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Original Article

The challenges of managing rheumatic disease of the mitral valve in Jamaica*

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Abstract Between January, 2009 and December, 2013, 84 patients were identified who underwent isolated mitral valve surgery in Jamaica at The University Hospital of the West Indies and The Bustamante Hospital for Children. The most common pathology requiring surgery was rheumatic heart disease, accounting for 84% of the procedures performed. The majority of patients had regurgitation of the mitral valve (67%), stenosis of the mitral valve (22%), and mixed mitral valve disease (11%). The most common procedure performed was replacement of the mitral valve (69%), followed by mitral valve repair (29%). Among the patients, one underwent closed mitral commissurotomy. The choice of procedure differed between age groups. In the paediatric population (<18 years of age), the majority of patients underwent repair of the mitral valve (89%). In the adult population (18 years and above), the majority of patients underwent mitral valve replacement (93%). Overall, of all the patients undergoing replacement of the mitral valve, 89% received a mechanical valve prosthesis, whereas 11% received a bioprosthetic valve prosthesis. Of the group of patients who underwent mitral valve repair for rheumatic heart disease, 19% required re-operation. The average time between initial surgery and re-operation was 1.2 years. Rheumatic fever and rheumatic heart disease remain significant public health challenges in Jamaica and other developing countries. Focus must remain on primary and secondary prevention strategies in order to limit the burden of rheumatic valvulopathies. Attention should also be directed towards improving access to surgical treatment for young adults.

Keywords: Rheumatic fever; rheumatic heart disease; mitral valve

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Rheumatic fever and rheumatic heart disease are recognised worldwide as the most common causes of cardiovascular disease in children and young adults.[1] This is mainly an affliction of developing countries such as Jamaica.

Jamaica has a population of ~2.7 million people.[2] In 1984, it was selected by the World Health Organization and the International Society and Federation of Cardiology as one of 16 countries for an international programme targeting the prevention of rheumatic fever and rheumatic heart disease.

The Jamaican Rheumatic Fever/Rheumatic Heart Disease National Control Programme was formed in July, 1985.[3] This programme targeted:

- primary prevention: the recognition and treatment of streptococcal pharyngitis;
- secondary prevention: the prevention of recurrent streptococcal pharyngitis and rheumatic fever in patients diagnosed with rheumatic fever or rheumatic heart disease. Secondary prevention is achieved with the use benzathine penicillin, which is administered every 28 days.

Over the last 3 decades, despite local efforts, rheumatic fever and rheumatic heart disease remain significant public health challenges. Rheumatic valvulopathy, particularly when the mitral valve is involved, remains the most commonly acquired

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valvar pathology seen in both children and adults who present for surgery.

In Jamaica, cardiac surgery is performed at The University Hospital of the West Indies and The Bustamante Hospital for Children.

Methods

A retrospective review of the database of all the patients at The University Hospital of the West Indies and The Bustamante Hospital for Children who underwent cardiac surgery for isolated mitral valve disease, between January, 2009 and December, 2013, was conducted. Data related to the indications for surgery, the procedures performed, and the need for re-operation were recorded.

Results

Over the period, 84 patients who underwent isolated mitral valve surgery were identified. Of the patients undergoing isolated mitral valve surgery, 20 were aged 18 or less. The most common pathology requiring surgery was rheumatic heart disease, accounting for 84% of the procedures performed. The majority of patients had regurgitation of the mitral valve (67%), stenosis of the mitral valve (22%), and mixed mitral valve disease (11%).

The most common procedure performed was the replacement of the mitral valve (69%), followed by mitral valve repair (29%). Among the patients, one patient underwent closed mitral commissurotomy. The choice of procedure differed between age groups.

In the paediatric population (<18 years of age), the majority of patients underwent repair of the mitral valve (89%). In the adult population (18 years and above), the majority of patients underwent mitral valve replacement (93%). Overall, of all the patients undergoing replacement of the mitral valve, 89% received a mechanical valve prosthesis, whereas 11% received a bioprosthetic valve prosthesis.

Of the group of patients who underwent mitral valve repair for rheumatic heart disease, 19% required re-operation. The average time between initial surgery and re-operation was 1.2 years.

Discussion

Open heart surgery was first performed at the University Hospital of the West Indies in 1968.[5] Despite significant advances in the quality of healthcare, there remain significant challenges in the management of patients with rheumatic mitral valve disease. Although the nature of the disease itself impacts management, the effect of socio-cultural issues and economic conditions cannot be ignored. Some of these challenges are similar to those of other developing countries.

There are several challenges to the management of patients with rheumatic disease of the mitral valve.

First, ongoing damage to the native valve occurs, despite medical and surgical management. Consequent to this and other factors, patients not uncommonly present for surgical treatment when the disease is at an advanced stage. This includes severe thickening and calcification of the valvar and subvalvar apparatus. The advanced stage of the disease makes mitral valve repair technically difficult because of the poor quality of the native tissue. The durability of repair is also negatively impacted by the progressive nature of the disease. These factors in part account for the high rate of re-operation in our rheumatic patients.

Although mitral valve replacement may be less difficult, the management of a calcified annulus poses its own challenges. Extensive debridement of the calcified annulus increases the risk of complications such as atrioventricular groove disruption and heart block. Although these complications occur infrequently, their impact can be devastating.

Second, associated complications: patients with mitral valve disease not infrequently present with pulmonary hypertension and or atrial fibrillation. Pulmonary hypertension complicates the intraoperative and postoperative management of these patients. Use of pharmacological adjuncts such as milrinone and sildenafil are made with good effect.

The management of patients with atrial fibrillation continues to remain a challenge. This is because the surgical treatment of atrial fibrillation is limited by the availability of requisite equipment and disposables needed to perform the maze procedure. The availability is dependent on the patients' financial ability to purchase the required disposables at the time of surgery. Although the classical cut and sew maze procedure remains an option, this is infrequently performed because of the risk of bleeding.

Third, socio-cultural problems pose challenges in the management of patients with rheumatic mitral valve disease. The general population has limited knowledge about rheumatic fever and rheumatic heart disease. As a result, patients with rheumatic fever may present late for treatment. There is also a resistance to comply with antibiotic rheumatic fever prophylaxis. The most commonly used antibiotic is benzathine penicillin, which is administered intra-muscularly every 28 days. Needless to say, these injections are quite painful and persons may have difficulty in appreciating its importance and in understanding the relationship between chemoprophylaxis and the prevention of recurrent rheumatic fever. In addition, compliance with other cardiac-related medication is also a challenge.

There is also reluctance in a significant proportion of the population to undergo cardiac surgery. There is a perception that cardiac surgery carries a high mortality

risk; hence, persons who are in a position to undergo surgery sometimes postpone the decision. This has the effect of delaying surgical intervention.

Fourth, the patients who agree to go ahead with mitral valve surgery demand a durable solution. For most adults, the choice is that of a mechanical valve replacement. This is because mitral valve repair or bioprosthetic mitral valve replacement carry a higher likelihood of the need for repeat cardiac surgery, especially in young adults. In the paediatric population, however, mitral valve replacement is frequently not a good option because of the small size of the native annulus and the absence of growth potential.

Fifth, the majority of adult patients who undergo valve surgery for mitral valve disease have mechanical mitral valve replacements. This typically requires coumadin anticoagulation for the prevention of thromboembolic complications. Once again, compliance with medication is a challenge. In addition, monitoring the effect of coumadin by means of prothrombin time is challenging. Although this test is available in most of the major cities and towns throughout the island, the frequency of testing is less than desirous. Point-of-care testing is expensive and not widely available. As a result, many patients have results outside the therapeutic range. Although bleeding complications do occur, the more feared complication of valve thrombosis sometimes occurs. These patients, if fortunate enough to arrive at the hospital, do so with severe cardiac failure and require emergency cardiac re-operation.

Sixth, another challenge in patients who have undergone surgery is the frequent default from follow-up. The problem of patient follow-up applies to patients who have undergone surgery locally as well as those operated on overseas. Not infrequently, these patients present to the emergency department with complications associated with valve repair or replacement. Although uncommon, mechanical valve dysfunction from pannus in-growth can be a devastating complication (See Fig 1). Early intervention is important in salvaging these patients, and hence the importance of good medical follow-up and social work intervention to ensure compliance.

Finally, Jamaica's inadequate expenditure on healthcare cannot be ignored. Medical care at public healthcare facilities is free. This applies to children undergoing surgery at The Bustamante Hospital for Children, where the cost of surgery is heavily subsidised by non-governmental organizations. At the University Hospital of the West Indies, a quasi-private institution, most patients requiring cardiac surgery must either pay out of pocket, utilise health insurance, or request special assistance from the government. For the majority of adult patients, the cost of surgery is prohibitive. This results in patients not receiving timely surgical care.

Rheumatic fever and rheumatic heart disease remain significant public health challenges in Jamaica and other developing countries. Focus must remain on primary and secondary prevention strategies in order to limit the burden of rheumatic valvulopathies. Attention should also be directed at improving access to surgical treatment for young adults. Improving the quality of follow-up care is of paramount importance. This would be facilitated through a centralised registry and intensive outreach programmes.

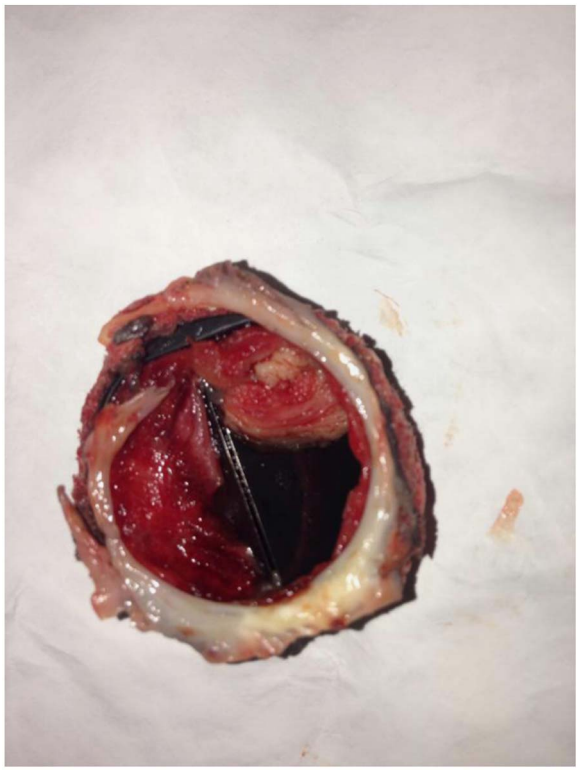

Figure 1.
Pannus in-growth resulting in mechanical valve dysfunction in a patient with a rheumatic heart disease.

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