



HAIR PIN LOOP TECHNIQUE WITH THREE DIMENTIONAL SHAPE SUPPORTED STYLET FOR SUCCESSFUL BALLOON MITRAL VALVOTOMY IN A DIFFICULT CASE.

Cardiology

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ABSTRACT

Percutaneous balloon mitral valvotomy using Accura or Inoue balloon is an effective treatment for patients with rheumatic mitral stenosis suitable for valvotomy. Procedural success rates are high in experience hand with success rates are more than 90%. Inability to cross the mitral valve is one of the prime reasons for procedure failure. We are reporting a case of 35 year female with severe mitral stenosis with severe subvalvular thickness using hairpin loop with double curve support of stylet, where all traditional methods of crossing mitral valve get failed. Mitral valvotomy successfully performed with mitral valve area increase from 0.5 cm² to 2.1 cm².

KEYWORDS

Hair pin loop ,balloon mitral valvotomy , stylet.

Case report

A 35 year old female patient presented with history of dyspnea on exertion NYHA (New York Heart Association) class 2 from last 5 year which increase to class 3 from last 6 month. Her clinical examination revealed blood pressure 106/72 mmHG and pulse rate of 64 /minute regular. Cardiovascular auscultation revealed loud s1 ,opening snap and mid diastolic rumble at apex. Electrocardiography show sinus rhythm with feature of left atrial enlargement. Chest Xray revealed feature of left atrial enlargement with pulmonary venous congestion. Echocardiography show feature characteristic of RHD with fixed posterior mitral leaflet with sever thickened both subvalvular chordate with Wilkins score of 9/16. Mitral valve area by planimetry was 0.5 cm². Doppler mitral inflow mean pressure gradient was 12 mm Hg.

As per guidelines ,patients with isolated severe mitral stenosis with favourable valve morphology and no LA clot candidate for PTMC. PTMC was planned after procedural consent. Femoral artery and vein were accessed with a 5F and 8F sheath respectively. Mullins dilator was placed in left innominate vein over the 0.032 " guidewire. 5 F Pigtail catheter was placed in aortic root for guidance during transseptal puncture. Transseptal puncture was done under fluoroscopic guidance using Brockenbrough needle in LAO 40 degree view and after confirmation by dye injection coiled LA wire was placed in left atrium (Figure 1) and septal dilation was done. Blue Arrow (Lifetech SYN) balloon 26 mm was placed in Left atrium over LA wire and placed medial to mitral valve orifice. After that several attempts to negotiate the balloon into LV across mitral valve with the pre shaped J tip stylet went in vain (figure 2) despite use of various technique, like vertical , direct, sliding and posterior loop. After failure of conventional techniques we decided to use alternative technique for success, we use hairpin loop technique in which we press tip if balloon against LA floor withdrawing stylet, although hairpin loop formed (figure 3),but due to severe subvalvular thickening and narrow orifice further advancement of balloon became unsuccessful. Shape of loop checked in multiple view after that stylet shape was given to anterior and outer curve (three dimentional), stylet was forward up to tip of balloon,after that with curved path balloon enter in Left ventricle (Figure 4, 5) and procedure was performed successfully (figure 6). After procedure mid diastolic murmur disappeared and MV area increased to 2.1 cm² and both commissures split seen in echocardiography mean gradient decrease to 4 mm HG

DISCUSSION :

PTMC is now standard procedure in rheumatic mitral stenosis with suitable valve morphology of all age group. In most cases balloon with preshaped stylet is use to cross the mitral valve. Some time after entering the LA entry to LV is very- 2 difficult due to abnormal position of Left ventricle inflow , critical MS and severe subvalvular disease which was present in this case. Various conventional technique ie Vertical , direct ,sliding and posterior loop methods was described but in difficult case all above mention technique might not effective. Various alternative technique was used but they are rarely used and its depend upon operator to operator experiences. Hairpin loop methods

was used but some time not effective due to nature of curve of mitral orifice and its severity ,keeping in mind of course of orifice we gave shape of both anterior and outer according to orifice after seeing in multiple view, and after that balloon cross with given shape stylet's support.

In our case balloon tip was pushed against floor of LA with drawing stylet from tip to take hairpin loop but due to severe subvalvular thickening and curved path , balloon unable to forward in LV so we make shape of stylet according to orientation (anterior and outer) and then with forward force balloon enter in LV with taking curved course and further procedure done successfully.

Usually after entry in LA, balloon is negotiated in RAO 30 degree view ,because in this view left ventricle in long axis profile , In our case orifice axis is perpendicular to long axis of LV (figure 3). Some time entry in LV extremely difficult in that case different technique of balloon entry such as placement of LA wire over diagnostic RCA into Left ventricle (1) floating a Swan Ganz catheter into the left ventricle (2), Over the wire technique (3,4), and other loop technique (5) was used. Another novel methods is veno arterial looping described by Nanjappa et al (6) and Ramamurthy S et al (7). Above mention techniques have potential problem of damaging adjacent structure, more use of hardware, ventricular arrhythmia, tear of mitral valve and stroke. Our method use two existing system in combination with little modification of angle of stylet and turning complex situation into a simple one.



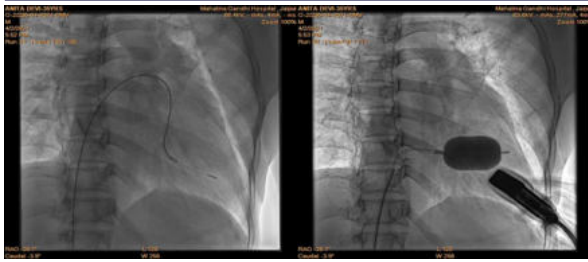
Fig 1 : LA wire in Left atrium

Fig 2 : Balloon in plane of LV apex



Fig 3 : Hair pin loop curve.

Fig 4 : Crossing via curved path.

**Fig 5 : Balloon in LV****Fig 6 : Fully dilated balloon across mitral orifice****REFERENCES**

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