COMPARING INCIDENCE OF SURGICAL SITE INFECTION AFTER IRRIGATION WITH 0.05% CHLORHEXIDINE AND TRIPLE ANTIBIOTIC SOLUTION IN IMMEDIATE BREAST RECONSTRUCTION

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INTRODUCTION

Postoperative wound infection with tissue expander (TE) breast reconstruction historically has a broad rate of 5-20% [1-4]. Majority of studies demonstrate about 12-16% infection rate. Breast pockets are thus generally irrigated with a variety of solutions to decrease bacterial load.

Triple antibiotic solution ((1 g of cefazolin, 50,000 U of bacitracin, and 80 mg of gentamicin in 500 mL of NS) is commonly used to decreases bacterial growth [5,6]. However, the concern is that antimicrobials work during bacterium logarithmic growth phase.

0.05% chlorhexidine gluconate (CHG) is commonly used to prep skin and known to be bactericidal on contact with rapid and persistent activity against common bacteria such as Staphylococcus aureus and Escherichia coli among others.

Given this, we hypothesize that dilute chlorhexidine would decrease postoperative TE infections.

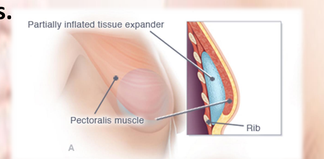

Fig 1. Tissue Expander Placement

OBJECTIVES

- ✓ Perform a **prospective, randomized study** comparing incidence of surgical wound infection between mastectomy wounds irrigated **with triple antibiotic solution (one side)** and **0.05% CHG (contralateral side)** in patients undergoing breast reconstruction
- ✓ Clinical trials: NCT02395614

METHODS

Inclusion criteria:
- ✓ Females 18-81 years old undergoing bilateral mastectomy
- ✓ Candidates for immediate breast reconstruction with tissue expanders (TE)

Exclusion criteria:
- ✓ Unilateral reconstruction
- ✓ Autologous reconstruction
- ✓ Bilateral reconstruction with other reconstructive techniques
- ✓ Allergies to treatment drugs

Consent patient.

↓

Randomize CHG to one side and record on surgery day. Irrigation of fluid is for 1 minute in pocket prior to TE placement.

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Examine breasts during clinic follow-up visits.

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End study at time of permanent implant exchange.

Fig 2. Procedure

Primary outcome:
- ✓ Frequency of surgical site infection (SSI)
  - ✓ Minor: treated with outpatient PO antibiotic tx
  - ✓ Major: IV antibiotics, surgical treatment
  - ✓ Explantation

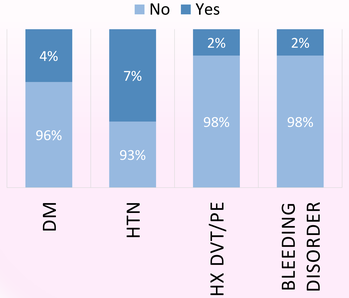
Secondary outcome:
- ✓ Necrosis
- ✓ Hematoma
- ✓ Wound separation
- ✓ Capsular contracture
- ✓ Implant extrusion
- ✓ Seroma

RESULTS

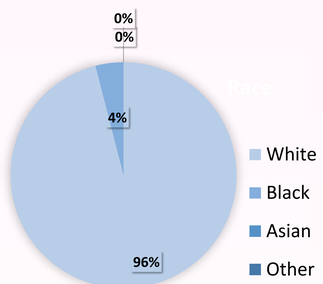
Demographics

Average age is **46.9**

Average BMI is **27.5**



Current Smoker 2%
Past Smoker 20%
Never Smoked 78%



80% with cancer diagnosis, 96% prophylaxis.

69% with no prior breast surgery.

42% with CA treatment.

Breast Reconstruction		Percent/ Value
Average length of operation		271 min
Type of Reconstruction	TE w/ ADM	89%
	TE w/o ADM	11%
	Above pec	24%
	Below pec	76%
Number of drains	1 on each side	16%
	2 on each side	84%
Average number of follow ups		7

Exchange for Implant		Percent/ Value
Average length of operation		126 min
Implant type	Saline	0%
	Silicone	100%
Average time to permanent implant exchange		183 days

Outcome	Triple Antibiotic (n=44)	CHG (n=44)	P Value (p<0.05)
SSI	3 (6.8%)	1 (2.3%)	0.62
- Major	0	1	
- Minor	2	0	
- Explantation	1	0	
Necrosis	12 (27.3%)	9 (20.5%)	0.62
- Partial thickness	8	5	
- Full thickness	4	4	
Hematoma	0 (0.0%)	0 (0.0%)	1.00
Wound Separation	1 (2.3%)	0 (0.0%)	1.00
Capsular Contracture	1 (2.3%)	0 (0.0%)	1.00
Implant Extrusion	0 (0.0%)	0 (0.0%)	1.00
Seroma	3 (6.8%)	3 (6.8%)	1.00

CONCLUSION

Preliminary data demonstrates **no significant difference** in infection rate between CHG and Triple Antibiotic Irrigation though trends showed **decreased infection in CHG group**.

In order to reach adequate power to demonstrate a true difference with the use of chlorhexidine with infection rates, enrollment is to continue.

REFERENCES

1. Reish RG et al. Infection following implant-based reconstruction in 1952 consecutive breast reconstructions: salvage rates and predictors of success. *Plast Reconstr Surg.* 2013 Jun;131(6):1223-30.
2. Francis SH et al. Independent risk factors for infection in tissue expander breast reconstruction. *Plastic and Reconstructive Surgery.*2009. 124 (6): 1790-1796.
3. Chun YS et al. Implant-based breast reconstruction using acellular dermal matrix and the risk of postoperative complications. *Plastic and Reconstructive Surgery.* 2010. 125 (2): 429 – 436.
4. Kim JY et al. A meta-analysis of human acellular and submuscular tissue expander breast reconstruction. *Plastic and Reconstructive Surgery.* 2012. 129 (1), 28 – 41.
5. Adams WP Jr et al. Enhancing patient outcomes in aesthetic and reconstructive breast surgery using triple antibiotic breast irrigation: six-year prospective clinical study. *Plast Reconstr Surg.* 2006;118:46SY52S
6. Adams WP Jr, Conner WC, Barton FE Jr, et al. Optimizing breast pocket irrigation: an in vitro study and clinical implications. Plast Reconstr Surg.2000;105:334Y338; discussion 339Y343