GF, Keone JF, Parry SB, Sanders SP, Lock JE. Balloon dilatation of congenital aortic valve stenosis. Results and influence of technical and morphologic features on outcome. *Circulation* 1988, 78: 351-360.
7. Beekman RH, Rocchini AP, Amy Andes RN. Balloon valvuloplasty for critical AS in the newborn. Influence of new catheter technology. *J Am Coll Cardiol* 1991, 17: 1172-1176.

Enterogenous Intramedullary Cyst

A.K. Jain
S. Sethi
A. Arora
S.M. Tuli
R.P. Singh

Spinal enterogenous cysts are rare cystic lesions of the spinal cord, first described by Harriman(1). Many isolated case reports

(2-4) are available in the literature. Majority of them are intradural extramedullary. The intra-medullary cyst has a different clinical presentation and to the best of our knowledge only 6 cases have been reported till now(3,5-8). Based on one of our case and

From the University College of Medical Sciences and Gum Teg Bahadur Hospital, Shahdara, Delhi.

Reprint requests: Dr. Anil Kumar Jain, 177-Old Arya Nagar, Ghaziabad, U.P. 201 001.

Received for publication: January 27, 1993;

Accepted: September 16, 1993