Do surgical closure techniques really effect the risk of surgical site infection (SSI) in dermatologic procedures?

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Introduction

- Closure techniques have been studied before as independent risk factors for SSI, though no large-scale studies have been done to understand their significance while taking patient demographic and surgical characteristics into consideration.

Primary Outcome

- Assess closure technique as an independent risk factor for surgical site infections on excisions and Mohs micrographic surgery.

Variables

Surgical Site Infection: Definition for Study

Antibiotics given one or more days after surgery, post-surgery visits notes that mentioned “infection”, culture positive report after surgery, purulent discharge, or signs and symptoms of pain, erythema, warmth, or pain on palpation.

Surgical Procedures of Interest

- Mohs micrographic surgery
- Excision

Closure Techniques

- Primary Closure
- Secondary Intention
- Flaps
- Grafts

Project Overview

Sample Size (n = 2453)

- Primary Closure: 1549
- Secondary Intention: 509
- Flap: 288
- Graft: 89

Infections (n = 184)

- Primary Closure: 184
- Secondary Intention: 104
- Flap: 21
- Graft:12

Method

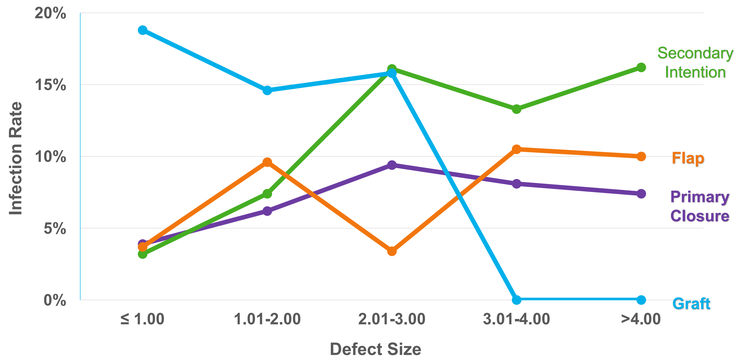
Step 1
Identified all patients who received an excision or Mohs between 2016-2019

Step 2
Demographic and surgical data collected on patients fitting inclusion criteria

Step 3
All quantitative data qualified into appropriate categories

Step 4
Univariate and Multivariate models with regards to surgical site infection created.

Data



	Surgical Site Infection by Closure Technique and Defect Size (cm)				
	≤ 1.00 cm	1.01 -2.00 cm	2.01 -3.00 cm	3.01 -4.00 cm	> 4.00 cm
Primary Closure Infection Rate, %	n = 256 **3.9%** (10)	n = 763 **6.2%** (47)	n = 351 **9.4%** (33)	n = 111 **8.1%** (9)	n = 68 **7.4%** (5)
Secondary Infection Rate, n	n = 62 **3.2%** (2)	n = 229 **7.4%** (17)	n = 118 **16.1%** (19)	n = 60 **13.3%** (8)	n = 37 **16.2%** (6)
Flap Infection Rate, n	n = 54 **3.7%** (2)	n = 146 **9.6%** (14)	n = 59 **3.4%** (2)	n = 19 **10.5%** (2)	n = 10 **10.0%** (1)
Graft Infection Rate, n	n = 16 **18.8%** (3)	n = 41 **14.6%** (6)	n = 19 **15.8%** (3)	n = 7 **0.0%** (0)	n = 6 **0.0%** (0)
Total Infection Rate, n	n = 389 **4.4%** (17)	n = 1186 **7.1%** (84)	n = 551 **10.5%** (58)	n = 198 **9.6%** (19)	n = 55 **10.9%** (6)

Results

Odds Ratio of Closure Techniques by Univariate Analysis

Secondary Intention	Flap	Graft	Reference
• OR 1.62 • P-value 0.01	• OR 1.11 • P-value 0.69	• OR 2.28 • P-value 0.01	• Primary Closure

Significant Multivariate Analysis SSI Risk Factors

Defect Size

- **1.01 - 2.00 cm**
  - OR 1.88, P-value 0.03
- **2.01 - 3.00 cm**
  - OR 2.88, P-value <0.001
- **3.01-4.00 cm**
  - OR 2.32, P-value 0.03
- **< 4.00 cm**
  - OR 2.86, P-value 0.01
- **Reference**
  - ≤ 1.00 cm

Primary Site

- **Lower Extremities**
  - OR 2.15, P-value 0.03
- **Lips**
  - OR 2.79, P-value 0.04
- **Reference**
  - Face

Gender

- **Female**
  - OR 1.45, P-value 0.02
- **Reference**
  - Male

* Notably, no closure technique was significant by multivariate analysis.

Conclusion

- **Closure technique alone is not a significant risk factor for SSI in dermatologic surgeries.**
- **Other factors such as defect size, primary site, and interestingly gender, seem to play a more significant role in SSI risk.**