Western European Journal of Medicine and Medical Science
Volume 3, Issue 12 December 2025
https://westerneuropeanstudies.com/index.php/3
ISSN (E): 2942-1918 Open Access| Peer Reviewed

THE ROLE OF OCCLUSION STRESS IN THE OCCURRENCE OF INFLAMMATORY PROCESSES AROUND IMPLANTS

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Annotation: Reducing the number of complications after dental implantation remains an urgent problem in dentistry. All risk factors can be divided into general - smoking, systemic pathology, condition after radiation therapy, etc., and local - poor oral hygiene, periodontal disease, iatrogenic conditions, design and quality of processing of the transgingival part of the implant. Understanding the course of inflammatory and destructive processes around a dental implant after its installation directs scientists and implant manufacturers to improve the already used conservative and surgical methods of treating these diseases, as well as greater attention to the prevention of this pathology, and, accordingly, the risk factors for its development. The development of new techniques for surgical interventions and prosthetics, the creation of new implant systems will help increase the service life of dentures on implants and improve the quality of life of patients.

Key words: implant, peri-implantitis , mucositis .

Over the past decade and a half, dental implantation as a method of treating partial and complete adentia has gained a strong position in modern orthopedic dentistry [1, 4, 10]. Analysis of the dental services market shows that more than 2 million implants are installed annually in the world.

The vast majority of scientific works devoted to this topic do not study the viability of implantation in general, but all sorts of details and nuances of the surgical and prosthetic stages of this dental intervention [3, 5, 6]. Methods for introducing implants into bone tissue have been proposed and tested, the shape of root-shaped implants from leading manufacturers is calculated using computer modeling, and several types of threads for various types of bone tissue are offered to choose from.

Despite the fact that implantation in recent years has been characterized by a high level of success in the early postoperative period, the possibility of long-term complications remains an urgent problem in dentistry, primarily associated with the development of inflammation of the tissues surrounding the osseointegrated implant .

To find ways to solve the problem, a clear understanding of the nature of the inflammatory process occurring in peri-implant tissues is necessary. Today it is customary to

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distinguish peri-implantation mucositis and peri-implantitis . Mucositis in the implant area is an inflammation of the surrounding soft tissues without disruption of osseointegration . Peri-implantitis is an inflammatory reaction of the tissues surrounding an osseointegrated implant, accompanied by loss of supporting bone. According to various authors, the prevalence of mucositis varies from 32 to 54% at various times after implantation, peri-implantitis - from 14 to 30%. These two pathologies correlate with each other, just as gingivitis correlates with periodontitis, that is, they have common etiological factors, similar pathogenesis, and essentially represent different stages of the same inflammatory-atrophic process [7, 2].

The most likely cause of the development of peri-implantitis may be the penetration of an oral infection into the area of contact between the implant and the bone [2, 9]. The microbial composition of peri-implantitis is currently known and represents a wide variety of aerobes and anaerobes, the presence of which is characteristic of inflammatory periodontal processes - gingivitis and periodontitis (Prevotella Intermedia , Porphyromonas Gingivalis , Treponema Denticola , Veillonella spp , Branhamella catarrhalis). No specific pathogens of oral diseases have been identified. Most types of identified microorganisms are opportunistic, some are saprophytes. Such a high proportion of anaerobic agents and their diversity makes it difficult to identify the leading pathogenic microorganism, which could be the “leader” of the infectious-inflammatory process [2]. It is obvious that it is the combined effect of the most commonly diagnosed pathogens and the peculiarities of the interaction of anaerobic agents of parasitocinosis that can largely determine the nature of the inflammatory process in the peri-implant zone, capable of destruction and resorption of bone tissue in the implant area. According to a number of authors, without adequate treatment, mucositis turns into peri-implantitis in 43% of cases within a five-year period, while the presence of maintenance therapy reduces this frequency to 18% .

Thus, understanding the course of inflammatory and destructive processes around a dental implant after its installation, as well as the body’s reaction to the implant itself as a foreign body, directs scientists and implant manufacturers to improve the already used conservative and surgical methods for treating these diseases, as well as greater attention to prevention this pathology, and, accordingly, risk factors for its development [3, 4, 6].

All risk factors can be divided into general and local. Common ones are smoking, systemic pathology (diabetes mellitus, diseases of the cardiovascular system, immunodeficiency states), and a condition identified by some researchers after radiation therapy . Local factors include poor oral hygiene, a history of periodontal disease, iatrogenic conditions, design and quality of treatment of the transgingival part of the implant [6].

A number of authors have already conducted studies on the influence of individual factors on the condition of peri-implant tissues. Thus, tobacco smoking is the most common and most often identified risk factor for the development of peri-implantitis [10]. According to Clementini , the annual rate of peri-implant bone loss in smokers is 0.16 mm. The rate and degree of osseointegration of the implant is also reduced in smokers. According to Wallowy , cigarette smoking , as well as a history of periodontitis, increases the risk of developing perimplantitis by 4.7 times [11].

Speaking about systemic pathology, first of all it is necessary to pay attention to the presence of diabetes mellitus. It has become customary to place this disease at the top of the

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list of risk factors and relative contraindications to any surgical and periodontal intervention . However, a number of publications do not provide a categorical conclusion regarding the higher incidence of peri-implantitis in patients with diabetes mellitus. High blood glucose levels can affect tissue repair abilities. At the same time, there is no data in the literature on a direct relationship between these diseases.

According to M.V. Shcherbakov, dental peri-implantitis and peri-implant mucositis may be a consequence of minimal thyroid deficiency syndrome, accompanied by a decrease in active thyroid hormones. According to the author, the “risk” group for the development of dental peri-implantitis should include women who have a tendency to hypothyroid conditions.

We should not forget about the condition of the teeth surrounding the implant [6]. In particular, the lack of oral sanitation can be

as a constant source of bacterial microflora. Microbiological studies of groups of patients with periodontitis showed that cultures of Agg . bacter actinomycetcommitans and Porphyromonas gingivalis are restored within a short time after antibacterial therapy; others, for example Prevotella intermedia , is constantly sown, that is, the flora is resistant to antibiotic therapy. Thus, the type of nosology - partial or complete adentia - can influence the type and quality of microbial contamination of the tissues surrounding the implant.

According to Willson (2009), among patients with a clinical or radiological picture of inflammation, in 81% of cases the presence of cement residues for fixation of orthopedic structures in the peri-implant groove is noted [2]. After their removal, clinical parameters returned to normal in 74% of cases. Korsh, in similar studies , found that removal of cement debris resulted in a reduction in the inflammatory response in 60% of cases .

Normalization of oral hygiene should mean not only sanitation at the stages preceding implantation, but also constant monitoring in the postoperative period, including regular professional cleaning of teeth and the implant area during control examinations. Their frequency should be set individually - from 2 to 4 times a year [6]. In patients with orthopedic structures on dental implants, the lack of complete prevention of oral diseases can lead to the formation of plaque, plaque, and tartar on the neck of the implant and the gingival area of the prosthesis. If these formations are not removed in a timely manner, the epithelial adhesion to the surface of the implant may be disrupted with the subsequent formation of a pathological pocket, which can provoke bone loss and the development of peri-implantitis with loss of the prosthesis. Personal “mechanical control” of plaques (with manual or mechanical toothbrushes) can be considered an effective preventive measure.

When using a two-piece implant, it is inevitable that there will be a gap between the implant and the abutment [2]. Bacteria and their metabolic products can and will colonize this area, and can initiate the development of inflammation in the soft tissues surrounding the implant. In order to minimize the risk of peri-implantitis, certain efforts can be made both on the part of the manufacturer and on the part of doctors. An important role is played primarily by the quality and design of the mating surfaces of the implant and abutment . A subcrestal placement of the dental implant articulation platform can significantly reduce the risk of an inflammatory reaction. Increasing the torque values to 25–35 n/cm2 when connecting the

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abutment to the implant is also a preventive measure, if this is possible for a particular manufacturer.

To seal the internal interface of a dental implant, sealants can be used to prevent the migration of microflora from peri-implant tissues to the internal interface of the implant and back [2]. Many studies have proven the fact of bacterial leakage into and out of the internal interface of a dental implant. However, the question remains as to which type of articulation can minimize or eliminate bacterial microleakage from the implant interface into the peri-implant tissues.

Thus, the problem of finding optimal implantation technologies, as well as methods for the prevention and treatment of peri-implantitis , is relevant to this day and includes not only the development of new surgical techniques, the use of additional measures during prosthetics, but also the creation of new implant systems that fully meet the requirements for the prevention of inflammatory diseases. diseases in the peri-implant area. There is no doubt that new advances in this direction will help reduce the number of complications after implantation in dental patients and improve their quality of life.

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