

Mitral valve surgery; from median sternotomy to closed chest procedures, from replacement to repair techniques/ Clinical outcomes of mitral valve repair in mitral regurgitation: a prospective analysis of 100 consecutive patients

Mitral kapak cerrahisi, mediyan sternotomiden kapalı göğüs işlemlerine, replasmandan onarım tekniklerine/Mitral yetersizliğinde mitral kapak onarımının klinik sonuçları: Ardışık 100 hastanın prospektif analizi

Closed commissurotomy technique is the first surgical mitral valve (MV) treatment of severe mitral stenosis pioneered by Cutler and Levine followed by Souttar in 1923 (1, 2), further refined by Harken and Bailey (3) which offered more predictable outcomes. With the development of the heart-lung machine in 1953, direct access to the MV was possible, commissurotomy could then be performed under direct controlled vision through a left or right atriotomy. The first MV replacement was performed in 1961 by Starr et al. (4). Although valve replacement rapidly became popular, surgeons encountered complications with prosthetic valve replacement and this led them to investigate further techniques to repair the MV. The establishment of a physiologic classification of the MV by Carpentier in the 1970s allowed a comprehensive approach to its repair (5). Further development in prosthetic rings ensured reproducible and durable repair rates among centers. With refinements in operative techniques including cardiopulmonary bypass (CPB) circuits as well as perioperative care, mitral repair surgery through a sternal approach is now performed with mortality rates ranging from 1 to 4% with minimal morbidity. Furthermore, freedom from reoperation after mitral repair is excellent, especially when the disease is localized to the posterior leaflet and the postoperative echocardiography shows minimal residual mitral regurgitation.

In 1995, surgeons began to focus on the benefits of smaller sternal incisions and short cardiopulmonary perfusion times. In 1996, Carpentier's group performed the first videoscopic MV repair through a right thoracotomy using cold fibrillatory arrest (5). Three months later, East Carolina University surgeons completed a videoscopic MV repair through a 6-cm right mini-thoracotomy using peripheral perfusion, a transthoracic aortic cross clamp, and antegrade cardioplegia (6). Then, Mohr et al. (7) performed a similar operation using three-dimensional camera guidance displayed through a head-mounted monitor. New peripheral cannulation techniques were developed and widely used, along with intraaortic occlusive balloons. Then, surgeons at East Carolina University developed cross clamps that enabled central aortic occlusion without the use of intraaortic balloons and further minimized the skin incision. Over the last 10 years computerized surgical robotic systems have been developed. Da Vinci (Intuitive Surgical, Inc, Mountain View, CA) and Zeus (Computer Motion, Inc, Santa Barbara, CA), the first true surgical robots, have assisted the surgeon's work using tele-manipulation through a master-slave (console-effector) activation principle with a three dimensional intracardiac camera. In 1998, Carpentier and Mohr (7) serially performed the first MV repairs using the da Vinci in combination with small thoracic access. Since then, many additional robotic mitral repairs have been performed to determine device safety and efficacy worldwide.

Since avoidance of CPB is well accepted as the method for minimally invasive cardiac surgery, new technologies have been developed also for surgical therapy of the MV using the off-pump technique. In

current high-end cardiac surgical procedures, interventional treatments in combination with small access surgery are becoming more important. Using a transatrial catheter approach with a valve-in-valve technology, off-pump minimally invasive MV replacement is being experimented (8). Percutaneous and off-pump treatments for functional mitral regurgitation are also currently in clinical trials (9).

One of the main differences between rheumatic (RMV) and degenerative (DMV) valve disease is that, RMV affects young people in their most productive years, while DMV is seen more in elderly patients. Highly calcified valves are difficult to repair whichever etiology, leading to the development of repair techniques especially in young patients because of obvious advantages. 80% of mitral valve disease in Europe and the US is degenerative, while the same percentage in Asia and Latin America is rheumatic. For this reason, repair techniques are different in those regions. Repair of the rheumatic mitral valve is more technically demanding and may have less durability, and so surgeons in countries like Turkey, up to now, have preferred valve replacement. Mechanical valve replacement has its attendant complications. MV repair avoids these complications, permits growth and preserves left ventricular geometry and function, with less endocarditis and bleeding. Improved surgical experience has demonstrated greater durability of the repair and better valve function, thus encouraging surgeons to perform more mitral valve repair in rheumatic disease.

The paper by Korkmaz et al. (10) reflects exactly this tendency to repair instead of replacement and shows excellent results. Minimally invasive techniques are also used in some patients, showing an innovative touch. I prefer myself to repair the mitral valve rather than opting for the easier route of replacement. Even complex repairs can be dealt with using very small access with great success.

The authors should be congratulated for their sterling work, and we hope that these encouraging results will motivate them, and other surgeons in our field, to continue, and indeed develop better and more innovative techniques also.

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Author's Reply

Dear Editor,

Mitral valve repair has become a standard surgical treatment for mitral regurgitation in chronic degenerative disease and selected cases of mixed mitral pathologies. Favorable postoperative outcome and patient's benefit after surgery allowed both cardiac surgeons and cardiac specialists to recommend mitral repair, instead of making a mechanical valve replacement. Repair procedure is associated with a lower rate of reoperation, thromboembolism and valve infection than mitral valve replacement. During the last two decades, the number of mitral valve repair procedures has increased across the world. However, we are not aware of the actual number of repair procedures in our country; it is considered less than replacement procedures as well as expected numbers for chronic MR. This situation can be related to prolonged follow-up time of patients under medical treatment, instead of referring to a specialist for repair before myocardial function deteriorates. Another concern can be the presence of inadequate number of surgeons experienced in valve repair. Nevertheless, cardiologists and surgeons in our country have observed that the results of mitral repair procedures are much more successful and durable than their expectations. In our series of 100 consecutive patients undergoing surgical mitral repair, we aimed to present our preliminary results of mitral valve repair, and to focus on the benefit of repair procedures (1).

I would like to thank the author (2) of the letter for their suggestions on our series about mitral valve repair. We generally prefer to make a repair procedure in different types of mitral valve pathologies causing regurgitation, instead of performing a replacement. We agree that minimally invasive approach in mitral repair may be preferred in the surgical treatment of mitral valve repair. Our experience showed that mitral repair is a feasible and safe procedure in experienced hands with an excellent surgical outcome. We believe that symptomatic as well as asymptomatic patients with severe mitral regurgitation may have an improved prognosis if they are operated before cardiac dysfunction develops.

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E. coli outbreak and myocarditis: a story in cardiology

E. coli salgını ve miyokardit: Bir kardiyoloji öyküsü

Dear Editor,

The present problem of *E. coli* outbreak in many countries in Europe draws attention of physicians and medical scientist around the world on this emerging infection. Routinely, the intestinal symptoms as severe diarrhea is the main presentation of this infection, however, there are also other presentations. The cardiac presentation might be a forgotten presentation of *E. coli*. The myocarditis is reported in severe fatal case of *E. coli* O157:H7 infection (1). The inflammatory cell infiltration in the myocardium is the common pathohistological finding (1). This condition can be misdiagnosed as myocardial infarction (2). The cause of carditis is not conclusive but might be a result endotoxin injury (3). In management of case with *E. coli* infection, the assessment on cardiac status is required. Nevertheless, it should not be forgotten that the cardiac presentation can be the uncommon presentation of the new emerging *E. coli* infection in new settings.

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Electrocardiographic diagnostic dilemma: gradual QRS widening recorded by rhythm Holter monitoring

Elektrokardiyografik tanısal ikilem: Ritim Holter kaydında QRS'lerin giderek genişlemesi

Figure 1 demonstrates one of the frequent episodes of gradual QRS widening during sinus rhythm recorded by Holter monitoring of a young lady, who has been complaining of palpitation for a few years. She has no structural heart disease and echocardiographic findings are normal. In Figure 1, the first beat has normal QRS duration, whereas the subsequent group beats demonstrate gradual widening of QRS complexes