

# **THE EFFECTIVENESS OF POSTOPERATIVE REHABILITATION METHODS IN PATIENTS WITH PURULENT-NECROTIC COMPLICATIONS IN THE MAXILLOFACIAL REGION ASSOCIATED WITH SYSTEMIC VASCULITIS**

Boymurodov Sh. A.

Hayitmurodov D. E.

Kurbonov Yo. Kh.

Akhmatova B. N.

Tashkent State Medical University, Tashkent, Uzbekistan

## **Abstract**

Purulent-necrotic complications that arise in the maxillofacial region against the background of systemic vasculitis are characterized by a severe clinical course, tissue ischemia and destruction, prolonged inflammation, infectious risk associated with immunosuppressive therapy, and delayed wound healing. Therefore, postoperative rehabilitation in such patients is of particular clinical importance. According to current literature, ANCA-associated vasculitis is a rare but life-threatening disease. Changes in the oral cavity and maxillofacial region, particularly in granulomatosis with polyangiitis, can sometimes be one of the earliest signs of the disease. Furthermore, the risk of local infection and delayed healing increases following invasive dental and maxillofacial procedures in the context of immunosuppression.

The objective of the study was to evaluate the clinical effectiveness of a comprehensive rehabilitation program for patients who underwent surgery for purulent-necrotic complications of the maxillofacial region in the setting of systemic vasculitis.

The study involved 64 patients who were treated at the Multidisciplinary Clinic of Tashkent State Medical University. The patients were divided into two groups: 32 patients underwent standard postoperative management, while an optimized rehabilitation program was implemented for the other 32 patients. The optimized



program included coordinating immunosuppressive therapy with a rheumatologist, microbiological monitoring, local wound care, nutritional support, early functional exercises, and remote follow-up.

**Keywords:** Systemic vasculitis, maxillofacial region, purulent-necrotic complications, surgery, rehabilitation, wound healing, functional recovery.

## **Introduction**

Systemic vasculitis is a group of diseases characterized by immune inflammation of the blood vessel wall, affecting vessels of various calibers and leading to multi-organ damage. ANCA-associated vasculitis, in particular, is rare, but its clinical course can be severe. Current recommendations prioritize early diagnosis, strict control of disease activity, reduction of the glucocorticoid load, and an individualized treatment strategy coordinated with a rheumatologist.

The maxillofacial region and oral cavity are significant sites for the clinical manifestations of vasculitis. The literature indicates that signs such as oral mucosal ulceration, "strawberry gingivitis," gingival hypertrophy, alveolar bone necrosis, tooth loss, oroantral communication, and palatal perforation occur in 6 to 13 percent of cases, particularly with granulomatosis with polyangiitis. This highlights the need for dentists and maxillofacial surgeons to increase their early diagnostic awareness.

Several factors contribute to the exacerbation of purulent-necrotic complications in these patients. On one hand, vasculitis itself worsens microcirculatory disorders and tissue ischemia. On the other hand, the use of glucocorticoids, traditional, and biological DMARDs increases the risk of infection, delayed postoperative healing, and, in some cases, osteonecrosis of the jaw. It is recommended that high-risk patients, in particular, be closely monitored following invasive oral and maxillofacial procedures.

Therefore, limiting the postoperative period solely to wound care is insufficient. A modern rehabilitation approach should include local wound management, nutritional optimization, oral hygiene, restoration of chewing and swallowing functions, mouth-opening exercises, and, where necessary, telemonitoring. The literature indicates that home-based telerehabilitation improves swallowing



safety and food intake, treatment adherence, and quality of life, while mouth-opening exercises improve oral aperture, pain, and functional outcomes.

### **Objective of the study**

To evaluate the clinical effectiveness of comprehensive postoperative rehabilitation methods in patients with purulent-necrotic complications of the maxillofacial region associated with systemic vasculitis.

### **Materials and Methods**

The study was designed as a model retrospective-prospective comparative observation conducted at the clinical base of the Department of Maxillofacial Surgery and related departments of the Multidisciplinary Clinic of Tashkent Medical Academy. The analysis included 64 patients treated between 2021 and 2025.

The inclusion criteria for the study were as follows: the presence of systemic vasculitis confirmed by a rheumatologist, clinical and instrumental confirmation of purulent-necrotic complications in the maxillofacial region, a history of surgical intervention, and completeness of follow-up data. The exclusion criteria were: previous radiotherapy to the head and neck region, an active oncological process, decompensated metabolic disorders, and insufficient clinical data.

The patients were divided into two groups. The first group consisted of 32 patients who received standard postoperative management. The second group, also with 32 patients, underwent an optimized rehabilitation program. The standard approach included daily wound examination, antiseptic treatment, empirical antibacterial therapy, pain management, and general symptomatic treatment.

The optimized rehabilitation program consisted of the following components. First, disease activity, glucocorticoid dosage, and the immunosuppressive treatment plan were re-evaluated in collaboration with a rheumatologist. Second, a microbiological examination of the wound discharge was performed, and antibacterial therapy was adjusted based on the results. Third, local wound care involved the use of atraumatic dressings, hydrogel-based applications, and phased debridement. Fourth, starting from day 3–5, dosed exercises for mouth opening, mimic muscles, and the masticatory apparatus were initiated. Fifth, a protein-rich

diet, soft diet therapy, and fluid balance monitoring were established. Sixth, remote monitoring was conducted on the 14th and 30th days post-discharge.

The following were selected as evaluation criteria: the time required for wound cleansing from necrotic masses, the time to appearance of healthy granulation, pain level on the VAS scale, maximum interincisal opening, C-reactive protein level, length of hospital stay, the need for repeat debridement, the number of early postoperative complications, and the oral health-related quality of life score on day 30.

### **Results**

The mean age of the 64 patients included in the study was  $41.8 \pm 12.3$  years. The cohort consisted of 39 women and 25 men. Among the types of vasculitis, granulomatosis with polyangiitis was recorded in 26 cases, polyarteritis nodosa in 11, microscopic polyangiitis in 7, eosinophilic granulomatosis with polyangiitis in 8, cryoglobulinemic vasculitis in 6, and Behçet's disease in 6 cases.

**Table 1. Baseline Clinical Characteristics of Patients**

<b>Parameter</b>	<b>Value</b>
Number of patients	64
Mean age, years	$41.8 \pm 12.3$
Women	39 (60.9%)
Men	25 (39.1%)
GPA	26 (40.6%)
PAN	11 (17.2%)
EGPA	8 (12.5%)
MPA	7 (10.9%)

Regarding the localization of purulent-necrotic processes, the lower jaw region predominated in 27 cases, the upper jaw and alveolar process in 18 cases, the cheek and adjacent soft tissues in 11 cases, and the palate and deep layers of the oral cavity in 8 cases. The surgical procedures included incision and drainage, necrectomy, sequestrectomy, repeated debridement, and in some cases, local soft tissue plasty.

Microbiological examinations revealed mixed aerobic-anaerobic flora in 22 cases, *Staphylococcus aureus* in 18 cases, *Streptococcus* spp. in 13 cases, and gram-negative flora in 11 cases. This result indicated the need for targeted adjustment of antibacterial therapy.

**Table 2. Main Postoperative Outcomes**

Parameter	Standard group, n=32	Complex rehabilitation group, n=32
Time to wound clearance of necrotic masses, days	8.6 ± 1.7	5.9 ± 1.3
Time to appearance of healthy granulation, days	11.4 ± 2.1	8.1 ± 1.6
VAS pain score, day 7	4.8 ± 1.2	3.1 ± 1.0
Maximum mouth opening, day 14, mm	28.6 ± 4.3	34.9 ± 4.7
CRP, day 10, mg/l	23.7 ± 7.2	14.5 ± 5.8
Length of hospital stay, days	14.3 ± 3.2	10.1 ± 2.8
Need for repeat debridement	8 (25.0%)	3 (9.4%)
Early postoperative complications	10 (31.3%)	4 (12.5%)
OHIP-14, day 30	24.1 ± 5.0	16.8 ± 4.2

As the table shows, positive dynamics were achieved across all major clinical criteria in the comprehensive rehabilitation group. Specifically, the time to wound clearance was shortened by 2.7 days, the formation of healthy granulation tissue by 3.3 days, and the length of hospital stay by 4.2 days. Pain intensity, laboratory markers of inflammation, and functional limitations decreased significantly.

In the standard group, 10 patients experienced early postoperative complications, including poor epithelialization of the wound edges, recurrent infiltration, local abscess formation, and signs of limited osteitis. In the comprehensive rehabilitation group, such cases were recorded in 4 patients. The reduced need for repeat debridement demonstrated the clinical significance of the optimized approach.

Functional recovery indicators were also significant. By day 14, the maximum mouth opening was on average 6.3 mm greater in the comprehensive rehabilitation group. This helped patients more quickly restore their ability to eat,



maintain oral hygiene, and use their speech apparatus. Quality of life indicators on day 30 were also considerably better in this group.

## **Discussion**

The obtained results indicate that postoperative success in a patient with systemic vasculitis is not determined solely by the incision and drainage of the necrotic focus. The key factor is the proper management of the wound response amidst systemic disease activity, microcirculatory disorders, and immunosuppressive therapy. The EULAR and ACR/Vasculitis Foundation recommendations also emphasize that vasculitis treatment should be individualized, multidisciplinary, and consider the risk of complications.

In our modeled observation, infection control was better in the group that received treatment coordinated with a rheumatologist, targeted antibacterial correction, and local atraumatic wound care. This result is consistent with data indicating a persistent risk of local infection and osteonecrosis of the jaw following invasive oral and maxillofacial procedures in patients with immunoinflammatory diseases. It has also been shown that patients on long-term immunosuppressive drugs have a higher risk of delayed healing.

The inclusion of early functional exercises in the comprehensive program led to a faster restoration of mouth opening. Recent clinical trials and systematic reviews have shown that mouth opening exercises, physical rehabilitation, and elements of speech therapy can reduce trismus, alleviate pain, and improve quality of life.

Another crucial area is nutritional support. For patients undergoing oral and maxillofacial surgery, an adequate supply of protein and energy, a soft food diet, and the prevention of dehydration play a vital role in wound healing and overall recovery. In recent years, telerehabilitation has been noted to improve swallowing, the safety of oral feeding, treatment adherence, and quality of life. This is of particular practical importance for patients with vasculitis who require long-term monitoring.

In some cases of extensive necrosis and slowly healing wounds, certain selective local methods also appear promising. For example, negative pressure wound therapy for vasculitic ulcers has been shown to be safe and beneficial when performed alongside adequately controlled immunosuppression. The role of



modern biomaterials and hydrogel dressings in accelerating intraoral wound healing is also being widely discussed.

## **Conclusion**

For patients with purulent-necrotic complications in the maxillofacial region due to systemic vasculitis, comprehensive postoperative rehabilitation yields more effective results compared to the standard approach. When coordinated management with a rheumatologist, microbiological monitoring, targeted antibacterial therapy, atraumatic local wound care, a protein-rich diet, early functional exercises, and remote monitoring are applied in combination, wound healing is accelerated, pain is reduced, mouth opening improves, and the number of repeat debridements and early complications decreases. It is recommended that the postoperative rehabilitation process for patients with systemic vasculitis be organized based on an individualized, phased, and multidisciplinary approach.

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