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Tackling lower extremity surgical site infection in dermatologic surgery

Neera R. Nathan, MD, MSHS[1], Su Luo, MD and Suzanne M. Olbricht, MD

[1]Department of Dermatology, Harvard Medical School, Boston, MA

Background/Objectives: Surgical site infection (SSI) leads to excess healthcare costs and may contribute to increasing bacterial resistance rates due to use of antibiotics. SSI is the most common adverse event following dermatologic surgery,[1] especially when the procedure is performed on the lower extremity.[2] There is a dearth of information about factors that contribute to SSI following lower extremity dermatologic surgery, and further, investigations about prevention.

Methods and Results: In the first part of this study, we evaluated SSI rates following excision or Mohs surgery on the lower extremity using patient demographics, tumor characteristics, surgical approach and pathogenic organisms. Using a retrospective review of cases from the Lahey Clinic Department of Dermatology over a 15-month period, we demonstrated an SSI rate of 6.3% (21/332 cases). Of sites evaluated on the lower extremity, the lower leg was the most commonly infected area (70% of all cases, **Figure 1**). The predominant organism demonstrated on culture was Staphylococcus aureus, contained in 16 out of 21 cases; of which, two were Methicillin-resistant Staphylococcus aureus. A complete or partial purse-string repair closure was significantly associated with increased SSI rate (p<.0001). Ten of the infected cases (47%) were repaired with a purse-string closure while only 7.5% of all cases utilized this repair. Advanced age, location of the tumor, defect size, type of suture used, and duration of surgery did not appear to be significantly related to SSIs and neither, reassuringly, did trainee participation.

Given the predilection for SSI on the lower leg, we performed a prospective review of calamine and zinc oxide impregnated gauze wrap (Unna boot) applied post-procedure to see if this could reduce infection rates. An additional 410 cases over an 18-month period from our institution were analyzed. Unna boot was applied post-procedure in 70 cases on the lower extremity (**Table 1**). Five of the 70 cases were complicated by definitive infection (7.1%), compared to 20 (5.9%) cases that used standard dressings and home wound care (p=0.7829).

Conclusion: While a purse-string closure is a good option to reduce the surgical defect area and time to heal lower extremity wounds, our study suggests that there is a significantly increased SSI rate with this technique. One putative explanation is that a purse-string closure without excised dog-ears leads to greater tension and potential pressure necrosis in an area of already compromised blood supply. There was no significant difference between the rate of infection with and without Unna boot applied post-procedure. It is possible that selection

for patients with an increased risk of infection, including patients with venous stasis or limited ability to perform home wound care, was enriched in the Unna boot cohort. Further investigation is necessary to identify interventions that may help reduce the high infection rate following dermatologic surgery on the lower leg.

The control of infections following dermatologic surgery has implications not only for our field, but for the health care system at-large. Thorough investigation of this topic will exemplify dermatology as a leader in preventing complications and good antibiotic stewardship.

Figure 1. Site-specific infection rate following lower extremity dermatologic surgery.

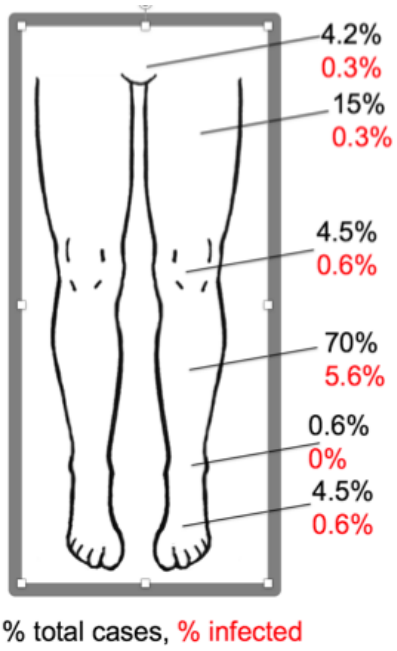

Table 1. Lower extremity dermatologic surgery infection rate with Unna Boot use.

	With Unna boot		**Without Unna boot**	
	n	Rate of infection %	*n*	Rate of infection %
Total number of Exc or Mohs	70		340	
Total suspected infections	10	14.30	40	11.80
No Culture	4		17	
Negative culture	1		1	
Total culture-proven infections	5		22	
Distinct events	5	7.10	20*	5.90

*2 patients had 2 sites each excised on the ipsilateral leg and subsequently infected following the same visit.

References:

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2. Dixon, AJ, Dixon, MP, Askew, DA, Wilkinson, D. Prospective study of wound infections in dermatologic surgery in absence of prophylactic antibiotics. Dermatol Surg 2006. (32)6: 819-826.