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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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NON-INVASIVE ESTHETIC TREATMENT OF INITIAL CARIES WITH RESIN INFILTRATION IN A PATIENT WITH AUTISM SPECTRUM DISORDER

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Abstract.

This report presents the case of an 11-year-old male patient diagnosed with Autism Spectrum Disorder (ASD), who was treated for mild dental fluorosis using the ICON® resin infiltration technique. The child's parents expressed concern about the esthetic appearance of the teeth, which was affecting his self-confidence in social situations. Clinical examination revealed carious lesions of the enamel on the central incisors corresponding to code 3 of the CAST system (distinct changes in enamel color due to demineralization, indicating a more advanced initial stage of caries). Vital staining was performed for diagnostic purposes and to assess the condition of the enamel, revealing significant demineralized areas. Additionally, light-induced fluorescence was used to confirm structural changes in the enamel. As part of the treatment protocol, remineralizing therapy was also administered using R.O.C.S. gel to enhance enamel structure.

Considering the cooperative behavior of the patient and his mild sensory sensitivity, a non-invasive resin infiltration technique (ICON®) was selected. The procedure was carried out on the upper central incisors using a custom-designed device developed by our team for isolating the anterior tooth group, which served as an alternative to the conventional rubber dam. The infiltration protocol was followed step-by-step in accordance with the manufacturer's instructions. Immediately after the procedure, vital staining and light fluorescence methods revealed a marked improvement in tooth aesthetics, with white spots appearing less prominent and the enamel displaying a more uniform color. Resin infiltration provided good material integration with the enamel, significantly improving the appearance of the teeth. At the three-month follow-up, repeat examination using light-induced fluorescence and vital staining demonstrated stable results: the enamel remained uniform, the white spots had almost disappeared, and enamel color was preserved. The resin infiltrate exhibited durability with no signs of degradation or discoloration. The patient reported improved esthetic self-perception, which contributed to enhanced self-confidence.

The treatment was performed without sedation and was well tolerated by the patient, resulting in satisfaction for both the child and his parents. Minimally invasive resin infiltration demonstrated high efficacy and esthetic benefit in the management of early caries on the central incisors in children with ASD, ensuring clinical success and patient comfort.

Key words. Initial caries, autism spectrum disorder, resin infiltration, remineralizing therapy, pediatric dentistry.

Introduction.

Dental caries is the most prevalent chronic disease in children worldwide, and its early form – initial or non-cavitated caries – is often underdiagnosed or inadequately treated. These lesions are typically characterized by subsurface enamel demineralization, appearing clinically as white spot lesions (WSLs) [1,2]. Although non-cavitated, these lesions represent the earliest visible manifestation of the caries process and are indicators of an imbalance in the demineralization-remineralization cycle. If left untreated, such lesions may progress to irreversible cavitation, leading to the need for more invasive restorative procedures. Thus, timely diagnosis and management of initial caries are critical in modern preventive and minimally invasive dentistry.

The ICON® resin infiltration system represents a groundbreaking technique in the management of initial caries. This method allows clinicians to arrest the progression of early enamel lesions and simultaneously improve esthetic outcomes. ICON® utilizes a low-viscosity light-curing resin that penetrates the porous enamel structure after selective etching, effectively occluding micro-channels that allow acid diffusion and bacterial ingress. By replacing lost mineral with resin, this technique not only halts lesion advancement but also alters the refractive index of the enamel to restore its translucency and mask white spot lesions [3].

Compared to traditional methods such as fluoride varnish application or microabrasion, ICON® offers a one-time, non-invasive intervention with immediate esthetic benefits. Numerous studies have confirmed its efficacy in arresting early carious lesions on smooth surfaces and proximal areas, with high patient satisfaction and low risk of recurrence. Given these advantages, ICON® is increasingly integrated into pediatric dental care protocols, especially for patients requiring non-traumatic approaches.

Treating children with autism spectrum disorder (ASD) introduces additional clinical complexity. ASD encompasses a range of neurodevelopmental conditions characterized by difficulties in communication, social interaction, and often heightened sensory sensitivities [4-6]. Dental care for these patients is often complicated by anxiety, difficulty in tolerating stimuli such as lights and sounds, and challenges in understanding instructions or remaining still during procedures. As such, minimally invasive, quick, and painless dental procedures are highly preferred for this population [7]. A higher frequency of dental anomalies was found in children and adolescents with delayed mental development [8]. Additionally, children with

autism often need more time and additional staff involvement.

In this context, the ICON® system emerges as an ideal intervention due to its atraumatic nature, rapid application, and lack of need for mechanical drilling or anesthesia. Additionally, its potential to improve esthetic appearance can contribute positively to the psychosocial well-being of children with ASD, who may already face social integration challenges.

This clinical case report presents a successful application of the ICON® resin infiltration technique to treat early enamel caries on the maxillary central incisors of an 11-year-old male patient diagnosed with autism spectrum disorder. The case demonstrates not only the clinical efficacy of the procedure but also its feasibility and acceptability in a special-needs pediatric patient.

Case presentation.

This case report aims to demonstrate the clinical feasibility, esthetic outcome, and patient tolerance of resin infiltration using ICON® in the treatment of initial caries lesions on the central incisors in a pediatric patient diagnosed with autism spectrum disorder.

An 11-year-old male patient with a confirmed diagnosis of ASD presented with parental complaints regarding the presence of white spots on the upper central incisors (Figure 1). Clinical examination revealed enamel carious lesions corresponding to code 3 of the Caries Assessment Spectrum and Treatment (CAST) index [9,10], indicating distinct demineralization without cavitation. The patient had a DMF index of 2 and demonstrated inadequate oral hygiene as per the OHI-S index [11].

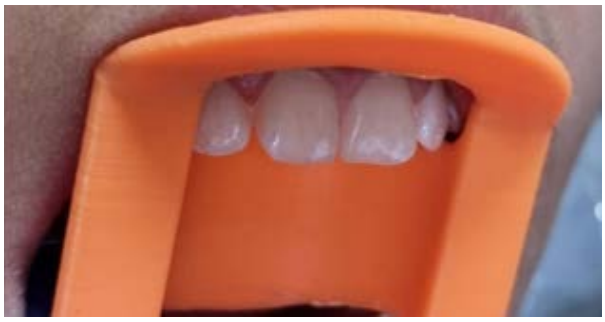

Figure 1. *Condition of the hard dental tissues before the start of treatment.*

Given the behavioral characteristics and sensory sensitivities of the child with autism spectrum disorder, a phased treatment plan was implemented, focusing on acclimatization and the gradual introduction of necessary interventions. The initial visits were dedicated to building a trusting relationship with the patient through the use of visual cues, calm verbal instructions, and behavioral reinforcement strategies. This approach ensured a comfortable experience and helped reduce anxiety in the clinical setting. Laser fluorescence analysis using a DIAGNOdent Pen and vital staining was performed before and after the non-invasive treatment. Blue-stained areas indicate enamel demineralization revealed after application of 2% methylene blue, highlighting early carious lesions targeted for resin infiltration (Figure 2).

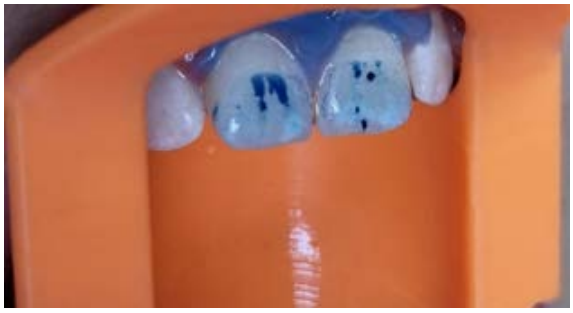

Figure 2. *After vital staining.*

Following successful acclimatization, professional oral hygiene was performed. This included plaque staining and photographic documentation, ultrasonic scaling to remove calculus, pigment removal with the Air Flow system, and polishing of the teeth using prophylactic paste and a soft brush. Over the course of a week, remineralizing therapy was carried out using R.O.C.S. Medical Minerals gel. The gel was topically applied to areas of enamel demineralization to strengthen the enamel structure and enhance tissue resistance.

Upon completion of the remineralization phase, ICON® resin infiltration was applied to areas where signs of initial carious lesions persisted. By the time the infiltration phase commenced, the patient had adapted well to the treatment environment, and the procedure was performed without sedation and was well tolerated. The integration of this non-invasive technique into an individualized approach allowed for a favorable clinical outcome and ensured a high level of cooperation from the child. During the application of non-invasive treatment in children with autism spectrum disorder (ASD), considerable difficulties were encountered in achieving adequate field isolation. The use of a rubber dam proved labor-intensive and poorly tolerated due to heightened sensory sensitivity and behavioral challenges. To address these limitations, we developed a custom device specifically designed for isolating the anterior group of teeth. The device provides optimal access and visibility, maintains the mouth in an open position, and protects soft tissues. It is equipped with an integrated tongue shield that prevents tongue intrusion into the operative field and simultaneously stabilizes the jaws, significantly facilitating dental procedures in children with heightened anxiety and hyperreactivity. A liquid rubber dam was used to isolate the soft tissues of the oral cavity.

This reusable tool (Patent RK, utility model № 8630 2023/1085.2, registered on 17.11.2023) enabled effective field control with minimal distress.

The invention relates to the field of medicine, specifically pediatric therapeutic dentistry, and may be used to improve visibility of the working area and to protect the soft tissues of the oral cavity from various types of injury. The mouth retractor is a device comprising an upper frame (1) with a semicircular shape that follows the contour of the upper lip, a lower frame (2) also semicircular in shape, lateral sides (3) connecting the frames, and a tongue guard (4). On both the left and right sides, the upper frame (1) extends into the lateral sides (3), which are flat vertical plates. A tongue guard (4), in the form of a flexible arch with a widened middle section, is mounted between these plates. The arch features a broad central part that blocks forward

tongue movement and keeps both jaws in an open position. The tongue guard is rigidly attached to the lateral sides. The upper and lower frames retract the upper and lower lips, thereby providing access and visibility to the anterior group of teeth. The lateral sides have notches (5) for securing a saliva ejector. The entire structure is made of plastic (Figure 3).

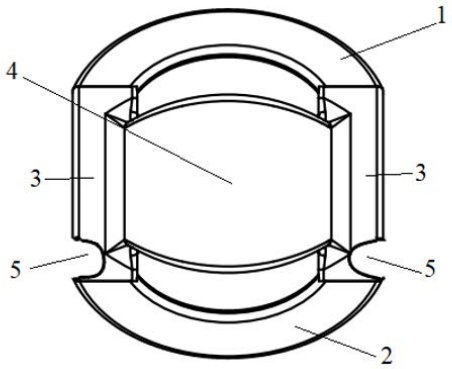

Figure 3. *Schematic representation of the device for anterior teeth isolation.*

The ICON technique was carried out in several carefully sequenced stages to ensure optimal infiltration and esthetic outcomes. The procedure began with a repeated session of professional oral cleaning, ensuring an unobstructed surface for infiltration. Following this, the affected enamel surface was thoroughly dried, and a custom anterior isolation device equipped with an integrated tongue shield was positioned to maintain a dry field and enhance patient comfort.

The first step of the infiltration protocol involved the application of Icon-Etch, a hydrochloric acid gel, which was left on the lesion area for two minutes to selectively erode the superficial mineralized layer and expose the underlying porous enamel. After rinsing and drying, Icon-Dry—a 99% ethanol solution—was applied to the etched surface to remove moisture and allow visual inspection. If the white spot lesion remained clearly visible, the etching process was repeated, with a maximum of three cycles permitted to avoid over-treatment.

Once adequate lesion preparation was achieved, Icon-Infiltrant, a low-viscosity resin, was applied to the lesion surface. This resin was allowed to penetrate the enamel's microporosities by capillary action, effectively sealing the subsurface lesion. After an appropriate dwell time, excess material was carefully removed, and the area was light-cured to harden the resin. The procedure concluded with fine polishing to smooth the surface and enhance the esthetic result.

Results.

The effectiveness of the treatment was assessed using vital staining and laser fluorescence both immediately after the ICON® resin infiltration procedure and at the 3-month follow-up. Immediately post-treatment, vital staining demonstrated a marked reduction in dye uptake in the previously demineralized enamel zones, indicating a decrease in enamel porosity and successful infiltration (Figure 4). The enamel surface exhibited a uniform coloration with minimal residual opacity.

Figure 4. *Result immediately after treatment with the ICON system.*

Laser fluorescence measurements were obtained using a DIAGNOdent Pen on the maxillary central incisors. Baseline values indicated active demineralization, which decreased significantly after resin infiltration and remained stable at the 3-month follow-up (Table 1).

Table 1. *DIAGNOdent Pen values before and after resin infiltration.*

Tooth	Time Point	DIAGNOdent Pen Value
11	Before treatment	28
11	Immediately after	8
11	3-month follow-up	8
21	Before treatment	27
21	Immediately after	7
21	3-month follow-up	8

At the 3-month evaluation, both diagnostic methods demonstrated stable results. Vital staining did not reveal any newly active or recurrent lesions, and fluorescence readings remained low and consistent with inactive enamel surfaces. These results support the long-term effectiveness of the resin infiltration technique in halting caries progression and improving the esthetic appearance of the enamel in a minimally invasive and behaviourally acceptable manner (Figure 5).

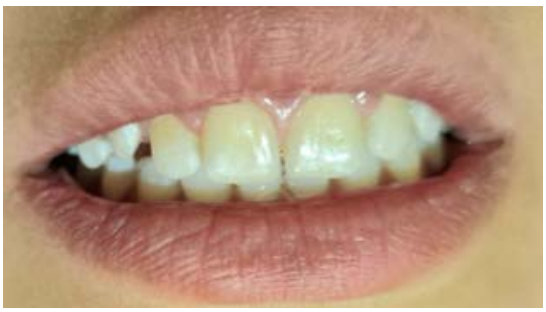

Figure 5. *Result three months after treatment with the ICON system.*

Discussion.

The application of resin infiltration using the ICON® system in a pediatric patient with autism spectrum disorder (ASD) highlights a multidisciplinary intersection of minimally invasive dentistry, behavioral science, and pediatric patient-centered care. This case illustrates not only the technical success of the ICON® protocol but also its compatibility with the unique psychological and physiological profiles of neurodiverse children.

Minimally invasive approaches, such as ICON®, have been recognized in the literature as the gold standard for early caries management. As emphasized by Rajesh et al. [12], these approaches aim to halt the disease process with minimal structural intervention, preserving tooth integrity and reducing psychological burden for pediatric patients. Paris et al. [13] confirmed the efficacy of resin infiltration in arresting lesion progression and improving esthetic outcomes, outcomes consistent with our present case.

The non-invasive nature of ICON® proved crucial for this ASD patient, who exhibited heightened sensitivity to traditional stimuli like drilling or suction. Avoiding these triggers reduced the need for sedation—a key concern in this population. As discussed by Zhang et al. [2], pharmacological interventions in ASD children require cautious consideration due to increased sensitivity and comorbidities. Therefore, the ability to complete treatment without sedation underscores ICON®'s value in special-needs dentistry.

Behavioral adaptability also plays a vital role. As shown in the 5-year study on dental problems in children with autism [14], poor oral health is frequently observed due to challenges in cooperation and daily hygiene. Choi et al. (2023) further emphasized that ASD children often present with higher plaque accumulation and caries risk, validating the necessity of individualized preventive programs.

Integrating remineralizing therapies into treatment aligns with the evidence presented by Silva et al. [15], who showed that silver fluoride and similar agents can promote lesion inactivation. Although silver agents were not used in this case, R.O.C.S. Medical Minerals gel provided a complementary remineralization phase prior to resin infiltration, reinforcing enamel resilience and optimizing esthetic outcomes.

In terms of treatment strategy, Patel et al. [16] advocate for a stepwise behavioral desensitization process tailored to neurodevelopmental needs. Our phased protocol—beginning with acclimatization and culminating in ICON® application—reflects this model, reinforcing the relevance of gradual, relationship-based clinical care.

The guidelines set by the American Academy of Pediatric Dentistry (AAPD) emphasize patient comfort, minimal invasiveness, and long-term outcomes, all of which are addressed through this approach. The visual masking of white spot lesions additionally supported psychosocial well-being, a point reinforced by feedback from caregivers and consistent with oral health promotion principles discussed by Casamassimo et al. [17].

Lastly, a recent comparative study on caries management strategies in ASD and non-ASD children [18] found that treatment success is significantly influenced by behavioral compatibility. The present case confirms this observation, with patient-tailored isolation tools and anxiety-reducing techniques contributing to the positive clinical outcome.

In summary, this case not only reinforces the clinical efficacy of the ICON® system in managing non-cavitated enamel lesions but also integrates behavioral, ethical, and psychosocial dimensions of care in ASD populations. The findings align with current best practices and underline the need for continued interdisciplinary innovation in special-needs pediatric dentistry.

The management of initial caries in pediatric patients with autism spectrum disorder (ASD) presents unique clinical and ethical challenges, requiring a balance between effective intervention and minimal invasiveness. The present case supports growing evidence in favor of resin infiltration using the ICON® system as a clinically viable and behaviorally appropriate method for treating non-cavitated enamel lesions in children with special healthcare needs.

Minimally invasive therapies are increasingly recognized as the standard of care in pediatric dentistry, particularly when treating early-stage carious lesions. According to Rajesh et al. [1], resin infiltration offers a superior alternative to traditional restorative techniques by sealing the lesion, halting its progression, and improving esthetics without the need for enamel removal. This is particularly valuable in pediatric and ASD populations where cooperation during invasive procedures may be limited.

A systematic review by Paris et al. [19] demonstrated high efficacy of the ICON® technique in arresting lesion progression and reducing lesion visibility. These outcomes align with our clinical observations, where the use of ICON® led to both functional and esthetic improvements with no reported discomfort or resistance from the patient.

The role of remineralizing agents, such as those used prior to infiltration in this case, has also been well established. Silva et al. [20] found that silver fluoride applications can both remineralize and arrest carious lesions, particularly when applied early. While silver agents carry esthetic drawbacks, combining remineralization with resin infiltration, as done in our protocol, allowed for tissue strengthening prior to esthetic masking.

Children with ASD often present with poor oral hygiene, increased caries risk, and limited cooperation during treatment. Several studies confirm this trend. Choi et al. reported significantly higher plaque indices and caries prevalence among children with ASD compared to neurotypical peers. Similarly, the retrospective cohort study by Zhang et al. [21] emphasized the importance of caries prevention strategies, such as fluoride varnish and sealants, to reduce caries incidence in ASD populations over time.

Navigating care in children with neurodevelopmental conditions also requires behavioral sensitivity. As highlighted by Patel et al. [22], tailoring dental interventions to sensory and behavioral profiles not only improves treatment outcomes but also enhances patient trust. This was evident in our approach, where phased behavioral adaptation facilitated patient compliance and allowed for completion of procedures without pharmacological intervention.

The long-term outlook for restorative strategies in ASD children remains a subject of active research. A recent comparative study [23] found that the survival of different caries treatments, including resin-based approaches, varies between children with and without ASD, with behavioral adaptability playing a crucial role in clinical success.

Finally, ethical and clinical guidelines, such as those presented by the AAPD, advocate for conservative treatment methods that prioritize patient comfort and long-term oral health. Resin

infiltration is in line with these recommendations, offering a non-invasive yet effective treatment modality with reduced need for future restorations.

In summary, this case contributes to the growing body of literature supporting minimally invasive, esthetically focused, and behaviorally adaptable strategies for managing early caries in children with ASD. Integrating remineralization and resin infiltration within a structured, patient-centered approach offers both clinical efficacy and psychosocial benefit.

Conclusion.

Resin infiltration using ICON® presents a clinically effective, esthetically pleasing, and behaviorally appropriate treatment option for initial caries in children with autism spectrum disorder. Its minimally invasive nature makes it especially suitable for pediatric patients with special healthcare needs. Further clinical studies are warranted to establish standardized protocols and long-term outcomes in this population.

The successful use of the ICON® resin infiltration technique in this case emphasizes its role as a promising solution for managing early enamel caries in pediatric patients with autism spectrum disorder. The treatment was well tolerated, required no sedation, and resulted in both clinical and esthetic improvements. This approach not only meets the clinical needs of arresting caries progression but also addresses the behavioral and sensory sensitivities common in children with ASD.

By integrating minimally invasive caries management with personalized behavioral strategies, clinicians can effectively improve oral health outcomes and patient experiences. The positive feedback from the patient and caregivers further underscores its potential as a preferred method in special-needs pediatric dentistry. Continued research and broader clinical application will help to define optimal protocols, identify long-term outcomes, and expand its benefits to a wider population of children requiring autism-sensitive dental care.

Ethical Approval.

Approval for the study was granted by the Local Ethics Committee of the S.D. Asfendiyarov Kazakh National Medical University, decision No. 8(114) dated 30.06.2021.

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