Percutaneous balloon valvuloplasty — the first line treatment for mitral stenosis and restenosis

See page 1683 for the article to which this Editorial refers

Mitral stenosis is a progressive disease that leads to heart failure symptoms NYHA class 3–4 and is finally fatal unless mechanical intervention enlarges the mitral–valve orifice to permit adequate cardiac output at a tolerable left atrial pressure. Starting over 50 years ago, a variety of techniques were developed for closed commissurotomy, finally leading to the use of mechanical dilators inserted through the apex of the beating left ventricle[1,2]. After the introduction of the cardiopulmonary bypass, surgical repair of the mitral valve under direct vision was possible, resulting in more effective and safer valvotomy than with closed commissurotomy[3]. Both forms of commissurotomy eliminate the risks common to prosthetic valves, which include primary valve failure, thromboembolism and endocarditis necessitating replacement of the prosthetic valve.

Percutaneous balloon valvuloplasty was introduced in 1984 by the Japanese surgeon Inoue, who developed the procedure as a logical extension of surgical closed commissurotomy for the treatment of mitral valve stenosis[4]. The mechanism by which both procedures reduce stenosis is the same and involves mechanical dilatation of fused mitral commissures[5]. Both forms of commissurotomy eliminate the risks common to prosthetic valves, which include primary valve failure, thromboembolism and endocarditis necessitating replacement of the prosthetic valve.

Excellent initial results contributed to the rapid proliferation of this procedure, which has become the technique of choice in many patients with mitral stenosis. With increasing experience, immediate results of the procedure have improved and the rate of complications declined. When the reported complications of percutaneous balloon valvuloplasty are viewed in aggregate, complications occur at approximately the following rates: mortality (0–5%), cerebrovascular accidents (0–5–10%), cardiac perforation (1%), mitral regurgitation requiring surgery (2–3%), mitral regurgitation of some degree or increase of preexisting mitral regurgitation (15%), and atrial septal defects (5–10%)[6]. These complication rates compare favourably to those reported after surgical closed or open commissurotomy. Several randomized trials reported similar haemodynamic results with percutaneous balloon valvuloplasty and surgical commissurotomy while periprocedural complications in surgical patients were somewhat higher[7–9]. Percutaneous balloon valvuloplasty has not only been successfully performed in younger patients with optimal anatomy but in elderly patients with calcified valves, patients with restenosis after surgical commissurotomy and patients with stenotic porcine bioprosthesis valves[8].

Restenosis after closed surgical commissurotomy within a decade of the procedure is not uncommon and occurs in about 5% of patients per year[2]. That means that after 10 years half of the patients experienced a clinically relevant restenosis. Despite the fact that the acute haemodynamic results after open commissurotomy are somewhat better compared to closed commissurotomy, restenosis rates and the need for reoperations were only slightly lower in patients after open commissurotomy[3]. After percutaneous balloon valvuloplasty, the restenosis rate ranges from 4–27% depending on patient selection, duration and method of follow-up. In a small randomized trial with 60 patients comparing percutaneous balloon valvuloplasty and open commissurotomy, the restenosis rate after 3 years was 10% in the percutaneous balloon valvuloplasty and 13% in the surgical group[9]. Therefore it can be postulated that the restenosis rate after percutaneous balloon valvuloplasty is not higher compared to surgery.

The report by Iung and colleagues in this issue deals with an important patient group, those with restenosis after percutaneous balloon valvuloplasty[10]. It shows that a repeat-percutaneous balloon valvuloplasty can be performed safely and provide sustained mid-term functional improvement. It has to be said that these results were obtained in selected patients of young age (the mean age was 38 years) and with favourable valve anatomy. Therefore repeat percutaneous balloon valvuloplasty is certainly the treatment of choice in these patients. Although the acute and mid-term results in elderly patients with calcified valves are less good than in patients with
more favourable anatomy, percutaneous balloon valvuloplasty can be performed safely and with satisfactory results in over 85% of these patients\(^1\). It is also possible that repeat PMV can be performed in these patients with acceptable risks and results. In our own single centre experience in about 390 procedures repeat percutaneous balloon valvuloplasty was performed in 17 cases (mean age 65 ± 13 years) without any increase in the rate of acute complications (no death, no embolic event, no tamponade) and with acceptable haemodynamic results (valve area >1.5 cm\(^2\) in 15 patients). In elderly patients, mitral valve replacement is often associated with an increase in morbidity and mortality during surgery and at follow up. Therefore by avoiding the apparent risk of mitral valve replacement a suboptimal haemodynamic result of percutaneous balloon valvuloplasty resulting in an improvement of one NYHA class, which is achieved even in degenerated and calcified valves, may be of clinical significance and sufficient for mid-term improvement in these patients. In addition, the costs of a repeat percutaneous balloon valvuloplasty are considerably lower compared to mitral valve replacement.

In summary, percutaneous balloon valvuloplasty should be considered as the first option in patients with restenosis after surgical commissurotomy or percutaneous balloon valvuloplasty. Open commissurotomy should be performed only in selected patients in whom direct visualization of the mitral valve seems to be advantageous, e.g. patients with severe subvalvular disease, calcification, or thrombus who are judged to be candidates for plastic procedures rather than mitral valve replacement. In all cases where mitral valve replacement is considered the somewhat better haemodynamic results should be weighted against the increased peri- and postoperative risk, especially in elderly patients.

**U. ZEYMER**

**K.-L. NEUHAUS**

Medizinische Klinik II, Klinikum Kassel, Germany

References


---

**Homograft — the optimal aortic valve substitute?**

**See page 1699 for the article to which this Editorial refers**

**Background**

Why make it simple when you can make it complicated? To put in a bileaflet mechanical valve or, if appropriate, a bioprosthesis of adequate size in the aortic position is quite simple. On the other hand, the surgical procedure of implantation of a homograft is, in the hands of most surgeons, more complicated. So what is the rationale for this procedure?

In this issue Grocott-Mason et al\(^1\) present a paper with the aim of assessing the influence of the choice of valve substitute on the outcome following aortic valve replacement. It is achieved even in degenerated and calcified valves, resulting in an improvement of one NYHA class, which is achieved even in degenerated and calcified valves.

---

\(^1\) Grocott-Mason et al.