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OPTIMIZATION OF METHODS FOR THE PREVENTION AND TREATMENT OF ALVEOLITIS

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Abstract
The aim of this study was to evaluate the effectiveness of using collagen coatings in combination with antibacterial agents in the treatment of purulent complications after tooth extraction. The study involved patients divided into three groups: the main group (MG), which received treatment using Alvostaz and collagen coatings, and two control groups: CG-1 — treated with a standard paste based on eugenol and iodoform, and CG-2 — treated with the collagen sponge "Collost®". The results showed that treatment in the main group was more effective, characterized by lower pain intensity, faster wound healing, and reduced inflammation compared to the control groups.

Keywords: Alveolitis, collagen coatings, antibacterial drugs, wound healing, treatment of purulent complications, postoperative period, anti-inflammatory treatment, wound exudate, pain syndrome.

Introduction

Acute inflammatory processes such as alveolitis are a common complication after tooth extraction and can significantly deteriorate the patient's condition by prolonging healing time and increasing the risk of infection. Modern treatment methods include the use of antibacterial drugs and collagen coatings that promote exudate drainage, rapid wound cleansing, and stimulation of healing. This study examines the effectiveness of a combined therapy using collagen coatings and antibacterial agents and provides a comparative analysis with traditional treatment methods.

Materials and Methods:

Patients diagnosed with alveolitis were treated using both traditional methods and an improved author’s method.

Control Group 1 (CG-1) received a standard paste based on eugenol and iodoform, known for its antiseptic and analgesic properties, widely used in dental practice in Uzbekistan.

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Control Group 2 (CG-2) was treated using the collagen sponge "Collost®", which exhibits hemostatic and anti-inflammatory properties.

Main Group (MG) underwent treatment using an optimized method developed in accordance with current understanding of alveolitis pathogenesis. The method included the use of the collagen material "Alvostaz" pre-saturated with a targeted antibacterial combination. The antimicrobial combination was selected based on microbiological analysis and included agents effective against mixed microflora, such as metronidazole with lincomycin or ciprofloxacin.
All patients were divided into three groups:

MG (Main Group) — treated with the optimized method using Alvostaz saturated with a targeted antibacterial agent;
CG-1 — treated with a standard eugenol-iodoform paste;
CG-2 — treated with the collagen sponge "Collost®".

Results

Analysis of seasonal and temporal dynamics of patient visits for alveolitis revealed several patterns useful for planning outpatient care.
The lowest number of visits occurred during the summer months (June, July, August), possibly due to favorable climatic conditions, improved diet (fresh vegetables and fruits), increased physical activity, and vacation season — all contributing to better overall health and oral condition, reducing complications after tooth extraction. This trend should be considered when organizing dental outpatient services during summer.
Patients' time of presentation after tooth extraction varied; most sought care in later stages. According to our data, most patients sought medical help on days 3–5 after tooth extraction, indicating delayed recognition of complications or underestimation of initial symptoms.

Time of presentation:	**Time of presentation:**	Number of patients
Day 1		21 (13,82%)
Day 2		24 (15,79%)
Day 3		26 (17,11%)
Day 4		31 (20,39%)
Day 5		27 (17,76%)

Thus, 46.7% of patients sought help within the first three days, while 53.3% came after three days. Time of presentation closely correlated with the clinical form of alveolitis. Patients with the serous form usually sought help earlier (by day 3), while those with purulent alveolitis mostly came on days 4–7, indicating gradual symptom progression and increasing inflammation.
The findings highlight the importance of early diagnosis and timely intervention to prevent progression from serous to purulent form.

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Clinical monitoring showed that using antibacterial-impregnated Alvostaz (MG) provided significant improvement within the first 72 hours of treatment. Patients experienced reduced pain, decreased inflammation, and rapid decrease in pathological exudate, which became serous and minimal by days 3–4.

In contrast, CG-1 and CG-2 showed slower wound cleaning. In CG-1, the eugenol-iodoform paste had a deodorizing effect but often irritated granulation tissue, sometimes increasing pain — especially during dressing replacement. Strong adhesion to the socket walls made removal difficult and caused additional trauma.

In CG-2, the "Collost®" sponge offered moderate improvement by maintaining moisture and providing a protective barrier, but lacked strong antiseptic and antimicrobial action, leading to prolonged inflammation and slower symptom reduction. Most patients showed signs of inflammation up to days 5–6, and some up to the end of the first week.

A significant reduction in epithelialization time was noted in MG. By days 7–8, most MG patients had nearly complete epithelial closure of the socket, while in CG-1 and CG-2 this occurred only by days 10–12.

Importantly, no recurrence or complications such as secondary infections were observed in MG. In CG-1, two cases of purulent tissue necrosis were noted; in CG-2 — one case of rebleeding due to clot failure.

Table 2. Treatment outcomes by group

Parameter	MG (Main Group)	CG-1 (Control Group 1)	CG-2 (Control Group 2)
Wound exudate dynamics (by day):			
Day 1	Heavy (55%)	Heavy (60%)	Heavy (58%)
Day 3	Moderate (70%)	Moderate (45%)	Moderate (50%)
Day 7	Slight (90%)	Moderate (60%)	Moderate (75%)
Pain intensity (avg. points)	2.1 ± 0.3	4.4 ± 0.5	3.8 ± 0.4
Healing time (days)	7 ± 1	10 ± 2	9 ± 2
Complication-free period (days)	10 ± 2	13 ± 3	12 ± 2
Body temperature	36.8 ± 0.2°C	37.3 ± 0.3°C	37.1 ± 0.2°C
Leukocyte index	1.2 ± 0.1	1.6 ±...	

Thus, the obtained data indicate the high clinical effectiveness of using Alvostaz saturated with an antibacterial agent in the comprehensive therapy of alveolitis. This method allows for the rapid relief of the inflammatory process, elimination of pain syndrome, and acceleration of reparative and epithelialization processes in the socket after tooth extraction.

Conclusions

The use of Alvostaz saturated with an antibacterial agent demonstrated the highest clinical efficacy compared to traditional treatments in the management of alveolitis. Patients in the main group experienced rapid relief of pain, reduced inflammation, and accelerated socket epithelialization, while patients in the control groups showed significantly longer persistence of symptoms.

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The method used in the main group shortened the treatment duration by 3–5 days compared to Control Group 1 and Control Group 2 and helped avoid complications during the observation period.

The use of eugenol-iodoform paste was associated with an irritating effect on granulation tissue and posed a risk of trauma during dressing changes.

The use of the Collost® collagen sponge had a beneficial effect on the inflammation due to its barrier effect but did not provide adequate antiseptic control.

Based on the conducted study, it is recommended to implement the optimized method using Alvostaz in clinical practice as one of the most effective approaches for the treatment of post-extraction alveolitis.

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