

## Wound Infection in Breast Augmentation: The Role of Prophylactic Perioperative Antibiotics

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**Abstract.** Infection after augmentation mammoplasty is not common, with the reported incidence between 1% and 7%. The use of prophylactic antibiotics, however, is widespread in plastic surgery: It was documented in a 1975 survey in which 43% of responding plastic surgeons used prophylactic antibiotics. Fifteen years since this survey, surgeons have witnessed an explosion in antibiotic variety and have participated in their increased use. For many procedures, the use of antibacterials has evolved by convention and personal preference, based often on only anecdotal information. This report is our study of the routine use of antibiotics to prevent wound infection after augmentation mammoplasty.

**Key words:** Breast augmentation — Wound infection — Perioperative antibiotics

### Materials and Methods

One hundred ninety two of 208 consecutive patient charts were reviewed from 1985 to 1989. No patients were excluded from this study. All augmentations were performed by, or under the guidance of, two senior surgeons. The periareolar submuscular technique [6] was used in 187 patients and the transaxillary approach in 5 patients. Smooth low-bleed silicone gel prostheses were used in all cases.

A first-generation cephalosporin was given intravenously prior to the skin incision and was continued orally for at least 24 hours in those patients receiving antibiotics. The decision to use antibiotics

depended on the surgeon attending the case. Thereby, the patients were unknowingly randomized independent of factors other than one surgeon always used antibiotics and the other never. All prostheses were bathed in a Bacitracin solution (50,000/L) prior to submuscular placement. There were no complications associated with the administration of antibiotics.

Followup evaluation was six weeks to three years.

### Results

One hundred thirty two patients did not receive antibiotics and 60 patients received prophylactic antibiotics. The infection rate of these groups was 0.7% (1/132) and 0.0%, respectively. This is not statistically significant. One postoperative hematoma occurred and this was in the same patient with the postoperative infection.

Steroids (10 mg Decadron IV) were given to three patients in the antibiotic group and to one patient in the nonantibiotic group. This did not affect the outcome.

Irrigation of the submuscular pocket was carried out in all cases (Table 1). Bacitracin solution (50,000/L) was used in 50/60 patients and 5% Betadine solution was used in 4/60 patients. Similarly, in the nonantibiotic group, Bacitracin solution (129/132) and Betadine solution (1/132) were used, with two patients receiving an unknown irrigation solution.

Patients of both groups had drains inserted. The antibiotic group had 15 patients with drains (25%) while the nonantibiotic group had 66/132 (50%) with drains. All drains were bilateral.

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**Table 1.** Irrigation

	Antibiotic	No antibiotic
Bacitracin	56/60	129/132
Betadine	4/60	1/132
Other	0	2/132

**Table 2.** Age

Antibiotic	No antibiotic
Avg. 32 (18–50)	Avg. 28 (18–55)

The average age of the two groups was 32 (range 18–50) for the antibiotic group, and 28 (range 18–55) for the group without antibiotics (Table 2).

Of the patients receiving antibiotics, this was the first breast procedure for 83% (50/60), 12% (7/60) were undergoing prosthesis replacement, and 5% (3/60) had augmentation plus additional surgery during the same anesthesia. The nonantibiotic group similarly had 90% (119/132) in the primary procedure category, 8% (10/132) had replacement of their prosthesis, and 2% (3/132) underwent augmentation plus additional surgery (Table 3).

These two groups of patients who underwent augmentation mammoplasty were similar with respect to infection rate, age, irrigation, use of steroids, and procedures. The major differences occurred in the use of antibiotics and drains. Forty five patients received prophylactic antibiotics and no drains. No infections occurred in this group. Sixty six patients received no antibiotics and no drains. One patient (1.5%) had a postoperative wound infection (Table 4). The difference is not statistically significant.

## Discussion

The appropriate use of prophylactic antibiotics has been thoroughly reviewed and documented in the medical literature [7–9]. From this wealth of information, guidelines can be extracted.

(1) The potential incidence and danger from infection are sufficient to warrant the use of such agents.

(2) The agent chosen is appropriate for the potential infection.

(3) The agent is administered at a time, in a dosage, and by a rate most likely for it to be effective [5].

To date, there are no well-controlled studies dealing strictly with breast augmentation though three studies showed that infection after mammoplasty is rare [1, 3, 4]. It is at this point that plastic surgeons find they are at the mercy of data from other surgi-

**Table 3.** Procedure

	Antibiotics	No antibiotics
First procedure	(50/60) 83%	(119/132) 90%
Replacement	(7/60) 12%	(10/132) 8%
Augmentation plus additional surgery	(3/60) 5%	(3/132) 2%

**Table 4.** Infection rate

Antibiotics	No antibiotics
0/60 0.0%	1/132 0.7%
Antibiotics/no drains (0/45) 0.0%	No antibiotics/no drains (1/66) 1.5%

cal specialties. By extrapolation many justify the use of prophylactic antibiotics.

Antibiotic prophylaxis reduces the incidence of wound infection after colorectal surgery, vaginal hysterectomy, laryngeal and oropharyngeal resection from carcinoma, and in high-risk patients undergoing gastroduodenal or biliary surgery. In clean operations, such as cardiac surgery, vascular procedures, or orthopedic surgery with placement of prosthesis, the high morbidity associated with an infection justifies the use of antibiotics even though the risk of infection is small [9].

It is easy to see how assumptions have been made, but it is imperative that each set of patients be studied separately as different procedures and different anatomical locations give different results.

This study confirms the lack of benefit of antibiotics for augmentation mammoplasty. Cronin and Greenberg [1, 2] also found that there was no correlation between patients who developed "infections" and those receiving antibiotics.

## Summary

In a retrospective study of 192 breast augmentations, infection rate was evaluated in relation to prophylactic antibiotic use. The two groups evaluated were similar and showed no difference in infection rate. This data suggests no advantage to the routine administration of prophylactic antibiotics for decreasing infection rates in breast augmentation.

## References

1. Cronin TD, Greenberg RL: Our experiences with silastic gel breast prosthesis. *Plast Reconstr Surg* 46:1, 1970

2. Cronin TD, Braner RO: Augmentation mammoplasty. *Surg Clin N Am* **51**:441, 1971
3. DeCholnoky T: Augmentation mammoplasty: survey of complications in 10,941 patients by 265 surgeons. *Plast Reconstr Surg* **45**:573, 1970
4. Edgerton MT, Meyer E, Jacobson WE: Augmentation mammoplasty, II. Further surgical and psychiatric evaluation. *Plast Reconstr Surg* **27**:279, 1961
5. Krizek TJ, Koss N, Robson MC: The current use of prophylactic antibiotics in plastic and reconstructive surgery. *Plast Reconstr Surg* **55**:21, 1975
6. Vazquez B, Given KS, Houston GC: Breast augmentation: a review of subglandular and submuscular implantation. *Aesth Plast Surg* **11**:101, 1987
7. Kasiser AB: Antimicrobial prophylaxis in surgery. *New Engl Med* **315**:1129, 1986
8. Stone HH et al: Prophylactic and preventive antibiotic therapy: timing, duration and economics. *Am Surg* **189**:691, 1979
9. Guglielmo BJ et al: Antibiotic prophylaxis in surgical procedures: a critical analysis of the literature. *Arch Surg* **118**:943, 1983