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VIEWPOINT

Tissue Expander Infection in Breast Reconstruction: Importance of Nasopharynx Screening for Methicillin-resistant *Staphylococcus aureus*

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Sir:

Postoperative infection is cited as a major complication of breast reconstruction using a tissue expander (TE). Once an infection develops, it is difficult to treat, often leading to TE evulsion and increased medical costs. Although there has been extensive research on TE infection risk factors, no studies have evaluated the relationship between the preoperative carrier status of patients and TE infection. This study investigated the correlation between postoperative TE infection and several factors, including preoperative carrier status, in 203 cases with TEs used in breast reconstructions performed between July 2013 and February 2016.

This study was approved by the Ethics Committee of Osaka University, and informed written consent for publishing personal and medical information was obtained from all patients. All procedures conformed to the Declaration of Helsinki. All surgical procedures were performed by 2 plastic surgeons following identical protocols. Nasopharyngeal screening for carrier status was performed preoperatively on all patients, and the bacterial strain with the greatest volume and the patient's methicillin-resistant *Staphylococcus aureus* (MRSA) carrier status were recorded. Excluding patients whose infections improved conservatively with only antibiotic treatment after drain removal, wound cultures or drainage cultures were performed on patients with an infection, and the phlogogenic bacterium was identified. We also selected the following risk factors: body mass index (kg/m^2), method of breast cancer surgery (primary reconstruction only), history of axillary dissection (primary reconstruction only), timing of reconstruction, history of exposure to radiation, location of TE insertion, and amount of saline solution infused during surgery (evaluated based on the proportion of the total amount infused). Statistical analysis was performed using Statcel version 3 (OMS-publishing, Saitama, Japan). The data were analyzed using the chi-squared test. A value of $P<0.05$ was considered significant.

Among the 203 TE cases, postoperative infection developed in 13 (6.4%). In 2 of these cases, the infection was alleviated with antibiotics. The remaining 11 patients required surgery: 9 were successfully treated and 2 underwent TE removal. The risk factor analysis suggested that obesity and preoperative presence of nasopharyngeal MRSA are significant risk factors for postoperative TE infection (Table 1). Additionally, axillary dissection tended to increase TE infection ($P = 0.051$). In 8 among 12 patients in whom the phlogogenic bacterium was identified, the same bacterium was found to show the greatest volume in the nasopharyngeal cultures (Table 2).

In addition to obesity, studies have also reported smoking, chemotherapy, large breast size, etc., as risk factors for postoperative breast prosthesis infection.[1,2] The present study also investigated the relationship between nasopharyngeal carrier status and TE infection. The type of bacteria carried and the phlogogenic bacterium of TE infection were consistent in most patients, suggesting that preoperative nasopharyngeal screening could be effective. Additionally, 4 (33.3%) of the 12 patients who were MRSA carriers developed postoperative TE infections, 3 of whom had MRSA as a phlogogenic bacterium. Although first-generation cephem antibiotics are usually employed as perioperative antibiotics, in the future, research needs to be conducted on the effectiveness of preoperative MRSA eradication and perioperative use of anti-MRSA medications in MRSA carriers.[3–5]

Table 1. Factors Affecting Tissue Expander Infection

Variables	No. of Expanders	No. of Infection, n (%)	*P*
Age (y)			
<60	170	10 (6.3)	0.491
≥60	33	3 (9.1)	
Body mass index (kg/m^2)			
<26	178	9 (5.1%)	**0.019**†
≥26	22	4 (18.2)	
Type of breast surgery*			
Nipple-sparing mastectomy	26	0 (0)	0.28
Skin-sparing mastectomy	85	8(9.4)	
Total mastectomy	8	1 (12.5)	
Axillary dissection*			
Yes	15	3 (20.0)	0.051
No	104	6 (5.8)	
Timing of reconstruction			
Primary	119	9 (7.6)	0.42
Secondary	84	4 (4.8)	
Radiotherapy			
Preoperative	16	1 (6.3)	0.70
Postoperative	7	1 (14.3)	
No	180	11 (6.1)	
Tissue expander position			
Subpectoral	189	12 (6.8)	0.91
Subcutaneous	14	1 (7.1)	
Intraoperative fill volume/total tissue expander volume			
<0.25	95	5 (5.3)	0.57
0.26–0.49	77	7 (9.1)	
≥0.50	31	1 (3.2)	
MRSA in nasopharynx			
Positive	12	4 (33.3)	**0.0001**†
Negative	191	9 (4.7)	

*Cases for primary reconstruction were assessed.
† $P<0.05$ is considered significant.

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Table 2. Phlogogenic Bacterium and Bacterial Flora in the Nasopharynx

Case	Phlogogenic Bacterium	Bacterial Flora in the Nasopharynx*
1	MRSA	MRSA
2	MSSA	MSSA
3	MSSA	Corynebacterium
4	MSSA	MSSA
5	CNS	CNS
6	MSSA	MSSA
7	MSSA	MRSA
8	MRSA	MRSA
9	Unknown	Neisseria
10	MRSA	MRSA
11	CNS	Negative
12	CNS	CNS
13	CNS	MSSA

*Shows the bacteria with the greatest volume identified in nasopharyngeal cultures. CNS, coagulase-negative *Staphylococcus*; MSSA, methicillin-susceptible *Staphylococcus aureus*.

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DISCLOSURE

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