

The 'Minneapolis Score': A Pre-Operative Scoring System for Spinal Cord Injury Pressure Ulcer Treatment – An Outcome Analysis.

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Abstract

Introduction:

The short and long-term outcome of pressure ulcer (PU) treatment with tissue flaps in spinal cord injury (SCI) patients has been very variable in the literature. Overall complication rates are reported from 4-50%, and PU recurrence rates are reported from 3-82%¹⁻³. We describe a scoring system that stratifies SCI patients pre-operatively based on **M**edical, **N**utritional, **P**sychological, **P**hysical, **L**ocal, **S**urgical, **S**ocial, and **S**urface variables (The MNPPLSSS: 'Minneapolis Score') with the hypothesis that this stratification would assist in determining candidacy for surgical treatment to improve outcome.

Methods and Materials:

The 'Minneapolis Score' system was implemented in January 2012, and was used as a guide to determine surgical candidacy (ideally Score < 15 and no 'auto-fail' factors were deemed ideal surgical candidates). Patients who had their flaps performed between 2008-11 (Group A) had their Minneapolis Score calculated retrospectively, while the score was calculated to determine flap candidacy for patients from 2012-13 (Group B). A retrospective study of SCI patients who underwent PU flap surgery from January 2008 - December 2013 was subsequently performed. The 'Minneapolis Score', and outcome data were collected and analyzed. A p-value of <0.05 was considered significant.

Results:

A total of 54 flaps were performed on 42 patients (all males, Mean age: 60 years). The mean follow up period was 22.7 months (Range: 3.5 – 59.8 months). There were 37 (68.5%) flaps performed in Group A; and 17 (31.5%) flaps performed in Group B. The mean 'Minneapolis Score' for Group A was 15 (Range: 5-29), and for Group B was 11 (Range: 8-19) (p=0.036). Additionally, in Group A, 16 (43.2%) cases scored ≥15, while in Group B only 4 (23.5%) cases scored ≥15 (p=0.09). In Group A, there were 54.1% (n=20) minor wound complications and 13.5% (n=5) major complications; whereas, in Group B, there were 47.1% (n=8) minor wound complications (p=0.21), and 5.8% (n=1) major complications (p=0.29). A higher 'Minneapolis Score' was associated with a higher risk of long-term flap failure and pressure ulcer recurrence (OR: 1.15, p=0.04). The mean score for the 6 major flap failures was 18.2 (Range 9-29). When we analyzed the data using a score of 10 as our cutoff point, the association of Minneapolis Score with minor complications was stronger (p=0.07), and 66.68% (n=4) flap failures fell over this cutoff point.

Conclusions:

The 'Minneapolis Score' may help determine which SCI patients are potentially better candidates for flap surgery and may have an impact on decreasing flap failure and recurrent pressure ulcer rates.

References:

1. Cushing CA, Phillips LG. Evidence-Based Medicine: Pressure Sores. *Plast Reconstr Surg.* 2013;132(6): 1720-1732.
2. Sameem M, Au M, Wood T, et al. A Systemic Review of Complication and Recurrence Rates of Musculocutaneous, Fasciocutaneous, and Perforator-Based Flaps for Treatment of Pressure Sores. *Plast Reconstr Surg.* 2012;130(1):67e-77e.
3. Tchanque-Fossuo,C; Kuzon, WM. An Evidence-Based Approach to Pressure Sores. *Plast Reconstr Surg.* 2011;127(2):932-939.

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