

Hand Infections: A 10-Year, Multicenter Retrospective Analysis of 743 Cases Highlighting Epidemiology, Microbiology, Surgical Management and Outcomes

Jacob Denton¹, Ali Abdulsahib¹, Esha Rajadhyaksha¹, Tolga Turker², Talha Riaz¹

¹Division of Infectious Diseases, College of Medicine – Tucson ²Department of Orthopedic Surgery, College of Medicine – Tucson



THE UNIVERSITY OF ARIZONA
College of Medicine
Tucson

Introduction

Orthopedic hand infections are a frequent reason for referral to orthopedic surgery and infectious diseases, presenting as deep space infections, tenosynovitis, abscess, or osteomyelitis with widely variable treatment courses. We present a large, single-system case series characterizing the epidemiology, risk factors, treatment, and outcomes of orthopedic hand infections in Southern Arizona.

Methods

Inpatient records with ICD-10 codes for hand infections, 2013–2023

1,768 records identified

743 hand infections included

Manual extraction of demographic & clinical data from each chart

Table 1. Baseline Patient Characteristics (N = 743)	
Characteristic	n (%) of 743
Male sex	491 (66.1%)
Diabetes mellitus	182 (24.5%)
Peripheral vascular disease	28 (3.8%)
Chronic kidney disease	61 (8.2%)
Chronic liver disease	59 (7.9%)
Rheumatoid arthritis	14 (1.9%)
Gram-positive cocci (predominant pathogen)	425 (57.2%)
Gram-negative rods / bacilli	97 (13.1%)

Comorbidities and pathogen classes were not mutually exclusive.

Table 2. Comparison by Treatment Failure Status			
Variable	No Failure (n=670)	Failure (n=73)	p-value
Diabetes mellitus	147 (21.9%)	35 (47.9%)	<0.001
Peripheral vascular disease	18 (2.7%)	10 (13.7%)	<0.001
Chronic kidney disease	48 (7.2%)	13 (17.8%)	0.003
Prior trauma (occupational, etc.)	177 (26.4%)	32 (43.8%)	0.003
Intraoperative bone necrosis	25 (3.7%)	13 (17.8%)	<0.001
Intraoperative tendon necrosis	40 (6.0%)	13 (17.8%)	<0.001
Amputation performed	34 (5.1%)	25 (34.2%)	<0.001
Bone resection performed	41 (6.1%)	19 (26.0%)	<0.001

Treatment failure defined as readmission after discharge, amputation, or death (n=73 of 743, 9.8%).

Results

83.0% required surgical intervention (617 of 743)
No comorbidity was associated with surgical intervention

9.8% (73 of 743) had recorded treatment failure
Defined as readmission after discharge, amputation, or death

Diabetes & PVD associated with higher risk of treatment failure
Diabetes: OR 3.28, p<0.001 • PVD: OR 5.75, p<0.001

Bone / Tendon Necrosis Intraoperative findings also associated with treatment failure
Bone necrosis: OR 5.59, p<0.001 • Tendon necrosis: OR 3.51, p<0.001

278 / 234 patients had a recorded CRP / ESR value
Serially trended in only 4 (CRP) and 14 (ESR) patients — overall <2%

Higher NLR associated with need for surgery and treatment failure
Surgery: 6.14 vs 4.46, p=0.034 • Failure: 7.71 vs 5.62, p=0.026

Conclusion

- In this 10-year case series, diabetes and peripheral vascular disease identified hand-infection patients at highest risk of treatment failure.
- Inflammatory markers were markedly underutilized for monitoring treatment response.
- The neutrophil-to-lymphocyte ratio — derived from a routine complete blood count — was associated with both need for surgery and treatment failure, and may offer a low-cost adjunct for early risk stratification.

Inflammatory Markers Graphs

WBC (Pre → Mid → End)

ESR (Pre → Mid → End)

CRP (Pre → Mid → End)

Neutrophil-to-Lymphocyte Ratio by Treatment Failure

Neutrophil-to-Lymphocyte Ratio by Surgery Status

European Bone & Joint Infection Society
EBJIS

EBJIS-MSIS 2026 | 17-19 SEPTEMBER · PORTO · PORTUGAL

MUSCULOSKELETAL
INFECTION