MITRAL VALVE PROLAPSE

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INTRODUCTION

Mitral valve prolapse is the most common abnormality of human heart valves, and frequently will be seen in patients presenting to the podiatric practice. Due to different investigative techniques and diagnostic criteria, the exact prevalence of mitral valve prolapse is uncertain but the incidence from reported studies in the general population has ranged from 1 to 7%. The condition is much more frequent in females with an approximate 17% prevalence in college age women. The prevalence of mitral valve prolapse in women decreases with age.

The purpose of this paper is to review mitral valve prolapse with considerations for peri-operative management in podiatric surgery. The author will explore the clinical spectrum by reviewing diagnostic techniques, symptoms and potential complications. Specific management in the peri-operative period will be discussed.

WHAT IS MITRAL VALVE PROLAPSE?

Mitral valve prolapse (MVP) is a condition where during systole one or both leaflets of the heart will balloon abnormally above the plane of the atrioventricular junction into the left atrium. The leaflet edges may remain apposed and have minimal flow disturbance, or the apposition of the edges may be disrupted with resulting regurgitation. Prolapse of the valve occurs secondary to an imbalance between supporting connective tissue, muscular structures and the leaflets. Mitral valve prolapse is also referred to as Click-Murmur Syndrome, Barlow's Syndrome, Click Chick, Straight Back Syndrome, Balloon Mitral Valve and Floppy Valve Syndrome.

ETIOLOGY

Mitral valve prolapse commonly occurs as a primary condition. The exact etiology is unknown but it has been found to have increased familial incidence. Occasionally, this condition is secondary and associated with other non-cardiac disorders such as Marfan Syndrome, Ehlers-Danlos Syndrome, Osteogenesis Imperfecta, Thoracic Skeletal Abnormalities or Duchenne Muscular Dystrophy.

CLINICAL SPECTRUM

Diagnosis

Heart auscultation is an important aspect of examination and screening for patients with mitral valve prolapse. A snapping, crisp, high pitched click occurring in mid to late systole is the hallmark finding of the syndrome. This non-ejection click may be single or multiple and may be associated with a murmur. The murmur, if present, is an indication of mitral valve regurgitation and usually begins in mid to late systole and continues up to the second cardiac sound. Occasionally, a pansystolic murmur which corresponds to more severe regurgitation will be auscultated.

With mitral valve prolapse, auscultatory patterns change with position or postural changes and other maneuvers. As the patient stands, the click and murmur will become louder and occurs earlier in systole. As the patient squats, the click and murmur will be later and softer. Maneuvers such as the valsalva exercise, and inspiration will alter the timing and intensity of the click. These pattern changes distinguish mitral valve prolapse from all other cardiac conditions. When the click and murmur vary appropriately in timing and

intensity with these maneuvers, auscultation can give a definite diagnosis. Postural auscultation is the single most important part of evaluation of a subject with mitral valve prolapse.

Echocardiography may be utilized to confirm the diagnosis of MVP and to evaluate the thickness of the mitral valve. The thickness of the valve has a direct correlation with potential complications: progressive regurgitation, infective endocarditis and sudden death. Doppler ultrasound is helpful in assessing the presence and severity of mitral regurgitation.

Frequently, healthy patients with undiagnosed MVP will present to the podiatric practice. With an increased awareness and routine auscultatory heart examination, the podiatric physician may identify a click and/or late systolic murmur. For the surgical patient, appropriate measures should be taken and the patient referred to an internist or cardiologist for evaluation and monitoring.

Symptoms and Complications

Many clinical symptoms have been associated with mitral valve prolapse but generally patients with this condition are asymptomatic. Symptoms such as palpitation, syncope and chest pain may occur and are related to the severity of regurgitation and subsequent arrhythmias. Other symptoms such as dyspnea, fatigue and psychiatric manifestation have been associated with MVP but recent studies indicate that these symptoms are no more common among unselected patients with MVP than among normal controls.

Generally, the course for mitral valve prolapse patients is benign with good prognosis, but potential complications can occur. Occasionally, due to severe progression of regurgitation, the valve becomes completely incompetent and requires surgical replacement. Transient ischemic attacks have also been associated with MVP. Two potential complications, infective endocarditis and sudden death, occur infrequently but should be considered in the surgical patient.

PERIOPERATIVE MANAGEMENT

Infective Endocarditis and Surgical Prophylaxis

As with many other cardiac abnormalities, the relative risk of developing infective endocarditis is greater in patients with MVP. Although the exact risk for infective endocarditis with any of these cardiac abnormalities is unknown, educational assumptions have considered the risk in MVP to be 5 to 8 times greater than that of normal patients. Males and older patients (>45) with MVP have an even higher risk.

Infective endocarditis may result from blood-borne bacteria adhering to damaged valves. Patients with MVP and a murmur may have mechanical stress and turbulent flow which produces endothelial damage. The tissue damaged results in exposed collagen and deposition of platelets and fibrin. Microorganisms from transient bacteremia may then anchor to these injury sites and establish microbial colonization. Thickened valves secondary to MVP have also been a site of attachment for microorganisms and have shown a higher incidence of infective endocarditis.

Infective endocarditis in patients with MVP is generally sub-acute. Following certain procedures, a variety of organisms may be seeded into the bloodstream, however *streptococcus viridans*, enterococci and Staphylococci are the common etiological agents of infective endocarditis. Prophylaxis, when employed should be directed against these organisms.

Substantial controversy exists about surgical prophylaxis for infective endocarditis. Although the increased incidence of infective endocarditis in MVP has been shown, there is minimal clinical information regarding the risk/benefit factors of prophylaxis. A quantitative analysis study by Bor and Himmelstein demonstrated that due to the low incidence of infective endocarditis even without prophylaxis, the years of life lost from anaphylactic reaction to penicillin could exceed the years saved by prevention of infective endocarditis.

The American Heart Association (AHA) revised their recommendation on infective endocarditis prophylaxis in 1990. They recommended antibiotics for all procedures creating transient bacteremia such as dental, oral, upper respirato-

ry, GU and GI procedures in patients with MVP and a murmur. Clean orthopedic surgery (podiatric surgery) does not generally create a transient bacteremia and subsequently antibiotic prophylaxis is *not recommended.* According to the AHA, the only podiatric surgery requiring prophylaxis will be incision and drainage of infected tissue. Consideration for antibiotic prophylaxis should be taken with removal of a toenail with paronychia.

For dental, oral and upper respiratory procedures, the AHA recommends amoxicillin, 3 gm po 1 hour prior to the procedure then 1.5 gm 6 hours after the initial dose. Erythromycin or Clindamycin may be given as an alternative to patients allergic to penicillins. IV alternatives include ampicillin, clindamycin and vancomycin.

No recommendation for a particular antibiotic is given for podiatric cases, however recommendations for prophylaxis against the most likely infecting organism is addressed. The most likely organism to cause infective endocarditis because of a foot infection is a staphylococcus species. An anti-staphylococcal antibiotic such as Dicloxacillin, Ancef, Vancomycin or Clindamycin should be given.

Sudden Death

Mitral valve prolapse is generally not a contraindication to elective surgery, however, due to the potential risk of sudden death, appropriate peri-operative considerations are required. First, it is important to establish not only the diagnosis of MVP but also the severity of mitral regurgitation. The risk of sudden death increases with the severity of regurgitation and left ventricular dysfunction.

Progressive mitral valve regurgitation, especially if associated with syncope or palpitation, may compromise the cardiac status of the patient. As regurgitation worsens, the left ventricular function decreases and multiple arrhythmias usually develop. Both conditions are associated with sudden death.

Patients with a murmur associated with MVP should be properly evaluated by an internist or cardiologist prior to surgery. An EKG is required and occasionally, further testing such as 24 hour monitoring, echocardiogram, stress test and/or catheterization will be necessary.

Although MVP is generally a benign condition, appropriate cardiac work-up may be required. A compromised cardiac condition will increase anesthesia and surgical risk and the likelihood of initiating a sudden death episode.

CONCLUSION

Mitral valve prolapse is a common condition that is not uncommonly seen in potential surgical patients. Diagnosis of the condition is made with heart auscultation and is often confirmed with echocardiography. Peri-operative management depends on the presence and severity of mitral valve regurgitation. With regurgitation, cardiac function precautions and selective infective endocarditis prophylaxis are indicated preoperatively. During the postoperative period, close observation for potential complications is recommended. MVP is usually benign and is not a contraindication to surgery.

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