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COMPLETE INTRAOPERATIVE DISLODGMET OF A ST. JUDE MEDICAL MECHANICAL HEART VALVE HEMODYNAMIC PLUS* VALVE SEWING CUFF

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Mechanical disruption of bileaflet heart valves has previously been described.¹⁻⁴ The St. Jude Medical Mechanical Heart Valve Hemodynamic Plus (HP) valve (St. Jude Medical, Inc., St. Paul, Minn.) is a prosthesis designed to reduce transvalvular gradients by increasing valvular area. In 1995, a randomized Italian multicenter study on the hemodynamic performance in the aortic position of the St. Jude Medical HP valve versus the St. Jude Medical standard valve (St. Jude Medical, Inc.) was started. We describe a case of complete intraoperative dislodgment of a St. Jude Medical HP sewing cuff that occurred during the course of that study. We believe this event to be the first reported case of sewing cuff slip-off of a St. Jude Medical valve in the literature.

A 61-year-old man with coronary artery disease and severe aortic regurgitation was referred to our department for aortic valve replacement and coronary artery bypass grafting. After admission to our unit, he gave informed consent for his enrollment in the multicenter study on the hemodynamic performance in the aortic position of the St. Jude Medical HP valve versus the St. Jude Medical standard valve.

At operation, once standard cardiopulmonary bypass had been instituted with two-stage venous cannulation, the aorta was crossclamped and opened. Surgical inspection revealed severe aortic regurgitation with advanced thinning of the valve cusps and no calcification. After valvular excision, the aortic anulus was measured with both St. Jude Medical standard and HP sizings; a 23 mm diameter was found to be adequate and a 23 mm St. Jude Medical HP valve was randomly selected.

The valve implantation was performed in our usual manner. Interrupted U-shaped 2-0 Tevdek sutures (Deknatel Division, Fall River, Mass.) with no pledgets were passed at supraannular level and then through the sewing cuff. The prosthesis was oriented with the axis perpendicular to the ventricular septum. During these stages, the prosthesis was always encased in its holder and held by the assistant surgeon, so no stress was applied to the sewing cuff while the stitches were being placed through the cuff, nor was any rotational force exerted on the valve.

When the prosthesis was inserted while it was being slid down to its supraannular position, the entire sewing cuff was dislodged, causing the sewing cuff to slip completely off of the pyrolytic carbon ring (Figs. 1 and 2). The insertion maneuver was carried out by the first surgeon, who always held the prosthesis in its holder so that no stress was applied to the cuff.

After this breakdown, stitches were quickly removed from the sewing cuff and then mounted on free needles to replace the St. Jude Medical HP valve with a CarboMedics valve (CarboMedics Inc., Austin, Texas) of the same diameter. At the end of valve implantation, coronary artery bypass grafting with the left internal thoracic artery on the left anterior descending coronary artery was also performed.

The postoperative course was uneventful. At the time of this writing, the patient is well and free of complications. The broken St. Jude Medical HP valve has been returned to the manufacturer for examination.

Structural dysfunction of bileaflet valve prosthesis generally concerns leaflet rupture with subsequent embolization.¹⁻⁴ To the best of our knowledge, this is the first reported case of intraoperative dislodgment of the sewing cuff.

The problem occurred during implantation of a 23 aortic St. Jude Medical HP valve in a patient with severe aortic regurgitation. The sewing cuff on the St. Jude Medical HP series of valves is a small horizontal flange designed to be sutured above the anulus. Only the carbon orifice ring is placed into the anulus. The sewing cuff is held in place by six suture windings running tightly around the inner ring. To increase the orifice area, the sewing cuff was thinned by eliminating all cuff material from the

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Fig. 1. Sewing cuff dislodgment of 23 mm St. Jude Medical HP aortic valve prosthesis.

Fig. 2. Complete slip-off of sewing cuff of 23 mm St. Jude Medical HP aortic valve prosthesis.

anulus, enabling the use of a larger pyrolytic carbon orifice.

The likely explanations for this structural malfunction may be the sudden disruption of the suture windings. This event may be caused either by the windings being cut by the suture needles or may result from a spontaneous breakdown of the winding material caused by a manufacturing defect.

With respect to the first hypothesis, it is recommended by the manufacturer that U-shaped stitches not be used for the implantation of St. Jude Medical HP valves because of the reduced flange thickness, which makes the St. Jude Medical HP valve potentially more susceptible to disruption of the cuff windings. Nevertheless, before this event, several St. Jude Medical HP aortic valves had been

implanted at our institution with the same suture technique, and no such complications had been observed, either during operation or at follow-up. Moreover, care was taken during valve implantation not to pass stitches too close to the carbon ring, and no stress or rotation of any sort was exerted on the valve at any time. In addition to these technical precautions, the Tevdek 2-0 sutures used do not have sharp needles. In case of a manufacturing defect, further examination of the manufacturing process may explain its causes.

In conclusion, the complication we observed may highlight a design drawback of the St. Jude Medical HP valve, which otherwise is characterized, at least in our experience, by decreased aortic transvalvular gradient and better prosthetic performance.

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TRANSCATHETER EMBOLIZATION OF MYCOTIC ILIAC ANEURYSM AFTER AORTIC VALVE REPLACEMENT BECAUSE OF BACTERIAL ENDOCARDITIS

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Mycotic aneurysms have been reported to occur in about 15% of cases of infective endocarditis.¹ Sudden rupture of these aneurysms is life threatening in the case of intracranial and visceral aneurysms, yet their detection and prediction of rupture are not always possible even with arteriography.² The role of operation in the treatment of these aneurysms is well established, but operation is not always feasible because of difficult anatomic locations or multiplicity of aneurysms. Selective transcatheter embolization to occlude the feeding artery can produce thrombosis of the aneurysm and obviate the need for operation. Though experience with this technique is limited, more and more cases of its successful use are being reported. We present a case of a mycotic aneurysm of a branch of the superior gluteal artery diagnosed by selective arteriography and successfully treated by embolization with steel coils.

A 55-year-old man was admitted to the hospital with a 4-week history of increasing shortness of breath, fever, and rigors. He was in hemodynamically stable condition and an early diastolic murmur was heard over the aortic area. There were no splinter hemorrhages or other evidence of peripheral embolization. Laboratory study results were hemoglobin 9.5 gm/dl, white blood cell count $11.9 \times 10^9/L$, urea 553 mg/L, and creatinine 13 mg/L. Liver function test results were within normal limits as was

a coagulation screen. Chest x-ray films showed a normal-sized heart with evidence of pulmonary venous hypertension. Transthoracic and transesophageal echocardiography demonstrated severe aortic regurgitation and large vegetations attached to the valve leaflets. A diagnosis of acute bacterial endocarditis was made and blood cultures isolated *Streptococcus mitis* sensitive to penicillin and gentamicin.

After 7 days of antibiotic therapy the patient underwent aortic valve replacement with the use of cardiopulmonary bypass. The operative findings were of a bicuspid aortic valve destroyed by vegetations and a small abscess cavity in the annular area. After the aortic valve was excised and all the infected tissue cleared the abscess cavity was obliterated and a 23R CarboMedics bileaflet mechanical valve (CarboMedics, Inc., Austin, Texas) was implanted with interrupted 2-0 Ethibond polyester sutures (Ethicon, Inc., Somerville, N.J.). The patient made a good postoperative recovery and intravenous antibiotic therapy was continued for 2 weeks. Warfarin therapy was started on the first postoperative evening with the aim of maintaining the international normalized ratio between 2.5 and 3.5.

On postoperative day 8 a large painful swelling suddenly developed in the right buttock. This was thought to be a hematoma related to the anticoagulation. Aspirate of the hematoma was sterile. The patient remained well and showed no signs of local or generalized sepsis. The hematoma was slow to resolve but he was well enough to be discharged from the hospital on postoperative day 21. He received antibiotics for a total of 6 weeks and anticoagulation therapy was continued. At 3-month follow-up the swelling was smaller and nontender.

Seven months after his hospital discharge while still receiving anticoagulation he noticed a sudden increase in the size of the swelling, which also became excruciatingly painful. Ultrasonography showed a large blood-containing cavity in the right gluteal region. The international normalized ratio was within the target range. A selective right internal iliac arteriogram showed a branch of the superior

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