

Original Study Article

DOI: <https://doi.org/10.17816/dent582067>

Mouth protector as a preventive measure against unintended oral mucosal injury during the use of dental instruments

Alexander V. Guskov, Olga S. Guiter, Anzhela S. Kokunova, Sergey I. Kalinovskiy, Nikolay M. Shuvalov, Dmitry G. Zhukovets

Ryazan State Medical University, Ryazan, Russia

ABSTRACT

BACKGROUND: Modern dental practice frequently involves the use of invasive instruments. In complex clinical settings with limited access to the operative field, such tools can cause unintended trauma to the oral mucosa. Existing protective methods have notable limitations and do not fully prevent mechanical injury to oral soft tissues. As a potential solution, the authors propose the use of mouth protectors.

AIM: To evaluate the clinical efficacy of the proposed mouth protectors.

METHODS: A single-center, observational, prospective study was conducted involving 40 patients aged 20 to 60 years undergoing prosthodontic treatment with fixed dental prostheses. Participants were randomly assigned to two equal groups. Group A received treatment using the proposed mouth protectors during tooth preparation. Group B underwent tooth preparation without mouth protectors. The total duration of the study was 5 weeks. Throughout the study, all cases of unintended oral mucosal injury occurring during the tooth preparation stage were recorded for both groups using visual inspection and staining, and documented in a summary table. The surface area of the lesions was measured photometrically, and patient-reported symptoms were assessed via structured interviews. The results were compared between groups to assess the effectiveness of the mouth protectors.

RESULTS: All participants completed the study. The incidence of oral mucosal injuries in Group A was 76.9% lower than in Group B. The total lesion area in Group A was 74.6% smaller than in Group B.

CONCLUSION: The findings demonstrate the effectiveness of the proposed mouth protectors in reducing mechanical injury to the oral mucosa during prosthodontic procedures.

Keywords: mouth protectors; dentistry; tooth preparation; oral mucosa injuries; dental complications.

To cite this article:

Guskov AV, Guiter OS, Kokunova AS, Kalinovskiy SI, Shuvalov NM, Zhukovets DG. Mouth protector as a preventive measure against unintended oral mucosal injury during the use of dental instruments. *Russian Journal of Dentistry*. 2025;29(2):133–142. DOI: <https://doi.org/10.17816/dent582067>

Received: 18.09.2023

Accepted: 25.12.2024

Published online: 11.03.2025

Оригинальное исследование

DOI: <https://doi.org/10.17816/dent582067>

Защитные стоматологические накладки как способ профилактики нежелательных повреждений слизистой оболочки полости рта при использовании стоматологических инструментов

А.В. Гуськов, О.С. Гуйтер, А.С. Кокунова, С.И. Калиновский, Н.М. Шувалов, Д.Г. Жуковец

Рязанский государственный медицинский университет имени академика И.П. Павлова, Рязань, Россия

АННОТАЦИЯ

Обоснование. Современная стоматологическая практика сопряжена с применением ряда агрессивных инструментов. Работа с данными инструментами в сложных клинических условиях, при ограниченном доступе к месту проведения манипуляции может приводить к нежелательному повреждению слизистой оболочки полости рта. Тем не менее в клинической практике современные средства её защиты имеют ряд недостатков и не способны в полной мере защитить слизистую оболочку полости рта от механических повреждений. В качестве возможного решения данной проблемы коллективом авторов предлагается использовать защитные стоматологические накладки.

Цель. Оценка эффективности применения предлагаемых авторами защитных стоматологических накладок в клинической практике.

Материалы и методы. Проведено обсервационное проспективное выборочное одноцентровое исследование, которое выполнялось путём наблюдения за группой пациентов в процессе ортопедического лечения с применением несъёмных конструкций. В исследовании принимали участие 40 человек в возрасте от 20 до 60 лет, разделённых на 2 равные группы. У пациентов из первой группы (группа «А») на этапе, связанном с препарированием зубов, применяли предлагаемые авторами стоматологические накладки. У пациентов из второй группы (группа «Б») лечение на данном этапе проходило без использования стоматологических накладок. Общая продолжительность исследования составила 5 нед. В ходе исследования для обеих групп путём визуального наблюдения и окрашивания фиксировали и заносили в сводную таблицу все случаи нежелательного повреждения слизистой оболочки полости рта, возникшие на этапе препарирования зубов. Фотометрическим методом определяли площадь повреждений и оценивали субъективные ощущения при повреждениях слизистой оболочки полости рта (посредством опроса пациентов). На основании полученных данных делали выводы об эффективности применения предлагаемых авторами защитных стоматологических накладок.

Результаты. Все пациенты успешно завершили участие в исследовании. Установлено, что пациенты из группы «А» подвергались нежелательным повреждениям слизистой оболочки на 76,9% меньше, чем пациенты из группы «Б». Суммарная площадь полученных повреждений в группе «А» была на 74,6% меньше, чем в группе «Б».

Заключение. Результаты исследования подтвердили эффективность использования предлагаемых стоматологических накладок.

Ключевые слова: защитные стоматологические накладки; стоматология; препарирование зубов; повреждения слизистой оболочки полости рта; осложнения в стоматологии.

Как цитировать:

Гуськов А.В., Гуйтер О.С., Кокунова А.С., Калиновский С.И., Шувалов Н.М., Жуковец Д.Г. Защитные стоматологические накладки как способ профилактики нежелательных повреждений слизистой оболочки полости рта при использовании стоматологических инструментов // Российский стоматологический журнал. 2025. Т. 29, № 2. С. 133–142. DOI: <https://doi.org/10.17816/dent582067>

BACKGROUND

Various materials and devices are used in dentistry to isolate and restrict the operative field, including cotton rolls, saliva absorbent pads, and the rubber dam system [1, 2]. These methods can effectively protect the operative field from oral fluid and the surrounding tissues from aggressive agents used during treatment. For example, cotton rolls cannot fully protect the oral mucosa from traumatic injury because of insufficient fixation. Saliva absorbent pads, by contrast, provide stable fixation and reliable protection of the oral mucosa from trauma; however, their placement area is limited, and they are relatively costly and not reusable. The rubber dam system cannot be used during tooth preparation for fixed prosthodontic restorations. Its primary purpose is to isolate the operative field from saliva and irritating solutions. A common drawback of all currently available dental isolation devices is their insufficient protection against mechanical impact on the isolated areas of the oral cavity [3]. Moreover, any instrumental dental procedure performed in the oral cavity may, under certain circumstances, cause unintended oral mucosa trauma and result in complications such as acute iatrogenic injury [4]. In rare cases, when trauma is extensive or sufficiently deep, patients may require emergency care. Any traumatic injury in the oral cavity, when local cell-mediated and humoral immunity factors are insufficient, will inevitably be complicated by infection, which delays and hinders successful healing [5]. Periodontal tissue trauma during tooth preparation induces inflammation, sustained not only by the virulence factors and toxins of established periodontopathogens but also by their microbial consortia. This response increases virulence and upregulates the secretion of interleukin 1 β (IL-1 β) and soluble CD14 (sCD14), ultimately causing alveolar bone destruction [6]. The most adverse outcome of wound healing in such cases is scarring [7, 8].

Thus, under certain circumstances, iatrogenic trauma occurring during dental procedures can unacceptably complicate subsequent stages of dental rehabilitation. Therefore, developing preventive approaches to such injuries may minimize risks, enhance safety in dental practice, and improve the predictability of treatment outcomes.

AIM

This study aimed to evaluate the clinical effectiveness of the proposed mouth protectors.

METHODS

To protect the oral cavity from injuries caused by unintended trauma from dental instruments during treatment, the authors proposed the use of original mouth protectors [9]. A prototype of this device is shown in Fig. 1–9. The mouth protector is a three-layer disposable device (pad) that is secured to the areas of the oral cavity requiring protection. During use, the protector is placed intraorally and positioned over the mucosal site requiring protection. After the required dental procedures, the mouth protector is carefully removed from the oral mucosa and discarded. Mouth protectors of various sizes are proposed, designed to shield the mucobuccal fold, cheek, hard palate, tongue, and sublingual area. During the study, all cases of unintended oral mucosal injuries occurring during tooth preparation were identified by visual inspection and staining and entered into a summary table for both groups. The lesion surface area was measured photometrically, and patient-reported symptoms of oral mucosa trauma were assessed via interviews. The collected data were used to evaluate the clinical effectiveness of the proposed mouth protectors. To delineate the boundaries of traumatic oral mucosa lesions after tooth preparation, areas were stained with Color-Test No. 1 solution (VladMiVa, Russia) using the original method [10].

Study Design

It was an observational, prospective, single-center, controlled, nonrandomized study. The study included 40 patients with patient-specific treatment-complicating factors who underwent prosthodontic rehabilitation in the posterior segments of the dentition. Participants were 20–60 years of age.

Patients were divided into two groups: group A received prosthodontic rehabilitation using the proposed mouth protectors; group B (control) underwent prosthodontic rehabilitation without mouth protectors. Each group included 2 patients with complex medical histories (conditions increasing the risk of oral mucosal injury during treatment): 2 diagnosed with Parkinson disease (ICD-10 code G20) and 2 diagnosed with chronic motor tics of the facial musculature (ICD-10 code F95.1).

Prosthodontic treatment was performed by 4 prosthodontists, each with at least 5 years of clinical experience and holding a first- or second-level professional certification. Each dentist treated 5 patients from each group. Study procedures (detection of oral mucosa trauma, staining, and documentation) were performed by 2 independent prosthodontists of the highest professional qualification who were not involved in treatment delivery.

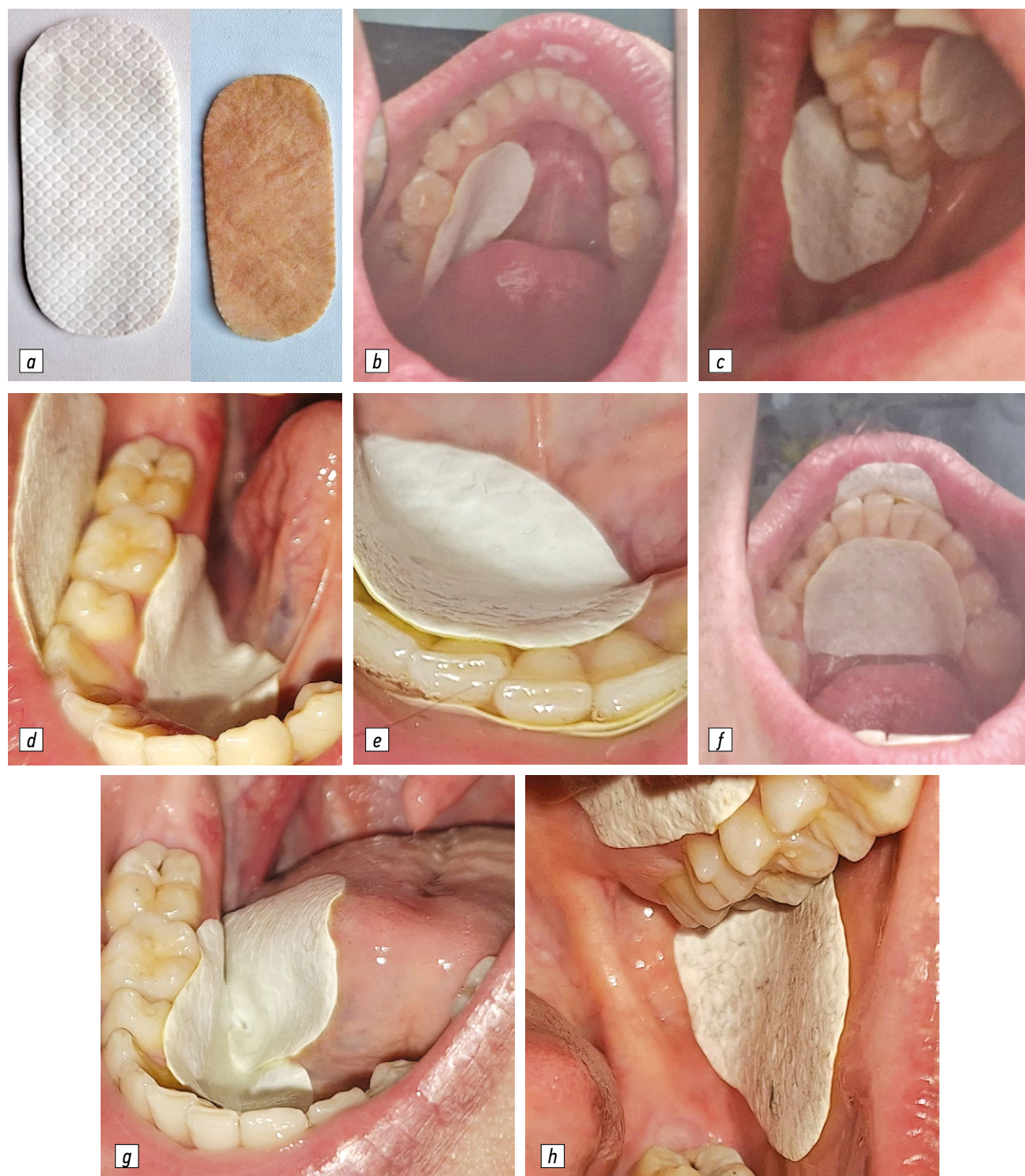


Fig. 1. Mouth protectors designed to shield the oral mucosa (smooth side facing the mucosa): *a*, general view; *b*, positioned on the lingual surface of the alveolar process to protect tooth 36 (FDI/ISO designation; mandibular left first molar); *c*, positioned on the buccal and palatal surfaces of the alveolar process to protect tooth 17; *d*, positioned on the buccal and lingual surfaces of the alveolar process to protect tooth 46; *e*, positioned on the lingual and vestibular surfaces of the alveolar process to protect teeth 32, 31, 41, and 42; *f*, positioned on the lingual and vestibular surfaces of the alveolar process to protect teeth 35, 34, 33, 32, 31, 41, 42, 43, and 44; *g*, positioned on the lingual surface of the alveolar process and the tongue to protect tooth 46; *h*, positioned on the buccal and palatal surfaces of the alveolar process to protect teeth 25 and 26.

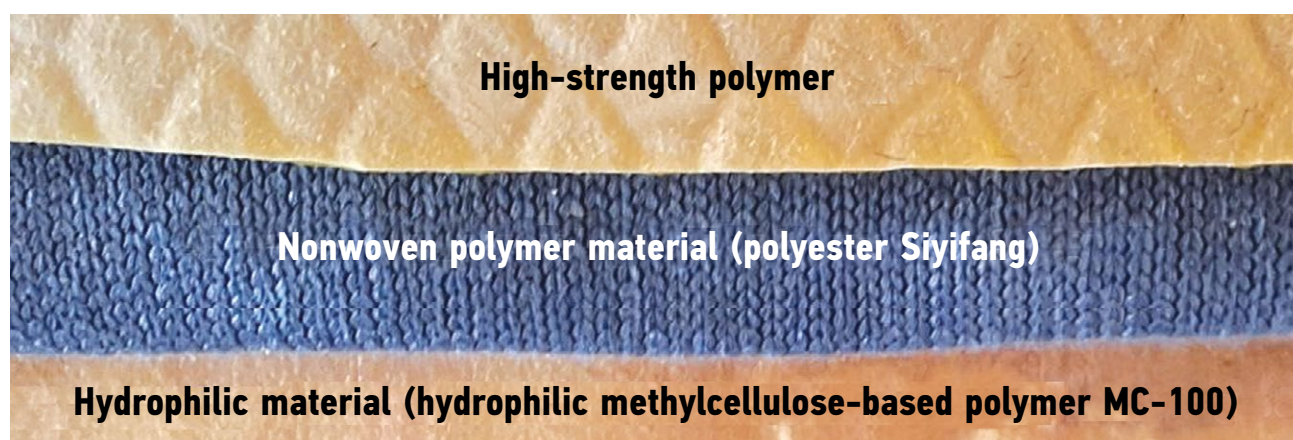


Fig. 2. Structure of the dental mouth protector designed to shield the oral mucosa, from top to bottom: outer layer made of high-strength polymer; middle layer of nonwoven polyester (Siyifang, Cordura oxford fabric; Siyifang, China); inner layer of hydrophilic material MC-100 (Defy, Russia). All layers were bonded with Technomelt PS 1540 adhesive (Henkel Adhesives, Germany).

Eligibility Criteria

Inclusion criteria: The primary inclusion criterion was the need for tooth preparation for fixed prosthodontic restorations and the presence of individual features complicating treatment.

Individual factors complicating prosthodontic treatment included heightened anxiety during dental visits, an exaggerated gag reflex, and specific anatomical variations that hindered access and visibility at the treatment site (e.g., buccal soft tissues obstructing access of the handpiece to the vestibular surfaces of teeth). In patients with complex medical histories, these features included tremor in Parkinson disease and involuntary facial muscle movements associated with motor tics. Additional inclusion criteria were the absence of any pathological changes in the oral mucosa and a signed informed consent form for study participation.

Exclusion criteria: refusal to participate in the study; HIV infection or parenterally transmitted viral hepatitis based on medical history or records; patient nonadherence to study procedures; the need for prolonged preparatory treatment before prosthodontic rehabilitation in general or before the placement of fixed restorations; and, for female patients, pregnancy or lactation.

Study Setting

The study was conducted at the Department of Prosthodontics and Orthodontics, Ryazan State Medical University named after Academician I.P. Pavlov. Participants were recruited from patients seeking prosthodontic rehabilitation during routine outpatient visits.

Study Duration

During the enrollment period, patients were screened and recruited into the study, assigned to groups, and scheduled for visits.

The follow-up period for patients was 5 weeks. Within this period, each patient was observed on the day of their tooth preparation appointment. In the final week of the study, results were summarized and analyzed. No deviations from the planned study schedule occurred. Upon completion of the clinical phase, a patent for the mouth protectors was obtained based on the study findings [9].

Intervention

As part of the study, clinical examinations were performed immediately before and after tooth preparation. During the initial pre-preparation examination, the condition of the oral mucosa in the operative area was assessed to confirm the absence of lesions or trauma. During the second examination, traumatic injuries to the oral mucosa resulting from tooth preparation were documented. After both examinations, patients were interviewed to assess their subjective experience of oral mucosa trauma during tooth preparation.

Main Study Outcome

All cases of unintended oral mucosa trauma identified after tooth preparation were documented in a summary table. Lesions were categorized by anatomic site: tongue mucosa, hard palate, retromolar area, and buccal mucosa.

A comparative analysis of the number and distribution of oral mucosa injuries between groups was performed.

Additional Study Outcomes

In addition to comparing the total number of oral mucosa injuries between groups, the visually detected traumatic lesions were stained, and their total area was measured photometrically for each of the above-mentioned anatomic sites. The results were recorded in a summary table and expressed in square millimeters (mm²). In addition, pain intensity during tooth preparation was assessed in both groups using the Numeric Rating Scale (NRS).

Subgroup Analysis

Both groups included 20 patients each. Patients meeting inclusion criteria were assigned to groups regardless of sex, age, or primary diagnosis. Patients with complex medical histories were distributed so that each group contained an equal number of such participants with different verified diagnoses.

Outcomes Registration

Documentation of unintended oral mucosa injuries was performed by expert dentists in several stages. First, in the prosthodontic operatory, a clinical examination of the oral cavity was performed directly in the dental chair using 4.0× magnification dental binocular loupes, a 3-W LED headlamp, and standard diagnostic instruments. To improve visualization of the oral cavity, mouth props and lip retractors were also used.

Staining results were interpreted as follows: the area of injury caused during tooth preparation was defined as the region surrounding the visually identified oral mucosal lesion that stained dark to light brown. The lesion area was measured using photometry. Images of the identified mucosal lesions were captured with a calibrated intraoral scanner, Trios 3 (3Shape, Denmark), in intraoral camera mode. To improve measurement accuracy, a semitransparent grid with 1 mm² divisions was placed over adjacent healthy mucosa during image acquisition. The area of each lesion was then calculated using the GIMP graphic software package, and the total lesion area was determined for each site: buccal mucosa, hard palate, sublingual area, retromolar area, and tongue. Results were expressed in square millimeters (mm²). In addition, the total number of lesions was recorded for each anatomic site.

To assess pain perception at the time of oral mucosal injury, patients were interviewed at the end of this stage using the widely accepted Numeric Rating Scale for pain (NRS). They were asked to rate the intensity of pain at the moment of mucosal injury on a scale from 0 to 10. A score of 0 corresponded to no pain, and a score of 10 represented unbearable pain. For each study group, mean pain scores were

calculated based on all participants' responses and compared between groups. Results were reported as $M \pm SD$.

Statistical Analysis

Sample size: As this was a pilot study designed to obtain preliminary data on the use of the proposed moth protectors, no formal sample size calculation was performed.

Data analysis: Statistical analysis was performed using MedCalc version 20.104 (MedCalc, Belgium). One-way analysis of variance was applied, with statistical significance set at $p < 0.05$. Levene test was also calculated to verify the obtained results.

RESULTS

Participants

Among the patients enrolled, 25 were diagnosed with ICD-10 K08.1: loss of teeth due to accident, extraction, or local periodontal disease (partial edentulism); 8 with ICD-10 K02.8: other dental caries, including caries in endodontically treated teeth, with an occlusal surface destruction index ≥ 0.7 ; 4 with ICD-10 K03.7: posteruptive color changes of dental hard tissues; and 3 with ICD-10 K03.0: excessive attrition of teeth, local forms.

Of the study participants, 2 had a comorbidity of Parkinson disease (G20); 2 had chronic motor tics involving the facial musculature (F95.1); 1 patient had comorbid localized chronic hypertrophic gingivitis (K05.1); and 11 patients had a confirmed diagnosis of localized chronic periodontitis (K05.3). In addition, 27 patients experienced increased psychoneurotic tension during treatment, 6 had an exaggerated gag reflex, and 3 had individual anatomic variations complicating dental care (2 patients were diagnosed at baseline with anomalies of tooth position (K07.3), lingual displacement; and 1 patient had a narrow oral vestibule).

Primary Results

A total of 16 oral mucosa injuries were recorded across both groups. Before staining, during the initial visual inspection with optical magnification, all injuries were determined to be superficial and did not extend beyond the oral mucosa. The detailed distribution of injuries, including localization and total number per group, is presented in Table 1. A statistically significant difference was observed between groups ($p = 0.032$). Levene test yielded a value of 10.145, with significance at $p = 0.003$.

In group A, traumatic oral mucosa lesions were registered in only 2 of 20 patients, totaling 3 injuries.

Of these, 66% ($n = 2$) were localized to the tongue, and 33% ($n = 1$) to the sublingual area. No injuries were detected in the other examined areas of the oral cavity.

In group B, oral mucosa injuries were identified in 10 of 20 patients, totaling 13 lesions localized to buccal mucosa in 7.69% of cases ($n = 1$), hard palate in 15.38% ($n = 2$), sublingual area in 23% ($n = 3$), retromolar area in 23% ($n = 3$), and tongue in 30.76% ($n = 4$).

Secondary Results

The results of lesion area measurements are presented in Table 2. Comparison of the total lesion area between groups also revealed statistically significant differences ($p = 0.035$). Levene test was 6.472, with significance at $p = 0.015$. These results indicate that the total lesion area in group B (12.6 mm²) was 74.6% greater than in group A (3.2 mm²). The largest lesion areas in both groups were observed on the tongue: 2.2 mm² in group A and 3.5 mm² in group B. In group B, which showed lesions in all examined sites, the smallest lesion areas were recorded on the buccal mucosa (1.1 mm²) and hard palate (1.1 mm²).

According to patient interviews, the mean pain score on the NRS was 0.650 ± 0.715 in group A, compared with 2.0 ± 0.4 in group B. Statistical analysis showed significance at $p < 0.001$. Levene test was 4.132, with significance at $p = 0.049$. Thus, patients in group A reported significantly lower pain intensity during oral mucosa trauma compared with group B.

Adverse Events

No adverse events were reported during the study, including deep oral cavity injuries (beyond the mucosa), medical emergencies during treatment, or prosthodontic complications.

DISCUSSION

Summary of Primary Results

The incidence of oral mucosal injuries in group A was 76.9% lower than in group B.

Discussion of Primary Results

Currently, isolation devices capable of protecting the oral mucosa from unintended trauma caused by dental instruments are virtually unavailable. Furthermore, no previous studies have evaluated the ability of isolation devices to prevent oral mucosa injuries during dental procedures performed in complex clinical settings.

Since prosthodontic treatment in both groups was performed under identical conditions, the authors attribute the high incidence of oral mucosa injuries (50% of all patients) in group B to tooth preparation in complex clinical settings without the proposed mouth protectors.

Because all prosthodontists who performed treatment had first- or second-level certification and more than 5 years of clinical experience, the authors believe that the high incidence of oral mucosa injuries in group B was not related to insufficient professional competence. This is further supported by the superficial nature of the lesions, as a lack of competence and manual skills under the study protocol would likely have resulted in deeper or more extensive injuries. However, the authors note that oral mucosal injury during prosthodontic rehabilitation may result from the need to work in close proximity to the oral mucosa, for example, when preparing a finish line. The authors also consider that the risk of oral mucosa injury increases when dentists use optical equipment (binocular loupes, microscopes), sharp-tipped burs (flame- or pear-shaped), or dental lasers and electrosurgical units. If the patient has a complex

Table 1. Oral mucosa injuries recorded during treatment in Groups A and B

Group	Injury site					Total injuries	p-value
	Buccal mucosa	Hard palate	Sublingual area	Retromolar area	Tongue		
Group A	0	0	1	0	2	3	0.032*
Group B	1	2	3	3	4	13	0.032*

Note (Here and in Table 2). * statistically significantly.

Table 2. Surface area of oral mucosa defects after tooth preparation in Groups A and B, mm²

Group	Injury site					Total surface area	p-value
	Buccal mucosa	Hard palate	Sublingual area	Retromolar area	Tongue		
Group A	0	0	1.0	0	2.2	3.2	0.035*
Group B	1.1	1.1	3.0	2.8	3.5	12.6	0.035*

medical history or makes unexpected movements during treatment, the probability of acute iatrogenic trauma increases.

The study also revealed that, in both groups, the majority of oral mucosa injuries were located on the lateral surfaces of the tongue. The authors attribute this finding primarily to the proximity of the lateral tongue surface to the lingual surfaces of mandibular teeth undergoing preparation. Notably, the initial design of the proposed mouth protectors focused mainly on shielding the dorsal tongue surface, which likely explains the relatively high number of lateral tongue injuries in group B. Based on these findings, the design of the tongue protectors was subsequently refined to improve coverage of the lateral surfaces.

Study Limitations

The study findings may be influenced by the fact that only patients undergoing prosthodontic rehabilitation with fixed restorations were included. Patients requiring restorative, orthodontic, or surgical dental care were not included. Therefore, the authors note that the clinical effectiveness of mouth protectors in restorative dentistry, oral surgery, or orthodontics may differ, and further studies are needed for a more precise evaluation.

CONCLUSION

This study demonstrated that mouth protectors used during tooth preparation for fixed prosthodontic restorations reduce both the incidence and the extent of iatrogenic oral mucosal injuries.

These findings confirm the effectiveness of the proposed mouth protectors.

ADDITIONAL INFORMATION

Author contributions: A.V. Guskov: investigation, writing—review & editing; O.S. Guiter: fabrication of the mouth protector, investigation, writing—original draft, writing—review & editing; A.S. Kokunova: investigation, writing—review & editing; S.I. Kalinovskiy: investigation, writing—review & editing; N.M. Shuvalov: fabrication of the mouth protector, investigation, writing—original draft; D.G. Zhukovets: fabrication of the mouth protector, writing—original draft, writing—review & editing. All the authors approved the version of the manuscript to be published and agreed to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethics approval: The study was approved by the local Ethics Committee of Ryazan State Medical University named after Academician I.P. Pavlov, Ministry of Health of the Russian Federation (protocol extract No. 3, October 12, 2022).

Funding sources: No funding.

Disclosure of interests: The authors declare no relationships, activities, or interests (personal, professional, or financial) with third parties (for-profit, not-for-profit, or private entities) whose interests may be affected by the content of this article. The authors also report no other relevant relationships, activities, or interests within the past three years.

Statement of originality: No previously published material (text, images, or data) was used in this work.

Generative AI: No generative artificial intelligence technologies were used to prepare this article.

Provenance and peer-review: This paper was submitted unsolicited and reviewed following the standard procedure. The peer review process involved two external reviewers, a member of the editorial board, and the in-house scientific editor.

REFERENCES | СПИСОК ЛИТЕРАТУРЫ

1. Scott D, Hogan T, John J. Rubber dam evidence. *Br Dent J*. 2020;229(3):150. doi: 10.1038/s41415-020-2011-y EDN: UZLMXR
2. Zahra SF, Yousaf A, Ashfaq S, et al. Different techniques for rubber dam isolation: a cross-sectional study. *Life and Science*. 2021;2(3):5–5. doi: 10.37185/LnS.1.1.124
3. Radwan-Oczko M, Sokół I, Babuśka K, et al. Prevalence and characteristic of oral mucosa lesions. *Symmetry*. 2022;14(2):307. doi: 10.3390/sym14020307 EDN: XUCMET
4. Mezhevikina GS, Vagner VD, Kokunova AS. The condition of the oral mucosa in workers of the city of Ryazan. *Science of the Young (Eruditio Juvenium)*. 2023;11(3):397–402. doi: 10.23888/HMJ2023113397-402 EDN: BRLQVT
5. Savychuk N, Trubka I, Savychuk AV, et al. Local immunity of the oral mucosa and colonization resistance. *Dentistry. Aesthetics. Innovation*. 2020;4(1):74–88. doi: 10.34883/PI.2020.4.1.007 EDN: JIMYPO
6. Galieva AS, Davidovich NV, Opravin AS, et al. The role of inflammatory biomarkers of gingival fluid involved in the modulation of immune defense mechanisms in chronic periodontitis. *I.P. Pavlov Russian Medical Biological Herald*. 2023;31(3):451–458. doi: 10.17816/PAVLOVJ321217 EDN: MZRELK
7. Griffin MF, Fahy EJ, King M, et al. Understanding scarring in the oral mucosa. *Advances in Wound Care*. 2022;11(10):537–547. doi: 10.1089/wound.2021.0038 EDN: AIRBUO
8. Waasdorp M, Krom BP, Bikker FJ, et al. The bigger picture: why oral mucosa heals better than skin. *Biomolecules*. 2021;11(8):1165. doi: 10.3390/biom11081165 EDN: UBYRXA
9. Patent RUS № 2803861 C1/ 01.09.2023. Kalinovskiy SI, Guskov AV, Guiter OS, et al. *Dental overlay to protect the patient from injury with instruments*. (In Russ.) Available from: <https://elibrary.ru/aothxq> EDN: AOTHXQ
10. Patent RUS № 2764365 C1/ 01.17.2022. Guiter OS, Guskov AV, Kalinovskiy SI, Olejnikov AA. *Method for marking the area of the oral mucosa*. (In Russ.) Available from: <https://elibrary.ru/xmblgl> EDN: XMBLGL

AUTHORS' INFO

* **Dmitry G. Zhukovets**, MD;

address: 57 Chapaeva st, Ryazan, Russia, 390000;

ORCID: 0009-0006-7146-8905;

eLibrary SPIN: 1441-0334;

e-mail: jukovets.dmitry@ya.ru

Alexander V. Guskov, MD, Cand. Sci. (Medicine), Associate Professor;

ORCID: 0000-0001-9612-0784;

eLibrary SPIN: 3758-6378;

e-mail: Guskov74@gmail.com

Olga S. Guiter, MD, Cand. Sci. (Medicine), Associate Professor;

ORCID: 0000-0003-1707-7015;

eLibrary SPIN: 7745-4210;

e-mail: gos.stam@mail.ru

Anzhela S. Kokunova, MD, Cand. Sci. (Medicine), Associate Professor;

ORCID: 0000-0003-3644-4191;

eLibrary SPIN: 9532-6012;

e-mail: kokunova1977@mail.ru

Sergey I. Kalinovskiy, MD;

ORCID: 0000-0002-6222-3053;

eLibrary SPIN: 2506-0080;

e-mail: Kalinovskiysi@yahoo.com

Nikolay M. Shuvalov, MD;

ORCID: 0009-0005-3708-3860;

eLibrary SPIN: 7290-0717;

e-mail: Darkenoid00@mail.ru

ОБ АВТОРАХ

* **Жуковец Дмитрий Геннадьевич**;

адрес: Россия, 390000, Рязань, ул. Чапаева, д. 57;

ORCID: 0009-0006-7146-8905;

eLibrary SPIN: 1441-0334;

e-mail: jukovets.dmitry@ya.ru

Гуськов Александр Викторович, канд. мед. наук, доцент;

ORCID: 0000-0001-9612-0784;

eLibrary SPIN: 3758-6378;

e-mail: Guskov74@gmail.com

Гуйтер Ольга Сергеевна, канд. мед. наук, доцент;

ORCID: 0000-0003-1707-7015;

eLibrary SPIN: 7745-4210;

e-mail: gos.stam@mail.ru

Кокунова Анжела Сергеевна, канд. мед. наук, доцент;

ORCID: 0000-0003-3644-4191;

eLibrary SPIN: 9532-6012;

e-mail: kokunova1977@mail.ru

Калиновский Сергей Игоревич;

ORCID: 0000-0002-6222-3053;

eLibrary SPIN: 2506-0080;

e-mail: Kalinovskiysi@yahoo.com

Шуvalов Николай Михайлович;

ORCID: 0009-0005-3708-3860;

eLibrary SPIN: 7290-0717;

e-mail: Darkenoid00@mail.ru

* Corresponding author / Автор, ответственный за переписку

