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국소 산소 치료와 음압 상처 치료 병합의 임상적 유용성

(The Clinical Usefulness of Combining Topical Oxygen Therapy and Negative Pressure Wound Therapy)



인제대학교 해운대백병원

김동균, 윤성호, 선욱, 이경아*

Purpose: Negative pressure wound therapy (NPWT) is a standard for advanced wound care; however, its efficacy can be limited by tissue hypoxia in pressure injuries. This study evaluated the clinical usefulness of combining topical oxygen therapy (TOT) with NPWT compared to NPWT monotherapy.

Methods: We retrospectively reviewed 16 patients with stage 3 or 4 pressure injuries. Patients were divided into two groups: combining TOT-NPWT (n=8) and NPWT alone (n=8). In the combination group, TOT was initiated when granulation was delayed under NPWT (Fig. 1). Clinical outcomes, including wound area, granulation tissue percentage, and exudate levels, were assessed at baseline and after 4 weeks of bi-weekly treatment (Table 1).

Results: The combination group showed a superior reduction in mean wound area (42.5%; 35.2 cm² to 20.2 cm²) compared to the NPWT group (36.0%; 39.4 cm² to 25.2 cm²). Granulation tissue formation significantly increased in the combination group (20% to 80%) compared to NPWT alone (15% to 50%). Furthermore, exudate levels in the combination group decreased from heavy to low, whereas the NPWT group only achieved a reduction to moderate levels (Table 2).

Conclusion: Combining TOT and NPWT significantly improved wound contraction, granulation, and exudate management compared to NPWT monotherapy. These findings suggest that TOT is a highly effective adjunct to NPWT in optimizing the healing environment for hypoxic chronic wounds.



Fig. 1. (A) Pressure injury before treatment with combining TOT and NPWT. (B) Application of TOT to the pressure injury. (C) Decreased wound size and formation of healthy granulation tissue after combining TOT and NPWT.

	TOT & NPWT	NPWT
Patients, n	8	8
Age, mean	72	70
Stage (3 / 4), n	2 / 6	2 / 6
Baseline wound area (cm ²), mean	35.2 cm ²	39.4 cm ²
Mean TOT-treatment time	3 weeks	-

Table 1. Baseline patient and wound characteristics.

Outcome	TOT & NPWT		NPWT	
	Baseline	4-week follow-up	Baseline	4-week follow-up
Wound area (cm ²), mean	35.2 cm ²	20.2 cm ²	39.4 cm ²	25.2 cm ²
Granulation tissue (%), mean	20%	80%	15%	50%
Exudate level	heavy	low	Heavy	Moderate
TOT-related complications	-	none	-	-

Table 2. Clinical outcomes at baseline and 4 weeks.