



Improving The Treatment of Abnormal Bite Caused by Severe Damage To The Jaw

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 14 Oct 2023	<p>Currently in Ecuador, knowledge about the various care options for patients with systemic diseases, such as chronic renal failure, is limited. It is important to highlight that health professionals, particularly dentists, face the challenge of acquiring the necessary knowledge to carry out a multidisciplinary approach between medicine and dentistry. In this research, our objective was to exhaustively analyze the scientific bases and previously published studies that address dental surgical treatments in patients with chronic renal failure. To carry out this article, we carried out a thorough preliminary search in the relevant databases, identifying a total of 37 scientific articles, of which 34 met the established inclusion criteria. The focus of our research was descriptive and applied, allowing us to deepen the knowledge available in the area and establish relevant conclusions. Our research has revealed that patients with chronic renal failure require special consideration before undergoing dental treatment. Within the context of dentistry, the approach to patients with chronic renal failure must be carefully planned, considering the systemic health of the patient and avoiding possible drug interactions.</p>
CC License CC-BY-NC-SA 4.0	<p>Keywords: Surgical procedures, Dentistry, Renal failure, Dental treatments, Patients, Health professionals</p>

1. Introduction

Today, in the practice of orthodontics, early diagnosis of clinical signs of pathological bites caused by narrowing of the upper jaw is one of the urgent problems of the effectiveness of chewing in children, the organization of the restoration of physiological functions. Deformities of the maxillary bite are the third most common dental disease among children. Their diagnosis and treatment are considered one of the urgent tasks in orthodontics, they affect the functions of chewing, lead to speech disorders, aesthetic defects and significantly reduce the quality of life, leading to limitations in the manifestation of human potential. Also in Uzbekistan, there was a tendency of a sharp increase in facial-jaw anomalies and deformities among children and adolescents, and in a number of literature it was noted that from 15% to 40% [3.6.8]. And in Russia - from 17% to 55% of those listed.

Khoroshilkina F. Ya. According to the data provided (2014), it is noted that dental disorders occur on average during the period of milk teeth – 24%, during the period of exchange bites – 49%, during the period of permanent bite – up to 17 years - up to 35%. The rapid increase in the prevalence of malocclusion of dentition in the periods from temporary bite to replacement bite, as well as permanent bite confirms the need for early orthodontic practice. Early detection of pathological occlusions in orthodontics makes it possible to obtain large displacement deformities in advance, in which the dental-jaw apparatus hinders the growth and cracking of teeth, as well as pathological development and treatment. A promising direction is considered to be the creation of a new method for correcting pathological bite during the bite of baby teeth and tooth replacement in order to restore physiological

development in the field of formation of the dental system, prevention of severe disorders in the dental system and restoration of children's health [1.3.5.7.9.11.13].

In order to predict and identify early and latent forms of malocclusion in children, as well as optimize the effectiveness of diagnostic and therapeutic measures, large-scale scientific research is carried out in the world, existing diagnostic methods and additional research methods are considered important. The application of these diagnostic methods and therapeutic measures for orthodontic pathologies in children is being studied. The development of methods of the most accurate approach to the diagnosis and treatment of malocclusion in combination with excessive narrowing of the upper jaw and the previous condition of the dental alveolar complex of the upper jaw helps to provide stable and improving aesthetic signs. The elimination of morphofunctional and aesthetic disorders caused by this type of pathology is an urgent problem of orthodontics.

The problem of early diagnosis of latent forms of pathological bite caused by narrowing of the upper jaw, and their timely prevention, as well as treatment, information about deep morphofunctional changes affecting the proper development of masticatory function, the formation of jaws and bite is presented in a number of literature. The factors causing pathological occlusion caused by narrowing of the upper jaw depend on the following: unsightly appearance of the patient's face, bottic or bullish profile, incorrect smile, presence of sagittal openness between the jaws, speech and oral breathing disorders, narrowing of the upper jaw, narrow gnatic palate and malocclusion, of course, pathologies of this type require effective methods treatment. To achieve aesthetic and functional results, it is necessary to analyze the data of orthodontic diagnostics, pay attention to all morphological structures of this pathology and avoid complications leading to irreversible results when planning treatment stages. Often adolescents and adult patients not only want to get the functional maximum from orthodontic treatment, but also require maximum aesthetic results that affect their psychological state in the environment [2.4.6.8.10].

Excessive narrowing of the upper jaw in combination with the previous condition of the dental alveolar complex of the upper jaw indicate the need to develop the most approximate approach to the diagnosis and treatment of malocclusion in order to achieve the most optimal result. Morphofunctional and aesthetic disorders that occur with this type of pathology are an urgent problem of orthodontics. Purpose of the study: Development and implementation of methods of effective jaw extension in the sagittal and transverse direction in the treatment of pathological bite caused by high jaw development. The object of the study: 69 sick children aged 13 to 17 years were admitted to the orthodontics department of the children's dental polyclinic of the Bukhara region, who in 2020-2022 were treated with a diagnosis of a pathological bite caused by a narrowing of the upper jaw.

2. Materials And Methods

Treatment of children diagnosed with a pathological bite caused by a narrowing of the upper jaw was carried out using methods of objective, subjective and dental examination of children according to the methods of Ton, Snagina, Gerlach, Tanaka - Johnson, using advanced orthodontic devices, as well as an orthodontic device with a plate base extending to the upper jaw. Side I - II. In our scientific study, the patient was studied by dividing the children into 2 groups.

Improved orthodontic devices were used in 48 children aged 7 to 13 years during the first group of exchange bite.

During the Guruh prikus II exchange program, 21 Guruh control child patients aged 7 to 13 years were fitted with plate-based orthodontic devices extending to the I and II sides.

The results of the study and discussions were carried out according to the method of treatment of the examined child patients using advanced orthodontic devices and the use of orthodontic devices based on plates extending to the I and II sides. The main and additional methods of examination were used in the diagnosis of the examined patients.

During the objective examination, attention was paid to the location of the child's head and facial area, the morphological structure of the upper and lower jaw, the inside of the mouth, the location of the teeth in the dentition.

However, during the subjective examination, a survey was conducted of the parents of their children (transitional criteria of the condition during pregnancy, types of childbirth, types of nutrition of the child). Of the methods of further examination, an examination was carried out using the orthodontic methods presented in the plan.

In a patient with a diagnosis of "pathological bite" caused by narrowing of the upper jaw, when examining children with orthodontic methods, it was found that the frequency of occurrence in girls is higher than in boys.

During the 1st guruch exchange course, 48 patients aged 7 to 13 years were examined using the methods of Ton, Snagina, Tanaka- Johnson and treated using advanced orthodontic devices. The proportionality of the mediolateral dimensions of the upper cranial teeth to the sum of the mesiodistal dimensions of the lower cranial teeth was determined by the Ton index in the diagnosis of pathological occlusions during the exchange bite. The paper presents the intergroup distribution of children with a pathological bite resulting from a narrowing of the upper jaw, by age, gender.

The method of calculating the ton. In case of a pathological bite caused by a narrowing of the upper jaw, a certain correlation between the sum of the mesiodistal dimensions of the teeth and the sum of the mediolateral dimensions of the teeth of the lower part of the skull determined the law of proportionality of Tone during the period of replacement bite.

In the results of the study, 48 patients aged 7 to 13 years were observed during the first bite of the guruch exchange, who were diagnosed with a pathological bite caused by a narrowing of the upper jaw, as a result of a high level of macrodontia in the first and second cranial teeth of the upper jaw during examination by the Ton index in children and a violation of morphological [15.17.19.21.23.25.27.29.31].

During the period of the exchange bite, the upper cranial teeth have a mesiodistal size, and the lower cranial teeth are equal to the sum of the mediolateral dimensions of R. The comparative sum of the sizes of the teeth of the upper and lower jaw, based on the correlation proportionality of tone, is presented in Table 2.

In addition, SI is included as an expression of the size of the teeth of the upper jaw and as an indicator in the tonn index, based on the sum of the morphological structure of the teeth of the lower jaw SI.

The analytical results of the tonn index in the diagnosis of dental macrodontia and cranial density of teeth in 48 patients aged 7 to 13 years during the period of alternating bite of group I are presented.

When using advanced orthodontic devices in the treatment of pathological bites caused by narrowing of the upper jaw, there is a plastic base, an occlusal surface (the area of chewing teeth), a screw and a lip protrusion protruding in three directions, a U-shaped wire loop connecting the protrusion to the base part. The connecting loops with the face mask attached to the base face mask rest on the chin, as well as on the forehead area, forcing the middle part of the face to protrude forward, increasing the upper jaw in the sagittal direction. The pilot that relaxes the lip muscles is located on the vestibular side (the upper back is between the teeth and the upper lip), and these parts are a device that can effectively treat a three-sided complete narrowing of the upper jaw, without complications, quickly and in patient-friendly conditions. style.

Adapted for use with narrowing of the upper jaw in the transverse and sagittal direction, complete narrowing of the upper jaw occurs after operations of uranoplasty and cheiloplasty in people with congenital complete defects. Hypertonicity, as well as improper attachment of the lip muscles, thick, short attachment of the lip jugan leads to narrowing of the anterior fragment.

This device ensures that at the same time the upper jaw is extended in three directions, if we are trying to reduce the hypertonicity of the lip muscles, then in this case the upper jaw increases the force of the push in the sagittal direction. This is applied to the orthodontic apparatus together with a face mask (Dilara mask). The fastening details consist of a plastic base, an occlusal surface (the area of the chewing teeth), a three-sided expansion screw and its guides, an Adams clamp for the base molars (two), U-shaped loops that share the guide with the base part, connecting loops with a face mask attached to the base.

The proposed device will be applied as follows:

Stage 1. The stage of obtaining a cast from the upper and lower jaw of the patient. In this case, a two-layer form is obtained from the upper and lower jaw of the patient using an S-Silicon mass.

Stage 2 is the stage of casting the model from the resulting mold.

At stage 3 of the model, the anthropometric dimensions of teeth, dentition and jaws are determined. The boundaries of the device to be manufactured and the orthodontic elements have been drawn and prepared.

Stage 4. The stage of preparation of the orthodontic apparatus. The base part of the device itself is made of hard plastic, 3 orthodontic directional expansion screws are located in the center of the palate, two loops for the facial arch, two lip clamps are made of soft plastic, and they are made of orthodontic wire bent to the base with a U-shaped shape of 0.8 mm.

Stage 5. The stage of installing the device on the patient's upper jaw.

Stage 6. Device activation stage. The orthodontic screw is unscrewed and expanded weekly with an elastic insert of the size of the facial arch (3/8 inch) (strength 6.5 ounces).

The composition of the orthodontic apparatus used for total narrowing of the upper jaw, some part of which is hardening by itself (Redont – 0.3, Redont - color, Protacril–M, Vilacril-C.) and is made on the basis of soft plastic Vilacril soft. The use of an orthodontic device with a complete extension of the upper jaw, the use of the method of elongation of the upper jaw in the transverse direction up to 5 mm in the sagittal direction up to 4 mm, leads to an orthognathic bite of the interaction of the jaws. An improved device used for complete narrowing of the upper jaw showed that after 3 months the permanent teeth formed sufficient space in the upper jaw to exit, and diastema and tremor developed between the physiological milk teeth.

The analytical results of the postoperative examination by the Snagina method of 48 children aged 7 to 13 years after using advanced orthodontic devices during the 1st guruh exchange course were explained as follows [12.14.16.18.20.22.24.26.28.30.32].

3. Results and Discussion

Snagina's method: N.G.Snagina (1965) determines that there is a correlation between the sum of the mesiodistal dimensions (width) of 12 permanent teeth and the following values:

- the width of the dental arch between the premolars and molars (at the points of pon);
- width of the apical base (in points Xaus);
- the length of the apical base (in points Xaus).

In children with abnormal bite caused by narrowing of the upper jaw, the width of the dental arch between the first premolars was 39.2% of the sum of the mesiodistal width of 12 teeth, while the width between the first molars was 50.4%.

With a pathological bite caused by a narrowing of the upper jaw, the width of the base of the upper jaw averaged 44% of the sum of the mesiodistal dimensions of 12 permanent teeth, the lower jaw – 43%, and the length – 39 and 40%, respectively.

According to Snagina, with a pathological bite caused by a narrowing of the upper jaw, the proportions between the sum of the mesiodistal width of 12 teeth and the indicators of the apical base were determined with a dense arrangement of teeth.

I the distance between the premolars and molars on the upper and lower jaw from the sum of the mesiodistal dimensions of the second group of examination to determine the first and second degree space deficit in sick children. In this regard, it should be said that with the secondary narrowing of the upper dentition, there was not only a narrowing of the dental arch, the apical base of the jaw and the hepatic-nasal cavity. Early diagnosis and effective treatment of these anomalies are important.

According to the results of the study, data on the measurement of the width of the base of the upper and lower jaw by the Snagina method and its analyses were compared with the normal physiological state of pathological changes.

Alternation of group I is a method of predicting spatial deficit in the lateral sector according to the Tanaka–Johnson method in patients aged 7 to 13 years during the bite period. Also, the pile on the upper and lower jaw, before the exit of premolars I, II, with the help of a Shtangen compass, determines the distance from the distal region of the crown part of the lateral cranial tooth to the mesial point of the crown part of the first permanent molar. Depending on the lack of space in the lateral sector, the length of the dentition increases. In many cases, deformation occurs due to the migration of the first permanent molar to the mesial side with early loss of milk molars or with a violation of the integrity of the crown rod. This method is distinguished by its high economic efficiency, convenience and ease of use.



Figure 1: The main group is the processes of healing patients

Comparative comparison of cases of use with orthodontic devices, oral and facial mask, improved in patients between the ages of 7 and 13 during the period of the i-Group exchange prikus. Diagnosis by the Gerlach method.

It is determined that the etiological factor of the incorrect location of curved teeth is caused by macrodontia of the teeth of the upper jaw or narrowing of the jaws in the transverse direction. This method is based on dividing each dentition into anterior and two lateral segments, for which the distances between the molar, the first and second premolars and the first permanent molar are measured. The size of the anterior upper segment will be equal to the sum of the widths of the four cranial teeth, while the size of the lower anterior segment – the lower cranial teeth will be in an orthognathic bite equal to the product of the sum of the latitudes by the tone index (1.35). With a proper bite, this indicator is calculated to be 1.22. In the Gerlach method, the ratio of segments between the rod tooth, the first and second premolars and the first permanent molar in a permanent bite was determined as the following formula:

$$Lor \geq SI \leq Lol$$

$$\parallel \quad \parallel \quad \parallel$$

$$Lur \geq SII \leq Lul,$$

here, SI is the sum of the width of the crowns of the upper cranial teeth; SII is the size of the lower anterior segment; L is the length of the lateral (lateral) segment. Gerlach used German initials to mark each side segment:

L (Lange) ;

o (Oberkiefer) ;

u (Unterkiefer);

r (rechts);

l (links).

In the Gerlach permanent bite method, the average sizes of the segments between the cranial teeth, the carapace, the first and second premolars and the first permanent molar are given. In our first group, which is being examined, it was found that there are curved dentitions and pathological bites caused by narrowing of the jaws. In addition, the mesiodistal dimensions of the teeth of the lower jaw were taken as a basis. I gurukh replacement with permanent Gerlach bite in patients aged 7 to 13 years during the bite of the thoracic tooth, the average size of the segments of the first and second premolars is 32, 24 mesiodistal sizes of 4 scapular teeth in the upper jaw, 22.18 transverse sizes of 4 scapular teeth in the lower jaw, 31.47 mesiodistal sizes of the upper right lateral sigmental teeth, 31.24 the upper left lateral lateral lower right and left sides are the sum of the mesiodistal dimensions of the teeth. During the second bite of the Guruh exchange, 21 control Guruh patient children aged 7 to 13 years were examined using the methods of Snagina, Ekel, Ponder-Hart. In the Snagina study conducted among 21 control patients aged 7 to 13 years during the second bite of the Guruh exchange, correlations were found between the sum of the mesiodistal dimensions (width) of 12 permanent teeth and the following values:

the width of the dental arch between the premolars and molars (at the points of the pon);

the width of the apical base (in Xaus points);

the apical base is long (at the points of the house).

In the study of the condition of pathological bite in children of our control group, which arose as a result of narrowing of the upper jaw, the width of the dental arch between the first premolars was 39.2% of the sum of the mesiodistal width of 12 teeth, while the width between the first molars was 40 – 50.4%.

Pathological occlusion caused by narrowing of the upper jaw, the width of the base of the upper jaw was determined by the results of the study by an average of 44% of the sum of the mesiodistal sizes of 12 permanent teeth, the lower jaw – by 43%, and the length – by 39 and 40%, respectively. According to Snagina, with a pathological bite caused by a narrowing of the upper jaw, with a dense arrangement of teeth, the proportionality between the sum of the mesiodistal width of 12 teeth and the indicators of the apical base was studied. **Ekel** in case of a pathological bite, the method of which arises due to the narrowing of the upper jaw, this method determines a certain correlation proportionality between the sum of the mesiodistal dimensions of the teeth and the sum of the mediolateral dimensions of the teeth of the lower part of the skull.

During the second bite by guruch exchange, who was diagnosed with a pathological bite caused by a narrowing of the upper jaw, patients from 21 control groups aged 7 to 13 years were examined for a higher level of macrodontia in the first and second cranial teeth of the upper jaw. During the analysis of the results of the study, violations of the morphological structure of subsequent teeth located in the dentition, as well as the transition of the bite into a pathological appearance, were studied.

For the first premolars, a comparison was made to find the measurement points and measure the initial width of the dental arch between them using a rod cylinder. For the first molars, it was calculated to find the measurement points and the width of the dental arch between them, using a vortex Stager apparatus. The size of the dental arch between the premolars and molars and the width of the dentition in the transverse direction in the examined child patients were comparative. Cases of obtaining individual teeth or the shape of the face were also taken into account in cases where there was not enough space for teeth in the dentition.

- with a dense arrangement of the shovel teeth, the transverse size of the central tooth of the shovel is more than 10 mm;

- the mesiodistal size of the lateral cranial teeth is 7.5 mm or more;

- the total width of the shovel teeth is equal to or exceeds 35 mm;

- with a narrow type of face shape, the total width of curved teeth in some cases is 33 mm or more (individual macrodontia;

During the period of the second bite of the Guruh exchange, 21 Guruh control patients aged 7 to 13 years, based on the pon formula, determined the sum of the mesiodistal width of the cranial teeth when determining the normal physiological state of the premolars and molars and the width of changes in the deformities of the tooth – the jaw, the location in the dentition of the Pon - Linder-Hart, In children-patients of the control group, the width of the upper jaw teeth was determined from 26.8 to 35.5, the width of the premolars - from 31.4 to 41.5, the width of the molars - from 41.3 to 51.2 by variations of the Ponder- Hart methods. An orthodontic device based on an extension plate was applied either to the I or II side.

In the treatment of our patients from the control group, an orthodontic device with the base of the screw plate protruding in the I or II side was used for symmetrical elongation of the dental arch, with uneven elongation, a separating element was placed on the plate. In these cases, the expansion occurred mainly in the area of the front teeth. To move the group teeth forward, a plate with a sector cross-section of the screw is applied from the side of the palate. One of the important conditions when using this plate is that it is necessary to correctly determine the relationship of occlusion with occlusions.



Figure 2: Treatment processes for control guhi patients

It should be remembered that the position of the screw determines the direction of the force, and the type of cut on the plate determines the direction of the force in a particular tooth group. The number of activation of the screw and the number of turns of the screw determine the force and distance at which the tooth or group of teeth moves, and additional elements can increase or decrease the effect of the screw. In the case of anomalies in the shape and size of the teeth in the sagittal and transverse directions at the same time, orthodontic screws can be used that give pressure in two and three directions.

4. Conclusion

1With early detection of gross narrowing of the upper jaw as a result of taking therapeutic measures, pathological bites that have been treated for years are corrected within 6-8 months. Patients with deformities of the upper jaw should be under the supervision of an orthodontist and a dentist of other narrow specialties (pediatrician, ent, psychotherapist, endocrinologist, therapist). After treatment, the dispensary is taken under control and re-monitored every 6 months. The cost-effectiveness of the treatment of pathological changes in the dental system was achieved by restoring the normal

physiological state of the chewing efficiency of patients, improving physiological clinical signs. Children with a high probability of developing maxillofacial deformities were recommended to undergo a quarterly examination by a therapist and an orthodontist. When using an advanced orthodontic device, a reduction in the patient's recovery time from 8-10 to 6-8 months was achieved. After the use of an improved orthodontic device in sick children, a complete restoration of the state of chewing efficiency was achieved. Restoration of vital functions in patients with dental anomalies and deformities by stabilizing the myofunctional balance, practical recommendations were given to improve the efficiency of chewing and quality of life.

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