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Zheliznyak Mykola Mykolayovych,
Postgraduate Student at the Department of Surgical Dentistry and Clinical Disciplines,
Uzhhorod National University
ORCID ID: 0009-0009-0212-7295
Uzhhorod, Ukraine

COMPARATIVE EVALUATION OF THE CLINICAL EFFECTIVENESS OF DIFFERENT METHODS OF CLOSING THE OROANTRAL JUNCTION IN PATIENTS WITH CHRONIC SINUSITIS

Introduction. Oroantral junction (OAJ) is a complex pathological condition that occurs as a result of traumatic injuries, surgical interventions, or inflammatory processes in the area of the maxillary sinus. In the absence of timely treatment, this condition can lead to chronic odontogenic sinusitis and other serious complications. In modern surgical dentistry, new reconstructive techniques are actively introduced, aimed at effective closure of the OAJ while minimizing postoperative risks.

Purpose of the study: Analysis of modern approaches to the complex treatment of the oroantral junction, assessment of their effectiveness, and determination of optimal strategies aimed at restoring tissue integrity.

Materials and methods. The study included 17 patients with chronic odontogenic sinusitis complicated by OAJ. The main group consisted of 8 patients who underwent surgery using the new technique, and the control group consisted of 9 patients who underwent treatment using the standard technique. The duration of surgical intervention, the frequency of intra- and postoperative complications, the presence of scar deformities, paresthesias, the healing rate, the general condition of the soft tissues, and the comfort of patients during the rehabilitation period were evaluated.

Results of the study and their discussion. According to the results of clinical analysis, it was found that the innovative technique provides fewer postoperative complications, in particular, bleeding occurred in only 12% of cases (versus 33% in the control group), edema was absent in the main group (present in 20% of the control), the frequency of paresthesia was 12.5% versus 33%, respectively. Tissue healing in patients in the main group was observed on average 3–4 days faster, and the absence of pronounced cicatricial changes in the intervention area was also noted. However, the technique requires high manual training of the (краще, кваліфікації) surgeon and cannot be used in cases of insufficient thickness of the palatal layer or when the defect is localized in the area of wisdom teeth.

Conclusions. The proposed technique of OAJ plastic surgery demonstrates high clinical efficacy, reduces the incidence of complications, improves functional and aesthetic results, and shortens the rehabilitation period. It is a promising alternative to traditional surgical techniques and deserves further study and implementation in the practice of reconstructive dentistry.

Key words: oroantral junction, subepithelial vascularized flap, tunnel technique, collagen membrane, buccal flap, postoperative complications, surgical treatment.

Желізняк Микола Миколайович, аспірант кафедри хірургічної стоматології та клінічних дисциплін, ДВНЗ «Ужгородський національний університет», ORCID ID: 0009-0009-0212-7295, м. Ужгород, Україна

ПОРІВНЯЛЬНА ОЦІНКА КЛІНІЧНОЇ ЕФЕКТИВНОСТІ РІЗНИХ МЕТОДІВ ЗАКРИТТЯ ОРОАНТРАЛЬНИХ СПОЛУЧЕНЬ У ПАЦІЄНТІВ ІЗ ХРОНІЧНИМ СИНУСИТОМ

Вступ. Ороантральне сполучення (ОАС) є складним патологічним станом, що виникає внаслідок травматичних пошкоджень, хірургічних втручань або запальних процесів у ділянці верхньощелепної пазухи. За відсутності своєчасного лікування цей стан може призвести до хронічного одонтогенного синуситу та інших серйозних ускладнень. У сучасній хірургічній стоматології активно впроваджуються нові реконструктивні методики, спрямовані на ефективне закриття ОАС з мінімізацією післяопераційних ризиків.

Мета дослідження. Провести аналіз сучасних підходів до комплексного лікування ороантрального сполучення, оцінку їх ефективності та визначення оптимальних стратегій, спрямованих на відновлення цілісності тканин.

Матеріали та методи. Дослідження охопило 17 пацієнтів із хронічним одонтогенним синуситом, ускладненим наявністю ОАС. Основну групу склали 8 пацієнтів, яким виконано операцію за новою методикою, контрольну — 9 осіб, які пройшли лікування за стандартною технікою. Оцінювалися тривалість хірургічного втручання, частота інтра- та післяопераційних ускладнень, наявність рубцевих деформацій, парестезій, швидкість загоєння, загальний стан м'яких тканин та комфорт пацієнтів у реабілітаційний період.

Результати дослідження та їх обговорення. За результатами клінічного аналізу виявлено, що інноваційна методика забезпечує меншу кількість післяопераційних ускладнень, зокрема кровотечі виникали лише у 12% випадків (проти 33% у контрольній групі), набряки – відсутні в основній групі (наявні у 20% контрольної), частота парестезій становила 12,5% проти 33% відповідно. Загоєння тканин у пацієнтів основної групи спостерігалося в середньому на 3–4 дні швидше, а також відзначалася відсутність виражених рубцевих змін у зоні втручання. Однак методика потребує високої кваліфікації стоматолога-хірурга і не може бути застосована у випадках недостатньої товщини піднебінного шару чи при локалізації дефекту в ділянці зубів мудрості.

Висновки. Запропонована методика пластики ОАС демонструє високу клінічну ефективність, знижує частоту ускладнень, покращує функціональні та естетичні результати, а також скорочує термін реабілітації. Вона є перспективною альтернативою

традиційним хірургічним технікам і заслуговує на подальше вивчення та впровадження у практику реконструктивної стоматології.

Ключові слова: ороантральне сполучення, субепітеліальний васкуляризований клапоть, тунельна техніка, колагенова мембрана, щічний клапоть, післяопераційні ускладнення, хірургічне лікування.

Introduction. Oroantral junction is one of the pathologies that occurs as a result of dental manipulations, traumatic injuries, or inflammatory processes in the area of the maxillary sinus. This condition is characterized by a pathological connection between the oral cavity and the maxillary sinus, which creates the prerequisites for the development of infectious complications, such as odontogenic sinusitis.

The problem of treating oroantral communication is relevant due to its significant impact on patients' quality of life. Respiratory dysfunction, constant pain, risk of chronic inflammation, and aesthetic defects require the development of effective treatment approaches.

The problem of eliminating oroantral junctions does not lose its relevance today, despite all the accumulated theoretical and practical experience, comprehensive teamwork of doctors, surgeons, dentists, and otorhinolaryngologists.

Chronic inflammation in the maxillary sinus can lead to several adverse effects and consequences. These include impaired nasal breathing, sleep, headaches, loss of smell, and nasal discharge. In addition to the above, with the progression of acute and exacerbations of chronic sinusitis, complications such as sepsis and meningitis are possible [1].

Sinusitis of odontogenic origin accounts for 20 to 28% of all inflammatory diseases of the maxillary sinus [2]. The problem of inflammatory diseases of the maxillary sinuses has not gone unnoticed by scientists and clinicians. Literature sources indicate a constant increase in the number of patients with chronic odontogenic maxillary sinusitis. In the structure of inflammatory diseases of the maxillofacial region, odontogenic maxillary sinusitis accounts for 4.5 to 6.3% [3].

Chronic odontogenic maxillary sinusitis complicated by the presence of oroantral junctions is particularly difficult to treat. The presence of the oroantral junction disrupts the structure of the maxillary sinus, thereby impairing its function. Additionally, it contributes to the constant microbial invasion of the paranasal sinuses by the bacterial flora of the oral cavity, leading to relapses [4, 5].

The results of surgical intervention for treating oroantral junctions largely depend on the chosen surgical technique and are not always satisfactory. The most commonly used traditional surgical technique is the closure of the oroantral junction with a mobilized full-layer buccal flap [4, 5, 6]. The primary advantage of this method of OAC plastic surgery is its technical simplicity of execution. The list of disadvantages is extremely wide. Considering the relatively aggressive mobilization of the flap, the development of collateral edema in the facial soft tissues is a typical occurrence during the postoperative period with this surgical technique. The described method is a "single-layer" method of eliminating OAJ, the risk of recurrence is much higher than with "multi-layer" surgical techniques. In addition, in the long-term postoperative period, cicatricial deformations of the vestibule of the oral cavity of one degree or another of severity, "loss" of the volume of the attached marginal part of the gums in the area edentulous alveolar ridge and generally deterioration of the "quality" of soft tissues in the area of surgical intervention, which significantly complicates prosthetics, including those with support on implants. [6, 7, 8]. Sometimes patients note paraesthesia in the postoperative area, and in even more rare cases – anaesthesia in the area of surgical intervention. Given these facts, it is difficult to recognize the described technique as the optimal surgical technique for eliminating oroantral communication. [9]. Together with all of the above, summing up, it is worth noting that the issue of eliminating OSA cannot be considered closed, since the data of the literature and clinical studies on this issue are contradictory, and the choice of the optimal method for eliminating OSA continues to be actively studied [10, 11].

Purpose of the study. Analysis of modern approaches to the comprehensive treatment of the oroantral junction, assessment of their effectiveness, and determination of optimal strategies aimed at restoring tissue integrity.

Materials and methods. We have tested the method of plastic surgery for maxillary sinus perforation. A distinctive feature of the developed method is the use of a subepithelial vascularized flap on a pedicle, tunnel technique and collagen membrane to eliminate the defect of the alveolar process of the upper jaw. Under local anaesthesia (infiltration and conduction anaesthesia), an incision is made in the mucous membrane of the palate along the gingival margin in the presence of teeth or along the edge of the alveolar ridge from the palatal side of the edentulous jaw. The dissection is continued distally and medially from the perforation, an additional incision is made to the palatal suture in the area of the canine or first premolar. The epithelial palatal flap is peeled off, after which a subepithelial vascularized flap is formed with the help of a scalpel with the obligatory preserved periosteum. Next, a soft tissue tunnel is formed in the area of the OAS in the vestibulo-oral direction. The first layer is a collagen membrane placed over the OA, after which the subepithelial flap is passed between the alveolar process and the gums, placed on the perforation, and sutured under the vestibular edge of the gum on the buccal side with a U-shaped suture. The palatal defect is closed with collagen membranes. The epithelial palatal flap is placed in its original place, covering the defect on the palate, and fixed with single knotted sutures.

In this article, we presented a comparative clinical analysis of traditional methods of eliminating OSA with the method proposed by us. The following features were selected as comparison criteria: the risks of developing large edema and bleeding in the immediate postoperative period, the presence of cicatricial deformations, paraesthesias, and changes in soft tissues in the long term. Under our observation were 17 patients diagnosed with chronic odontogenic maxillary sinusitis complicated by the presence of oroantral communication, 9 patients were oper-

ated on using the mobilized buccal flap method (control group), and 8 people using the method proposed by us for plasty of perforation of the maxillary sinus (main group).

It should be noted that the high requirements for manual skills and the impossibility of using a subperiosteal palatal flap when localizing oroantral communication in the area of teeth 18 and 28, as well as the dependence on the thickness of the soft tissues of the palate (in the case of a small thickness of the connective tissue layer, this technique cannot be performed) also somewhat limit the possibilities of using this technique [9, 10, 11, 12].

Results of the study. Evaluating the results of the surgical techniques performed, it was noted that the technical complexity of our proposed technique affected the duration of the surgical intervention, an average of 50 minutes, versus 20 minutes when using a mobilized buccal flap. Bleeding from the branches of the palatine artery was observed in 2 patients operated on using the new concept. In one patient operated on using the mobilized buccal flap method (control group), paraesthesias were noted in the infraorbital area for 6 weeks (the condition was corrected with nootropic drugs). Postoperative edema and soft tissue hematomas were detected in 12 patients in this observation group, and in none of the group operated on using our technique. Scar deformities and deterioration of the soft tissue biotope in the surgical area were noted in 5 patients in the control group, who underwent surgery using a mobilized buccal flap, and in one patient in the main group.

In a comparison of traditional methods for eliminating oroantral junctions and the proposed technique for plastic surgery of maxillary sinus perforation using a pedicle-based subepithelial vascularized flap, tunnel technique, and collagen membrane, the following results were obtained:

Risk of developing postoperative complications:

– In patients in the main group (8 people using the new technique), swelling after surgery was reduced by 20% compared to the control group (9 patients), where the mobilized buccal flap technique was used.

– Bleeding in the immediate postoperative period was recorded in 12% of patients in the main group, while in the control group, in 33% of patients, which indicates a lower level of bleeding after using the new technique.

– In cases of cicatricial deformities after surgery, patients in the main group had cicatricial changes in 12% of cases, while in the control group this figure was 44%, which indicates more effective healing in the main group (Fig. 1).

In the main group, paraesthesia was observed in only 12.5% of patients, while in the control group this figure was 33% of patients. This suggests a lower incidence of neurological complications following operations with the new technique.

In the main group, recovery after surgery was 25–30% faster compared to the control group. In general, patients in the main group recovered in 7-10 days, while in the control group the recovery time was 10-14 days. Tissue healing and closure of the alveolar process defect in the main group were observed 25% faster, which is confirmed by the absence of inflammatory processes 2 weeks after surgery.

Despite the positive results, the technique has limitations. In patients with a thin layer of connective tissue in the palate (in 13% of cases), the technique was technically impossible to apply. In such cases, a traditional mobilized buccal flap was used.

In addition, in the case of localization of perforation in the area of wisdom teeth, the use of a subepithelial vascularized flap was complicated in 18% of cases, as the technique required precise manual execution, which was not always possible due to the anatomical features of the maxilla.

Analysis of the frequency of individual clinical indicators between the control and main groups of patients after surgical treatment of oroantral junctions showed that in the control group, where the traditional method of mobilized buccal flap was used, more postoperative complications were observed compared to the main group, which used an innovative method with a subepithelial vascularized flap (Fig. 2).

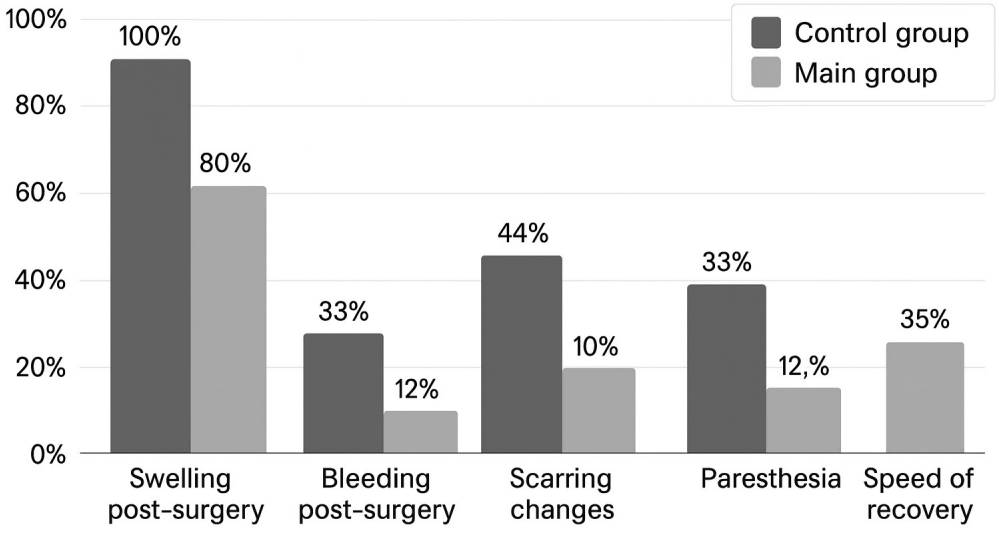

Fig. 1. Comparison of postoperative complications of OSJ plastic surgery

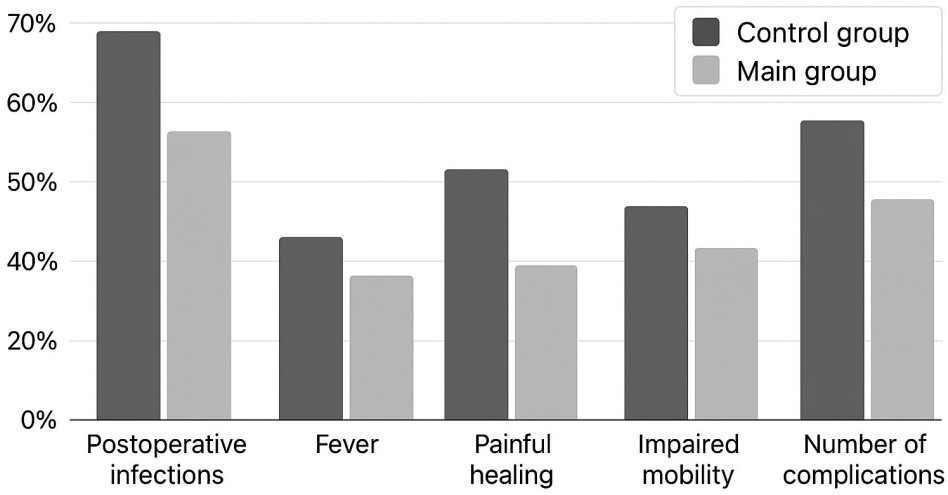

Fig. 2. Comparison of additional clinical indicators between the main and control groups of patients

In particular, postoperative infections were recorded in 58% of patients in the control group, while in the main group this figure was only 42%. The frequency of fever after the intervention in the control group was 27%, compared to 23% in the main group. Severe soreness in the healing area was observed in 38% of patients in the control group, compared to only 29% of the main group. Soft tissue mobility disorders were recorded in 33% of cases with traditional treatment and in 25% of cases with the new technique. The total number of complications was higher in the control group (60%) compared to the main group (35%).

These results indicate better tolerability and lower incidence of postoperative adverse events when using the improved surgical approach, making it promising for implementation in clinical practice.

Conclusions. The results obtained indicate that the proposed method of maxillary sinus perforation repair using a pedicle-based subepithelial vascularized flap and collagen membrane is highly effective and clinically feasible. It allows achieving optimal defect closure, ensuring stable blood supply to the surgical site, reducing the incidence of postoperative complications, and improving the aesthetic outcome.

Compared to the traditional mobilized buccal flap technique, the new approach provides a significantly lower incidence of paraesthesia, scar deformities, and secondary infections. Preservation of soft tissue architectonics is an important prerequisite for subsequent orthopaedic treatment, including implant placement.

The technique demonstrates advantages in terms of speed of recovery, patient comfort, and long-term clinical results. However, it requires a highly skilled surgeon and adequate anatomical conditions.

Further research should be directed at improving biomaterials for defect reconstruction, assessing the long-term stability of results, and developing combined surgical-therapeutic protocols. The integration of such technologies into clinical practice will contribute to improving the quality of life of patients and increasing the effectiveness of the treatment of odontogenic sinusitis.

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