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A retrospective review of surgical methods of treatment of the inflammatory periodontal diseases in Ukraine

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Abstract

The article examines and summarizes the literature data on the use of surgical methods of treatment of the inflammatory diseases of periodontal tissues. It is shown the necessity and advisability of surgical intervention of various surgical methods depending on the severity of dental disease. Such the efficiency of treatment of patients with severe dental diseases largely depends on the choice of treatment measures, there is the necessity of including of surgical interventions in the treatment plan as they allow not only to eliminate the inflammatory symptoms, but also to reconstruct the lost periodontal tissues and to achieve a sustained remission. It was carried out a retrospective review of the use of surgical methods in complex treatment of generalized periodontitis by the doctors' periodontists for a long time in Ukraine from ancient times to the present.

Keywords: periodontal disease, generalized periodontitis, bone tissue, mucous-periosteal flap, gums, surgical treatment, operative intervention, osteoplastic material, gingival bandage, composit material, allograft.

1. Introduction

The inflammatory periodontal diseases occupy the second place in frequency and prevalence among all dental diseases of people. The periodontal diseases meet at 65 % adult population of the most developed countries of the world and in countries that develop over 90 % [1, 2]. The early manifestations of diseases of periodontal tissues of inflammatory character have been register for aged 10–16 years and after 40 years meet even more often than caries. For persons older than 40 years, most often found the expressed inflammatory and destructive changes involving to the process of bone tissue [3, 4]. A significant prevalence of generalized periodontitis, its relationship with other diseases of the organism, resistance to the existent methods of treatment make this problem among the most important not only in dentistry but also in other related disciplines, in particular clinical immunology, endocrinology, otolaryngology, gastroenterology, cardiology, infectology, etc. [5, 6]. The periodontal diseases are difficult respond to treatment, lead to a significant decrease in the functionality possibilities of the tooth-jaw system, need the participation of specialists of different fields, they are characterized by a lengthy period of rehabilitation.

With deepening of severity of flow of disease when the use only of conservative methods does not give the expressed results in the plan of treatment of such patients must include surgical measures, that are the most effective method of treatment of destructive forms of chronic generalized periodontitis and allow not only to cut the inflammatory symptoms of disease, but also conduct the reconstruction of lost periodontal tissues and to achieve a proof remission.

2. The purpose of the study

was to conduct a retrospective review of the development of stages of surgical treatment of generalized periodontitis.

3. Results and their discussion

The use of surgical treatment methods can to achieve the liquidation of inflammation and periodontal pockets, to suspend of progress of destruction of alveolar bone and providing of the long-term stabilization of periodontal tissues at the complex treatment of generalized periodontitis. Therefore, in recent years the surgical treatment of periodontal disease remains the priority for most periodontists.

A. Tshynsky was first offered a flap surgery in 1914, but

L. Widman proposed the same operation in 1918 independently of him and

G. Neumann in the 1920. The nature of operative intervention was that authors proposed two vertical cuts from the gingival margin to the alveolar bone, followed by cutting off the pathologically changed tissues from a vestibular surface, stepping back on 2–3 mm from the gingival margin. The main objective of the technique was the optimal machining of the tooth roots, removal of granulation tissue and mobilization of mucous-periosteal flap and imposition of seams in every interdental interval. The authors considered that there will be a healing type of primary tension. However they got relapses, because seams cut lead to the reduction of the periosteum and a pronounced refraction was examined in further^[9, 10, 12].

Ariaudo, Tyrell (1960), Heleman (1960) modified the operation Widmann proposed a method of using a split flaps, which consisted in the dissection of the soft tissues parallel to the bone surface^[13, 14]. This helped to protect the bone, to eliminate periodontal pockets with minimal postoperative pain and reduce the time of healing, but long-term observations were not described by the authors.

Fridman (1964) proposed the use of partially split flap, which is formed with an internal beveled incision, when the edge tissue and papillae thin or partially cut for creating a functionally adequate zone of keratinizing fastening of the gums. This incision is shown at the thickened gingival margin. However, these interventions are not directed to eliminate the periodontal pockets or achieve the correct physiological shape, they can be combined with techniques aimed at the development of a healthy periodontal complex, it makes it easier to bring the tissue in the butt to the bone and to the cervical area of the tooth^[1, 14].

Goldman and co-authors (1982) repeated the method of Fridman (1964) and pointed to possibility of the use partially split offset or tertiary flap and proposed the use of periosteal seams for right allocation and comparison of the flap^[1, 16].

A. P. Golbraikh (1964) proposed to extend the vertical incisors to the transitional fold, using a technique Widmann, followed further cut of pathologically changed tissues 3–4 mm below the gingival margin. The author put the first U-shaped seams at 0.5 cm below the edge of the flap after curettage with a planting osteoplastic material, creating a „coupling-cuff”, and the second number of seams in each interdental interval. However, two-line seams break circulation of blood in the flap, which leads to necrosis of gingival papillae. The second disadvantage of this operative intervention leads to a small vestibule, by raising flap from the transition folds. The third disadvantage of the proposed method requires reducing the volume of operative intervention and additional intervention for patients^[3, 17].

The important in proposed method of V.A. Kyselov (1970) is the preservation of pathological diseased gingival margin using arcadosimilar dissection, exfoliate mucous-periosteal flap, is curettage of bone pockets. The important stage is that the author proposes deepitelization the inner surface of mucous-periosteal flap by milling cutter. Osteoplastics provides lyophilized bone meal, mixed with patient's blood with the addition of antibiotics. For mobility of the flap is applied to the horizontal incisions of the periosteum to extend it, the flap is sutured in each interdental interval, the operating surface is covered by the protective gingival bandage. The author did not observe a significant refraction of the gums and exposure of the necks of the teeth. The disadvantage of this method is the use of small doses of antibiotics that lead to sensitization of the organism, and protective gingival blandage which hardens leads to compression of the flap and

this lead to break circulation of blood in it^[4, 16].

V.I. Lukyanenko (1977) also holds horizontal incisions of the periosteum from the vestibular and oral side at the angle of 35 degrees to it, keeping the configuration of the gingival margin^[5, 8].

T.V. Nikitina and co-authors (1976), V.G. Tatyntsyana (1986), V. Ivanov (1989) propose to carry out a radical gingiva osteoplastic using the bone allograft preserved in 0.5 % formalin solution. E.E. Leybour (1986) also used formalined allograft, but with trental (82 %).

Ammons and Smith (1976) described a technique for re-attachment and regeneration using apical displacement of mucous-periosteal flap with vertical incisions or without them for receipt admission to the roots and their visualization with the aim of removing dental plaque and smoothing of surfaces. The authors tried to maximal create periodontal support and to reduce the depth of periodontal pockets at the same time^[9, 10].

T. A. Solnceva (1979) proposed to fill the bone pockets with allogeneic bone marrow mixed with allogeneic bone sawdust in the ratio 1:1, which has a pronounced stimulating effect on the regeneration of bone tissue. It was emphasized that is necessary to know the blood group and RH factor of the patient to prevent hemolysis of the blood^[3, 5, 6].

V.P. Puryk (1993) uses a mixture of bone marrow with collagen sponge for filling of the bone pockets. In the experiments on animals the author confirmed the function of bone marrow in connection with collagen. The author proved the advantages of this transplantata compared with a change only of collagen that indicates a high efficiency of the used mixture^[12].

Y.I. Bernadsky and A.E. Kovalova proposed to use available mixture of autogenous and xenogenous plastic material at the gingiva osteoplastic to all practical doctors, according the technical difficulties in obtaining and processing of bone marrow, lyophilization of bone meal^[10, 14].

Olsen *et al.* (1985) reported the data of five years of work dedicated to the apical displacement of the flap using bone surgery and without it. The authors found that in the postoperative period in cases of performing surgery on the bones were much less pronounced bleeding and rarely any formation of pockets, but none of the treatment schemes do not lead to the increase of attachment^[2, 15].

T.D. Fedosenko, L.G. Vladimirova (1997) administered a composition of hydroxyapatite with foamed collagen "Stimulus" in the bone defects. Immediately after surgery were recorded complications in the form of swelling, hyperemia, the appearance of partial necrosis and prolonged healing. The authors did not indicate on long-term results of the treatment.

A.A. Timofeev, V.V. Kaminsky, V.T. Bokaya, A. Malykhina (2000),

A.I. Grudyanov, A.S. Grigoryan, A.I. Volozhin (2001), L. Antipenko (2004) used a ceramic hydroxyapatite „Kergap” in the form of pellets for filling the interdental spaces at gingiva osteoplastic. As the authors point, „Kergap” has a high biocompatibility, no immune response of the organism to a material, absence of a fibrous capsule around the implanted material, the absence of fibrous capsule around the implanted material, expressed osteointegration with the formation of bone-ceramic complex, acceleration of reparative processes in the bone and the gradual replacement of bioceramic with full bone tissue^[8].

A.S. Grygoryan, A.I. Grudyanov, A.A. Frolova (2001)

proposed "Gapkol", "Collapon", but before the injection into the bone pockets. The wound surface was purged for 2 minutes with a gas stream containing NO, by uniform movement of the gas beam at the perimeter of the wound at a distance of 10-14 cm from its surface. The whole surface of the wound was processed gas, the area of which amounted to an average of 10 cm². The flaps sutured with nanosorbent suture material, for two days imposed selfhardening periodontal bandage „Periodontol Pack”. According to the data of authors, remission observed after 90 days and later. The method of treatment is time-consuming and not readily available in outpatient clinics, and the use of hardening bandages can cause necrosis of the flap ^[11].

S.G. Bezrukov, V.N. Kyrychenko (2003) proposed to fill in pockets of bone osteoplastic combination with the composition of the preparation „Kergap” and „Togm”. The analysis of clinical data in the postoperative period showed a slight inflammatory tissue reaction to surgical trauma, the absence of complications of inflammatory character. The healing using primary intention was determined on 5-6 days of treatment at the condition of appeal healing complications on 12-16 days. The proposed method of treatment is pathogenetically justified, as it helps decrease of the inflammatory reaction, however, there is a significant percentage of complications in the postoperative period.

For the activation of the processes of regeneration of tissues in the postoperative period

I.A. Bugorkova (2005) used osteoplastic material „Osteoplast”, containing enriched plasma with platelet and anti-inflammatory effects. The results show the effectiveness of this method, but it is not available for wide use in dental practice ^[8].

E.V. Lytovchenko (2005) used bioactive composite material „Osteopathic ceramic”, which is a biological hydroxyapatite with a cementing addition of glassphase, composed of oxides of silicon, sodium and boron. The proposed material has full biocompatibility with bone tissue. Material: no toxic, allergic effects, has a permit for medical use ^[5, 6].

A.L. Schneider (2006) and co-authors proposed to obtain from the venous blood of the patient autoplasm before surgery by its centrifugation and education of middle fraction, added 2-3 drops of 10% solution of calcium chloride with subsequent mixing and got gelatinous mass with allograft Alloplant” and the xenograft „Osteoplast” in ratio 1:1. The defects filled with the mixture, from the average fraction of autoplasm model the protective pellicle in the form of membrane on the width of interdental interval. Then suturing in each interdental interval. The authors noted that the method allows to reduce the risk of ingrowth of epithelium in periodontal pockets and creating conditions for recovery contact the binder apparatus. The main disadvantages of the above proposed method are the common inflammatory complications, which lead to rejection of the allograft „Alloplant”, which is susceptible to infection, reduces effects of surgical intervention, results of operation reduces to zero ^[2].

A.V. Tsymbalov, N.I. Kuzmin (2011) pervaded the osteoplastic material with a solution of 10,000 IU of human leukiniferon diluted in 5 ml saline, which was used to fill bone defects and covered their resorbed membrane. The method can prevent inflammation, disease recurrence, to achieve a positive aesthetic and physiological outcome, but in what period of time the authors have not indicated ^[4, 16].

4. Conclusions

The complex treatment of chronic generalized periodontitis of varying degree of severity involves the use of the most modern pharmaceutical drugs in combination with orthopedic and surgical methods that further allow to obtain a stable positive result. The generalization of literary data and the results of these studies allow to confirm the high efficiency and the significance of surgical techniques for the treatment and prevention of postoperative complications, as a preparatory stage of orthopedic rehabilitation of patients with generalized periodontitis, whose role in complex rehabilitation of patients is underestimated, which requires the optimization of their use and further research.

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