

Efficacy of Topical Vancomycin Powder in Reducing Postoperative Wound Complications following Foot and Ankle Surgery: A Retrospective Cohort Analysis

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INTRODUCTION: Wound complications, whether superficial or deep, can be challenging to manage after orthopaedic foot and ankle surgery. Intra-operative application of topical vancomycin powder within surgical wounds has shown promise in reducing surgical site infections (SSI) among patients with diabetes, lower extremity trauma, and following spine surgery. However, there are few studies with large patient populations that examine its use in orthopaedic foot and ankle surgery. The purpose of this study is to retrospectively evaluate and compare postoperative wound complications following foot and ankle surgery with and without intra-operative application of topical vancomycin powder within the surgical wound(s). We hypothesize that patients who received topical vancomycin within their surgical wound(s) will have lower rates of wound complications than those without.

METHODS: 367 patients that received foot and ankle surgery were retrospectively included in this study, with 93 and 274 patients with and without the use of topical vancomycin within surgical wounds during surgery, respectively. All surgeries were performed by a single fellowship-trained orthopaedic foot/ankle surgeon from February 2019 - October 2023. Exclusion criteria were patients <18 years old, those with wounds too small for usage of topical vancomycin, or those receiving surgery for treatment of an infectious condition. Retrospective chart review was performed to identify patient demographics, comorbidities, and post-operative outcomes including the incidence and nature of superficial and deep wound complications. Chi-squared and independent samples t-tests were performed to determine statistically significant differences in patient characteristics and post-operative wound problems between these two groups.

RESULTS: There were no statistically significant differences in patient demographics between the two groups. While patients without topical vancomycin were more likely to be current smokers (25% vs. 13%, p=0.013), there were no significant differences in rates of all the other comorbidities assessed between the two study groups. Patients who received vancomycin powder had nearly twice the length of hospital stay as patients in the Control group (34.4 hours vs. 17.27 hours, p=0.011). 13 of 93 (14%) patients who received topical vancomycin during surgery developed post-surgical superficial wound complications compared to 27 of 274 (10%) of patients who did not receive topical vancomycin during surgery (p=0.270). 5 of 93 (5%) and 8 of 274 (3%) patients that did and did not receive topical vancomycin at their wound during surgery, respectively, developed post-surgical deep wound complications with surgical site infection (p=0.268). There was no statistically significant difference in hospital readmission rates between the two study groups.

DISCUSSION AND CONCLUSION: This study demonstrates that the intra-operative use of topical vancomycin powder at surgical wounds does not significantly decrease the incidence of superficial or deep wound complications in foot and ankle surgery. Despite its reported value in preventing wound complications and/or surgical site infection in prior literature, this study showed no such benefit in the patient populations examined. Studies that are prospective with a larger patient population may be needed to further confirm this reported lack of difference when using topical vancomycin intra-operatively to minimize post-surgical wound complications.

Table 1. Comparison of demographics, comorbidities, and postoperative outcomes between patients who received topical vancomycin powder and those that did not during foot and ankle surgery.

Patient Characteristics	Vancomycin Powder (n=93)	Control (n=274)	p-value
Age	43.12 ± 15.95	43.84 ± 14.66	0.889
Sex			0.851
Male	34 (37)	98 (36)	
Female	59 (63)	176 (64)	
Side	32.34 ± 24.45	31.06 ± 7.13	0.258
Laterality			0.842
Right	51 (55)	147 (54)	
Left	42 (45)	127 (46)	
Anatomic Location			0.346
Ankle	50 (54)	167 (61)	
Foot/heel	30 (32)	80 (29)	
Heel/foot	4 (4)	15 (5)	
Midfoot	8 (9)	15 (6)	
Leg	1 (1)	1 (0.4)	
Mechanism of Injury			0.988
Traumatic	50 (54)	147 (54)	
Degenerative	43 (46)	126 (46)	
Comorbidities			
Diabetes	13 (14)	41 (15)	0.845
Hypertension	28 (30)	99 (36)	0.281
COPD	1 (1)	7 (3)	0.386
PVD	2 (2)	21 (8)	0.037
Hypercholesterolemia	4 (4)	17 (6)	0.480
Total CCI Score	1.40 ± 1.70	1.88 ± 1.88	0.921
Smoking	51 (55)	189 (69)	0.008
Marijuana Use	29 (31)	89 (32)	0.801
History of IV Drug Use	3 (3)	7 (3)	0.755
Alcohol Abuse	1 (1)	17 (6)	0.251
Postoperative Outcomes			
Wound Complication	18 (19)	35 (13)	0.119
Superficial Infection	13 (14)	27 (10)	0.227
Deep Infection	5 (5)	8 (3)	0.268
Total Length of Stay (Hours)	34.4 ± 88.65	17.27 ± 38.13	0.031
Discharged on antibiotics	80 (87)	247 (90)	0.052
Readmission	5 (5)	13 (5)	0.813

n (percent), mean ± SD