



Role of Bone Biopsy and Deep Tissue Culture for Antibiotic Stewardship in Diabetic Foot Osteomyelitis



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BACKGROUND

Bone biopsy is the gold standard for diagnosing infectious osteomyelitis (OM), but it is not always done in the setting of diabetic foot infection (DFI), even where resistant organisms are common.

OBJECTIVES

- To describe organisms frequently identified on bone biopsy or deep tissue culture in patients with diabetic foot osteomyelitis (DFO)
- To determine how culture data impacted antibiotic use in patients with DFO

METHODS

- Retrospectively reviewed adults admitted with a diabetic foot ulcer (DFU) and selected for those diagnosed with DFO

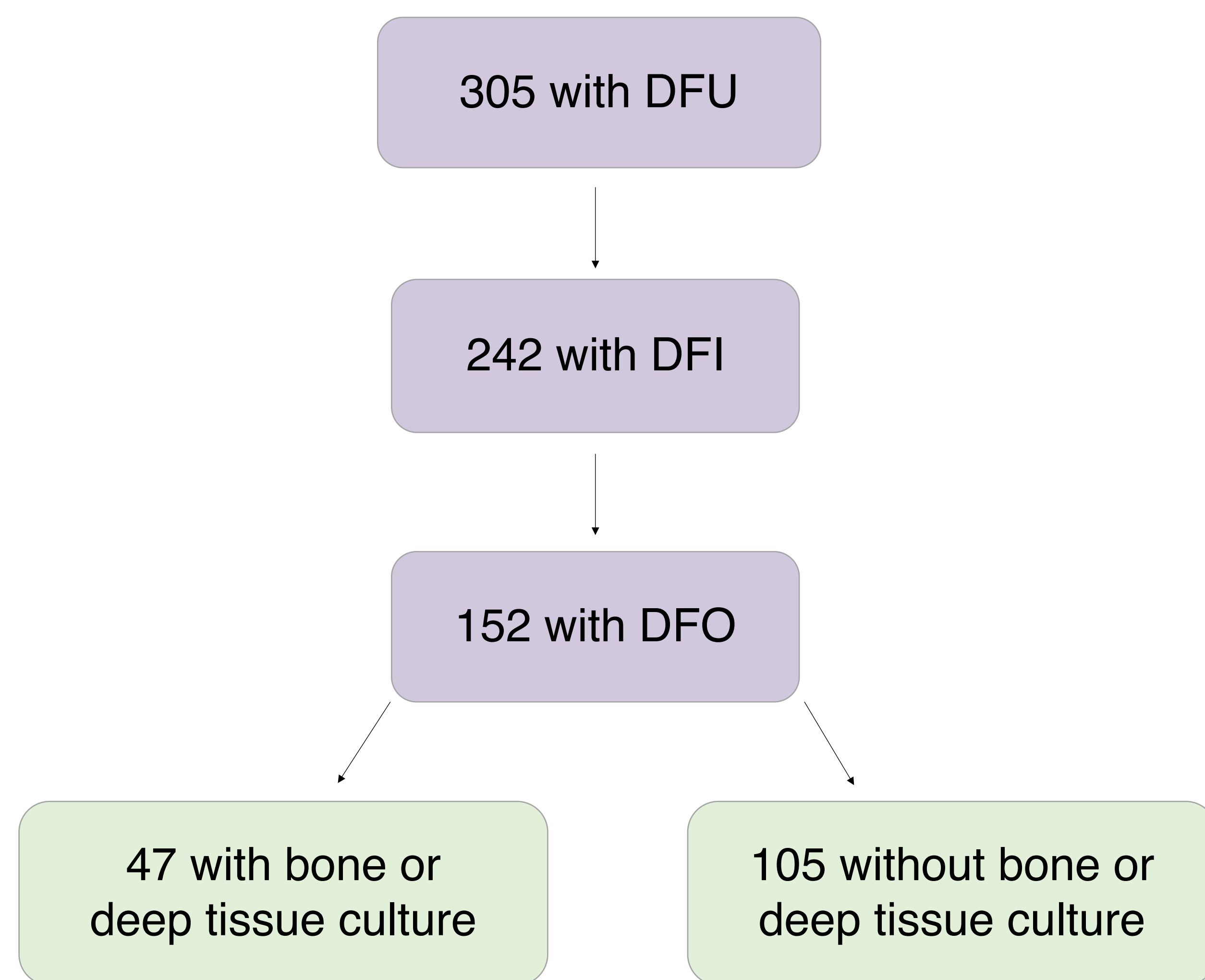


Figure 1: Flowchart for patient inclusion. We selected for patients diagnosed with DFO and stratified patients by whether a bone biopsy or deep tissue culture was obtained.

RESULTS

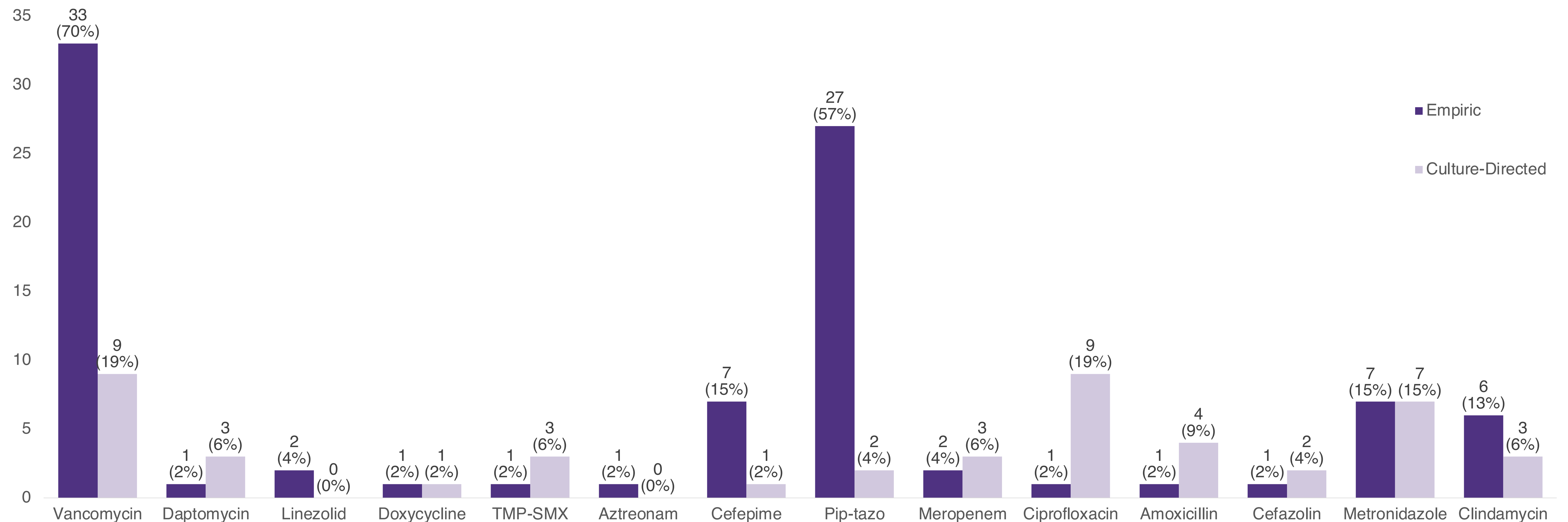


Figure 2: Rate of antibiotic utilization: empiric vs culture-directed. In patients who underwent deep tissue or bone biopsy, the most common empiric antibiotics were vancomycin and piperacillin-tazobactam (pip-tazo). Vancomycin was discontinued in 51% of patients after culture data was obtained, although it was one of the most common culture-directed antibiotics, along with ciprofloxacin and metronidazole.

	Patients (n=47)	Percent
Positive Culture	43	91.5%
Gram Positive Organisms	32	68.1%
<i>Staphylococcus aureus</i>	13	27.7%
Coagulase Negative Staph (CoNS)	8	17.0%
<i>Streptococcus spp</i>	14	29.8%
<i>Enterococcus spp</i>	12	25.5%
Gram Negative Organisms	17	36.2%
<i>Pseudomonas aeruginosa</i>	3	6.4%
<i>Proteus spp</i>	6	12.8%
<i>Klebsiella spp</i>	5	10.6%
<i>Escherichia coli</i>	3	6.4%
MDROs	7	14.9%
MRSA	5	10.6%
ESBL	2	4.3%
Antibiotics Changed	41	87.2%
Narrowed	29	61.7%
Broadened	4	8.5%

Table 1. Bacteria isolated from deep tissue and bone biopsy culture of diabetic foot osteomyelitis and effect on antibiotic therapy

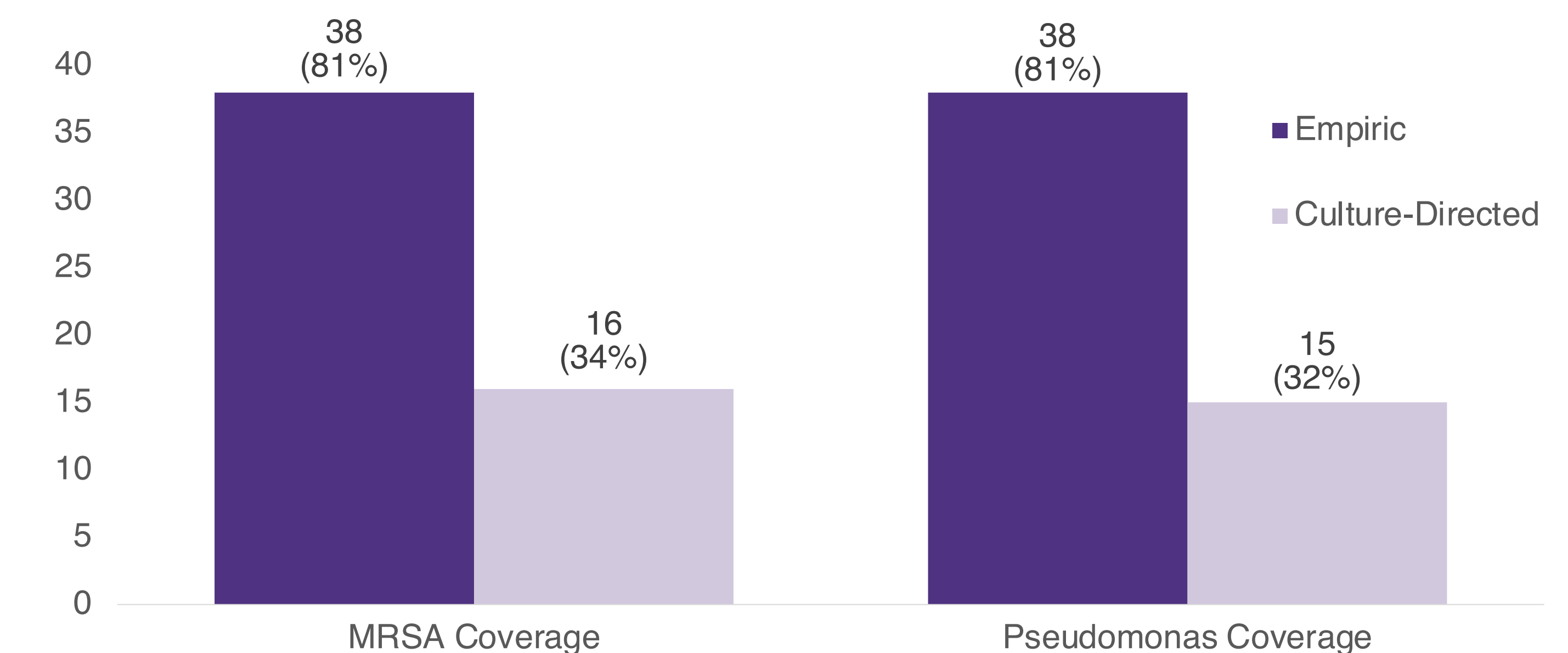


Figure 3: Culture data allowed for decreased rates of MRSA and Pseudomonas coverage. Culture data allowed for discontinuation of MRSA coverage (vancomycin, daptomycin, linezolid, doxycycline, and trimethoprim-sulfamethoxazole) in 47% of patients and pseudomonal coverage (aztreonam, cefepime, meropenem, and piperacillin-tazobactam) in 49% of patients.

CONCLUSIONS

In patients with DFO, bone biopsy and deep tissue culture was infrequently obtained but resulted in targeted therapy changes in most patients. Culture data usually allowed for narrowing of antibiotics but revealed inadequate empiric coverage in a subset of patients.