

Body Piercing: A Rare Cause of Mitral Valve Endocarditis

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Body piercing has become a way of life for many individuals. It represents freedom, as well as rebellion, and can provide shock value to the public. Often, it is used as a rite of passage from adolescence into adulthood, and can also provide a boost in self-esteem. However, body piercing may lead to non-infectious complications such as prolonged bleeding and keloid formation, while infectious complications include the transmission of blood-borne infections (e.g. human immunodeficiency virus, hepatitis B, C

and D), as well as bacteremia through the site of piercing. Infective endocarditis in individuals with congenital heart defects has been identified after body piercing. Here, the first documented case is reported of mitral valve endocarditis in a previously fit and healthy young female following navel piercing.

Body piercing appears to be gaining in popularity and social acceptance. With the increase in the number of piercings, it is likely that healthcare providers may see an increase in the consequent complications. The most common complications are infection, including the transmission of hepatitis viruses and bacteria at the time of the piercing or in the course of wound care, contact dermatitis, and hypertrophic scars and keloids (1). However, unique complications such as endocarditis, paraphimosis and urethral rupture can also result from body piercing (2). Here, the first ever case is reported of mitral valve endocarditis after navel piercing in a previously fit and healthy young female.

Case report

A 20-year-old female university student who had a previous history of plastic surgery for facial injuries sustained in a road traffic accident at the age of 15 years was referred to the authors for mitral valve surgery due to infective endocarditis. Initially she had presented to her general practitioner with a two-week history of flu-like symptoms, including high fever and severe lethargy. She was prescribed a broad-spectrum

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oral antibiotic for one week, but returned to her general practitioner with worsening lethargy, persistent temperature and increasing shortness of breath. The patient was referred to the district general hospital, where a detailed history failed to reveal a cause for her symptoms.

A clinical examination at that time showed her heart rate to be 150 beats/min, blood pressure 90/50 mmHg, and temperature 38.6°C. A physical examination revealed a loud pansystolic murmur at the cardiac apex radiating to the axilla with bilateral crepitus at both lung bases. The patient underwent transthoracic echocardiography (TTE) which revealed probable mitral valve endocarditis with mitral regurgitation. Blood cultures were taken, and the patient was empirically started on broad-spectrum antibiotics. Despite antibiotic treatment, she remained febrile and developed worsening dyspnoea, at which point she was transferred to the authors' institution.

Upon arrival, a repeat TTE revealed a large vegetation on the anterior mitral valve leaflet resulting in severe mitral regurgitation (Fig. 1). Blood cultures demonstrated a growth of *Staphylococcus aureus*. The patient was started on vancomycin, and the decision was made to proceed with urgent mitral valve surgery. Identification of the microorganism prompted the need to take another detailed history. Upon specific questioning, the patient stated that she had undergone navel piercing one month prior to the onset of symptoms. The site of piercing had developed localized

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Figure 1: Preoperative transthoracic echocardiography frame showing vegetation on the anterior mitral leaflet.

infection with purulent discharge, and the infection had only settled when the navel ring was removed.

The patient requested a cosmetic thoracotomy incision rather than a median sternotomy. The next day she was operated on through a right fourth space inframammary incision, using femoro-femoral bypass at normothermia and intermittent antegrade cold blood cardioplegia.

Intraoperative examination of the mitral valve revealed a large vegetation involving half of the free edge of the anterior mitral leaflet, from A2-A3. The vegetation and involved margin of the leaflet, along with the free margin chordae, were resected. Three groups of secondary chordae from the posterior leaflet (P2 portion) were then transferred to the A3 complex, and a single chordal group was transferred to the A2. The procedure was completed with the implantation of a Carpentier-Edwards Classic annuloplasty ring (Edwards Lifesciences LLC, CA, USA).

Intraoperative transesophageal echocardiography revealed a good repair, with minimal regurgitation. The patient remained hemodynamically stable after surgery. Repeat TTE on hospital day 5 revealed normal left and right ventricular function, and a normally functioning mitral valve. The vegetation culture was reported positive for *Staph. aureus*. The patient's antibiotic therapy was adjusted to vancomycin 2 g per day, intravenous - a regimen recommended by the American College of Cardiology/American Heart Association guidelines for the management of infective endocarditis (3).

At the time of discharge 12 days after surgery, the patient's white blood cell counts were persistently below 7000 per mm³, with a reducing trend in other markers of inflammation. She remained afebrile after the fourth postoperative day. Arrangements were

made for daily intravenous vancomycin therapy to be administered for a four-week period at the local general practitioner's surgery.

Discussion

Body piercing is rapidly becoming a common and accepted practice in Western cultures. Apart from the ear lobes, piercing of other sites such as the eyebrow, lip, tongue, nipple, nose, navel or genitals has been gaining in popularity. Body piercing is associated with both infective and non-infective complications. Infective complications include the transmission of blood-borne viruses (HIV and hepatitis B, C and D) and acute bacterial invasion at the site of piercing, with *Staph. aureus* being the most common organism associated with cutaneous infections (4). Infective endocarditis has been previously reported as an infrequent complication after body piercing (5-8). Herein, the first ever case is reported of bacterial endocarditis of the mitral valve after navel piercing in an otherwise healthy, young female.

Infective endocarditis is relatively uncommon, and is associated with underlying cardiac conditions. However, it also occurs in those with no previous heart disease, including intravenous drug abusers. Endocarditis is associated with some cardiac conditions more often than others. Despite advances in antimicrobial therapy and improvements in the ability to diagnose and treat complications, when endocarditis develops the severity of the disease and the ensuing morbidity are unpredictable (2). Cardiac conditions associated with a high risk of endocarditis include the placement of prosthetic cardiac valves, previous bacterial endocarditis, complex cyanotic congenital heart disease (e.g. tetralogy of Fallot), and the placement of surgically constructed systemic pulmonary shunts or conduits. Other congenital cardiac malformations, acquired valve dysfunction because of rheumatic heart disease, hypertrophic cardiomyopathy, and mitral valve prolapse carry a moderate risk (2).

Although a 1997 study by the American Heart Association confirmed that most cases of endocarditis are not attributable to invasive procedures (2), recent reports have indicated an increased incidence of endocarditis associated with body piercing, including *Staphylococcus epidermidis* endocarditis following nipple piercing (6), staphylococcal endocarditis following nasal piercing (7), and *Neisseria* endocarditis following tongue piercing (8). Endocarditis may occur despite antibiotic prophylaxis; therefore, following body piercing procedures in patients who are at risk, healthcare providers should remain suspicious of any unusual clinical events such as unexplained fever, night chills, weakness, myalgia, arthralgia, lethargy or malaise (2).

In the present patient, endocarditis was diagnosed by the presence of fever in conjunction with clinical features of mitral regurgitation, positive blood cultures and the demonstration of vegetation on echocardiography at about one month after navel piercing. A similar interval between navel piercing and clinical presentation for endocarditis has been reported previously (5). The present patient developed localized inflammation at the site of piercing, presumably resulting in transient bacteremia and subsequent seeding of the mitral valve. Body piercing was the only risk factor, as there was no congenital heart disease, valvular prosthesis, history of intravenous drug abuse or previous cardiac surgery.

It is concluded that body piercing is an increasingly common practice in Western cultures, and carries a substantial risk of morbidity. As the number of patients with body piercings increases, practitioners must be able to recognize, treat and counsel patients on associated complications, and also to identify unique problems such as endocarditis, even in previously healthy patients. In this way the morbidity and mortality due to these complications may be reduced through early recognition and appropriate treatment.

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