Locoregional Microbiology Differs by Mechanism, Location, Type, and First Intervention at Initial Evaluation: Novel Findings in Hand Infection Epidemiology

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INTRODUCTION: Hand infections confer significant functional morbidity due to prolonged recovery, loss of time at work, and diminished ability with activities of daily living. Prior investigations have focused exclusively on patients who were operated on. Delineating the locoregional microbiology of hand infections, including patients drained non-operatively who may have a different pathologic microbiome, can lead to a superior understanding of infection epidemiology and optimize initial antibiotic regimen.

MATERIALS AND METHODS: A prospective registry enrolled surgical hand infection patients. Infections were categorized by mechanism, location, and type. Patients were stratified by first intervention at initial evaluation. Chi-squared analysis compared microbiology by covariate.

RESULTS: 177 patients presented with a total of N = 238 culture results. Mechanisms were as follows: 5% burn, 4% fight bite, 34% trauma, 17% IVDA, 10% animal bite, 1% cancer-related, 2% dermatologic lesion, 1% sepsis, 1% foreign body, and 44% idiopathic. Locations occurred as follows: 10% thumb, 50% digit, 22% hand, 23% wrist, 20% forearm. Type was as follows: 9% paronychia, 5% felon, 57% abscess, 4% tenosynovitis, 5% osteomyelitis, 2% fasciitis, 18% joint. At initial evaluation, 23% were discharged after bedside drainage, 11% were admitted without drainage, 26% were admitted after bedside drainage, while 40% went to the OR.

From cultures, 71% grew Gram-positive microorganisms, 13% Gram-negative, 1% fungal, 5% few mixed, and 11% showed no growth. The overall prevalence of Staph aureus was 41%, with 19% MRSA. The prevalence of Staph aureus was significantly different in patients with mechanisms that were traumatic (51%, p=0.03), IVDA (18%, p<0.01), animal bites (21%, p<0.03), and idiopathic (62%, p<0.01), in locations in the digits (51%, p<0.01), wrist (23%, p=0.05), and forearm (20%, p<0.01), in infection types that were felon (69%, p<0.04) and joint (28%, p=0.05), and in patients who went to the OR at initial evaluation (30%, p<0.01).

CONCLUSIONS: These findings suggest that our locoregional infection microbiology varies significantly by mechanism, location, type, and in patients initially triaged for operative drainage. Coupled with sensitivity data, these findings can develop a risk-stratified, optimized algorithm for initial empiric antibiotic choice at presentation as a function of mechanism, location, type, and triage, which could potentially reduce inpatient length-of-stay and hasten recovery to normal functional status in this patient population.