



# Pressure Ulcers in Patients with Spinal Cord Injuries: Concordance Between Swab and Intraoperative Culture

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## BACKGROUND

Infection of pressure ulcers constitutes the most frequent complication in spinal cord-injured patients; evidently, the surgical treatment of infected pressure ulcers is effective only when combined with a selected antibiotic therapy. However, the choice of the appropriate antibiotics is not simply due to the widespread variety of bacterial species involved in such infections.

Only a few studies in the literature compare wound swabs with biopsies for the diagnosis of chronic infected wounds.<sup>1</sup> Until now, the Levine technique has been considered as the most reliable and valid method. Still, the best sampling technique for taking a swab has not yet been identified and validated.<sup>2</sup>

The objective of our study is to assess the predictive value of ulcer swab specimen culture in identi-

fying etiological agents of infection in patients with spinal cord injury (SCI) and pressure sores.

## METHODS

Prospective, observational, single-centre study on adult patients with SCI undergoing surgical debridement and reconstruction for pressure ulcers was conducted at Montecatone Rehabilitation Institute from July 2011 to January 2014.

Before surgery, an ulcer swab specimen was taken with Levine technique and sent for culture.

During surgery, bone and soft-tissue specimens were collected and sent for culture and histological evaluation.

The results of cultures of swabs and intraoperative specimens were compared.

## RESULTS

During the study period, 64 patients were treated.

On admission, 37 patients (58%) had fever and the median C-reactive protein serum level was 2.3 mg/dL (interquartile range, 1.4–5.2).

According to histology of intraoperative specimens, diagnostic certainty of osteomyelitis was present in 53% of patients (34/64).

Culture of intraoperative specimens yielded monomicrobial infection in 30% and polymicrobial in-

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fection in 47% of cases; culture was negative in 23% of cases. The most common microorganisms found were *Staphylococcus aureus*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*, which were cultured in 33%, 19%, and 12.5% of cases, respectively.

Results of culture of swabs and intraoperative specimens were concordant in 25% of cases (16/64). Different microorganisms were the main reason for nonconcordance in 40% of cases: false positives (swab culture positive/intraoperative culture negative) were 13 (20%) and false negatives (swab culture negative/intraoperative culture positive) were 10 (15%).

At univariate analysis, the presence of osteomyelitis was associated with nonconcordance ( $P = 0.001$ ).

## CONCLUSION

In our cohort of patients with SCI and infected pressure ulcers, results of culture of swab specimen

were predictive of etiology of infective process only in 25% of cases.

These findings suggest that ulcer swab specimen culture is not reliable enough to guide the choice of antimicrobial therapy in clinical practice, especially when osteomyelitis is present.

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