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The modern view on etiology and pathogenesis of gum recession (review of the literature)

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Abstract

The reasons, conditions development and classification of gingival recessions described. The retraction of marginal gingival may lead to negative consequences depending on the type of impregnating matter and on exposure period. Important part of the traumatic factors, specialties planning of treatment and prevention indicated, different methods of treatment analysed and estimated.

Keywords: gum recession, biotype of the gum, theories of the development of gum recession, traumatic factors

1. Introduction

One of the important tasks of periodontal plastic surgery is the prevention and elimination of gum recession. At a young age, the recession is quite rare (in 8-10% of patients). The prevalence and severity of gum recession increases with age, most often it develops in middle-aged and elderly people (from 80 to 95%). Of the total number of all periodontal diseases, the share of the gum recession is about 10%^[1, 2].

According to the summary data of WHO independent experts, based on the results of epidemiological studies, intact periodontium occurs only in 2 - 10% of observations, inflammatory diseases of the periodontal disease are detected in 90 - 95% of the adult population and lead to pathological changes in the tooth-jaw machine associated with loss of teeth in 5 times more often than as a result of complications of caries. The gum recession does not lead to loss of teeth, and for a long time was considered only as an aesthetic problem, the prevalence of which increases from 38% in the age group of 30-39 years to 90% in the age group of 80-90 years^[3].

2. The purpose of the study was to conduct a modern review of the etiology and pathogenesis of the gum recession.

3. Results and their discussion. By definition K.H. Rateischak^[4], a gingival recession is a periodontal tissue atrophy that manifests itself as a wedge-shaped or oval-shaped lowering of the gum from the vestibular surface, and the bulging of the root portion of the tooth without signs of inflammation.

According to G.F. Wolf *et al.*, the recession is not a gum disease as such, but a morphologically-induced change in the structure of the periodontal, provoked by various factors. Most authors point to the uncertain etiology of the disease, noting the dystrophic nature of the pathology^[1, 5, 6].

Typically, patients with a recession gums complain about the bark of the root of the tooth associated with this aesthetic defect, as well as the appearance of increased sensitivity of solid dental tissues to various types of stimuli, bleeding and the inability to use personal hygiene^[7]. In the international classification of periodontal diseases (ICD-10, 1995) and in third edition dental implication to it (ICD-S, Geneva, 1997), the recession is marked as K 06.0.

Leus P.A. and Kazeka L.A. proposed a clinical classification of gum recession, according to which distinguish the following types of recession: traumatic, symptomatic and physiological; by prevalence - localized, generalized^[8].

Dedova L. N.^[9] distinguishes the anatomical recession of the gums, the cause of which are the anatomical-topographic features of the tooth-jaw organ; physiological, as a result of natural age changes, and symptomatic, as a result of periodontal disease. An anatomical recession is observed in the absence of inflammation, not accompanied by loss of interdental papillae.

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Most often, the recession of the gum is localized from the vestibular side in the region of the upper incisors and premolars, as well as the lower incisors and incisors. The recession against the background of the onset periodontitis (symptomatic) develops slowly, sometimes for many years, and strikes both marginal gums, and interdental gums papillae. Physiological recession is a manifestation of age-related involution, in which case the gingival margin and gums papillae affects. The anatomical recession of gums occurs in 16-39% at the age of 20 - 29 years. With age, the prevalence and intensity of the disease increases. In this case, the prevalence of anatomical recession gums with age increases significantly to 15.7%, as the proportion of symptomatic increases, and from the age of 35 and the physiological recession of gums. By degree of severity are distinguished: light (up to 3 mm); medium gravity (3-5 mm); heavy (6 or more mm) recession of gum.

According to Wang H.L. *et al.* [10] There are certain patterns for the gum recession: the recession is asymptomatic with age; buccal surface is most prone to recession; lower incisors are more often affected than the upper ones; men are more inclined to recession than women.

A lot of scientists determine the recession as "Gingivo - periodontal atrophy"; it manifests itself with limited atrophy of periodontal tissues in the form of a wedge-shaped or oval decrease in gum height with the appearance of the surface of the root from the vestibular or oral surfaces. As a rule, without inflammatory events [11, 12, 13].

The entire diversity of gum recessions can be divided into two conventional classifications:

1. By Miller P.D., 1985 [14] 4 classes: Grade 1 - the recession of the gums does not go beyond the mucogingival connection, without loss of gums in the interdental spaces; Grade 2 - gum recession extends beyond the limits of the mucogingival connection, without loss of gums in the interdental spaces; Grade 3 - recession of the gums, which extends beyond the mucogingival linkage with gum loss in the interdental spaces; Grade 4 - Gingival recession around the tooth [112].

2. By Sullivan H.C. *et al.*, [15] the recession of the gums is estimated by the form of the defect: deep-wide, shallow-wide, deep-narrow, shallow-narrow.

As a result of the recession, the loss of marginal tissue and alveolar bone in the palatine, tongue and palatine projections occurs gums. Multiple recessions arise, first of all, with anomalies of bite, small premonition of the bottom of the oral cavity, constitutional features of the patient. Often, multiple recessions are the result of long-term periodontitis, the result of surgical interventions in fracture operations, orthodontic treatment, orthopedic surgery injuries. In the domestic literature, the term "recession" was replaced by V-shaped atrophic gingivitis. Thus they tried to show the connection between the name and the etiology. Many authors pointed to the dystrophic nature of the disease. But most of them agree that there is no single reason for the emergence of this pathology. This is usually a set of reasons [16].

Modern classification of etiological factors contributing to the formation of recession:

1. Morphological features

- Peculiarities of the structure of the bone of the alveolar appendix (bone type according to Mish, bone density, size and shape of the alveolar appendix);
- Features of the structure of the mucous membrane and gums (biotype of the gum, low attachment of the frenulum of the lips, tongue, mucous membranes, and

small vestibule of the mouth);

- The shape of the teeth, their improper position in the jaw;
- Features of attachment of muscles (high and wide attachment near the mental foramen).

2. Functional features

- Primary (infantile type of swallowing, occlusive parafunction, posture violation);
- secondary (mechanical trauma during tooth brushing, presence of supracontacts, mechanical and chemical factors, piercing).

3. Inflammation

- Unsatisfactory hygiene;
- Periodontal disease.

4. Age and sex.

5. The presence of concomitant diseases (diseases of the glands of the internal secretion) [17].

There are several theories of the development of gum recession, which consider the influence of exogenous and genetically determined factors.

The theory of the development of a recession under the influence of exogenous factors, takes into account the influence of orthopedic constructions on the periodontal, the influence of orthodontic devices, the tension of mucous tensions and frenulum, shallow vestibule of the oral cavity, the congestion of teeth [18].

Currently, the influence of exogenous factors is divided into the following categories: recession caused by trauma, caused by bacterial infection, viral infection and mixed etiology (trauma and bacterial infection) [19].

A recession of the first category causes an injury that can be caused by the patient (improper cleansing of teeth, improper use of floss, oral piercing) or as a result of dental treatment (orthodontic treatment, trauma with orthopedic constructions, traumatic occlusion). In an aggressive brushing of teeth, the patient is injured not only as gum tissue, but also erases firm tooth tissues (abrasion), opening the way for the invasion of microorganisms [20]. In case of improper use of floss, the patient deploys it too much into the groin's groin, causing injury. Often thereafter, a recession is observed in the gums in the form of the Shtilman slit; this recession is also observed in traumatic occlusion and the presence of supracontacts [21].

When wearing piercing on the lip, the tongue of the inner part adjoins to the gum in the projection of the mucogingival connection in the field of incisors. It causes damage to the gums from the tongue and the lips, which may lead to a recession [22]. Harmful habits such as holding a pen or pencil in the mouth, sucking the tongue and its forehead (infantile swallowing type), which is often preserved from an early age, can also affect the state of periodontal tissues. In this situation, the tongue rests in the tongue of the gum surface of the lower incisors, which leads to a recession and subsequent inflammation in this area [23]. Deep cutter overlays can also be an important factor that leads to the appearance of cervical and tooth roots, as this condition can contribute to mechanical trauma of the marginal edema, especially in the palatine surface of the upper incisors and the lower vestibular surface.

A recession caused by a bacterial infection appears when the bacterial plaque accumulates from the vestibular surface and is not removed by the patient. This form of recession can not be confused with periodontitis. Since parodontopathic microflora provokes the loss of periodontal attachment and

resorption of interdental partitions with the destruction of the cortical plate of the bone. This type of recession does not coincide with the generalized loss of interproximal gums and bones. In this recession, the appearance of pockets from the vestibular side is often observed, due to the accumulation of bacterial plaque and the loss of periodontal attachment [24].

The recession of viral etiology is caused by herpes virus [25]. On the gums there are bubbles that can then be transformed into sores that are painful. The patient avoids tooth decay in this area, there is an accumulation of bacterial plaque, which can then lead to a gum recession.

The recession of mixed etiology, as a rule, is caused by aggressive brushing of teeth, but the accumulation of raging causes inflammation and the progression of the recession.

One more reason for the outbreak of the recession is the unsatisfactory restoration of the V class by Black, which also violate hygiene in this area.

Another factor contributing to the recession is the biotype of the gum [26]. Modern scholars are increasingly sharing gums in 2 biotypes: thin and thick. These biotypes respond well to the so-called morphotypes of the structure of periodontal tissues. For thick morphotype are characterized by: "square" form of teeth, interdental contact points are well-defined, interdental gingival papillae short and wide, fastening clear in thickness 1.5 - 2.0 mm. Thin morphotype correspond: narrow rectangular teeth, contact points point, interdental gingival papilla thin and narrow, thickness of attached gums 1.0 mm. These are two extreme variants of the structure of periodontal tissues. Some authors still allocate an average biotype of the gums (the thickness of the attached gums is about 1.5 mm), but it is usually difficult to determine. Therefore, the classification is often used with a thin and thick biotype of the gums.

A thin biotype of the gum is a direct factor for the occurrence of recession, since thin (up to 1 mm) gum fastening is easy to damage when cleaning teeth and they quickly break down in the presence of inflammation. Also, the presence of low-attached mucous membranes and bridges of the lower and upper lip, combined with the thin biotype of the gums, may lead to a gum recession.

Another popular theory of gum recession is the genetic Lange D. E. *et al.* Gingivitis-alveolar atrophy occurs predominantly after teething, due to genetically determined irregularities in the ratio of the size, shape (signs of distortion) of the roots to the thickness of the bone of the alveolar sprout of the jaw. Thus, after teething, areas of bone resorption are formed, which do not clinically manifest themselves. Throughout the life of the teeth are exposed, and with age there is a refinement of the clear connective tissue, which is caused by trophic disorders. These violations deepen when stretching the periodontal connection when the teeth are exposed to excessive load (presence of supracontacts, traumatic occlusion with incomplete tooth row, unsatisfactory prosthetics), as well as with insufficient gingival glands.

Anatomy of the crown of the tooth also plays an important role in shaping the preconditions for a gum recession. If the equatorial part of the crown of the tooth is weakly pronounced and its diameter is close to the size of the cervical part of the tooth, then there is an incorrect redistribution of masticatory pressure as a result of the ligamentous apparatus of the tooth and solid tissue on cemento - enamel border feel increased load. This form of teeth is genetically determined and transmitted as an inheritance.

Conclusion

As already mentioned above, the gum recession has a multifactorial nature. But in the literature there are no papers that would confirm the influence of the molecular-genetic profile of the patient on the occurrence of gum recession. The etiopathogenetic basis of periodontal diseases, including the recession of the gums, is functionally weakened allelic variants of certain genes []. This genetic effect can be realized against the background of adverse environmental factors, and intensify in the presence of other factors (aggressive brushing of teeth, increased load, shape of the roots and teeth). But if you know that certain gene / gene variants are involved in the mechanism of gum recession, then by examining patients for the purpose of detecting this gene / genes, it will be possible to assume the development of this pathology and to take preventive measures at an early stage.

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