AN EXPERIENCE OF PERCUTANEOUS TRANSEPTAL BALLOON MITRAL COMMISSUROTOMY (PTMC) VIA PATENT FORAMEN OVALE (PFO)

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ABSTRACT

Objectives: This prospective study was undertaken to probe the interatrial septum for a possible PFO and to perform PTMC via the PFO.

Results: Out of the 41 patients in whom we undertook PTMC, we were able to successfully probe and enter the left atrium via the PFO in 31 patients. In all of these patients the procedure was completed satisfactorily.

Material and Methods: All patients with symptomatic severe Mitral Stenosis undergoing PTMC, entry into left atrium was attempted by probing persistent foramen orale with Mullins sheeth loaded with Brokenborough needle.

Conclusion: PTMC can be performed expediently and safety via PFO.

Key words: PTMC, PFO.

INTRODUCTION

Percutaneous transeptal balloon mitral commissurotomy (PTMC) has now established itself as the preferred procedure to treat symptomatic mitral stenosis, particularly when the valvular anatomy is favourable and both medium and long-term results have been very encouraging. PTMC is however not without its share of risks and complications. The most critical step in PTMC is the puncture of the interatrial septum to gain access to the left atrium. Very commonly because of moderate or severe pulmonary hypertension the interatrial septum is deviated or malpositioned because of cardiac rotation. Puncture of the interatrial septum in such patients can be difficult because of the lack of a satisfactory
needle position to attempt the puncture. This may lead to inadvertent puncture into the pericardium or of the pulmonary artery or aorta with it’s attendant complications. If the puncture site is not at the optimal position along the atrial septum, there, may then be difficulties in getting the dilatation balloon across the mitral valve into the left ventricle. Also some patients develop left-to-right shunts after percutaneous balloon mitral valvuloplasty related to the transeptal puncture.

A Persistent Foramen Ovale (PFO) is a persistent, usually flap like opening between the atrial septum primum and secundum at the location of fossa ovalis. A foramen ovale, if present, is located in the thinnest portion of the atrial septum and just below the mid-segment. This position also gives the best access to negotiate the dilatation balloon across to the left ventricle. Persistent left atrial enlargement associated with specific cardiac lesions can dilate the fossa ovalis and this in patients with mitral stenosis can be used to their advantage. We prospectively attempted to probe the interatrial septum for a PFO see whether that would obviate the need for a transeptal puncture.

MATERIALS AND METHODS

All patients with symptomatic mitral stenosis admitted for PTMC were included in the prospective study. The study was based at the Cardiology Department, Lady Reading Hospital, Peshawar. All patients had a trans-thoracic echocardiogram and a detailed trans-oesophageal echocardiographic study by a senior cardiologist of the department to exclude any left atrial or left atrial appendage clots as well as to check the integrity of the interatrial septum. All other baseline investigations were done routinely i.e.: haematology and biochemistry screen, electrocardiogram and chest radiograph. Written consent for the procedure was obtained from the patient or guardian.

After shifting the patient to the cardiac cath. laboratory 6 French femoral arterial and venous sheaths were passed under local anesthesia by the Seldinger method and left and right heart pressure studies and a left ventriculogram were done. This was done to document pulmonary artery pressure and the mitral valve gradient. A left ventriculogram was done to exclude mitral regurgitation.

The Brockenborough atrial puncture needle along with the Mullin’s sheath was advanced to the superior vena cava. With the needle tip within the sheath, both components would be brought vertically down and with the assembly pointing in the direction of the atrial septum, the interatrial septum was probed for a patent foramen ovale by gentle pressure applied to the atrial septum, particularly in the midportion. If the left atrium had not been entered having probed the septum in one direction then the whole exercise would be repeated by taking the needle and sheath back to the superior vena cava and probing in a different position or direction along the atrial septum. This would continue for until at least 15 minutes probing of the septum would be done either in the anteroposterior or the full left lateral view which was left to the discretion of the operator. Access to the left atrium would be confirmed by the position of the sheath in the left lateral position on fluoroscopy, by injecting dye into the chamber after pulling out the needle, left atrial pressure measurement and oxygen concentration of a blood sample from the site, if necessary. If access to the left atrium could not be gained, transeptal puncture with the Brockenborough needle would be performed and the rest of the PTMC done with a standard Inoue Balloon.
RESULTS

Patient recruitment started 1st January and continued till 31st December, 2002. In all 41 patients were entered into the trial. These comprised of 16 males and 25 females. The majority of bi-plane transoesophageal echocardiography, improvements in catheter and balloon designs as well as operator expertise has led to a significant reduction in complication rates. In a series of 200 patients of PTMC reported by Vahanian serious
ventricle. It is also quite likely that the total fluoroscopy time of the procedure will be shortened.

PTMC to treat mitral stenosis is relatively nontraumatic, may be repeated without additional risk, and has been shown to be an extremely useful and efficacious tool in those with unfavourable valve anatomy who refuse surgery and in certain subset of patients who are at high surgical risk because of co-morbid medical conditions.

Further studies and work needs to be done to also determine whether in such patients the overall procedure time and therefore fluoroscopy time is reduced and minimized and also whether in patients in whom a PFO is crossed have better overall PTMC outcomes both in terms of reduced rates of complications as well as the reduction in mitral valve gradients and increases in mitral valve area.

REFERENCES


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