



## Background

Calcaneal osteomyelitis accounts for approximately 3-10% of cases of all osteomyelitis and there is limited data comparing the general outcomes of calcaneal osteomyelitis vs. non-calcaneal foot osteomyelitis.

## Methods

This was a retrospective, observational cohort study of patients treated with at least 4 weeks of antibiotic therapy or surgical intervention for calcaneal or non-calcaneal OM at the VA St. Louis Health Care System between 1 January 2010 and 30 June 2021.

The primary outcome was treatment failure, defined as a follow-up encounter for new surgical intervention or re-initiation of antibiotics within 6 months of completion of initial surgical intervention or antibiotic therapy. Secondary outcomes included individual components of the primary outcome and antibiotic adverse events. A secondary subgroup analysis was performed for treatment failure in those receiving surgical intervention as part of initial therapy. The variables of calcaneal OM, poorly controlled diabetes, severe peripheral vascular disease, treatment for  $\geq 2$  weeks at a skilled nursing facility, and amputation as part of treatment were included in a univariate analysis and any variables with a  $p < 0.2$  were subsequently placed into a multivariate regression model to determine if any stated variables were independently associated with treatment failure.

### Inclusion

- Age 18-89 years old treated for calcaneal or non-calcaneal foot osteomyelitis
- Receipt of a total of at least 4 weeks of continuous antibiotic therapy or surgical intervention

### Exclusion

- Mortality prior to completion of initial antibiotic course
- Additional osteomyelitis episodes at an included anatomic site occurring more than 6 months after completion of treatment

**Table 2:** Baseline Characteristics

Baseline Characteristics	Calcaneal (n=40)	Non-calcaneal (n=40)	P-value
Age, mean (standard dev)	67 (8.2)	62 (9.1)	0.013
Male	40 (100%)	40 (100%)	
Race, no. (%)			
Caucasian	23 (57.5%)	31 (77.5%)	
African American	16 (40%)	9 (22.5%)	
Other	0	1 (2.5%)	
Diabetes with A1c $\geq 9$ within 1 year prior, no. (%)	15 (37.5%)	18 (45%)	0.496
Renal impairment (CrCl $< 30$ ml/min), no. (%)	3 (7.5%)	8 (20%)	0.105
Peripheral vascular disease, no. (%)	20 (50%)	15 (37.5%)	0.260
Intervention for peripheral vascular disease within 1 year prior, no. (%)	7 (17.5%)	2 (5%)	0.077
Presence of hardware or device, no. (%)	5 (12.5%)	7 (17.5%)	0.531
History of IV drug use, no. (%)	2 (5%)	0 (0%)	0.152
History of osteomyelitis at same site, no. (%)	2 (5%)	7 (17.5%)	0.770
History of osteomyelitis at different site, no. (%)	10 (25%)	10 (25%)	1.000
Bone biopsy obtained, no. (%)	25 (62.5%)	14 (35%)	0.014
Definitive therapy, no. (%)	31 (77.5%)	19 (47.5%)	0.006
Surgical treatment, no. (%)	26 (65%)	23 (57.5%)	0.491
I&D in OR, no. (%)	19 (47.5%)	12 (30%)	0.76
I&D at Bedside, no. (%)	5 (12.5%)	4 (10%)	0.76
Amputation, no. (%)	5 (12.5%)	13 (32.5%)	0.032
Antibiotic therapy, no. (%)	36 (90%)	40 (100%)	0.040
Days of total therapy, median days (IQR)	42 (42-42)	56 (43-69)	0.086

## Results

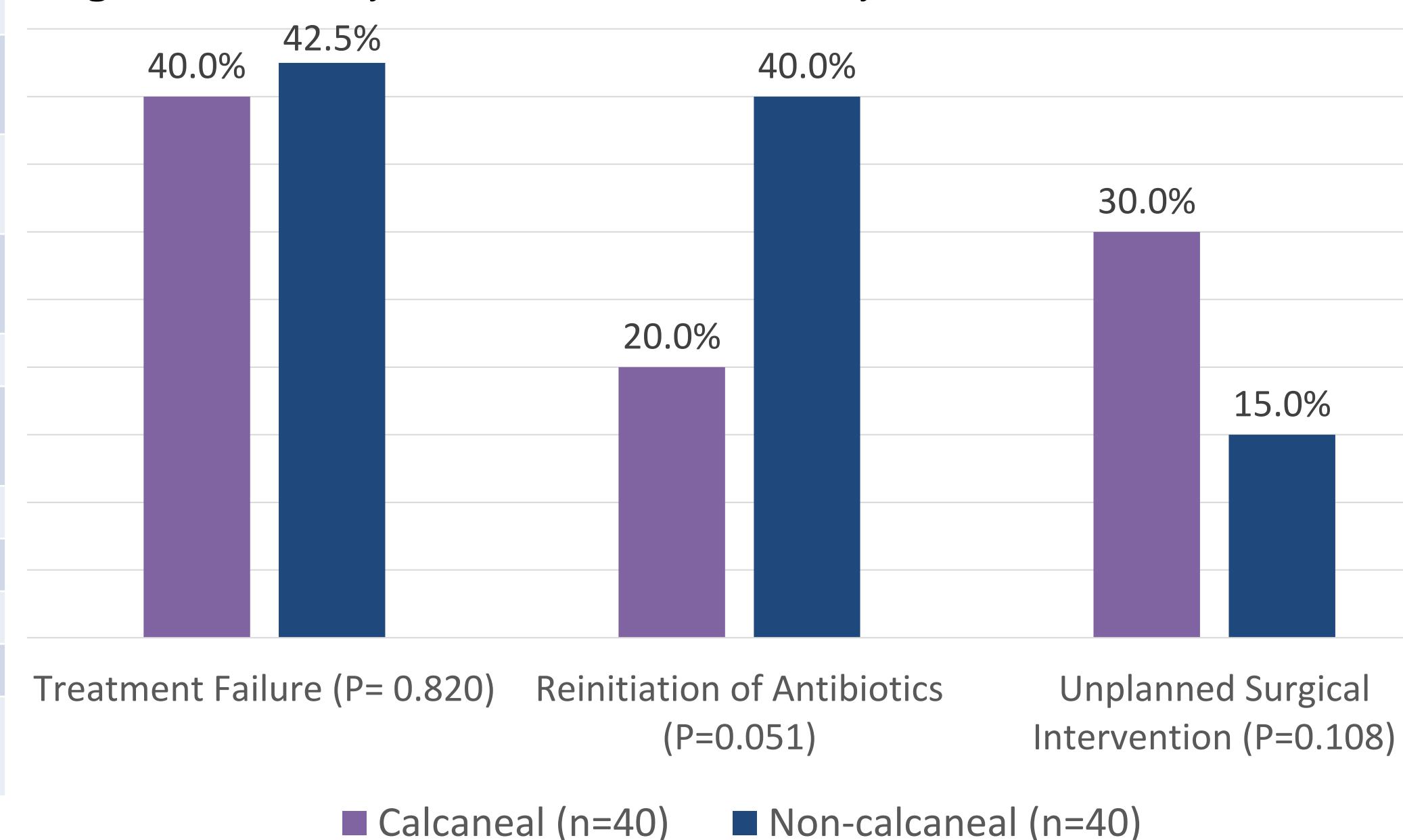
**Table 3:** Culture data

Culture data	Patients with culture data (n=64)
Type of culture sample	
Blood, no. (%)	1 (1.5%)
Bone, no. (%)	31 (48.4%)
Swab, no. (%)	29 (45.3%)
Tissue, no. (%)	8 (12.5%)
Common organisms	
Enterococcus spp., no. (%)	16 (40%)
MSSA, no. (%)	12 (30%)
MRSA, no. (%)	8 (20%)
Pseudomonas, no. (%)	9 (22.5%)
CONS, no. (%)	8 (20%)

**Table 4:** Antibiotics

Commonly Used Antibiotics	Patients receiving antibiotic therapy (n=76)
Vancomycin, no. (%)	33 (43.4%)
Cefepime, no. (%)	18 (23.7%)
Ceftriaxone, no. (%)	20 (26.3%)
Metronidazole, no. (%)	20 (26.3%)

**Figure 1:** Primary Outcome and Secondary Outcomes



**Table 5:** Adverse effects

Adverse events	Calcaneal (n=9)	Non-calcaneal (n=11)
AKI, no. (%)	2 (22.2%)	4 (36.4%)
Eosinophilia, no. (%)	2 (22.2%)	1 (9.1%)
Encephalopathy, no. (%)	1 (11%)	--
Transaminitis, no. (%)	1 (11.1%)	1 (9.1%)
Rash, no. (%)	1 (11.1%)	1 (9.1%)
CPK elevation, no. (%)	2 (22.2%)	1 (9.1%)
C. difficile, no. (%)	--	3 (27.3%)

**Table 6:** Subgroup Analysis

Surgical intervention subgroup analysis	Calcaneal (n=26)	Non-calcaneal (n=23)	P-value
Treatment failure	11 (42.3%)	12 (52.2%)	0.490

**Table 7:** Univariate Analysis

Risk factor	P value
Calcaneal Osteomyelitis	0.820
Severe diabetes	0.457
Severe PVD	0.836
Treatment for at least 2 weeks in nursing facility	0.845
Amputation as part of definitive therapy	0.845
Vancomycin-containing regimens	0.926

## Conclusion

There was no statistically significant difference between calcaneal and non-calcaneal outcomes in regards to treatment failure, rates of re-initiation of antibiotics, rates of unplanned surgical interventions, and rates of adverse events. The study was not able to identify any risk factors for treatment failure in calcaneal osteomyelitis.

## Disclaimer

This material is the result of work supported with resources and the use of facilities at the VA St. Louis Healthcare System. The contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government. This study was approved by the Institutional Review Board (IRB) at the VA St. Louis Healthcare System.