ORIGINAL ARTICLE

CONTENTS

Treatment of patients with crowding of the anterior group of teeth by circumferential supracrestal fiberotomy

Nataliia I. Zhachko[1], Iryna L. Skrypnyk[1], Romana O. Golod[2], Maksym S. Zhachko[2], Tamara S. Nespriadko-Monborgne[3]

[1]BOGOMOLETS NATIONAL MEDICAL UNIVERSITY, KYIV, UKRAINE
[2]MEDICAL CENTRE " SMILE TIME", KYIV, UKRAINE
[3]MEDICAL CENTRE "IRIS DENT", KYIV, UKRAINE

ABSTRACT

Aim: To evaluate the effectiveness of the use of circumferential supracrestal fiberotomy in the treatment of tortoanomalies to improve the effectiveness of treatment, prevent recurrence and increase the stability of the achieved result.

Materials and Methods: Our study consists in determining the effectiveness of the use of methods that prevent the recurrence of tortoanomalies - circumferential supracrestal fiberotomy (CSF) in patients over the age of 16 years and the effect of CSF on the gingival junction in the treatment of tortoanomalies with fixed orthodontic multibonding equipment.

Results: The high level of stability of results proves expediency operations circumferential supracrestal fiberotomy and papilla splitting at orthodontic treatment of frontal teeth density at patients older 16 years and for increasing stability of results of treatment by prevention of relapse tortoanomalies. Efficiency of the offered ways of treatment is proved clinically and anthropometrically on the early and remote terms of supervision (1, 6, 12 months).

Conclusions: The high level of stability of results proves expediency operations circumferential supracrestal fiberotomy and papilla splitting at orthodontic treatment of frontal teeth density at patients older 16 years and for increasing stability of results of treatment by prevention of relapse tortoanomalies. Efficiency of the offered ways of treatment is proved clinically and anthropometrically on the early and remote terms of supervision (1, 6, 12 months).

KEY WORDS: tortoanomaly, relapse of tooth turn, circumferential supracrestal fiberotomy, quality of life, orthodontic treatment

Wiad Lek. 2024;77(4):750-757. doi: 10.36740/WLek202404121 DOI

INTRODUCTION

Consistency of results has always been a key principle in orthodontic treatment [1-15]. Without the stability of the treatment result, it will be impossible to achieve a combination of ideal aesthetics and the function of the masticatory apparatus.

Achieving the stability of the results of orthodontic treatment of the anterior group of teeth has always been very important, since in this area the tendency to recurrence of crowding is most often observed. Many factors influencing the instability of the incisor position have been described: the width of the intercanine distance [4, 8, 11], the position of the third molars [7, 11], the mesio-distal dimensions of the incisors [10], the type of bite [7, 8], interocclusal relationships [4, 7], the state of periodontal tissues [9, 15], the state of the apical basis [4, 7, 8, 11], the direction of mandibular growth [12, 13], and muscle tone [13].

Our study consists in determining the effectiveness of the use of methods that prevent the recurrence of tortoanomalies - circumferential supracrestal fiberotomy (CSF) in patients over the age of 16 years and the effect of CSF on the gingival junction in the treatment of tortoanomalies with fixed orthodontic multibonding equipment.

AIM

To evaluate the effectiveness of the use of circumferential supracrestal fiberotomy in the treatment of tortoanomalies to improve the effectiveness of treatment, prevent recurrence and increase the stability of the achieved result.

MATERIALS AND METHODS

To do this, we examined 23 patients aged 16 and older, who were treated with non-removable multibonding equipment. The mean age of patients at the start of treatment in the CSF group and the control group was

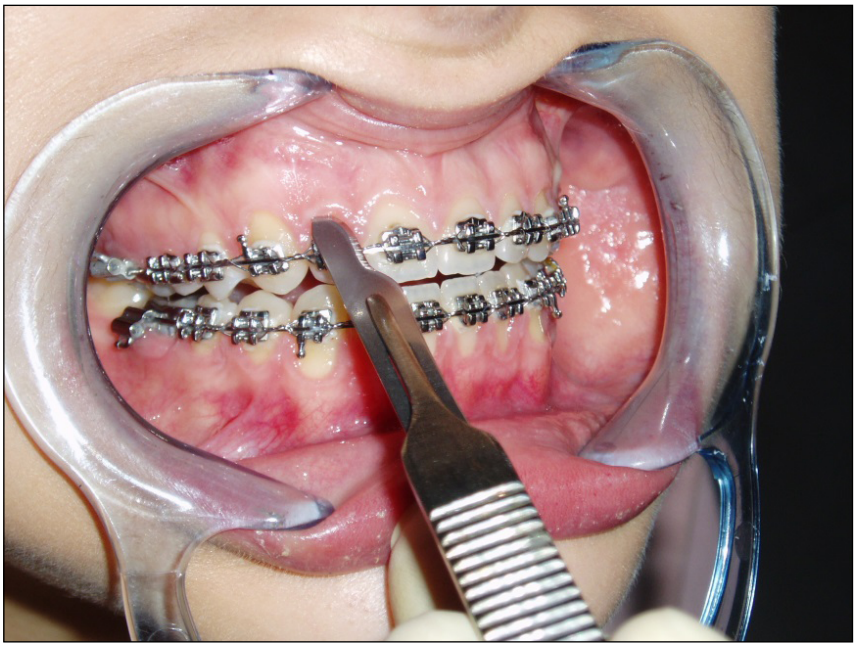

Fig. 1. Circumferential supracrestal fiberotomy of the 12th tooth.

16.0±1.5 and 15.8±1.3 years, respectively. The median treatment time was 21.5±4.4 months for the CSF group and 23.3±1.3 months for the control group.

The characteristics of the pathological occlusion were similar in both groups, namely: crowding of the teeth of the anterior part of the upper and lower jaws or the presence of vertical pathology with the preservation of the occlusion key.

At the beginning of orthodontic treatment, all patients had crowding of the incisors of the upper and lower jaw from 2.3 to 25.5 mm according to the Little index of deviations (irregularity). The Little Deviation Index makes it possible to measure the crowding of the mandibular incisors, as well as to measure the maxillary dental arch [16-18].

All 23 patients used fixed appliances until an optimal bite was formed. Of these, 11 patients underwent circumferential supracrestal fiberotomy (CSF) on the anterior area of the upper and lower jaw 5 weeks before the removal of fixed equipment, 12 patients made up the control group. 5 patients of the study group with CSF and 6 patients of the control group were treated with removal of premolars.

The CSF procedure was prescribed to each patient if there was a clear displacement of the supraalveolar fibers, in the presence of painful sensations when moving the teeth, in the presence of rotated, impaled, tilted teeth, and teeth that were moved vestibulo-orally. In the case of tooth extraction in the area of displacement, surgery with retention procedures had a positive effect on the stability of treatment outcomes.

Surgical interventions were performed by one dental surgeon on the basis of one clinic. All surgeries were performed according to the Edwards method [19-20]. During the operation, a scalpel No. 15 was inserted into the gingival groove and a circular incision was made lingually along the alveolar ridge, holding the blade parallel to the long axis of the tooth (Fig. 1). The surgery consisted of dissecting all fibrous tissues, including the supraalveolar fibers surrounding the tooth, to a depth of approximately 1 mm up to the alveolar ridge. The transseptal (interseptal) fibers were cut with a blade in the area of the periodontal ligament of the interdental septa.

The fiberotomy method involves dissecting vestibular and lingual transseptal fibers, semicircular fibers located between the cementum and the alveoli, and multidirectional fibers stretched between the cementum of one tooth and the free gingival edge of the adjacent tooth. Thus, intergingival, transgingival, transseptal, and semicircular fibers are susceptible to dissection during CSF.

The condition of periodontal tissues in all patients at the time of surgery was within the normal range, oral cavity sanitation and hygienic procedures were carried out before surgery. After the removal of the fixed equipment, all patients received removable lamellar retention devices with an acrylic-contoured vestibular arch, as well as recommendations for their use. The Little deviation index [16-18] and changes in the width of the intercanine and intermolar distance were measured in control models at the beginning of active treatment (P1), after the end of active treatment (P2), 6 months after active treatment (P3), and one year after active treatment (P4) using a compass with an accuracy of 0.1 mm.

Periodontal tissues were examined to determine the depth of the dentitional junction before and

Table 1. Recurrence of crowding of the anterior group of teeth of the mandible

Retention period	Control group	Group with CFS	Difference
After 6 months (P3)	(P3-P2)/P1= (1.97-0.17)/ /4.66=38.6%	(P3-P2)/P1= (0.94-0.88)/ /9.80=0.6%	38%
After 12 months (P4)	(P4-P2)/P1= (3.13-0.17)/ /4.66=63.6%	(P4-P2)/P1= (1.04-0.88)/ /9.80=1.5%	62,1%

Table 2. Recurrence of crowding of the anterior group of teeth of the Maxilla

Retention period	Control group	Group with CSF	Difference
After 6 months (P3)	(P3-P2)/P1= (1.74-0.33)/ /10=14.1%	(P3-P2)/P1= (0.84-0.72)/ /15.23=0.8%	13,3%
After 12 months (P4)	(P4-P2)/P1= (2.83-0.33)/ /10=26%	(P4-P2)/P1= (0.88-0.72)/ /15.23=1%	25%

Table 3. Study of control models of patient S-ko N. during follow-up periods P1, P2, P3, P4

Variable	Parameter	Absolute Number, mm
Deviation Index (Maxilla)	P1	18, 7
	P2	1,7
	P3	1,9
	P4	1,9
Deviation Index (Mandible)	P1	10,8
	P2	1,6
	P3	1,8
	P4	1,9
Width of Intercanine Distance (Maxilla)	P1	33,1
	P2	35,3
	P3	35,1
	P4	34,8
Width of Intercanine Distance (Mandible)	P1	26,3
	P2	29,8
	P3	27,4
	P4	27,1
Width of Intermolar Distance (Maxilla)	P1	38,5
	P2	44,3
	P3	42,8
	P4	42,2
Width of Intermolar Distance (Mandible)	P1	33,7
	P2	37,2
	P3	36,2
	P4	35,2

after the CSF procedure, as well as during the retention phase.

The results of anthropometric and clinical studies were subjected to statistical processing. To solve these problems, the methods of variational statistics and probability theory were used. Statistical analyses included: calculation of expected value (mean); variance as an indicator characterizing the degree of dispersion of individual values relative to the average and the degree of reliability of its use; confidence interval, within which values can vary at 95% degree of reliability; conditional probability of occurrence of an event (the occurrence of a certain type of deformation or anomaly) in the presence of a certain feature.

Fig. 2. Photograph of patient S-ko N. Fixed braces on the teeth of the maxilla.

Fig. 3. Photograph of patient S-ko N. Mouth slightly open.

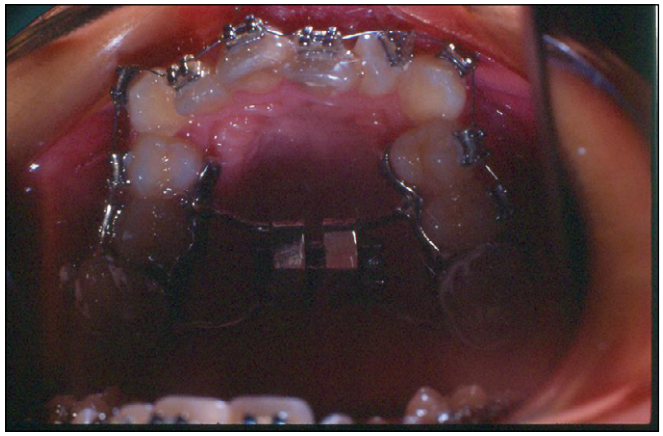

Fig. 4. Photograph of the patient S-ko N. Apparatus of rapid palatal dilation.

Fig. 5. Photograph of patient S-ko N. after 3 months of treatment. The braces on the mandible are fixed.

RESULTS

When comparing the changes that occurred in the groups, the increase in the deviation index for the maxillary dental arch in the control group was significant for the periods P2-P3 and P2-P4 ($R<0.01$ and $P<0.001$, respectively). In the mandibular dental arch, the increase in the deviation index was significant in comparison with group c CSF for periods P2-P3 and P2-P4 ($R<0.001$).

Tables 1 and 2 show the average overcrowding recurrence rate for both groups as a percentage. No significant changes in the level of epithelial attachment were found. The depth of the grooves measured by the periodontal probe did not change significantly from P1 to P2 and P3, as well as the depth of the gingival attachment zone after surgery (0.5 mm vestibular and 0.4 mm lingual).

To prevent the recurrence of tortoanom alies in case of crowding of the teeth of the anterior area, which determines the stability of long-term results, we used circumferential supracrestal fiberotomy.

The number of crowded teeth before treatment varied between the two groups in this study. In the control group, the Little deviation index averaged 10 mm in the mandibular arch and 4.6 mm in the upper jaw arch, while in the CSF group, the Little deviation index averaged 15 mm and 9.8 mm, respectively.

At the end of treatment, the deviation index of both groups was close to zero. In the group with CSF during the early retention periods at 6 and 12 months, no significant changes in the deviation index for the upper or lower jaw arches were noticed. The recurrence of the initial deviations of the anterior group of mandibular teeth was 0.6% at stage P3 and 1.5% at stage P4, and data for the anterior group of teeth of the maxilla were 0.8% at stage P3 and 1% at stage P4.

In the control group, an increase in deviations for the mandibular and maxillary dental arches was observed at 6 and 12 months of the retention period. In the mandibular arch of the control group, there was a greater recurrence after debonding of fixed appliances (38.6% at stage P3 and 63.6% at stage P4). The recurrence of crowding in the maxillary arch on average, based on the initial deviations, was 14.1% at stage P3 and 26% at stage P4.

Fig. 6. Photograph of patient S-ko N. after 8 months of treatment. Closed teeth.

Fig. 7. Photograph of patient S-ko N. 12 months after the removal of the braces. Mouth slightly open.

Fig. 8. Photograph of patient S-ko N. 12 months after the removal of the braces. View from the right.

Fig. 9. Photograph of patient S-ko N. 12 months after the removal of the braces. View from the left.

Preventing an early recurrence of crowding of the anterior group of teeth can help prevent a later recurrence. Late recurrence includes many factors, namely the growth of the jaws, third molars, changes in the width of the intercanine distance, vestibular inclination of the incisors. These factors are independent of the tendency to have an early recurrence of crowding, but this early recurrence may increase the likelihood of crowding later in the world if the above factors are present.

After treatment, changes in the inclination of the incisors of the lower and upper jaw were minimal. The same conclusion can be drawn about changes in the width of the intercanine distance.

Clinical results clearly indicate:

1) during the first year of active retention, a recurrence of anterior tooth protrusion and tooth rotation can be expected, even if the patient wears a retainer continuously;

2) CSF on the anterior group of teeth is effective in preventing recurrence of crowding for retention periods of 6 months and 1 year;

3) the stability of the CFS group was higher, despite the fact that the Little index of deviations of the upper and lower jaws before treatment was greater in the CSF group than in the control.

In the control group, the Little deviation index averaged 10 mm in the mandibular arch and 4.6 mm in the maxilla dental arch, while in the CSF group, the Little deviation index averaged 15 mm and 9.8 mm, respectively.

In the control group there was an increase in the index of deviations on average in the maxillary dental arch by 1.41 ± 1.46 mm in P2-P3 and 2.50 ± 1.68 in P2-P4. In the mandibular dental arch, the increase in the deviation index averaged 1.80 ± 0.92 mm during P2-P3 and 2.96 ± 1.43 mm during P2-P4. In the control group, at stages P3 and P4, there was a significant increase in the index of deviations for the anterior group of teeth of the upper and lower jaw ($P<0.05$, $P<0.01$).

In the CSF group, there were only minimal changes, ranging from 0.06 to 0.16 mm, numbers that were not statistically or clinically significant.

The conclusions of these studies indicate a slight recurrence of orthodontically rotated teeth with crowding of the anterior part of the upper and lower jaw after CSF.

In the clinic of the Department of Orthodontics and Propedeutics of Prosthetic Dentistry of the Bogomolets National Medical University, we observed a 16.5-year-old patient, Natasha S-ko, with a diagnosis: deep traumatic occlusion, narrowing of the dental arches of the upper and lower jaws, crowding of the frontal area of both jaws, supraocclusion of the lower frontal area, mesio-oral rotation of the 11th tooth by 30°, mesio-vestibular rotation of the 21st tooth by 30°, mesio-vestibular rotation of the 12th tooth by 60°, vestibular position of 13, 23, 33 and 43 teeth with space deficit, oral position of teeth 35 and 45 with space deficit in the dental arch. The patient has no history of injuries in the area of the front teeth and bad habits. The patient's malocclusion is genetically determined by the mother.

Estimation of the balance of space in the dental arch in control models using the Little method is described in Table 3.

In April 2019 brace-system is fixed on the teeth of the maxilla and a fast palatal expander of our modification (declarative patent for invention No. 2003043187 dated 15.01.2004). After fixing the brace, an initial orthodontic nitinol arch with a diameter of 0.14 was applied. After 4 weeks, it was replaced by an arc with a diameter of 0.16 (Fig. 2, 3, 4).

In July 2019 After leveling the upper dentition, the braces were fixed on the teeth of the lower dentition with a threadinol arch with a diameter of 0.14 (Fig. 5). Accordingly, the change of arcs.

Thus, the alignment of the rotated teeth in the horizontal and vertical planes, the correction of the Spee curve (normalization of the shape of the dentition) was carried out.

In March 2020, the signs of orthognathic occlusion and the "ideal" shape of the dental arches were determined, steel arches of 0.17x0.25 were fixed with a long metal ligature to achieve parallelism of the tooth roots (Fig. 6).

In February 2021, circumferential supracrestal fiberotomy of 11, 21, 12, 13, 23, 33, 43, 31, 41, 32, and 42 teeth was performed. In April 2021, the braces were removed and removable retention plate devices were put on the upper and lower jaw with an acrylic-contoured vestibular arch. The patient continues to be monitored. The fiberotomy procedure prevented the recurrence of tortoanomalies in the case of crowded teeth in this patient (Fig. 7, 8, 9).

DISCUSSION

At the same time, insufficient attention is paid to the problem of increasing the effectiveness of treatment of tortoanomalies in children and adults, taking into account the degree of space and the degree of formation of the tooth root. In order to achieve stable results in the treatment of cake anomalies, as a rule, treatment methods with hypercorrection are used. Nevertheless, according to the literature, treatment with hypercorrection is not always successful, and there are non-isolated cases of complications [1-4, 6, 7, 11-15]. This leads to the search for new means and the improvement of treatment methods aimed at optimizing the treatment of cake anomalies with the achievement of long-term stable results.

There is no irrefutable evidence that the recurrence of tortoanomalies occurs primarily due to the reorganization of connective tissue fibers [7, 21-23]. The displaced and stretched fibrous structures of the free gingival ligament are resistant to rotational forces; there are no displacements of fibrous structures in the marginal areas of the periodontium, where the supraalveolar fibers remain displaced and stretched even after a retention period of 33 weeks [12, 21-23].

The period after the removal of fixed equipment is the most critical, since relapse is most likely in the first 24 hours, and about 50% of relapse in general occurs during the first week after debonding [1-7].

Prevention of early recurrence of crowding of the frontal group of teeth contributes to the prevention of later recurrence. Late recurrence involves many factors, namely the growth of the jaws, third molars, changes in the width of the intercanine distance, vestibular inclination of the incisors, and interocclusal relationships [4, 6-8, 11]. These factors do not depend on the predisposition to early recurrence of crowding, but this early recurrence may increase the likelihood of early recurrence of teeth in the future if the above factors are present [16, 17, 19].

Thus, using circumferential supracrestal fiberotomy, we achieve high stability of the results of orthodontic treatment of crowding of the anterior group of teeth, which is confirmed by the low index of irregularity Little at the end of treatment in the CSF group and a statistically significant increase in the width of the intercanine distance in the maxillary dental arch and the intermolar distance in the maxillary and mandibular dental arches at the end of treatment.

We performed the circumferential supracrestal fiberotomy procedure in patients with vestibular and tortoanomaly teeth. Favorable results were obtained in groups with the study of long-term results of the retention period [6-17].

CONCLUSIONS

Clinical results indicate that CFS is effective in preventing the recurrence of tortoanomalies in the treatment of crowded teeth for retention periods of 6 months and 1 year. There is also a possibility that the recurrence may continue in later years, especially in the dental

arch in the lower jaw. Crowding of teeth may increase regardless of the method of treatment in all orthodontic patients due to the normal growth process. Prevention of early recurrence with CSF prevents late recurrence and leads to a more stable stable long-term result of treatment of tortoanomalies in crowded teeth.

REFERENCES

1. Proffit WR. Contemporary orthodontic. North Carolina. 2000, p.896.
2. McNamara JA, Brudon WL, Kokich VG. Orthodontics and dentofacial orthopedics. Ann Arbor: Needham Press. 2001, p.3.
3. Graber TM. Orthodontics: Current Principles and Techniques, 7e. UK : Elsevier. 2022, p.992.
4. Proffit WR, Fields Jr HW, Sarver DM. Contemporary Orthodontics, 5e. UK Elsevier. 2012, p.768.
5. Skrypnyk I, Zhachko N. Holovni trendy rozvytku svitovoi stomatolohii na naiblyzhchi roky: prohramni dokumenty Svitovoho stomatolohichnoho konhresu v Avstralii [Main trends in the development of world dentistry for the coming years: program documents of the World Dental Congress in Australia]. Oral and General Health. 2023;4(3-4):61–71. doi: 10.22141/ogh.4.3-4.2023.173. (Ukrainian) DOI
6. Zhachko NI. Vikovi osoblyvosti likuvannia povorotiv zubiv [Age-related features of teeth rotations treatment] Kyiv: Bogomolets National Medical University; 2007, p.25. http://ir.librarynmu.com/handle/123456789/3598. [Accessed 3 March 2024] (Ukrainian)
7. Cao T, Xu L, Shi J et al. Combined orthodontic-periodontal treatment in periodontal patients with anteriorly displaced incisors. American Journal of Orthodontics and Dentofacial Orthopedics. 2015;148(5): 805–813. doi: 10.1016/j.ajodo.2015.05.026. DOI
8. Zhachko N, Nespriad'ko-Monborgne T, Skrypnyk I et al. Vidnovlennia zdorovia porozhnyny rota yak odyn z vahomykh faktoriv pidvyshchennia yakosti zhyttia [Restoration of oral health as one of the important factors improving the quality of life]. Actual dentistry. 2021; 01:78-81. doi: 10.33295/1992-576X-2021-1-78. (Ukrainian) DOI
9. Tsyzh OO. Udoskonalennia suchasnykh metodiv diahnostyky, likuvannia ta profilaktyky retsydyviv u patsiientiv z vidkrytym prykusom [Improvement of modern methods of diagnosis, treatment and prevention of relapses in patients with open bite]. Kyiv: Bogomolets National Medical University; 2019, p.22. http://ir.librarynmu.com/handle/123456789/586 [Accessed 3 March 2024] (Ukrainian)
10. Kirschneck C, Fanghänel J, Wahlmann U et al. Interactive effects of periodontitis and orthodontic tooth movement on dental root resorption, tooth movement velocity and alveolar bone loss in a rat model. Ann Anat. 2017;210:32-43. doi: 10.1016/j.aanat.2016.10.004. DOI
11. Dmytrenko MI. Suchasni pidkhody do diahnostyky ta likuvannia zuboshchelepnykh anomalii, uskladnenykh skupchenistiu zubiv [Modern approaches to diagnosis and treatment of dento-jaw anomalies complicated by crowding of teeth]. Poltava; 2024, p.158. http://repository.pdmu.edu.ua/handle/123456789/22909 [Accessed 3 March 2024] (Ukrainian)
12. Kirschneck C, Fanghänel J, Wahlmann U et al. Interactive effects of periodontitis and orthodontic tooth movement on dental root resorption, tooth movement velocity and alve-olar bone loss in a rat model. Ann Anat. 2017;210:32–43. doi: 10.1016/j.aanat.2016.10.004. DOI
13. Zhachko N, Skrypnyk I, Shnaider S. Yakist zhyttia osib dorosloho viku z zakhvoriuvanniamy parodontu pry naiavnosti zubo-shchelepnykh deformatsii [Quality of life of adults with periodontal diseases in the presence of dental deformities]. Innovatsii v stomatolohii. 2023;4:50–53. doi: 10.35220/2523-420X/2023.4.9. (Ukrainian) DOI
14. Mozghova OM, Vovchenko LO, Opanasenko OO et al. Kharakterystyka stomatolohichnoho statusu ditei riznoho viku iz vrodzhenymy vadamy sertsia ta mahistralnykh sudyn v Ukraini [Characterization of the dental status of children of different ages with congenital heart and main vessel defects in Ukraine]. Scientific Collection "InterConf" «Recent Advances in Scientific World» (December 18-19, 2021, Monterrey, Mexico). Monterrey: Mendez Editores. 2021, pp.479–481. https://ojs.ukrlogos.in.ua/index.php/interconf/issue/view/18-19.12.2021/706 [Accessed 3 March 2024] (Ukrainian)
15. Kostiuk TM. Fizykalne obstezhennia patsiientiv iz dysfunktsiieiu skronevo-nyzhnoshchelepnoho suhlobu [Physical examination of patients with temporomandibular jont dysfunction]. Ukrainian Journal of Medicine, Biology and Sports. 2018;3-4(13):149–154. doi: 10.26693/jmbs03.04.149. (Ukrainian) DOI
16. Little RM, Wallen TR, Riedel RA. Stability and relapse of mandibular anterior alignment-first premolar extraction cases treated by traditional edgewise orthodontics. Am J Orthod. 1981;80(4):349–365. doi: 10.1016/0002-9416(81)90171-8. DOI
17. Boese LR. Fiberotomy and reproximation without lower retention, nine years in retrospect. Part I. Angle Orthod. 1980;50(2):88–97. doi: 10.1043/0003-3219(1980)050<0088:FARWLR>2.0.CO;2. DOI
18. Little RM. The irregularity index: a quantitative score of mandibular anterior alignment. Am J Orthod. 1975;68(5):554–563. doi: 10.1016/0002-9416(75)90086-x. DOI
19. Gokhale ShA, Byakod G, Gupta G et al. Effects of laser-aided circumferential supracrestal fiberotomy on relapse of orthodontically treated teeth: A pilot study. Journal of Dental Lasers. 2015;9(1):16–22. https://www.jdentlasers.org/article.asp?issn=2321-1385;year=2015;volume=9;issue=1;spage=16;epage=22;aulast=Gokhale [Accessed 3 March 2024]
20. Edwards JG. A surgical procedure to eliminate rotational relapse. Am J Orthod. 1970;57(1):35–46. doi: 10.1016/0002-9416(70)90203-4. DOI
21. Edwards JG. A long-term prospective evaluation of the circumferential supracrestal fiberotomy in alleviating orthodontic relapse. Am J Orthod Dentofacial Orthop.1988;93(5):380–387. doi: 10.1016/0889-5406(88)90096-0. DOI

22. Edwards JG. A study of the periodontium during orthodontic rotation of teeth. Am J Orthod. 1968;54(6):441–461. doi: 10.1016/0002-9416(68)90199-1. DOI
23. Dersot JM. Gingival recession and adult orthodontics: a clinical evidence-based treatment proposal. Int Orthod. 2012;10(1):29–42. doi: 10.1016/j.ortho.2011.09.013. DOI

The article was performed in accordance with the plan of research work of Bogomolets National Medical University: «The improvement of digital and analog protocols for diagnosis, treatment and prevention of patients of different age groupswith dento-maxillofacial anomalies and deformations» (2024-2026, № state registration 0124U000780).

CONFLICT OF INTEREST
The Authors declare no conflict of interest

CORRESPONDING AUTHOR
Nataliia I. Zhachko
Bogomolets National Medical University
1 I. Sikorskogo street,, 02114 Kyiv, Ukraine
e-mail: 2407@i.ua

ORCID AND CONTRIBUTIONSHIP
Nataliia I. Zhachko: 0000-0001-5333-0191 A B D E F
Iryna L. Skrypnyk: 0000-00023-3393-4649 A B D E F
Romana O. Golod: 0009-0006-1181-6963 A C D E F
Maksym S. Zhachko: 0000-0003-4054-6211 A C D E F
Tamara S. Nespriadko-Monborgne: 0000-0002-3102-8634 A C D F

A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article

RECEIVED: 07.12.2023
ACCEPTED: 29.03.2024