Minimally Invasive Cardiac Surgical Procedure in a Patient With Breast Implants by Use of a Fibrous Capsule Preservation Method

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We present a case of minimally invasive cardiac surgical procedure in a woman with previous breast implants. The capsule preservation method presented here may simplify cardiac surgical procedures and minimize complications in patients with breast implants.

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More than 286,000 procedures for breast augmentation were performed in the United States in 2012 [1]. With the aging of this patient population, the number of women needing cardiac surgical procedures who also have breast implants can also be expected to rise. Prior publications have described an approach to minimally invasive cardiac surgical procedures (MICS) in these patients in which the breast implant is removed and then reimplanted after the procedure [2, 3]. Here we present a fibrous capsule preservation method used during MICS without the need for removal of the breast implant.

In September 2011, a 30-year-old woman (weight 47.4 kg, height 160.1 cm) was admitted to our hospital for further evaluation of New York Heart Association class III dyspnea. In 2008, she had undergone breast augmentation with saline-filled implants placed through circumareolar incisions. There were no complications after this procedure, and she had been satisfied with the aesthetic result. Preoperative echocardiography showed a 20-mm secundum atrial septal defect (ASD) with a limited retroaortic rim, which hindered an interventional attempt to repair the ASD. She also had moderate tricuspid regurgitation and severe pulmonary hypertension. Minimally invasive tricuspid annuloplasty and ASD repair were planned. A preoperative consultation with a cosmetic surgeon was conducted to select surgical strategies that would lead to an optimal aesthetic result and to arrange for intraoperative assistance.

The patient was placed on her left side in a supine position at a 30° angle, with the right arm slightly flexed to expose the midaxillary line. After we had confirmed the appropriateness of the femoral vessels, a 5-cm incision was made along the submammary skin crease, and then subcutaneous dissection was initiated. To preserve the breast implant, the encapsulated breast implant was lifted up with gentle dissection with electrocautery (Fig 1A). Whenever we encountered a small tear of the fibrous capsule surrounding the implant, we applied an interrupted suture with absorbable material (Monocryl, Ethicon, NJ). To prevent damage to the implant, no percutaneous needle or puncture was inserted into the anterior chest. After successful dissection, a mini-thoracotomy was made along the fourth intercostal space. A soft tissue retractor (Edwards Lifesciences Co., Irvine, CA) was placed into the wound for better exposure and protected the implant from sharp surgical instruments (Fig 1B).

Cannulation of the right femoral artery (16F) and vein (20F) was performed through a 2-cm skin incision. After the initiation of cardiopulmonary bypass, the pericardium was opened longitudinally and 3 cm anteriorly to the phrenic nerve. After transthoracic aortic cross-clamping through the third intercostal space, cardioplegic arrest was induced with antegrade cold blood cardioplegia. After posterior right atriotomy, the secundum ASD was repaired with a Gore-Tex patch with 4-0 polypropylene running sutures. The tricuspid valve was repaired with bicuspidalization by the use of 2-0 pledged polyester suture. The cardiopulmonary bypass and aortic clamping times were 71 and 40 minutes, respectively.

Postoperative mechanical ventilation was needed for 1 hour, and the patient was transferred to a general ward after 23 hours. A postoperative echocardiogram on the second postoperative day showed no residual shunt, no tricuspid regurgitation, and decreased pulmonary hypertension. The patient was discharged on the third postoperative day with no surgical complications. At 24 months after the operation, the patient remained satisfied with the aesthetic results and had no sign of infection.

Comment

During the past two decades, minimally invasive strategies have been used increasingly in every surgical field, including the practice of cardiac surgery. As the use of MICS increases, along with the number of women with breast augmentation, cardiac surgeons are more likely to encounter female patients with breast implants who wish to undergo MICS. However, published articles describing this particular clinical situation are surprisingly rare.

MICS offers many potential benefits, including decreased postoperative pain, lower incidence of atrial fibrillation, shorter hospital stays, faster recovery, reduced blood loss, and better cosmesis [4]. However, patients with breast implants who are candidates for MICS require several considerations. Consultation with a plastic surgeon is highly recommended throughout the preoperative planning and treatment of women with breast implants who are undergoing MICS.

Previous publications have consistently reported the removal and reimplantation of breast implants in patients...
undergoing MICS [2, 3, 5]. Some authors suggest that removal of the breast implant exposes an intracapsular space that is well suited for an anterior thoracotomy at the fourth intercostal space. In our experience, however, a slight shift of the skin incision posteriorly, along with precise dissection to preserve the capsule of the implant, provides sufficient exposure of the fourth intercostal space without the need to enter the intracapsular space.

Another concern with regard to MICS in patients with breast implants is damage to the implant. This can result from pressure exerted by the rib spreader or penetration of the implant with the cardiac retractor. Our experience shows that gentle retraction with a soft tissue retractor and minimization of rib spreading can decrease pressure on the implant and reduce the risk of damage. Avoiding the use of a penetrating cardiac retractor is also a key to protecting the implant.

Because opening of the fibrous capsule surrounding the breast implant makes it vulnerable to infection, some authors suggest that patients with breast implants and valvular heart disease caused by infective endocarditis are not good candidates for MICS [3]. However, the fibrous capsule preservation method described here, along with proper dissection, can minimize the risk of implant infection.

The capsule preservation method may be unsuitable for patients who have received breast implants through an inframammary incision. Patients with circumareolar incisions appear to be better candidates for this approach.

In summary, we describe a successful MICS procedure using a fibrous capsule preservation method without removal of a breast implant. This procedure can simplify cardiac surgical procedures and minimize complications associated with these procedures in patients with breast implants.

References


