Recently, pathological tooth wear has become an increasingly common problem. This disease already affects about 12% of people (most often men) and this number is gradually growing.

Pathological abrasion of hard dental tissues (PSTTZ) refers to the loss of enamel and dentin in a relatively short period of time. In contrast to physiological abrasion (which occurs throughout a person’s life and begins immediately after teething), with pathological abrasion (PS), teeth quickly lose their anatomical shape and characteristic funnel-shaped depressions or areas are formed on the contacting surfaces, which have sharp edges and can injure the tongue and the mucous membrane of the lips and cheeks.

 Etiology

The occurrence of pathological tooth abrasion is associated with the action of various etiological factors, as well as their various combinations.

Conventionally, we can distinguish 3 groups of causes of pathological tooth abrasion:

1.functional deficiency of hard dental tissues;

2.excessive abrasive effect on hard dental tissues;

3. functional overload of teeth.

1. Functional deficiency of hard dental tissues. This deficiency may be a consequence of endogenous and exogenous factors. Endogenous factors include congenital or acquired pathological processes in the human body that disrupt the process of formation, mineralization and vital activity of dental tissue.

Congenital functional deficiency of hard tissues of teeth can be a consequence of pathological changes in ectodermal cell formations (enamel deficiency) or pathological changes in mesodermal cell formations (dentin deficiency) or a combination of both. At the same time, such a developmental disorder can be observed in some general somatic hereditary diseases: marble disease (congenital diffuse osteosclerosis or osteoporosis of almost the entire skeleton); Porac-Durant syndrome, Frolik syndrome (congenital osteogenesis imperfecta) and Lobstein syndrome (late osteogenesis imperfecta). This group of hereditary lesions includes Capdepont dysplasia.

With marble disease, slow development of teeth, their late eruption and changes in structure with pronounced functional deficiency of hard tissues are noted. The roots of the teeth are underdeveloped, the root canals are usually obliterated. Odontogenic inflammatory processes are characterized by severity and often develop into osteomyelitis.

In Frolik and Lobstein syndromes, the teeth are of normal size and regular shape. The color of the crowns of the teeth is characteristic - from gray to brown with a high degree of transparency. The degree of staining of different teeth in the same patient is different. Wear is more pronounced in incisors and first molars. Dentin of teeth in this pathology is not sufficiently mineralized, the enamel-dentin junction looks like a straight line, which indicates its insufficient strength.

The same picture can be observed with Capdepont syndrome. Teeth of normal size and shape, but with altered coloring, different for different teeth of the same patient. Most often the color is watery-gray, sometimes with a pearlescent sheen. Soon after teeth erupt, the enamel chips off, and the exposed dentin, due to its low hardness, quickly wears out. Impaired mineralization of dentin leads to a decrease in its microhardness by almost 1.5 times compared to the norm. The tooth cavity and root canals are obliterated. The electrical excitability of the pulp of worn teeth is sharply reduced. Affected teeth react poorly to chemical, mechanical and temperature stimuli. Obliteration of the tooth cavity and root canals with this dysplasia begins during the process of tooth formation, and is not a compensatory reaction to pathological abrasion. In the area of the root tips, bone loss is often noted.

In contrast to functional dental deficiency in Frolik and Lobstein syndromes, Capdepont dysplasia is inherited as a permanent dominant trait.

Acquired etiological endogenous factors of pathological tooth abrasion include a large group of endocrinopathies in which mineral, mainly phosphorus-calcium, and protein metabolism are disrupted.

Hypofunction of the pituitary gland of the anterior lobe, accompanied by a deficiency of somatotropic hormone, inhibits the formation of the protein matrix in the elements of the mesenchyme (dentin, pulp). A deficiency of pituitary gonadotropic hormone has the same effect. Violation of the secretion of adrenocorticotropic hormone from the pituitary gland leads to activation of protein catabolism and demineralization.

Pathological changes in the hard tissues of teeth in cases of dysfunction of the thyroid gland are associated mainly with hyposecretion of thyrocalcitonin. In this case, the transition of calcium from the blood to the tooth tissue is disrupted, i.e., the plastic mineralizing function of the dental pulp changes.

 The most pronounced disturbances in the hard tissues of teeth are observed when the function of the parathyroid glands changes. Parathyroid hormone stimulates osteoclasts, which contain proteolytic enzymes (acidic acid) osphatase), which contribute to the destruction of the protein matrix of hard dental tissues. In this case, calcium and phosphorus are excreted in the form of soluble salts - citrate and lactic acid calcium. Due to a deficiency in the activity of the enzymes lactate dehydrogenase and isocitrate dehydrogenase in osteoblasts, carbohydrate metabolism is delayed at the stage of formation of lactic and citric acids. As a result, highly soluble calcium salts are formed, the leaching of which leads to a significant decrease in the functional value of hard dental tissues.

Already in the initial stages of acid necrosis, patients develop a feeling of numbness and soreness in their teeth. Pain may occur when exposed to temperature and chemical stimuli, as well as spontaneous pain. Sometimes patients complain of a feeling of teeth sticking when they are closed. As replacement dentin is deposited and dystrophic and necrotic changes occur in the pulp of the affected teeth, these sensations become dull or disappear. Typically, acid necrosis affects the front teeth. The enamel disappears in the area of the cutting edges, and the underlying dentin is involved in the process of destruction. Gradually, the crowns of the affected teeth, being worn and destroyed, shorten and become wedge-shaped.

Significant disruption of the functional state of hard dental tissues occurs in conditions of phosphorus production. Necrotic changes in the structure of dentin were noted, in some cases - the absence of replacement dentin, an unusual structure of cement, similar to the structure of bone tissue.

Among the physical factors that reduce the functional value of hard dental tissues and lead to the development of pathological abrasion of teeth, radiation necrosis occupies a special place. This is explained by an increase in the number of patients subjected to radiation therapy in the complex treatment of oncological diseases of the head and neck region. In this case, radiation damage to the pulp is considered primary, which manifests itself in microcirculation disturbances with symptoms of pronounced plethora in the precapillaries, capillaries and venules, perivascular hemorrhages in the subodontoblastic layer. In odontoblasts, vacuolar degeneration and necrosis of individual odontoblasts are observed. In addition to diffuse sclerosis and petrification, the formation of denticles of different sizes and locations, and varying degrees of organization, is observed. In all areas of dentin and cement, demineralization phenomena and areas of destruction are detected. These changes in hard tissues occur at different times after irradiation and depend on the total dose. The greatest changes in dental tissues are observed in the period from the 12th to the 24th month after radiation therapy for tumors in the head and neck area. As a result of significant destructive lesions of the pulp, changes in hard tissues are irreversible.

To prevent dental damage during radiation therapy for diseases of the maxillofacial area, it is necessary to cover the teeth during the irradiation session with a plastic mouth guard such as a boxing splint, carry out thorough sanitation, and proper hygienic care.

2. The second group of etiological factors for pathological abrasion of teeth consists of factors of different nature, the common point of which is an excessively abrasive effect on the hard tissues of teeth. Data from a survey of residents of the Yamalo-Nenets District revealed a large number of severe cases of pathological abrasion of teeth down to the gum level as a result of residents consuming very hard food - frozen meat and fish.

S. M. Remizov's long-term observations of the abrasive effect of toothbrushes, tooth powder and toothpastes of various designs convincingly showed that incorrect, irrational use of hygiene and dental care products can turn from a therapeutic and prophylactic agent into a formidable destructive factor leading to pathological abrasion of teeth. Normally, there is a significant difference in the microhardness of enamel (390 kgf/mm2) and dentin (80 kgf/mm2). Therefore, the loss of the enamel layer leads to irreversible wear of the teeth due to the significantly lower hardness of dentin.

Industrial dust in highly dusty enterprises (mining industry, foundry) also has a strong abrasive effect on the hard tissues of teeth. Significant pathological abrasion of teeth occurs among coal mine workers.

Recently, due to the widespread introduction of prostheses made of porcelain and metal-ceramics into orthopedic dental practice, cases of pathological abrasion of teeth have become more frequent, caused by excessive abrasive effects of poorly glazed surfaces of porcelain and ceramics.

The study of the surface of natural teeth and dentures made of various ceramic materials made it possible to establish that the surface of a natural tooth is smooth, without roughness or protrusions, and visible scratches are a consequence of mechanical wear. The condition of the porcelain surface has a sharp difference, which consists in the presence of a significant number of irregularities of a pointed, point-like shape or in the form of vitrified areas with the inclusion of sharp grains. Samples made from Sikor have a more uniform surface. Visible roughnesses are smaller in size with a large radius of curvature. However, disruption of the glossy surface reveals the porous nature of the base material. The cast glass sample has a smooth surface, free of protrusions and roughness.

As a rule, the state of the surface is characterized by the number of irregularities per unit area and the radius of curvature of the vertices

protrusions Mechanical polishing does not smooth out roughness due to the fact that the glaze film is opened and the roughness increases.

Thus, glass-ceramic dentures, especially those made by casting (V.N. Kopeikin, I.Yu. Lebedenko, S.V. Anisimova, Yu.F. Titov), compared with porcelain dentures produced by powder sintering, have a much smoother surface that does not change during long-term use due to the fine-crystalline structure of glass ceramics and the absence of pores in it. Violation of the glazed layer of dentures, which occurs during grinding of glass-ceramic and porcelain dentures fixed in the mouth, sharply increases the surface roughness and, consequently, the coefficient of its friction with the antagonist, which, together with the high hardness of the material, can lead to intense abrasive wear of the hard tissues of the antagonist teeth . Therefore, when making dentures from ceramic materials, in order to prevent complications in the form of pathological abrasion of opposing teeth, it is necessary to carefully check the occlusal contacts at the stage of fitting the dentures, and be sure to glaze the surface of the ceramic dentures well without disturbing it after fixation.

3. Pathological abrasion of teeth may be a consequence of the nature of chewing, in which all teeth or only part of the teeth experience excessive functional load. In such cases, excessive functional load over time can lead to two types of complications: from the supporting apparatus of the teeth - periodontium or from the hard tissues of teeth - pathological abrasion of teeth, which more often occurs against the background of functional deficiency of hard tissues, although it can also be observed in teeth with normal structure and mineralization of enamel and dentin. Overload of teeth can be focal or generalized.

One of the reasons for focal functional overload of teeth is occlusion pathology. In the presence of pathology in the process of chewing in various phases of occlusion, certain groups of teeth experience excessive load and, as a result, pathological abrasion of teeth occurs. An example is the abrasion of the palatal surface of the anterior teeth of the upper row and the vestibular surface of the lower jaw incisors in patients with a deep blocking bite. A common cause of pathological abrasion of individual teeth is an anomaly in the position or shape of a tooth, leading to the occurrence of supracontact on this tooth during function.

The type of bite can also aggravate the development of pathological abrasion of teeth, resulting from functional inferiority of hard tissues of teeth or excessive abrasive effects of various factors. Thus, with a straight bite, the processes of erasing hard tissues proceed much faster than with other types of bite.

Partial adentia (primary or secondary), especially in the area of chewing teeth, leads to functional overload of the remaining teeth. With bilateral loss of chewing teeth, the front teeth experience not only excessive, but also unusual functional load. In this case, pathological abrasion of the remaining antagonizing teeth is observed.

Medical errors in the prosthetic treatment of dentition defects also lead to excessive functional load: the lack of multiple contacts of teeth in all phases of all types of occlusion causes overload of a number of teeth and their wear. Often there is abrasion of individual teeth that antagonize teeth that have protruding fillings made of composite materials, due to the inherent strong abrasive effect of composites.

In orthopedic dentistry there is currently a large arsenal of materials for the manufacture of dentures. When using them, you should strictly follow the indications and pay special attention to the possibility of their combined use. For example, plastic for fixed dentures “Sinma” is inferior in hardness to tooth enamel. Therefore, when making plastic prostheses (bridges with an open chewing surface or removable dentures) in the area of chewing teeth, the occurrence of functional overload of the anterior teeth due to abrasive plastics is inevitable in the immediate period after prosthetics. Another example: in the combined production of dentures from precious metals and plastic antagonists, plastic, due to its inherent high abrasive effect, will lead to rapid wear of crowns made of precious alloys, and consequently to a functional overload of the antagonistic natural teeth present in the mouth. When assessing abrasive wear, one should take into account not only the hardness of the material, but also the magnitude of its coefficient of friction with the antagonist material: the higher the coefficient of friction, the more significant the abrasive effect of the material. For example, the hardness of Sikor sital is higher than the hardness of Vitadur porcelain, but its abrasive effect is less, since its coefficient of friction with the tissues of natural teeth is lower.

 One of the causes of generalized pathologicalBrusomania, or bruxism, is considered to be an unconscious (usually nocturnal) clenching of the jaws or habitual automatic movements of the lower jaw, accompanied by grinding of teeth. Bruxism occurs in both children and adults. The causes of bruxism are not well understood. It is believed that bruxism is a manifestation of a neurotic syndrome and is also observed with excessive nervous tension. Bruxism belongs to parafunctions, i.e. to a group of perverted functions.

The role of functional overload of teeth in the etiology of pathological tooth wear has been proven in animal experiments. The overload of the anterior teeth was simulated by removing chewing teeth or making crowns for the anterior teeth of the lower jaw to increase the bite. As a result, after only 3 months, significant wear of the cutting edge of the anterior teeth was noted. Histological examination revealed that morphological changes during pathological abrasion of teeth due to functional overload take place in all periodontal tissues.

Pathogens

With pathological abrasion of teeth, in most cases, in response to the loss of hard tissues, replacement dentin is formed according to the localization of the abraded surface. The amount of replacement dentin varies and is not related to the degree of wear. With massive deposition of replacement dentin, its globular structure is noted. The tooth cavity decreases in volume until complete obliteration. The configuration of the altered dental cavity depends on the topography of the abrasion and the degree of damage. The formation of denticles of various shapes, sizes and degrees of maturity is often observed.

There are significant changes in the pulp of pathologically worn teeth.

The severity of pulp damage depends on the degree of pathological abrasion of teeth. In the nervous apparatus of the pulp, changes in the type of irritation are noted: hyperargyrophilia, thickening of the axial cylinders.

Typical for pathological abrasion of teeth with functional overload (more than 80%) is a compensatory increase in the thickness of the cement tissue - hypercementosis. In this case, the layering of cement occurs unevenly, the greatest is observed at the root apex. Not only does the mass of cement increase, but often its structure takes on a layered appearance. Cementicles are often found. In some patients, destruction of cement with its partial peeling from dentin is observed, which can be regarded as osteoclastic resorption of root tissue in response to functional overload.

Changes in the periodontium with pathological abrasion of teeth due to functional overload consist in the unevenness of the width of the periodontal gap along the gingival margin to the root apex. The expansion of the periodontal fissure occurs more in the cervical part and at the apex of the root and directly depends on the degree of functional overload. In the middle third of the root, the periodontal fissure is usually narrowed. In all cases, local hemodynamic disturbances, edema, hyperemia, and focal infiltration are noted. Often, in response to excessive functional load, chronic inflammation develops in the periodontium of worn teeth with the formation of granulomas and cystogranulomas, which must be taken into account when examining such patients and choosing a treatment plan. Pathological abrasion of teeth leads to a change in the shape of the crown part, which in turn contributes to a change in the direction of action of the functional load on the tooth and periodontium. At the same time, zones of compression and tension appear in the latter, which necessarily leads to tissue collagenization of the periodontium. In tension zones, on the contrary, there is a massive layering of cement, along the periphery of which there is a deposition of characteristic pathological changes in theperiodontitis. In areas of compression, cement resorption, its peeling from dentin, replacement with osteocement, and osteoclastic resorption of bone osteocement are noted.

Changing the shape of the coronal part with pathological tooth wear (PAW) increases the functional load on the teeth.

Thus, with pathological abrasion of teeth resulting from functional overload, a vicious circle is observed: functional overload leads to pathological abrasion of teeth, a change in the shape of the crowns, which in turn changes the functional load necessary for chewing food, increasing it, and this is even more promotes the destruction of hard tissues of teeth and periodontium, exacerbating pathological abrasion. Therefore, orthopedic treatment aimed at restoring the normal shape of worn teeth should be considered not symptomatic, but pathogenetic.

Classification of pathological abrasion of hard dental tissues

Working scheme for the classification of increased abrasion of hard dental tissues according to A.T. Zelinsky

For many decades, attempts have been made to systematize the types of pathological abrasion of teeth.

A.L. Grozovsky identifies three clinical forms of this pathology: horizontal, vertical and mixed.

Types of pathological abrasion. a - vertical; 6 - horizontal.

 Depending on the extent of the pathological process V.Yu. Kurlyandsky distinguishes between localized and generalized forms of pathological abrasion.

. Abrasion: generalized form.

 E.I. Gavrilov distinguishes limited and diffuse forms of pathology.

According to the depth of the lesion, three degrees of pathological abrasion of teeth are distinguished: I degree - up to 1/3 of the length of the crown, II degree - up to 2/3 of its length, III degree - complete abrasion of the tooth crown.

Clinic for pathological abrasion of hard dental tissues

The clinical picture of pathological tooth abrasion depends on the patient’s age, the reactivity of the body, the type of bite, the size and topography of the dentition, the severity of the pathological process and is therefore very diverse. And yet it is possible to identify common signs for this pathology. It is characteristic that the process of increased abrasion of tooth enamel and dentin is not accompanied by their softening.

The most typical signs of pathological abrasion of teeth include a violation of their anatomical shape (due to abrasion), dentin hyperesthesia, a decrease in the height of the bite, shortening of the lower third of the face, dysfunction of the masticatory muscles, and in severe cases, painful dysfunction of the temporomandibular joint. However, these signs are not always present simultaneously and clearly expressed - it all depends on the type of tooth wear.

With pathological abrasion of the hard tissues of the teeth, various morphological and functional disorders are observed in the dentofacial system: hyperesthesia of the hard tissues of the teeth, deformation of the dentition, shortening of the interalveolar distance and the lower third of the face, functions of the masticatory muscles, painful dysfunction of the temporomandibular joints.

Dysfunction of the masticatory muscles is manifested by pain when they contract. Their bioelectrical activity increases, and it is also observed in the phase of physiological rest, asynchronous contractions appear, and regional blood circulation in the periodontium is disrupted. These symptoms are observed mainly in cases of pronounced pathological abrasion of the hard tissues of the teeth and only in the decompensated form, when there is shortening of the lower third of the face. Patients with a compensated form of abrasion, accompanied by hypertrophy of the alveolar process of the jaws, do not have such disorders.

Diagnostics

 To make a correct diagnosis and choose the optimal treatment plan for such a diverse clinical picture of pathological tooth abrasion, it is necessary to carefully examine patients to identify the etiological factors of pathological tooth abrasion and concomitant pathology. The examination must be carried out in full according to the traditional scheme: 1) interviewing the patient, studying complaints, life history and medical history; 2) external inspection; 3) examination of the oral cavity; palpation of the masticatory muscles, temporomandibular joint, etc.; 4) auscultation of the temporomandibular joint; 5) auxiliary methods: study of diagnostic models, targeted radiography of teeth, panoramic radiography of teeth and jaws, EDI, tomography, electromyography and electromyotonometry of masticatory muscles.

Complaints of patients can be different and depend on the degree of pathological abrasion of teeth, topography and extent of the lesion, duration of the disease, and concomitant pathology. In the absence of concomitant lesions of the maxillofacial area, patients with pathological abrasion of teeth usually complain of a cosmetic defect due to progressive

loss of hard dental tissues, sometimes hyperesthesia of enamel and dentin, with acid necrosis - a feeling of soreness and roughness of the enamel.

When studying the patient’s life history, attention is paid to the presence of a similar pathology in other family members, which may indicate a genetic predisposition, congenital functional deficiency of hard dental tissues. It should be borne in mind that pathological abrasion of teeth can be observed in several members of the same family and not only as a result of hereditary pathology, but also due to common diet, everyday life, and sometimes occupational hazards. All this can contribute to a decrease in the functional value of hard dental tissues and increased abrasive wear.

When collecting anamnesis, it is necessary to identify concomitant general somatic pathology, congenital dysplasia, endocrinopathies, neurodystrophic disorders, kidney diseases, gastrointestinal tract, etc. It is necessary to very carefully identify the root cause of abrasion. If from the anamnesis and as a result of a clinical examination it turns out that pathological abrasion of teeth arose against the background of functional insufficiency hard dental tissues of endogenous origin, then when choosing a prosthesis design, one should prefer those that would minimally overload the supporting teeth. Otherwise, due to congenital (especially) or acquired deficiency in osteogenesis, resorption of the roots and severe atrophy of bone tissue from the dental alveoli may occur. Often, with hereditary diseases (marble disease, Frolik's syndrome, etc.), the roots of worn teeth are underdeveloped, the root canals are curved and obliterated. Therefore, in such cases, the indications for pin structures are narrowed. In addition, clarifying the history of hereditary pathology such as Frolik and Lobstein syndromes, Capdepont syndrome makes it possible to predict with a sufficient degree of probability the prognosis of the state of the dental system and the musculoskeletal system as a whole in subsequent generations, since dental changes in Frolik and Lobstein syndromes are inherited as an unstable dominant sign, and in Capdepont syndrome - as a permanent dominant sign.

When clarifying the history of the present disease, attention is paid to the age of occurrence of pathological tooth abrasion, the nature of its progression, the connection with prosthetics of teeth and jaws, the nature and working conditions and living conditions of the patient.

During an external examination of the patient’s face, the facial configuration, proportionality and symmetry are noted. The height of the lower part of the face is determined in a state of physiological rest and in central occlusion. The condition of the hard tissues of the teeth is carefully studied, establishing the nature, extent, and degree of wear. Pay due attention to the condition of the oral mucosa and periodontal teeth to identify concomitant pathologies and complications.

Palpation of the masticatory muscles reveals pain, asymmetry of sensations, swelling of the muscles, their hypertonicity and suggests the presence of parafunctions in the patient. In the future, to clarify the diagnosis, it is necessary to conduct additional studies: electromyography and electromyotonometry of the masticatory muscles, consult with a neurologist about possible bruxism, carefully question the patient and his relatives about possible grinding of teeth in sleep. This is necessary to prevent complications and select the optimal comprehensive treatment for such a contingent of patients.

Palpation of the temporomandibular joint area, as well as auscultation of this area, allows us to identify pathology, which is often found in pathologically worn teeth, especially in the generalized or localized form, complicated by partial edentia. In these cases, careful analysis of diagnostic models and x-ray examination are necessary; frontal and lateral tomograms with closed jaws and physiological rest.

Electroodontodiagnostics (EDD) is a mandatory diagnostic test for pathological tooth wear, especially grades II and III, as well as when choosing the design of fixed dentures. Often, pathological abrasion of teeth is accompanied by asymptomatic death of the pulp. As a result of the deposition of replacement dentin, partial or complete obliteration of the pulp chamber, the electrical excitability of the pulp is reduced. In case of pathological abrasion of teeth of the first degree, accompanied by hyperesthesia of hard tissues, EDI usually does not reveal deviations from the norm.

Just like EDI, radiography (sighted and panoramic) is a mandatory diagnostic method that allows us to establish the size and topography of the pulp chamber, topography, direction and degree of obliteration of the root canals, the severity of hypercementosis, the presence of cysts, which are often found with functional overload of teeth, and granulomas in worn teeth. All this is undoubtedly of great importance in choosing the right treatment plan.

Correct diagnosis and treatment planning for patients with pathological tooth wear, as well as monitoring the progress and results of treatment, is facilitated by a thorough study of diagnostic models. Using diagnostic models, the type, shape and degree of pathological abrasion of teeth, the state of the dentition are clarified, and when analyzed in an articulator, the nature of the occlusal relationships of teeth and dentition in various phases of all types of occlusion, which is especially important when diagnosing concomitant pathology of the temporomandibular joint and choosing a treatment plan.

Treatment of pathological tooth abrasion

Before drawing up a treatment plan for a patient with pathological tooth wear, it is necessary to find out the most likely etiological factor; form and degree of abrasion (localized, generalized, compensated, decompensated); clinical and radiological condition of dental crowns and periodontal disease; condition of the pulp (odontodiagnosis); possible changes in appearance and joint.

 Prosthetics for pathological tooth wear has both therapeutic and preventive purposes. The first means improving the chewing function and appearance of the patient, the second means preventing further abrasion of hard dental tissues and preventing diseases of the temporomandibular joint. The specific tasks that are solved during prosthetics for a particular patient depend on the characteristics of the clinical picture. Therapy for such patients should include: 1) elimination of the cause (bad habits, bruxism, parafunctions of the masticatory muscles, prevention of occupational hazards, etc.); 2) preparation for prosthetics (elimination of distal occlusion, normalization of interalveolar height, elimination of supracontacts, blocking points and deformations of the occlusal surface, creation of space for prostheses, treatment of joint dysfunctions); 3) replacement of lost tooth crowns with orthopedic methods.

Treatment of patients with the initial stage of development has the task of preventing the progression of pathological abrasion. Since the decrease in bite has not yet occurred or is barely noticeable and does not bother the patient, there is no need to restore the occlusal height, therefore orthopedic treatment is preventative. Patients with dentin hyperesthesia are prescribed medication and physiotherapeutic treatment. In cases where conservative treatment is ineffective, orthopedic treatment is indicated, aimed at restoring the damaged shape and function of teeth using fixed or removable dentures, depending on the indications.

Minor occlusion disorders and protruding tooth edges thinned due to pathological abrasion are eliminated using selective grinding.

 The use of stamped metal crowns should be limited due to their inherent disadvantages (they wear out relatively quickly, move deep into the gum pocket, destroying the circular ligament of the tooth and causing chronic

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Minor occlusion disorders and protruding tooth edges thinned due to pathological abrasion are eliminated using selective grinding.

 The use of stamped metal crowns should be limited due to their inherent disadvantages (they wear out relatively quickly, move deep into the gum pocket, destroying the circular ligament of the tooth and causing chronic

inflammatory process in the marginal periodontium), undoubtedly, preference should be given to solid metal crowns.

The type of prosthesis depends on the degree of loss of hard tissue. When hard tissue is erased by 2-3 mm (in frontal teeth without disturbing the anatomical shape on the vestibular side), the use of inlays is indicated. The inlay must cover the entire erased occlusal surface, so the outline of the inlay takes on a very varied appearance. Retention points for inlays can be irregularities (pits) in the dentin, retention pins or carious cavities. With these sizes of abrasion, it is possible to use all types of artificial crowns. With a generalized form of abrasion and loss of hard tissues of 2-3 mm, it is possible to use both inlays and crowns that cover the teeth of the opposite row, located in three functionally oriented groups - the anterior and chewing left and right sides.

One of the types of artificial crowns used to restore the anatomical shape of teeth, especially in children and adolescents, is a combined cap-loop design (T. V. Sharova, 1990). It is indicated when the angle of the tooth crown, the entire cutting edge, half or three-quarters of its length, and even the entire vestibular surface are broken off.

The cap-loop crown design consists of a cap and a fixing loop. The technology for its production is simple and it can be performed in any dental laboratory, even where there is no foundry facility.

The tooth stump is covered with a thin-walled cap with a cross-section of 0.12-0.14 mm, which is made from sheet titanium grade VT1-00 by external stamping. A U- or L-shaped loop made of titanium wire with a diameter of 0.6 mm is fixed to the cap using spot welding. The horizontal arm of the fixing loop is set 1.5-2.0 mm below the level of the cutting edge of adjacent teeth. The facing part of the crown is made of plastic or Evicrol.

After careful preparation of the tooth stump, an accurate impression is taken and a model is cast. The stump of the tooth crown is not modeled. A cap is made using the stamping method, which should tightly cover the tooth stump and end at the level of the gingival margin. After fitting the cap, impressions of the patient's upper and lower jaws are taken. Models are cast in the laboratory and the protection is modeled in an articulator, taking into account the level of antagonists and adjacent teeth. The resulting wax reproduction, together with the cap, is transferred to the foundry, where the protection is cast and connected to the cap. This results in a single cap-protection system. The latter is processed, reinstalled on the plaster model in the articulator, and the vestibular part of the crown is modeled from wax; then the wax is replaced with plastic according to a well-known method.

To restore the anatomical shape of chewing teeth, three options for cap-occlusal crowns have been proposed).

The proposed crown design consists of two parts: fixing and restoring. The fixing part of the crown is represented by a thin-walled metal cap, the restoring part is designed in three versions: cast metal, plastic and combined.

A gentle preparation of the permanent tooth crown is carried out, a vestibular bevel is created and its edges are rounded. In case of total horizontal pathological abrasion, tooth preparation is not performed. Depending on the clinical picture, a regular or double impression is obtained. A model is cast in the laboratory. The neck of the tooth is specified with a pencil, the stump is not modeled, and a thin-walled metal cap is obtained using external stamping.

The clinic fits the cap, which must meet the following requirements: fit to the tooth stump throughout its entire length, tightly cover it at the neck, and, if necessary, plunge into the gingival groove by 0.1 mm. Complete impressions of the upper and lower jaws are then obtained. The cap is removed from the tooth stump and transferred to the impression. In the laboratory, casting of models is carried out, placing them in the position of central occlusion and plastering into the occluder. The missing part of the crown can be made of metal (cast), Evicrol or plastic. Where there are biologically inferior hard tissues of antagonist teeth, the chewing surface is made of plastic in order to prevent the rapid abrasion of their hard tissues during function. If there are no deviations in the structure of the hard tissues of antagonist teeth, then the chewing surface of the cap-occlusal crown structure is made of the composite material Evicrol, which is more resistant to mechanical stress during function.

In the first type of crown on a thin-walled cap, the entire missing part is modeled taking into account the bite. The resulting composition - a metal cap and a wax model of the missing part of the crown - is transferred to the foundry, where during casting the fixing and restoring parts of the structure are connected. In the absence of a solderless method, the restoring part of the structure is cast, and then

using solder, it is connected to the fixing part - the cap.

If a generalized form of abrasion is accompanied by a decrease in occlusal height due to wear of the teeth of the upper and lower dentition, the doctor must solve the following problems: restoration of the occlusal height and the correct occlusal surface.

Orthopedic treatment is carried out in the following sequence. Using diagnostic models, wax bases with occlusal ridges are made, which are placed directly on the occlusal surface of the teeth. On the occlusal roller, placed on the dentition of the upper jaw, a prosthetic plane is created in the sequence described in the section “Prosthetics of toothless jaws”. This is a mandatory condition, since the level and position of the plane are the only guidelines for the dental technician when modeling and creating the occlusal surface on dentures. In the future, fixation of the central ratio is carried out in the sequence described earlier.

The design of prostheses is determined by the specific clinical picture. It should be remembered that stamped crowns cannot be used to restore occlusal height. This is due to the fact that they are significantly larger in vertical dimension than the tooth stump, and this difference must be made up for with cement, the strength of which is low.

The main task of the doctor when treating patients with declining occlusion is to restore the physiological conditions for the functioning of the dentofacial system: normalization of occlusal height, occlusal-articulatory relationships between the dentition, function of the neuromuscular system, elimination of overload of the temporomandibular joint and associated complications. Treatment is carried out in two stages. The presence of a decrease in the height of the bite in patients dictates the need for functional preparation of the oral cavity before dental prosthetics according to the method of I.S. Rubinov, which consists in the preliminary restructuring of the myostatic reflexes of the masticatory muscles with the help of bite-release devices, dental, subgingival aligners or replacement therapeutic dentures, the effect of which is aimed at localizing the efforts of the masticatory lifting muscles in a certain area of the dental arches (most often in the area of the anterior teeth). The degree of bite separation is determined by the magnitude of its reduction and is within the normal bite height for a given patient or with overcorrection of 2-3 mm. The functional preparation of the oral cavity ends with the development of new indicators of optimal thresholds for irritation of the masticatory muscle receptors and the emergence of a new functional rest of the lower jaw. In this case, a separation gap is formed between the worn-out teeth, the size of which allows one to outline a rational plan for dental prosthetics. The choice of tactics for orthopedic treatment of patients with pathological abrasion of teeth is also determined by the distribution of strength characteristics, maximum effort and the level of bioelectric activity of the masticatory muscles [A.V. Tsimbalistov, 1996]. Therefore, the use of tactics based on the use of a complex of diagnostic instruments, devices and a functional-physiological approach to determining the central relationship of the jaws will allow you to quickly, competently and differentiatedly maneuver the separation of the dentition during treatment.

The choice of tactics for managing patients with pathological tooth wear depending on the distribution of strength characteristics, maximum effort and the level of bioelectric activity of the masticatory muscles (according to A.V. Tsimbalistov)

 At the first stage, the interalveolar height is normalized, the function of the muscles and the temporomandibular joint is rebuilt. On the second stage, prosthetics are performed using various structures that restore the shape of the teeth.

Methods of step-by-step treatment are different. Some authors, when restructuring the myotatic reflex, separate the dentition in the anterior section. Others create multiple contacts with all antagonist teeth using a disconnecting mouthguard.

 If there is a large difference in the height of the lower third of the face in the resting position (6 mm) and the closure of the teeth without distal shift of the lower jaw, an increase in the interalveolar height can be done simultaneously. Initially, the height is raised to a normal temporary removable mouth guard. If no temporomandibular joint disorders occur, then after 2-3 weeks. make final prosthetics in some way. If pain occurs in the joint, the interalveolar height should be lowered, and after some time increased again, bringing it to the desired value.

In order to avoid undesirable reactions of muscles and joints, increasing the interalveolar distance by 8 mm or more should be done in several stages, using therapeutic bite blocks for these purposes. An increase in interalveolar height with a distal shift of the lower jaw requires special preparation of patients using a therapeutic bite block with an inclined plane. Moving the lower jaw forward should be carried out under x-ray control of the position of the head of the lower jaw.

When the pathologist

ical abrasion of teeth, to restore and secure the occlusal height, in addition to stamped conventional ones, stamped crowns with a cast and soldered overlay on the chewing surface are used. They are suitable for long-term use due to their high wear resistance and ability to withstand increased occlusal loads. These crowns are especially indicated for pathological tooth wear, accompanied by bruxism, as well as in cases where there are no possibilities for the use of metal-ceramic, cast and other structures. For the anterior teeth, stamped crowns with a cast occlusal surface are veneered.

The production of metal-ceramic crowns for the anterior teeth begins only after restoration of the occlusal height and stabilization of the bite on the lateral teeth with the help of prostheses, the choice of design of which depends on clinical indications. At the same time, a place appears in the anterior section for the application of metal-ceramic crowns, so the cutting edge in a direct bite is not ground off.

It is more difficult to restore the anatomical shape of the anterior and lateral teeth at the level of normal occlusal height if they are erased by more than 2/3 of the length of the crown. In such cases, first cast stump pins are made and attached to these teeth, and then solid crowns with veneer, porcelain or plastic, are made on them. The clinical steps for manufacturing cast post stumps are described in detail in the section on these prostheses. However, the manufacture of such inlays with pathological abrasion of more than 2/3 of the length of the crown is often associated with great difficulties. They are caused by a significant reduction in the volume of the tooth cavity due to the deposition of replacement dentin, as well as partial or complete obliteration of the root canals, most often in the lower incisors, premolars and molars.

In cases where it is not possible to use the root canals of teeth worn down more than 2/3 of the length of the crown for the manufacture of cast pin inlays, a removable denture with onlays on the teeth is used.

 Orthopedic treatment of limited pathological abrasion with intact dentition presents a certain difficulty. In this case, worn teeth maintain contact with antagonists due to vacate hypertrophy of the alveolar process, and the interalveolar height is not impaired. Orthopedic treatment for such patients is carried out in two stages: first, a place for the prosthesis is created, and then the prosthetics themselves. To do this, worn teeth (usually the front ones) are covered with a plastic mouthguard, while the lateral teeth are separated. The functional load in the area of worn teeth causes restructuring in the alveolar process and after 3-4 months there is enough space for a prosthesis. In old age, restructuring of the alveolar processes is almost impossible, therefore in such patients an increase in the interalveolar height by the thickness of the crowns within the “resting height” is indicated.

Partial tooth loss can occur against the background of already developed pathological abrasion. On the other hand, the loss of, for example, molars and premolars can lead to pathological wear of the anterior teeth. The clinical picture is very complex, since the pathological abrasion is layered with the symptoms of partial tooth loss. In this regard, the tasks of prosthetics are expanding. The tasks pursued in the treatment of pathological abrasion include the replacement of defects formed as a result of tooth loss.

The designs of prostheses used to solve the latter problem are determined by the specific clinical picture. For included defects without lowering the lower third of the face, fixed prostheses can be used. When the height of the lower third of the face is reduced, prosthetics provide, in addition to replacing defects, increasing the interalveolar height on all remaining teeth. This is very convenient to achieve using solid bridges.

In the case of end defects (unilateral or bilateral), the use of various designs of removable dentures (arch and plate) is indicated. The interalveolar height is increased using fixed dentures or clasp dentures equipped with special metal overlays for worn teeth.

Forecast

The prognosis for the treatment of pathological tooth wear is generally favorable. Treatment results are better in young and middle-aged people with an initial degree of abrasion. However, it is necessary to note the possibility of relapses in patients with pathological tooth wear due to bruxism and parafunctions, which confirms the idea that only orthopedic interventions are insufficient without appropriate psychoneurological corrections.

 All patients with pathological tooth wear should be monitored at the dispensary.

Prevention