Advanced Principles Governing the Comprehensive Management of Patients with Purulent Soft Tissue Wounds of the Upper and Lower Extremities

Nurboboyev Adhambek Uyg‘un o‘g‘li
Bukhara State Medical Institute named after Abu Ali ibn Sino

Relevance: Hyperventilation combined with oxygen therapy creates new opportunities for optimizing wound healing processes and enhancing antimicrobial defense. This approach reduces the risk of acute complications, shortens the duration of hospitalization, and contributes to lowering overall healthcare costs. Recent studies confirm that oxygen therapy exerts a positive effect on cellular metabolism, angiogenesis, and anti-infective mechanisms. At the same time, determining the efficacy of hyperventilation in the management of upper and lower limb wounds, adapting it to the individual characteristics of patients, and preventing potential complications remain pressing scientific and clinical challenges. Therefore, the investigation of oxygen-flow–induced hyperventilation in the treatment of infected limb wounds is highly relevant not only from a theoretical perspective but also in practical terms, offering broad prospects for achieving improved outcomes in surgical practice.

Objective of the Study: The aim of this study is to improve the treatment outcomes of patients with purulent surgical diseases of the soft tissues of the upper and lower limbs through the application of wound hyperventilation using an oxygen flow.

Materials and Methods: The data obtained from the examination and treatment of 122 patients with purulent diseases of the extremities were analyzed. Of these, 68 patients were included in Group I (comparison group), who were treated between 2020 and 2024 in the surgical departments of the Bukhara Regional Multidisciplinary Medical Center and the Bukhara City Medical Association. These patients presented with purulent diseases of the soft tissues of the upper and lower limbs without diabetes mellitus. Conventional treatment methods were applied, including local wound sanitation with 25% dimexide antiseptic solution, necrectomy, application of water-soluble ointments under aseptic dressings, systemic detoxification therapy, and mandatory endovascular diagnostic and therapeutic procedures. Group II (the main group) consisted of 48 patients treated between 2025 and 2026 in the same medical institutions, diagnosed with severe forms of purulent diseases of the soft tissues of the

upper and lower limbs without diabetes mellitus. In addition to conventional treatment, patients in this group underwent wound hyperventilation using an oxygen flow as an adjunctive therapeutic modality.

Results: In assessing the severity of wounds in patients of Group I (control group), we adhered to the classification proposed by M. I. Kuzin (1977), according to which the wound process is divided into three phases: Phase I — the inflammatory (exudative) phase, Phase II — the regeneration phase, and Phase III — the epithelialization phase. Group I included 68 patients with purulent diseases of the soft tissues of the upper and lower extremities. Among them, 37 patients (54.4%) presented with purulent wounds of the upper limbs, while 31 patients (45.6%) had purulent wounds of the lower limbs. Of the total number of examined patients in this group, 40 individuals (58.8%) were admitted with various purulent soft tissue conditions (including abscesses and phlegmons), whereas 28 patients (41.2%) were hospitalized with extensive purulent wounds of different etiologies, admitted at the initial phase of the wound process from other medical institutions or outpatient settings.

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