

Influence of Dental Implants in the Elderly Age in Totally Dental Patients - Literature Review

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ABSTRACT

This review is about the indication of the use of osseointegrated dental implant followed by prosthesis, as an alternative to edentulism, in order to restore better chewing, aesthetics, phonation, self-esteem and quality of life for elderly patients. Therefore, this is justified by the need for work related to the investigation and propagation of information related to the influence of implants used in the elderly. Based on this information, the objective of this study was to describe the positive points and their partial and total contraindications of its use, based on scientific articles.

After analyzing the literature, it was noted that the main negative points were the need for routinely outsourced post-surgical care, both in terms of adequate food and hygiene in order to avoid post-surgical infections. However, dental implants, when performed in the proper protocol and following all hygiene care, medication and guidelines such as adequate rest after surgery, positively influence the postoperative of patients, maximizing the improvement in health, and, consequently, of the well-being of the elderly.

Keywords

Aging, Implant dentistry for seniors, Mastication.

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Introduction

It is known that one of the greatest achievements of humanity was the increase in the years of life, in addition to an improvement in the health of the elderly population, even if these achievements are not even close to ideal. Population aging is a phenomenon that happens at an accelerated pace in all countries of the world [1].

In this context, attention to oral health in the elderly is an essential factor for healthy aging and a good quality of life. Through a literature review, some data were presented regarding the growth of the elderly population and the change in the epidemiological profile of the “new elderly” that appears, with different oral needs in relation to the previous generation, such as the reduction of edentulism [2]. Greater attention should be paid, especially, when preparing patients for total loss of teeth, when necessary, in carefully evaluating their expectations regarding the incorporation of prostheses, in clarifying their doubts and in the subsequent monitoring of the process [3]. The Dental Surgeon, in addition to the technical and surgical domain, must be prepared to deal with the psychological aspects of patients, in addition to the guidelines and proposals for treatments, the consultation must include enough time for a frank dialogue about the most common concerns and discomforts in the use of total dentures [4].

In the literature review by Vernizi and Loyola, 2013, it is mentioned by Macentee & Walton, 1998 that there are several reasons why implant prostheses provide a better quality of life, because apparently there is a feeling that they are an integral part of the body, being this more satisfactory for oral rehabilitation than conventional dentures [5,6].

The implant dentist should consult the family doctor or geriatrician, especially for the patient, when the patient suffers from a systemic condition, with the consumption of drug health that will influence oral health or may represent a disabling capacity [7].

In the elderly, the mucosa overlying the prosthesis support areas is often thin and unable to withstand functional stresses, causing ulceration and pain. Wearers of complete dentures experience more difficulties in chewing hard foods than dentures and estimate that their chewing capacity is lower than that of dentures [8]. In the study by EL Nosta., et al. 2017 showed an improvement in the quality of life and nutritional status of patients after the use of prostheses on implants in relation to conventional removable prostheses. Turkish elderly, users of conventional complete dentures who underwent surgery to place mandibular implants and received conventional dentures and then implant-supported overdentures, reported that they showed significant improvement after treatment with the implants, demonstrating a high quality of life after six months of treatment. The answers mentioned positive effects on oral health, speech, breathing, comfort, sleep, confidence, reduction of sadness, improvement of mood, social life, romantic relationship, smile and financial factors [9].

The basic implantology surgical technique consists of drilling the

bone and inserting the implant with good primary stability that achieves good bone-implant contact. The macroscopic design and the treated surface favor this union. Bone drilling, which must be performed carefully, with the corresponding standardized drills, with irrigation with saline solution, without pressure, and with reduced speed (around 800 rpm), avoids overheating of the implantation site, which can interfere with the future tissue-implant [7].

Overdenture rehabilitation can bring many benefits to the patient, such as retention, stability, comfort, and aesthetics. The need for individualized planning is highlighted, so that a correct treatment plan can be reached, in which fixed prostheses and overdentures can have an excellent prognosis, provided they are used at the appropriate time and in the indicated patient. Bone support, lip support, smile line, upper lip length, mucosa quality and quantity, alveolar ridge contour, crown/bone ratio, interarch space and phonetic zone should be taken into consideration when indicating overdentures and protocol [10]. Rehabilitation with an overdenture prosthesis can provide many benefits to patients, especially better retention and stability at a much lower cost than rehabilitation with a protocol-type prosthesis. Furthermore, in the scientific literature, the advantages of overdentures are also related to ease of cleaning and better restoration of the facial profile. Among the available overdenture retention accessories, the bar-clip system provides a greater degree of stability and, therefore, greater patient satisfaction. Compared to a mobile prosthesis that does not require implants, the financial situation can be considered a limiting factor, as it is necessary to include two or three implants to anchor the overdenture. The major disadvantage of a mandibular overdenture is related to the patient's desire, especially when the patient does not want a removable prosthesis. If the edentulous patient wants a removable denture, an overdenture is usually the best option [11]. The advantages and disadvantages of overdenture compared to fixed prosthesis are: advantages - fewer implants, better esthetic result, easy to care for and clean, better peri-implant probing, can be removed at night to decrease the risk of nocturnal parafunctional overload, lower cost compared to the protocol type, which is easier to repair, and can be used as a provisional or provisional prosthesis until a permanent fixed prosthesis is made; disadvantages - psychological factor (because it is a removable device), space needed to accommodate the volume needed for the tissue bar and any retaining clips, long term maintenance, continued posterior bone loss, food impaction and movement [10].

Azevedo et al. [12] indicate that although most of the dependent elderly are receiving necessary and essential care correctly, another part shows negligence in oral hygiene care, demonstrating the elderly's need for daily care with oral hygiene, whose lack results in diseases. in the oral cavity. Thus, this study is justified due to the need for work related to the investigation and dissemination of information related to implants used in the elderly.

Implant-supported prostheses can be fixed with screws, or cemented to abutments that are fixed to the implant with screws (retained with cement). The authors do not prefer one type of

restoration over the other because both types of screw-retained or cement-retained prostheses have certain advantages and disadvantages. However, based on the review of the related literature, it has been shown that one type of prosthesis is more suitable than the other in some clinical situations [13]. Age alone does not represent a limiting factor against indicating the use of implants, although there is a confusion due to the fact that it is associated with an increase in the frequency of systemic diseases and/or use of medications, but it does not represent a risk to the phenomenon of osseointegration [14]. When the bone volume is adequate or sufficient, implant insertion surgery in elderly patients usually does not offer significant complications or challenges, however, elderly patients with intense maxillary resorption process require maxillary sinus elevation, usually bilateral, for the insertion of the maxillary sinus. Implants and their subsequent prosthetic rehabilitation, sometimes requiring autologous iliac crest grafts, which through different techniques surgical procedures can achieve an acceptable increase in maxillary bone volume [7].

Trezubov 2018 states that the impossibility of using a set of implants in some cases of elderly patients is due to considerable atrophy, due to bone loss, considering the treatment expensive, and some are afraid of subsequent surgical trauma. Most edentulous elderly people have some degree of alveolar bone atrophy, which makes implant surgery more complex when there is extensive alveolar bone loss, and surgical complexity and invasiveness can be a major problem in elderly individuals. Anatomically the most important limitations are the inferior alveolar nerve in the mandible and the maxillary sinus in the maxilla [15]. In partial edentulous patients, the importance of the gingival, periodontal and endodontic status of adjacent teeth was highlighted, large accumulations of biofilm and gingival inflammation at the time of implant placement can increase the risk of failure, this must be observed and addressed with the patient and family members. Before the decision to make implants, as well as having a new oral education, and active hygiene [16]. Before placing osseointegrated implants and rehabilitating edentulous patients, it is essential to identify the anatomy and relationships of residual occlusive arches to contribute to successful dental treatment [17].

Material and Methods

This study was carried out through a literature review, of a qualitative nature. According to Rother [18], studies published as a narrative review contribute to the scientific population, as they are appropriate for the description and debates aimed at the development of a given subject, through a theoretical and conceptual vision, contributing to the update. Knowledge for a short period. These reviews are built through a critical analysis exposed by the author. Descriptive research together with exploratory are the ones that most social researchers carry out, they usually take the form of a survey, there are researches defined as descriptive, according to their objectives, they end up serving to provide a new vision of the problem, which brings them closer to exploratory research [19].

The bibliographic research was carried out from May to June

2022. The research data were acquired through scientific databases such as Pubmed, Journal of Oral and Maxillofacial Surgery, Capes, Scielo and Lilacs. The words: “elderly and implantology”, “implantodontia in the third age”, “implantodontia”, “Coating for dentures” (Overlay Prosthesis and Overdenture) and “Implant-supported fixed dental prosthesis” (Dental prosthesis of implant support, Dental prosthesis, and Implant Supported Prosthesis) in Portuguese, Spanish and English. As criteria used for the inclusion of articles, only scientific works published from 2007 onwards, with a temporal cut, were considered; original research focused on the use of implants in the elderly and articles that are not in English, Spanish or Portuguese. As for exclusion criteria, articles with more than 15 years of publication, and studies that do not have a direct relationship with the proposed objectives were eliminated. The analysis of the qualitative data collected was carried out using Bardin’s Content Analysis model, using the Clipping method, that is, removing a phrase, word or set of words that represents relevance to the analysis of the collected data, and later taken to the discussion in the light of the theoretical reference.

Results and Discussion

The choice between overdenture and Branemark protocol prosthesis will basically depend on the possibility of placing an adequate number of implants in the appropriate place, taking into account the patient’s economic situation [10]. In situations where it is possible to place a sufficient number of dental implants of adequate length, the prosthetic superstructure can be implant-supported, with the protocol type prosthesis being the choice in this case [13]. When there is poor bone quality, the load must be reduced or the number of implants must be increased [10].

In the study by Trezubov 2018, the use of implant prostheses was compared with the support of an implant and with two implants for the fixation of removable prostheses, and with two implants, it proved to increase the chewing degree indices by 19-44%, and a better efficiency in the fixation of the removable prosthesis was also noted. However, the fixation achieved compared to a single supporting retaining implant was sufficient to improve the quality functions and comfortable wearing of the lower denture, compared to the use of a denture without implant anchorage, the results of the quality measurement of life in relation to oral health were evident. The satisfaction of patients with mandibular overdentures supported by one or two implants statistically did not differ much (after 3 months of prosthesis use and after 12 months) [20].

Araújo et al., 2012 reports that with regard to the oral cavity, the physiological aging process causes few events that trigger dysfunctions and disabilities, but a large number of studies reveal, in general, that the oral health condition of the elderly is deficient. That the elderly population presents epidemiological indicators that elucidate oral health, demonstrating individuals with mucosal lesions, the existence of periodontal pockets, and partial or total lack of dentition and the incorrect use of prostheses result in favorable conditions for delay and difficulty in dental practice. It is also very relevant to mention aging in the oral cavity when it is stated that

the oral epithelium becomes thinner and less keratinized, with a decrease in cell density, in addition to a decrease in the potential for mucosal regeneration and resistance to diseases [21].

Orestes-Cardoso et al. [22] report that the main trigger of tooth loss is caries, followed by periodontal diseases. Thus, dentures in the elderly who need care must consider positive and negative factors, the dentist must be aware of the changes associated with aging and how this dynamic will affect the use of dental implants.

In the report by Guerra CO et al. In 2018, postoperative care consisted of mouthwash with 2% chlorhexidine twice a day for 7 days, without mechanical brushing in the surgical areas. A light diet was recommended for the first few weeks and avoidance of hard foods during the 3-month healing period to limit functional forces while osseointegration took place. Although you must follow a “soft” diet during the first stage, the patient will be able to chew from the day of the operation and will be able to speak and vocalize completely naturally. This constitutes a notable improvement from the point of view of his self-esteem, as he returns to smile with confidence, normality, comfort and security [23]. Given this context, Grant et al. [24] and Campos et al. [25] describe that the dental professional must take into account the anamnesis and the nutritional status of the patient who will undergo implant processes. It is difficult to understand certain changes in the physiology of oral health, such as bone remodeling and wound healing, however, the installation of implants can result in considerable changes in the quality of life for the elderly.

Azevedo et al., 2017 indicate that although most of the dependent elderly are receiving necessary and essential care correctly, another part shows negligence in oral hygiene care, demonstrating the elderly's need for daily care with oral hygiene, whose lack of care results in diseases in the oral cavity. Thus, this study is justified due to the need for work related to the investigation and dissemination of information related to implants used in the elderly [12]. After the surgical step, a good hard and soft tissue reaction is necessary for the long-term success of dental implants. Fixed and removable prostheses supported by dental implants were indicated in edentulous elderly patients, according to different functional loading protocols [7].

Taimur Khalid concludes that patients' masticatory function improved significantly after 3 months and was maintained over 3 years in participants with implant-stabilized mandibular overdentures [26].

Wöstmann, B et al., [27], Kanehisa et al. [28] and Gunji et al. [29] describe that the optimization of dental prostheses favors the masticatory process of the individual positively in the state of nutrition of his body, resulting in an increase in weight and albumin level, without compromising nutrient intake. Zavanelli et al. 2011 state that very elderly people can take drugs that control systemic problems and dialogue with the doctor becomes imperative prior to treatment with implants, due to the interaction of the drug in the body [30].

In 2017 Gupta et al. cited clinical reports in a comprehensive review of the literature regarding the effects of selective serotonin reuptake inhibitors on bone metabolism and dental implant survival in the elderly, as the elderly constitute a high-risk group for oral rehabilitation, clinicians should be aware of the potential association between selective serotonin reuptake inhibitors and dental implant failure, aware that SSRIs are linked to deleterious effects on bone. Thus, the use of SSRIs should be observed and in the assessment of the prognosis in the treatment of elderly patients who are indicated for dental implants [31].

In the systematic review by Schimmel et al. [32] where a study by [33] confirms higher implant failure rates in patients taking selective serotonin reuptake inhibitors for depression compared to non-users of selective serotonin reuptake inhibitors. The only contraindication by Schimmel et al. [32] are cancer patients, as implant survival is negatively affected due to radiotherapy. Ortega et al., [7] advise that implant surgery should be performed between 6-12 months after radiotherapy, the most ideal being between 13-24 months.

In the study by Zavanelli et al., 2011, the contraindication is during the growth phase, in high-risk heart diseases (congenital diseases, prosthetic valves, history of endocarditis), during the active phase of chemotherapy and in patients with psychiatric diseases. They did not contraindicate implant therapy in the elderly, in diseases of bone metabolism (osteoporosis, osteomalacia, Paget's disease and in multiple myeloma), in endocrine diseases (diabetes and hyperparathyroidism), in rheumatic diseases (rheumatoid arthritis, Sjögren's Syndrome and Lupus Erythematosus), in hematological, and in irradiated areas [30].

In the research entitled: Influence of Type II Diabetes Mellitus on Osseointegration, the objective of the review was to relate several sources, in search of information about the difficulties encountered in bone healing in patients with diabetes mellitus II who undergo bone implants, it is evident the need to control this endocrinopathy so that the procedures reach the desired healing [34]. According to LIMA and ARAÚJO [35], when a wound appears anywhere in the body, the organism triggers a cascade of cellular and biochemical reactions with the purpose of repairing the injured tissue.

In this sense, Oates et al., conclude that DM is a contraindication to the use of implant therapies due to difficult healing and compromised immune response, with glycemic control being directly related to implant stability. The scientific references that have shown that dental implant failure related to diabetes is when it is decompensated and without professional medical and dental follow-up [34,36]. The performance of dental implant techniques is recommended for patients who have a glycemic control within or close to normality, in addition to having the area in favorable conditions for the procedure, that is, presenting good quantity and bone quality, corroborating the aforementioned authors [37].

Freitas 2021 cites in his study that diabetes is not an absolute contraindication for the placement of dental implants. The

important thing is for the patient to be implanted under these conditions to keep it under control, especially during the osseointegration period, and that antibiotics be administered before and after the surgery, as well as the prescription of 0.12% chlorhexidine mouthwash for two weeks after the procedure. surgical procedure to avoid complications during the healing period [34].

In patients with Cardiovascular Disease, Schimmel et al., mention that the main concern may be related to the general status in the risk of performing invasive surgery if there is a need for anticoagulants or in case of changes in blood pressure due to the use of local anesthetics containing vasoconstrictors. Implant survival may be similar or longer compared to healthy patients. Interestingly, the current review identified a study that reported the positive impact of antihypertensive drugs on implant survival, it was reported that high blood pressure is associated with increased bone loss, Antihypertensives may affect bone-related clinical procedures due to its beneficial effects on bone metabolism. Treatment with antihypertensive drugs is associated with a higher survival rate of osseointegrated implants. Authors hypothesize that this may be related to the positive effect of such drugs, including beta-blockers, thiazide diuretics, ACE inhibitors and ARBs on bone metabolism, which constitutes an interesting field for future research [38]. Despite causing physiological changes, cardiovascular disease does not seem to affect the clinical success of the implant, more studies with implants in function are shown to be necessary, but it seems that cardiovascular disease does not decrease the initial survival of the implant.

The literature concerns smoking, diabetes and osteoporosis, which even when controlled, can increase the complications of the device and decrease survival, depending on factors such as bone quality or implant surface roughness [14]. By analyzing and reviewing the literature by Zavanelli et al., smoking, irradiation, diabetes, periodontal disease, osteoporosis, age and inadequate bone quality were the main patient-related factors that can affect osseointegration. The failure rate of dental implants found was low and no absolute contraindication to treatment was observed, however, some conditions are considered to be of greater risk (smoking habit and irradiated tissues in oncological treatment) and should be considered during the planning and patients and family members must be previously informed [30].

Conclusion

The implant dentistry professional focuses on the integral health of their patients, with multi-professional exchange and family support resulting in a lasting and comfortable Oral Rehabilitation to achieve acceptable functional and aesthetic results. Thus, it is noted that among the negative points, the need for routine post-surgical care dependent on caregivers or third parties stands out, so that the risks of infections and complications are avoided. However, dental implants, when performed properly and following all due care, positively influence the lives of patients in the elderly, maximizing the improvement in health, and, consequently, the well-being of the elderly.

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