The State of Antibiotic Use in Implant Based Breast Reconstruction

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Breast Reconstruction in the U.S.

• Each year approximately 100,000 breast reconstructions are performed in the U.S.
• Greater than 2/3 of reconstructions are implant-based
• Suction drains are routinely placed on each side of a reconstruction to prevent seromas

Antibiotic Use in Breast Reconstruction

• It has been postulated that the implant and the drain/drain site create a nidus for infection necessitating antibiotic prophylaxis
• Common use of acellular dermal matrix (Alloderm) potentially increases infection risk
• Despite current approaches, overall complication rates can reach 60% and infection rates are as high as 29%

Unique Challenges Related to Infection Risk in Breast Reconstruction

• A large surface area of undermined tissue
• Poorly perfused mastectomy skin flaps
• Synthetic implant
• Nonvascularized construct in direct contact with the implant
• Bacteria within the breast ducts
Unique Challenges Related to Infection Risk in Breast Reconstruction

• Seroma risk
• Drain and drain site opening
• The need for chemotherapy and/or radiation before or after mastectomy
• Radiation delivered directly to the surgical site

Difficulty in Analyzing Breast Reconstruction Data

• Lack of uniformity in the approach to mastectomy and reconstruction
• No randomized prospective data
• Widely divergent approach to antibiotic use
• Very broad range of infection rates within each antibiotic regimen

Difficulty in Analyzing Breast Reconstruction Data

• Variables that may influence outcomes
  – Thickness of mastectomy flaps
  – Incidence of skin necrosis
  – Preservation of nipple/areola
  – Use of acellular dermal matrix

Current State of Implant Based Breast Reconstruction

• Based on surveys of plastic surgeons
  

  – >80% always use drains
  – >70% use acellular dermal matrix
  – >60% always use postoperative antibiotics
  – 50% use antibiotics for a standard time (5-7 days)
  – 50% use antibiotics until drains out
Literature Review of Prophylactic Antibiotic Use in Surgical Patients

- Studies suggest that >24 hour postoperative prophylactic antibiotics not indicated in routine clean surgical procedures (Hawn, et al, 2011)
- Prophylactic antibiotics significantly reduce the incidence of surgical site infection in breast surgery without reconstruction (Cunningham, et al, 2006)
- Randomized clinical trials in breast reconstruction patients show significantly lower infection rates with prophylactic antibiotics (Amland, et al, 1995)

Current General Practices and Data for Implant Based Reconstruction

- No current consensus on postop antibiotic use
- Most common practice perioperative followed by either 5-7 day use or until drains removed
- Published surgical-site infection rates: 1-24%
- No clear consensus on how to report infection rates

Antibiotic Prophylaxis and Infection Risk in Expander/Implant Reconstruction

- Clayton, et al. UNC Surgical Improvement Program – despite increasing use of prophylactic antibiotics, no corresponding decrease in infection rates
- One year protocol of a single preoperative dose of antibiotics for all patients undergoing breast reconstruction compared to a group the year prior who received antibiotics until drains were removed

Clayton et al., 2012
- 250 patients
- Overall rate of surgical site infections increased from 18% to 34%
- Infections requiring reoperation increased from 4% to 16%
Antibiotic Prophylaxis and Infection Risk in Expander/Implant Reconstruction

- Clayton et al., 2012
  - Multivariate logistic regression: Preoperative-only antibiotic group 4.74 times more likely to develop surgical-site infection requiring reoperation
  - Preoperative-only antibiotic group 3.77 times more likely to require removal of the tissue expander/implant

UCSF Experience Expander/Implant Reconstruction

- Greater than 400 reconstructions each year
- Antibiotics continued until drains removed
- 17% overall incidence of infection
- 22% incidence of infection in radiated px
- Majority of infections resolved with PO antibiotics
- 5% risk of implant loss

Steps Taken at UCSF to Reduce Infection Rates

- Barrier between the skin and the prosthesis during placement
- Changing gloves prior to placement
- Alternative incisions with a h/o radiation
- Delaying implant placement when radiated
- Vigilant diagnosing and draining seromas
  - Strong cooperation with our colleagues in ultrasound and IR

Total Skin Sparing Mastectomy (preoperative photo)
Left mastectomy completed

2 mm skin flaps

Translucent Skin Flaps

Protective barrier preventing skin contact
Left expander reconstruction completed

Evaluating the Consequence of Breast Reconstruction Failure

• Why are we so concerned about the outcome of a non-life threatening scenario
• Why are we willing to put patients at risk for health issues in the future
• Need to explore the social significance of the breast as a body part and appreciate the impact of not having one or both