

Journal Pre-proof

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PII: S1748-6815(22)00688-X
DOI: <https://doi.org/10.1016/j.bjps.2022.11.060>
Reference: PRAS 8098



To appear in: *Journal of Plastic, Reconstructive & Aesthetic Surgery*

Received date: 15 April 2021
Accepted date: 29 November 2022

Please cite this article as: Joao Ferreira , Gregory Nicolas , Daniel Valente , Dimas Milcheski , Marita Saliba , Rolf Gemperli , Surgical Treatment of Sacral Pressure Wounds in Patients with COVID-19: a Case Series, *Journal of Plastic, Reconstructive & Aesthetic Surgery* (2022), doi: <https://doi.org/10.1016/j.bjps.2022.11.060>

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Correspondence and Communications

**Surgical Treatment of Sacral Pressure Wounds in
Patients with COVID-19: a Case Series**

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Abstract

Introduction

The COVID 19 pandemic has resulted in an increased number of patients requiring intubation and intensive care. This has led to an increased incidence of sacral pressure ulcers requiring surgical management. We report our experience of COVID 19 related sacral pressure ulcers requiring surgical reconstruction.

Methods

A case series study was performed with 12 patients who presented grade IV sacral pressure ulcers after hospitalization for COVID-19 in a single institution. The mean age was 49.8 years and the most frequent comorbidities were arterial hypertension, diabetes and obesity, each present in 6 patients. All of them were submitted to surgical reconstruction with fasciocutaneous

flaps after improvement of their clinical status. Follow up time was of at least 30 days after reconstruction. Preoperative laboratory tests and surgical outcomes were compared to data available in the literature.

Results

No major dehiscence was observed and minor dehiscence happened in 2 cases (16.7%). Out of the 12 patients, 8 (66.7%) had hemoglobin levels less than 10.0 and 5 (41.7%) had albumin levels less than 3.0, though this did not lead to a higher rate of complications.

Conclusion

This study showed that ambulating patients with grade IV pressure ulcer after COVID-19 infection may undergo debridement, negative-pressure wound therapy and closure with local flaps with adequate results and minimal complication rate.

Keywords: COVID-19, Negative-pressure wound therapy, flaps, sacral pressure lesions

Introduction

As of September 2020, Brazil had the third highest number of COVID-19 cases in the world, with more than 4 million confirmed cases.

As a reference in the treatment of the disease in the city of São Paulo, and because it has about 7% of the total ICU beds in the municipality (1), the Hospital of Clinics, Faculty of Medicine, University of São Paulo (HC-FMUSP) complex concentrates the most severe cases and consequently has a higher proportion of intubated patients in their ICUs.

A rapid increase of sedated and intubated patients happened during the COVID-19 pandemic.

This led to a higher incidence of hospital acquired pressure sores in intensive care units. In the largest center of COVID-19 treatment in Brazil, an immediate response of the Plastic Surgery department was necessary for the surgical treatment of grade IV sacral pressure lesions.

Methods

A case series study was performed with patients who presented grade IV sacral pressure lesions after hospitalization for COVID-19 in a single institution. Patients treated between March and June were recruited, and cases with grade IV sacral pressure ulcers (2) that developed during hospitalization for COVID-19 in our institution and that were treated surgically were included. Patients with positive rt-PCR for COVID-19 at the time of reconstruction, sacral ulcers unrelated to COVID-19 and those who lost follow-up (minimum of 30 days after the operation) were excluded. All of them were submitted to surgical reconstruction with fasciocutaneous flaps after improvement of their clinical status, 18 to 45 days (average of 31,1 days) after they were extubated. Preoperative laboratory tests and surgical outcomes were compared to data available in the literature. Surgeries performed consisted of debridement associated with negative-pressure wound therapy followed by wound closure through fasciocutaneous flaps performed from the unilateral or bilateral gluteal region.

Results

No major dehiscence was observed and minor dehiscence happened in 2 cases (16.7%). Out of the 12 patients, 8 (66.7%) had hemoglobin levels less than 10.0 and 5 (41.7%) had albumin levels less than 3.0. Even so, this did not lead to a higher rate of complications.

Discussion

Certain populations are at an increased risk of developing pressure injuries such as patients with hip fractures (range 8.8 to 55%), spinal cord injuries (range 33 to 60%) (3) elderly patients with immobility and cachexia, as well as trauma patients in the lower limbs. Although previous studies have shown that the development of pressure injuries in the hospital environment does

not result in higher mortality in ICU patients, they can indirectly contribute to mortality in certain patients (4).

In a cohort of 99 patients admitted due to COVID-19, the length of hospital stay averaged 22 days in patients with moderate pulmonary conditions and 25 days in patients with severe conditions (5). The average length of stay presented in our paper was 59 days. This may imply that these were more severe cases, since the meantime of intubation was 14 days and the meantime in the ICU was 21 days.

As for the best time to reconstruct sacral lesions, in this study, of the 12 patients, 8 (66.7%) had hemoglobin levels less than 10.0 and 5 (41.7%) had albumin levels less than 3.0. This did not lead to a higher rate of complications.

Chronic pressure injuries can have a relatively well-defined bursa in continuity with the base of the injury and methylene blue can be used to demarcate its margins. The approach commonly performed by plastic surgeons in the surgical treatment consists of complete excision of the injury, including devitalized tissue, scar and bursa; removal of possibly exposed bone and padding of any bony prominences; filling dead space; and covering the lesion with large pedicled regional flaps. The flap design should be as large as possible, placing the suture line as far away from the direct pressure zone as possible. The design must also preserve territories of adjacent flaps and allow for new advancement or rotation in cases of complications or recurrence.

Recent innovations that include NPWT combined with instillation have further increased the arsenal against difficult-to-treat wounds or high-risk complications cases. In this series of cases, it was used just the conventional NPWT.

The patients in this study, who had hospitalization and prolonged immobilization due to COVID-19, did not have paraplegia. They were ambulating, with preserved sensitivity and had the

possibility of frequent decubitus changes, allowing for an easier postoperative period with fewer complications.

Conclusion

This study showed that ambulating patients with grade IV pressure injury after COVID-19 infection may undergo debridement, negative-pressure wound therapy and closure with local flaps with adequate results and minimal complication rate. These findings led us to conduct a prospective cohort to investigate rates of surgical complication and preoperative optimization in ambulating patients with grade IV sacral pressure injury after COVID-19 infection.



Figure 1: *Intraoperative flap dissection and Immediate post-op.*

Table 1.

PATIENT	GENERAGE	AGE	COMORBIDITIES	CT SCAN SUGGESTIVE OF COVID-19	POSITIVE PCR-SARS-COV 2	OROTRACHEAL HEALING INTUBATION	DAYS OF INTUBATION	DAYS OF ICU STAY BEFORE RECONSTRUCTION	DAYS OF HOSPITALIZATION
1	M	69	HYPERTENSION, SMOKING	YES	NO	YES	20	23	57
2	M	41	HYPERTENSION, DIABETES, OBESITY, SMOKING	YES	YES	YES	14	14	57
3	M	56	HYPERTENSION,	YES	NO	YES	11	34	64

			SMOKING						
4	M	50	NONE	YES	YES	YES	16	21	63
5	M	43	NONE	YES	NO	YES	24	28	73
6	M	82	HYPERTENSION, DIABETES	YES	YES	NO	0	10	54
7	M	29	NONE	YES	NO	YES	19	29	55
8	M	28	NONE	YES	YES	YES	17	20	45
9	M	47	HYPERTENSION, DIABETES, OBESITY	YES	YES	YES	20	34	84
10	M	50	DIABETES, OBESITY	YES	YES	YES	7	9	46
11	M	48	HYPERTENSION,	YES	YES	YES	19	32	52

			DIABETES, OBESITY						
12	F	54	OBESITY, SMOKING	YES	YES	YES	9	11	47
PATIENT	DEBRIDEMENTS BEFORE RECONSTRUCTION	DAYS OF NEGATIVE PRESSURE THERAPY	TYPE OF FASCIOCUTANEOUS FLAP RECONSTRUCTION	COMPLICATION	COMPLICATION: DAYS AFTER SURGERY	NEED FOR REOPERATION	DAYS OF PLASTIC SURGERY FOLLOW UP		
1	2	7	UNILATERAL	NONE		NO	27		
2	2	8	ROTATION + CONTRALATERAL ADVANCEMENT	NONE		NO	23		
3	1	7	BILATERAL	MINOR DEHISCEN	7	NO	21		

				CE			
4	1	5	ROTATION + CONTRALATERAL ADVANCEMENT	NONE		NO	18
5	4	15	UNILATERAL	NONE		NO	25
6	1	7	UNILATERAL	NONE		NO	19
7	0	0	UNILATERAL	NONE		NO	22
8	1	4	UNILATERAL	NONE		NO	23
9	3	10	UNILATERAL	NONE		NO	53
10	0	0	UNILATERAL	NONE		NO	21
11	1	11	BILATERAL	MINOR DEHISCEN CE	6	NO	41
12	1	8	BILATERAL	NONE		NO	41

Consent

Written consent of the patient taken for the publication of this case report and images.

Ethical approval

Not required

Funding

None

Declaration of Competing Interest

None declared

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