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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

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გამოიცემა თბილისის სახელმწიფო სამედიცინო უნივერსიტეტთან
თანამშრომლობითა და მისი პატრონაჟით

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

ТБИЛИСИ - НЬЮ-ЙОРК

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 and The International Academy of Sciences, Education, Industry and Arts (U.S.A.) 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.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией и Международной академией наук, образования, искусств и естествознания (IASEIA) США 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.

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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.

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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).

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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.

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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).

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ავტორთა საყურადღებოდ!

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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.

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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.

Содержание:

CLINICAL AND RADIOGRAPHIC CHANGES FOLLOWING ORTHODONTIC INTRUSION OF OVERERUPTED MAXILLARY MOLARS WITH TWO MINI-IMPLANTS

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The problem of the permanent teeth loss and correction of the corresponding deformations due to the partially absent dentition is still one of the most urgent issues of modern dentistry. Several authors indicate that incidence rate of molar extrusion in case of missing antagonists varies from 83% [1] to 92% [2], with 27-32 % of teeth extruding more than 2 mm.

Untimely reconstruction of the defect resulting from tooth loss in 95% of cases causes extrusion of antagonists in the direction of the missing teeth, with maxillary lateral extrusion statistically more frequent than mandibular one [2].

Such deformations lead to occlusal and muscle disorders, pathological changes in the temporomandibular joint and make prosthetic rehabilitation in the area more complicated [3,4].

In order to optimize the forthcoming dental procedures, such as implantation and prosthetic rehabilitation, in clinical situations of the kind, orthodontic preparation with the use of partial constructions to normalize the position of individual teeth can be performed [5-7].

Orthodontic tooth movement is often limited by the anchorage available. The force applied to move the teeth, and any appliance that produces force on the tooth, must have an equal opposing force to the other area. It is often essential to prevent the recoil force to achieve the desired or at least the minimum tooth movement. In such cases the doctor needs to calculate the anchorage so that it avoids the movement of the anchorage teeth [8].

One of the difficult movements to perform in practice without any side effects is molar intrusion. In addition to the complexity of molar intrusion itself, there is an equally important question of preserving the viability of the moved tooth and the surrounding tissues [9-11].

The teeth being intruded can be highly prone to root resorption. Pressure arising under the intrusive forces is concentrated in the region of root apices and can lead to compression and necrosis of the periodontal ligaments [11-14].

To carry out the orthodontic intrusion of molars, various removable and non-removable appliances are used with and without anchorage to orthodontic mini-implants and mini-plates. Appliances for molar intrusion anchored with orthodontic mini-implants do not require patient compliance, do not cause discomfort and are a minimally invasive and cost-effective alternative, with a more predictable treatment result [7,15-17]. The number and location of orthodontic mini-implants and their combination with other appliances may vary. Several authors in their studies use 2 interroot orthodontic mini-implants placed palatally and bucally [4,18-21], 3 interroot mini-implants with 2 placed buccally and 1 palatally [20], mini-implants in combination with mini-plates [5,22,23], 1 interroot, buccally placed mini-implant in combination with a palatal clasp [24,25]. Previously, Sugii M.M. et al. [11] noted that the use of two mini-implants for molar intrusion — the double-traction technique — is optimal compared to a single mini-implant, and reduces the likelihood of resorption of the dental root apices and also controls the inclination of the tooth. To date, to achieve the required intrusion, various traction forces and traction vectors are used. In clinical studies, the force applied to an intruded tooth varies within a wide range: from 30g [24], and 50–70g [5,6], or 100-150g [9,14,17,18,25], to 300-450g [4,11,20,21]. However, the main task at the stage of molar intrusion is to reduce the risk of pathological changes in the periodontium, as well as the risk of root resorption, which, according to some authors, is 4 times higher during intrusion compared to extrusive displacement [9,26].

Therefore, it is still of vital importance to research and find the ideal protocol for the intrusion of molars, which will allow the desired tooth movement without side effects, in the shortest time possible and in a minimally invasive way [27].

So, the objective of this work was to study and evaluate clinical and radiographic changes during orthodontic intrusion of the first maxillary molars with two mini-implants and light intrusion forces to create conditions for adequate prosthetic rehabilitation of the lower jaw.

Material and methods. A prospective clinical study was conducted on a sample of 20 patients (8 men and 12 women) with an average age of 35.92±5.07 years (27.9 - 45 years), with extruded first maxillary molars, due to the missing opposing dentition of the mandible. The subjects were divided into groups by gender. Examination and treatment of patients was carried out at the Department of Orthodontics of A.I. Yevdokimov Moscow State University of Medicine and Dentistry (MSUMD).

The study design was reviewed and approved by the ethics committee of the MSUMD. Each patient included in the study signed an informed consent.

Criteria for inclusion in the study:

- age 25-45 years
- extrusion of the first maxillary molars due to the missing dentition of the mandible
- the need for preliminary orthodontic treatment of the patient for adequate prosthetic rehabilitation due to the lack of the space for the crown
- no periodontal changes and other contraindications for orthodontic treatment.
- no history of previous orthodontic treatment.

Patients with systemic diseases such as diabetes mellitus, osteoporosis, cardiovascular disease, coagulation disorders and metabolic bone disorders were excluded from the sample, as these factors can affect root resorption, stability of mini-implants, and, as a result, duration of treatment [13,20]. All moved molars were vital.

Before the start of the movement and after the end of the intrusion, orthodontic casts were made for all patients, and extraoral and intraoral photos were taken. Radiological changes that occurred after molar intrusion were analyzed based on cone beam computed tomography (CBCT) data. All CBCT and panoramic radiographs were done with PlanmecaProMax 3D. The inclination of the extruded molar was measured before and after the intrusion based on panoramic radiographs. Molar inclination was measured in relation to the plane of the corresponding half of the upper jaw. For this purpose, maxillary planes (NL) were drawn to the right and left through the ANS and PNS points, the axes of the extruded teeth were marked with blue lines drawn through the bifurcation and the middle of the molar crown at the equator

level. To determine the inclination of the extruded molar, we measured the lower external angle between the axis of the tooth and the plane of the corresponding half of the jaw (Fig. 1).

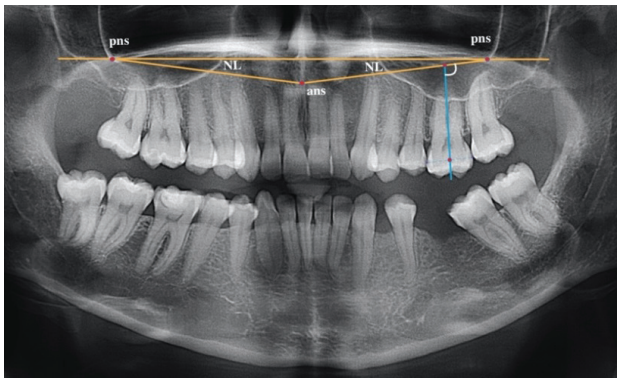


*Fig. **1.** Panoramic radiograph before orthodontic treatment. Inclination of the tooth 2.6 in relation to the maxillary plane (NL)*

CBCT data were used to evaluate intrusion and resorption severity of the moved teeth with Ez3D 2009 software. Presence or absence of root resorption and its severity was studied with the Levander and Malgrem scoring system [28], which includes five grades: 0 - no root resorption; I - a mild resorption with normal length of root and only an irregular contour; II – moderate resorption, with small areas of root loss and an almost straight contour of the apex; III - accentuated resorption with the loss of almost one third of the root length; IV - severe resorption with loss of more than one third of the root length. For this purpose, Multiplanar reconstruction (MPR) was performed with a sequential analysis of the structural integrity of the palatal, mesial and distal buccal roots (Fig. 2, a-c). The intrusion was evaluated by measuring the distance from the middle point of the occlusal surface of the molar (OU6) to the lowest/protruding point of the maxillary sinus (MS) in the frontal section (Fig. 2d). Reconstruction of the section in subsequent measurements was carried out by MPR with standardized values.

Intrusion efficiency was evaluated by dividing amount of intrusion by intrusion time [20]:

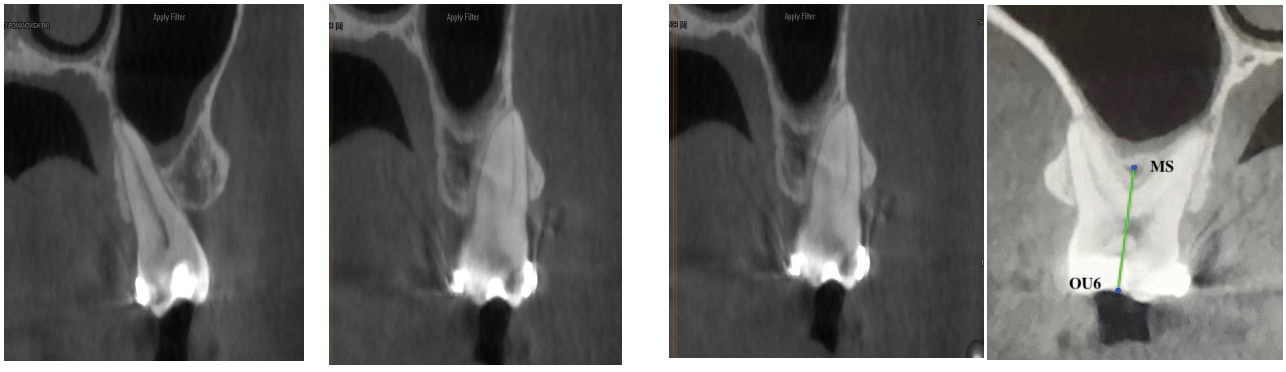
$$Efficiency = \frac{Amount\ of\ intrusion}{Intrusion\ time}$$

Using this formula, the values of the intrusion efficiency of the first upper molars were calculated for the two groups, respectively.

In the study, 28 first maxillary molars were intruded. Eight patients had bilateral molar extrusion, and 12 patients had unilateral one. The patients in the study were divided into 2 groups by gender. In terms of age the subjects in 2 groups were compatible, which made it possible to compare them with each other (Table 1).

Orthodontic treatment was performed with partial appliances of Conmet mini-implants (diameter 1.5 mm, length 10 mm) and an elastic chain (American Orthodontics) (Fig. 3, 4). A buccal mini-implant was placed in the interroot space, 2 mm apically from the attached gingiva margin, between the second maxillary premolar and the first maxillary molar. The palatal mini-implant was placed in the interroot space between the first and second maxillary molars, 12 mm away from the occlusal surface of the first molar. All mini-implants were placed by one surgeon. The elastic traction to orthodontic mini-implants was applied simultaneously with the implantation. To achieve the desired movement once every 3 weeks light elastic traction was applied from mini-implants to the tooth being extruded using a dynamometer - 15-25g per 1 mini-implant, the total traction force was 30-50 g per molar [5,6,24].

All images were measured by one operator. To evaluate the method error, 12 randomly selected panoramic radiographs and 12 CBCTs were re-measured after 4 weeks by the same operator. The statistical error was calculated using the Pearson correlation between the initial and repeated measurements and the paired samples t-test.



a *b* *c* *d*

Fig. 2. CBCT sections of the intruded tooth 2.6. a - palatal root. b - mesial buccal root. c - distal buccal root. d - tooth 1.6 after intrusion

Table 1. Intergroup distribution

Group	Number of patients	Number of maxillary first molars	Initial age (Mean±SD)
Male	8	12	37,18±4,39
Female	12	16	34,66±5,74
Total	20	28	35,92±5,07

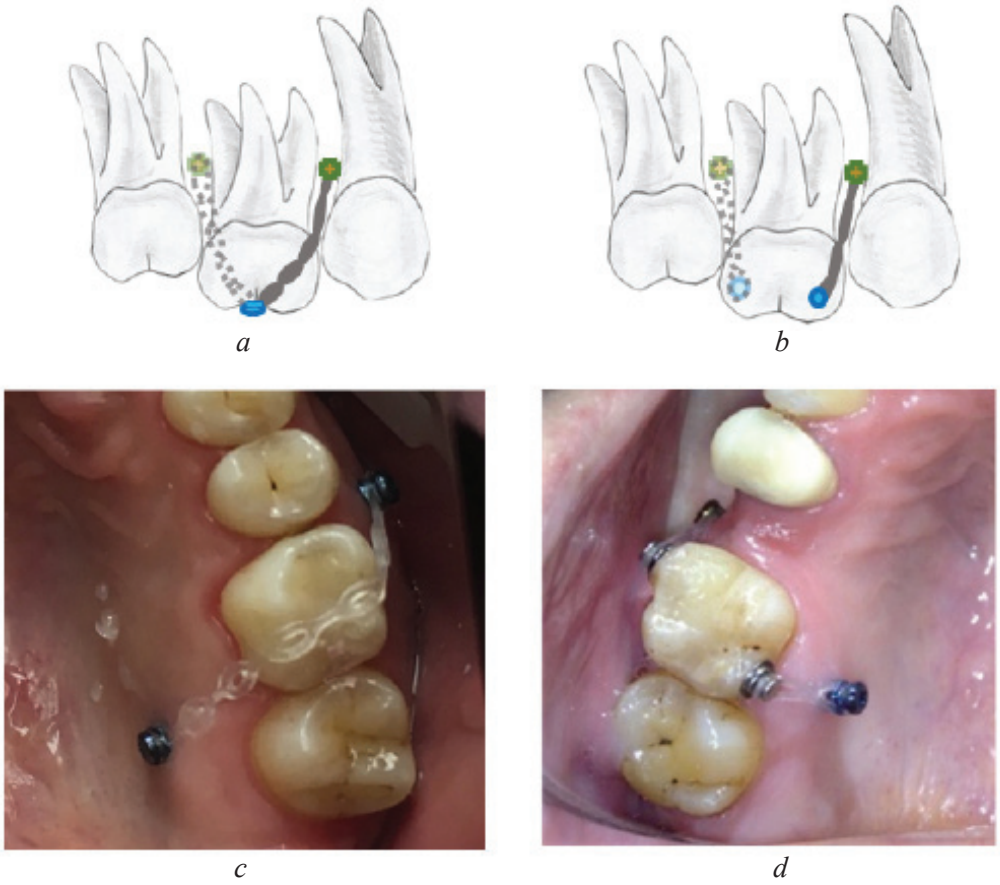


Fig. 3. Scheme of orthodontic mini-implants placement and the position of the buttons on the tooth. a - two mini-implants, one placed buccally and the other placed palatally, and the button, to prevent the elastic chain from slipping, is fixed on the chewing surface of the tooth. b, d - the position of the mini-implants (scheme and intraoral photo, respectively), as in Fig. 3a, but on the tooth 1.6 two buttons are fixed as vertically as possible under the mini-implants from the respective sides - buccal and palatal. c - intraoral photo of the appliance for intrusion of tooth 2.6. without buttons to fix the elastic chain on the tooth

Table 2. Intergroup comparability of initial age (t-test)

Variable years	Male group	Female group	P Value
	Mean±SD	Mean±SD	
Mean age	37,18±4,39	34,66±5,74	0,153

All measurements were statistically analyzed using Statistica v.6.1 software for Windows. Descriptive statistics were used to find mean values, standard error, and standard deviation of the data. The null hypothesis of the absence of intergroup difference in the studied parameters was used. Comparison of the measurement data obtained before and after the intrusion was carried out using a paired two-sample t-test. Results were considered significant if p-value <0.05.

Results and discussion. The method error evaluation demonstrated a significant high correlation of repeated measurements. The two-sample paired t-test showed no statistical significance of the differences between the initial and repeated measurements. The study groups were compatible in terms of age (Table 2).

In the study, 28 molars were successfully intruded that helped to create space for a prosthetic construction in the area of the antagonist in the mandible (Fig. 4).

Comparison of the data obtained during the study in the male and female groups did not show a significant difference in the radiographic parameters, such as amount, efficiency, time of intrusion, and change in the mesial molar inclination (Table 3).

The intrusion amount in the male group ranged from 1.33 to 3.94 mm (P<0.001), in the female group from 1.52 to 3.78 mm (P<0.001). The duration of molar intrusion in the male group ranged from 5.1 to 10.5 months (P<0.001), in the female group from 5.5 to 12.2 months (P<0.001). The change in the values of the mesial inclination of molar crowns after intrusion in the male group ranged from 1.1 to 2.5 degrees (P<0.05), in the female group from 1.5 to 3.3 degrees (P<0.05). The intrusion efficiency in the male group ranged from 0.26 to 0.38 mm (P<0.05) mm per month, in the female group from 0.27 to 0.31 mm per month (P<0.05). Evaluation of apical resorption according to Levander and Malgrem score [28] demonstrated 0 grade resorption in 50% of the studied molars, I grade resorption in 42.85% molars, II grade resorption in 7.5% molars (Table 4). II grade apical resorption was observed in the area of the mesial buccal roots of the two first maxillary molars in the female group. No resorption in the area of trifurcation was noted.

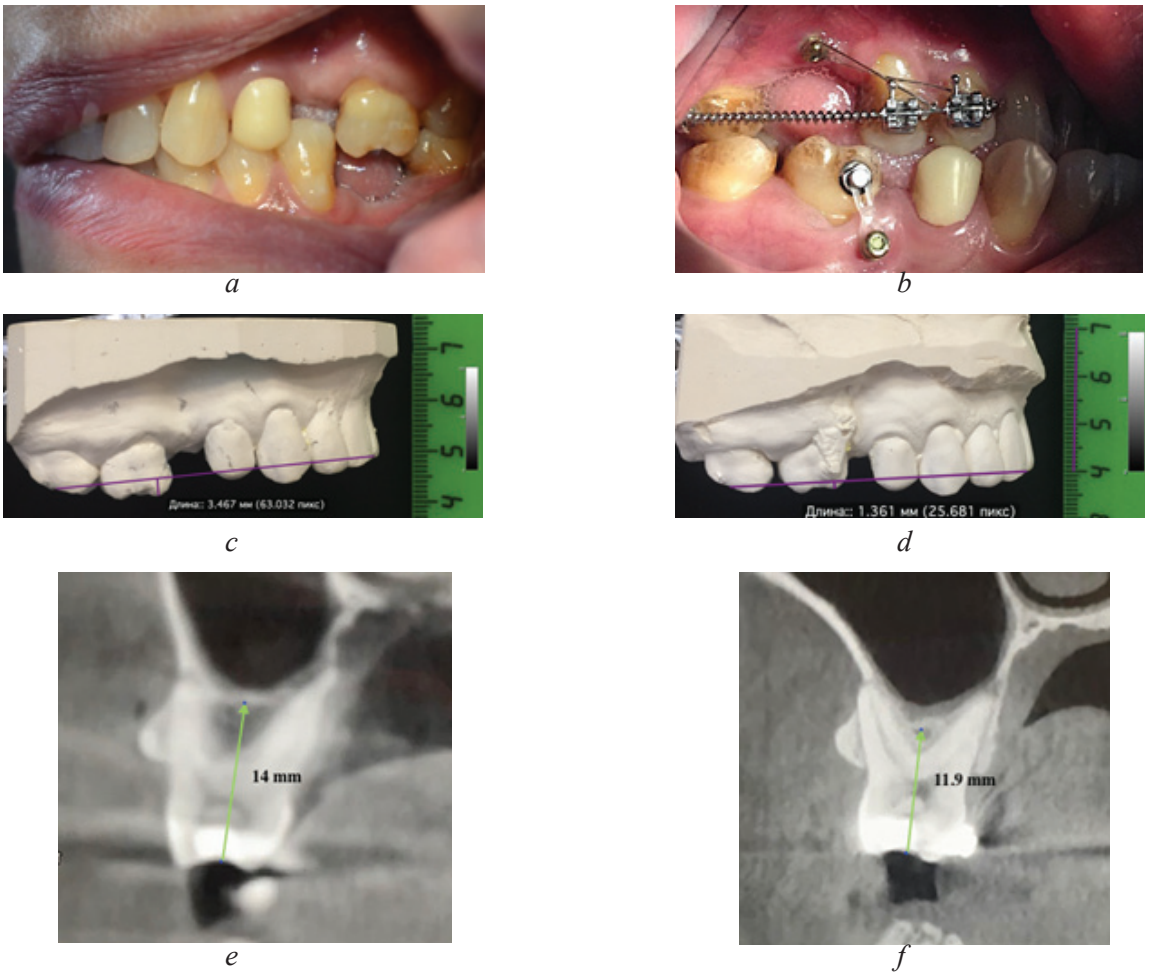


Fig. 4. *a, b – intraoral photo, c, d - maxillary casts, e, f - CBCT sections in the area of the moved tooth 1.6 before and after intrusion. The treatment time was 5.5 months, the intrusion was 2.1 mm*

Table 3. Intergroup comparability of radiographic changes of molar (t-test)

Parameter	Male group	Female group	P Value
	Mean±SD	Mean±SD	
Intrusion, mm	2,86±0,67	3,07±0,57	0,163
Intrusion duration, months	7,57±1,42	8,16±2,02	0,138
Mesial angulation, degrees	1,71±0,43	2,33±0,63	0,521
Efficiency of intrusion	0,32±0,08	0,29±0,02	0,673

Table 4. Distribution of molar root resorption grades in groups

Group	0	I	II	III	IV	Total
Male	7	5	0	0	0	12
Female	7	7	2	0	0	16
Total	14	12	2	0	0	28

In 68 mini-implants used in the study, loss of stability was noted in three palatal mini-implants.

The search for the optimal method of the maxillary molars intrusion continues to this day. This is evidenced by the variety of existing appliances for orthodontic intrusion of the maxillary molars. Evaluation of the U6-MS parameter on CBCT after molar intrusion showed its significant reduction in both groups, which indicates the efficiency of the selected intrusion mechanics. The amount of intrusion in the subjects ranged from 1.33 to 3.78 mm, which is due to the varying degree of initial molar extrusion (overeruption). In each case, molar intrusion stopped upon achieving originally set goals, which was determined clinically. The inclination of the molars after intrusion varied from 1.1 to 3.3 mm, but was not clinically significant. This allowed us to conclude that the use of two mini-implants and an elastic chain, as an independent appliance for the intrusion of the maxillary molars, makes it possible to achieve the desired vertical movement of the molar without significant changes in the incli-

nation of the tooth. Using this intrusion technique, it is necessary to take into account the difference in the anatomical structure of the alveolar process of the maxilla. The vector of application of elastic traction from the palatal side turns out to be more horizontal than from the buccal one, therefore a palatal inclination of the molar can occur, which must be controlled clinically. Assessment of the orofacial inclination of the molars was not the purpose of this study and requires further study, probably using CBCT data.

According to the literature available, in terms of risk of inducing root resorption by orthodontic intervention, there is no safe tooth movement and resorptive changes with varying degrees occur in all patients [9,29,32]. However, there has long been such an opinion that intrusive movement causes root resorption more often than other movements [31,32] and its duration directly correlates with the degree of resorption [28,31,32,34].

There are conflicting data on the influence of the sexual factor on the likelihood and incidence of root resorption during tooth intrusion. Kjar [35] in his study shows that women are more prone to root resorption than men. While Linge reports no gender effect on resorption rates [34]. However, in his retrospective study, the number of women prevailed.

In our study, there was no statistically significant gender dependence or correlation between the treatment duration and the grade of resorption. However, it should be noted that out of 28 intruded molars, the 2 grade of resorption was seen in two cases in the female group where the intrusion duration was 12 months, which was the maximum limit of variation in the duration of treatment in this study (5.1 - 12.2 months). In the remaining cases we mainly saw the 0 and I grade of apical resorption, which have no clinical significance. We suggest that such insignificant apical changes in the root region of the first maxillary molars are associated with the use of prolonged light intermittent intrusion forces (30-50 g). Such forces do not cause overload of periodontal tissues and persistent hemodynamic disturbances in the apex region, which in turn reduces the risk of resorption [36].

Conclusion. The use of two mini-implants and an elastic chain, as an independent appliance for the intrusion of maxillary molars makes it possible to achieve the desired vertical movement of the molar without a significant change in the inclination of the tooth. The use of light, prolonged intermittent force allows molar intrusion in a short time, while reducing the risk of root resorption.

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SUMMARY

CLINICAL AND RADIOGRAPHIC CHANGES FOLLOWING ORTHODONTIC INTRUSION OF OVERERUPTED MAXILLARY MOLARS WITH TWO MINI-IMPLANTS

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Objective - to evaluate clinical and radiographic changes of orthodontic intrusion of upper first molars with two mini-implants, using light intrusion forces, to create the space for prosthetic rehabilitation on the lower jaw.

In 20 patients (aged between 26.8 and 45) with secondary deformities in the lateral region in the vertical direction, associated with partial absence of teeth in the lower jaw, and orthodontic preparation for subsequent prosthetics was performed. Each subject was missing 1-2 teeth in the lateral segment.

All patients were divided into two groups: with intrusion mechanics with orthodontic implants (20 people) and intrusion with an orthodontic shape memory arch (20 people). The radiographic changes in male and female groups were assessed and compared based on the panoramic radiographs and CBCT data before and after intrusion.

In the study 28 molars were fully intruded and their position was normalized with two mini-implants placed palatally and buccally. Mean extrusion time was 7.86±0.42 months (P<0.001), mean intrusion length was 2.97±0.15 mm (P<0.001), and mean change of mesial molar inclination was 2.02±0.44 degrees (P<0,005). The degree of root resorption was evaluated according to CBCT data in Multiplanar reconstruction (MPR); 50% of molars had grade 0 of resorption, 42.85% had grade 1, and 7.15% of molars had grade 2. There was no resorption in the trifurcation area.

Intrusion of molars can be successfully accomplished with 2 mini-implants, placed palatally and buccally, with a light traction force (30-50 g) of an elastic chain.

Keywords: molar intrusion, mini-implant, orthodontic treatment, root resorption, CBCT.

РЕЗЮМЕ

КЛИНИЧЕСКИЕ И РЕНТГЕНОГРАФИЧЕСКИЕ ИЗМЕНЕНИЯ ПОСЛЕ ОРТОДОНТИЧЕСКОЙ ИНТРУЗИИ ПРИ ЗУБОАЛЬВЕОЛЯРНОМ УДЛИНЕНИИ ВЕРХНИХ МОЛЯРОВ С ПОМОЩЬЮ ДВУХ МИНИ-ИМПЛАНТОВ

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Цель исследования - оценить клинические и рентгенологические изменения ортодонтического вмешательства на первых верхних молярах двумя мини-имплантами, используя легкие силы вторжения, для создания пространства протезной реабилитации на нижней челюсти.

20 пациентам в возрасте 27,9-45 лет с наличием экструзированных верхнечелюстных моляров ввиду отсутствия антагонистов проведена ортодонтическая интрузия с помощью двух мини-имплантов (диаметр 1,5 мм, длина 10 мм) и эластической цепочки. Сила используемой тяги составила 30-50 г на один моляр. Оценка радиографических изменений в группе мужчин и женщин, а также сравнение групп между собой проводились по данным ортопантомограммы и конусно-лучевой компьютерной томографии, выполненных до и после интрузии.

В ходе исследования в полном объеме выполнены интрузия и нормализация положения 28 моляров с помощью двух мини-имплантов, расположенных небно и щечно. Средняя продолжительность интрузии моляра составила 7,86±0,42 месяца (P<0.001), средний объем интрузии - 2,97±0,15 мм (P<0.001), мезиальный наклон моляра изменился, в среднем, на 2,02±0,44 градуса (P<0,005). Оценка резорбции корней по данным конусно-лучевой компьютерной томографии в мультипланарной реконструкции показала наличие 0 степени резорбции у 50% исследуемых моляров, резорбции I степени - у 42,85%, резорбции II степени - у 7,15%. В области трифуркации резорбции не наблюдалось.

Интрузия моляров может быть успешно выполнена при помощи двух мини-имплантов, расположенных небно и щёчно, и легкой интрузионной силы (30-50 г), создаваемой эластической цепочкой.

რეზიუმე

კლინიკური და რენტგენოლოგიური ცვლილებები ორთოდონტიული ინტრუზიის შემდეგ ზედა მოლარების კბილ-ალვეოლური დაგრძელების დროს ორი მინი-იმპლანტის გამოყენებით

ა. სლაბკოვსკაია, ა. დივნიჩი, მ. აბრამოვა,
რ. სლაბკოვსკი, ა. ალიმოვა, გ. ლუკინა

მოსკოვის ა.ევდოკიმოვის სახ. სახელმწიფო სამედიცინო-სტომატოლოგიური უნივერსიტეტი, რუსეთი

კვლევის მიზანს წარმოადგენდა ზედა პირველ მოლარებზე ორი მინი-იმპლანტით ორთოდონტიული ჩარევის კლინიკური და რენტგენოლოგიური ცვლილებების შეფასება. ჩარევის დროს, ქვედა ყბაზე საპროთეზო რეაბილიტაციისათვის სივრცის შექმნის მიზნით, გამოყენებული იყო შედწევის რბილი ძალები.

27,9-45 წლის ასაკის 20 პაციენტს, ექსტრუზირებული ზედა მოლარებით ანტაგონისტების არარასებობის გამო, ჩაუტარდა ორთოდონტიული ინტრუზია ორი მინი-იმპლანტის (დიამეტრი – 1,5 მმ, სიგრძე – 10 მმ) და ელასტიური ძეწკვის გამოყენებით.

დაჭიმვის ძალამ შეადგინა 30-50 გ ერთ მოლარზე. რადიოგრაფიული ცვლილებების შეფასება მამაკაცებისა და ქალების ჯგუფში, ასევე, ჯგუფების შედარება ერთმანეთთან ჩატარდა ორთოპანტომოგრამის და კონუს-სხივური კომპიუტერული ტომოგრაფიის მონაცემების მიხედვით ინტრუზიამდე და მის შემდეგ.

კვლევის პროცესში სასის და ლოყის განლაგების ორი მინი-იმპლანტის საშუალებით სრულად ჩატარდა ინტრუზია და 28 მოლარის მდგომარეობის ნორმალიზება. მოლარის ინტრუზიის საშუალო ხანგრძლივობამ შეადგინა 7,86±0,42 თვე (P<0.001), ინტრუზიის საშუალო მოცულობამ - 2,97±0,15 მმ (P<0.001), მეზიალური მოლარის დახრილობა შეიცვალა, საშუალოდ, 2,02±0,44 გრადუსით (P<0,005). ფესვების რეზორბციის შეფასებამ კონუს-სხივური კომპიუტერული ტომოგრაფიის მიხედვით გამოკვლეული მოლარების 50%-ში აჩვენა რეზორბციის 0 ხარისხი, 42,85%-ში – რეზორბციის I ხარისხი, 7,15%-ში - რეზორბციის II ხარისხი. ტრიფურკაციის მიდამოში რეზორბცია არ აღინიშნებოდა.

მოლარების ინტრუზია შეიძლება წარმატებით იქნეს ჩატარებული სასისმიერი და ლოყისმიერი განლაგების ორი მინი-იმპლანტის საშუალებით და ელასტიური ძეწკვით შექმნილი მსუბუქი ინტრუზიული ძალით (30-50 გ).

CORRECTION OF DENTAL ARCHES DIMENSIONS IN CHILDREN WITH DENTITION DEFECTS IN THE PERIOD OF MIXED OCCLUSION USING NON-REMOVABLE ORTHODONTIC PROSTHESIS APPLIANCE

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Monitoring of dental morbidity in children of Ukraine in recent years has shown an increase in diseases of hard tooth tissues, periodontitis, dento-maxillaire anomalies and dentition defects, which is the result of reducing the level of specific resistance caused by declined social conditions of life and environmental situation [5,11].

Among the multiple factors that ensure the harmonious growth and development of a child, the physiological development of the dento-maxillaire complex is important, which functioning depends on the preservation of teeth in the period of temporary and permanent occlusion [2,6,8].

Prosthetic rehabilitation in children in the period of mixed occlusion is especially important. A systematic approach to diagnosis is of particular importance when choosing the method of occlusal rehabilitation in children with dentition defects and secondary dento-maxillaire deformities [1,7]. As well as the need for timely prosthetics of teeth and dentitions in the period of mixed occlusion with the help of prosthesis designs that have a positive effect on the harmonious development of the dento-maxillaire system and the body as a whole [3,4,9,10].

The study aimed to increase the effectiveness of orthopaedic and orthodontic treatment of children with dentition defects during the period of mixed occlusion to prevent secondary dento-maxillaire deformities.

Material and methods. To achieve this goal, we examined and conducted orthodontic treatment of 47 children aged 6 to 11 years with dentition defects (DD), who applied to the Department of Orthopedic Dentistry and Orthodontics, Private Educational Institution “Kyiv Medical University”.

The results of clinical, anthropometric, functional and radiological examination methods were entered to a specialized medical record “Medical file of an orthodontic patient № ___ year__”, the form of primary accounting documentation №043-1 / o for further analysis of the data and treatment planning.