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RESEARCH ARTICLE

SURGERY ATRAUMATIC IN DENTISTRY: A REVIEW

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ABSTRACT

It is estimated that in dental atraumatic surgery in general, studies of synthesis and meta-analysis (n = 269), Cost-Effectiveness Analysis (n = 35) and decision analysis (n = 23) represent nearly 27% of all studies. Most of the selected studies was developed in the USA, Netherlands and the UK. These three countries and 15 journals were responsible for almost 50% of all publications. The other papers were published in other journals and 61 originated from 32 other countries, including Brazil. This study aimed to demonstrate through literature review and case developments and consequent importance of improved techniques for atraumatic surgery in dentistry. It was hypothesized that there were statistically significant results on progress in an attempt to minimize the trauma. So, since the most basic extraction techniques were created and developed, have been various attempts to minimize the effort of professional, decreasing surgical time and minimize bleeding and inflammation, swelling, pain and bruising that can affect patients in trans and postoperative periods. Thus, one must seek the maximum preservation of the integrity of the soft tissue (and papillae range and inserted free gingiva) adjacent to abutment areas; preservation of the alveolar ridge bone level. Based on the histological concept in which living tissues are formed by cells joined by thin elastic tissue and nerve, capillaries fibrils, lymphatic and blood vessels. Disruption of these cells by surgical trauma promotes the release of enzymes that retard healing. For this reason one should minimize surgical trauma. We conclude that the world and in Brazil have been several attempts to minimize the effort of professional, decreasing surgical time and minimize bleeding and inflammation, swelling, pain and bruising that can affect patients. Thus, one should seek the maximum preservation of the integrity of the soft tissues adjacent to prosthetic spaces and the preservation of the alveolar ridge bone level to achieve the minimization of surgical trauma.

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INTRODUCTION

It is estimated that in dental surgery atraumatic studies include 269 meta-analyzes, 35 Cost-Effectiveness Analysis and Decision Analysis 23 represent almost 27% of all studies. This selection of data was due to the significant increase in quantitative synthesis methods in the dental literature from the early twenty-first century (Altaf Hussain Shah *et al*., 2016; Harsh *et al*., 2016). Most of the selected studies was developed in the USA, Netherlands and the UK. These three countries and 15 periodicals accounted for almost 50% of all publications.

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The other works were published in other journals and 61 originated from 32 other countries, including Brazil (Frencken *et al*., 2012; Amorim *et al*., 2011). Added to this, each of these three methods provides a summary of the available evidence and reveals information gaps (Frencken *et al*., 2012). In short, the meta-analysis is the uncertainty about the conclusions from a set of studies on minimally traumatic surgery. For decision analysis, uncertainty is in clinical decision making for a patient or a group of similar patients. In the Cost-Effectiveness Analysis, uncertainty is the amount of procedures, treatments or health services (Amorim *et al*., 2011). So that way, the studies were classified in the following areas: periodontics (n = 80); cariology (n = 52); implantology (n = 40); endodontics (n = 31); orthodontics (n = 32); oral pathology (n = 26); maxillofacial surgery (n = 28); prosthesis (n = 25) and others (n = 24) (Frencken *et al*., 2012; Amorim *et al*., 2011; Barreto *et*

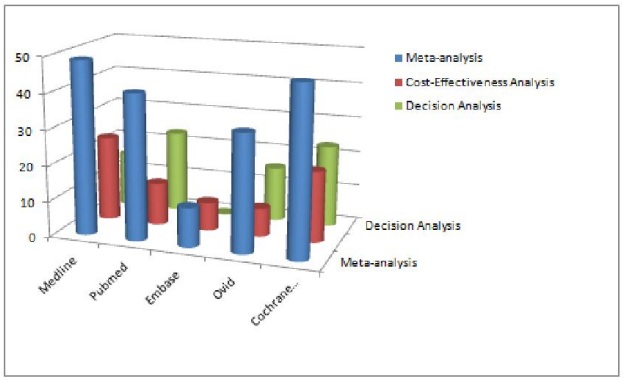
al., 2007). The present work some of these procedures as in implantology area, oral pathology and cardiology. As a corollary and example, dental transplantation emerges as an alternative treatment to all social layers, termed as bioprosthesis (Barreto *et al*., 2007). Thus, the transfer of a natural tooth in its socket elsewhere are related to extensive caries, root resorption, periodontal disease, fracture coronorradicular, agenesis aplasia teeth. The technique should be atraumatic to better prognosis tooth to be transplanted, since the periodontal ligament must not be manipulated to be required for repair of periodontal tissue (Brasil, 2004; Cardoso, 2005). Moreover, with the increasing modernization of implantology, we have the immediate implant as the procedure that is most likely to succeed from the rehabilitative treatment of the oral cavity, using dental implants. Immediate implants are those installed soon after the extraction of roots or compromised teeth, using, for this, the actual remaining socket for the implant installation, minimizing trauma and optimizing treatment (Carvalho, 2007; Carvalho, 2009).

Among the many advantages that the implants provide immediate, they have good patient acceptance, reducing the number of surgical interventions, beyond the limitation of the residual alveolar bone resorption edge. Added to this, there is the possibility of temporary tooth facility in acrylic resin or photo-curing, fixed on the implant newly installed, further decreasing bone loss and preserving the gingival contour of the region, returning aesthetics, smile and reintegration social (Coatoam, 2000). Thus, this procedure is called "immediate aesthetic" on immediate implant. However, for there to be results with good critical level of significance, the implant will have much of the surface of its turns anchored in healthy and natural bone.

Furthermore, a significant and useful procedure directly associated with immediate implants is the technique known as root burial, which allows for a gingiva proliferation enough for covering sometimes all, of the alveolus after the installation of immediate implantation without the need of total retail relaxation, if it does not receive temporary tooth in the same implant installation session. (Colares, 2009) However, this is not a technique widely used by some experts, though easily executable and can provide great biological and aesthetic benefits (Amorim *et al*., 2011; Colares *et al*., 2009). This study aimed to demonstrate through literature review and case reports developments and consequent importance of improving techniques of atraumatic surgery in dentistry. it was hypothesized that there was a statistically significant results on the progress in trying to minimize the trauma.

METHODS

For the identification of studies in this review study, carried out a detailed search strategy for Medline, Pubmed, Embase, Ovid and Cochrane Library in the years 1989 - 2016, as well as books and magazines related to the topic. They were used as descriptors: Atraumatic surgery; Implantology; Extraction and Cariology. Analyzed studies systematic review, meta-analysis, randomized controlled cases, nonrandomized clinical cases and opinion articles that addressed the term atraumatic surgery. The data were analyzed, correlated to the discussion of the results highlighted in the literature, as shown in graphic 1.



Graphic 1. Quantitative data on the types of jobs found in relation to surgery atraumatic in five database

Continuous Predictors

The continuous predictors were Implantology, Extraction, Cariology.

Response Predictor

The response predictor was Atraumatic surgery.

Development- Review Literary

The performance of tooth extractions indiscriminately, without the purpose of immediate or delayed rehabilitation of new prosthetic space, has long ceased to make sense as they are generally known serious biological and social consequences generated by tooth loss without proper rehabilitation (Cooper *et al*., 2002). Due to the huge advancement and diffusion of modern implant dentistry and the security level of treatment provided by the same, in addition to the refined techniques of making relatively safe conventional prostheses if planned correctly, the patient can have a proper rehabilitation with various techniques (Cooper *et al*., 2002), (Covani *et al*., 2004). If the maintenance of the original tissue contours is respected, the chances of achieving good aesthetic levels and acceptable staffs greatly increased. Such care is even more important and critical when the surgery is performed in anterior regions of the mouth. The preservation of the interproximal bone levels becomes essential for maintaining the vertical level of interdental papillae, avoiding dark and space areas between the natural and artificial teeth, which can harm the aesthetic result that can produce real satisfaction to the patient (Foschetti, 2010). Likewise, the preservation of bone and gingival health can dramatically decrease the volume of administered drugs in the postoperative period and facilitatethe production of profiles and appropriate interim contoured to gingival conditioning, even though procedures and techniques of conventional implants or immediateimplants with immediate aesthetics, are used for the rehabilitation of the case (Holmgren *et al*., 2013), (Frencken, 2001). So, since the techniques most basic extraction were created and developed, several have been attempts to minimize the professional effort, reduce surgical time and minimize bleeding and inflammation, swelling, pain and bruising that can affect patients in trans and postoperative periods. Thus, one should seek the maximum preservation of the integrity of the soft tissues (buds and band-free gum and inserted) adjacent to the prosthetic spaces; preservation of the alveolar bony ridge level (Gomes *et al*., 2003).

In addition, atraumatic restorative treatment the (ART) was developed by Frencken in Africa in order to control the development of caries. The main functions of the ART are preservation of tooth structure with minimal surgical intervention or exdontia reduction endodontic treatment and reducing the discomfort to the patient no need for local anesthesia. On the partial removal of decayed tissue, Imparato *et al*. (2010) cited a systematic review of the Library Cochane Library Ricketts *et al*. (2006) (Groisman *et al*., 2003). Furthermore, Baker (2007) (Barreto, 2007) cited work of Van Amerogen (2003) and Deery (2005) compared the psychological behavior of children when using ART compared to the conventional treatment. Heart rate were monitored over the procedures and the researchers concluded that the hand tools in atraumatic treatment caused less discomfort and anxiety that rotary instruments of the conventional technique. Still, glass ionomer cements the (GIC) are widely used in dentistry for its Caries inhibition effect, because of the fluoride release in the upper layers of the restorations (Irinakis, 2007). Still, in addition to the fluoride release, the GIC are able to incorporate it again from toothpastes.

DISCUSSION

Based on histological concept where living tissues are composed of cells held together by thin elastic tissue and nerve, hair fibrils, lymph vessels and blood. Disruption of these cells by surgical trauma promotes the release of enzymes that retard the healing (Jahangiri *et al*., 1998). For this reason one should minimize surgical trauma. Prevention of trauma is by means of good planning surgery, working together, good lighting, force control, knowledge of topographic anatomy, control of movements and gestures, looking for a foothold to decrease tremor and decreased time of surgery (Jahangiri *et al*., 1998; Kan *et al*., 2003; Vescovi *et al*., 2011; Wheeler *et al*., 2000). The basic rules that guide the doctrine of surgical technique atraumatic are surgeon without tension, minimal and precise movements, only dissect the indispensable, reducing exposure of tissues to a minimum, gentle handling, use of correct tools and techniques, use of compresses soaked in warm saline (Kan *et al*., 2003). As evidence, the atraumatic extraction techniques have several advantages over conventional techniques currently performed mainly with regard to maintaining the integrity of the alveolar bone and attached gingiva. They consist of controlled techniques, with high level of predictability. (Vescovi *et al*., 2011).

However, the extraction technique of controlled avulsion can be considered more likely to ensure maximum integrity of the alveolar wall, drastically reducing the bleeding and especially, the time of the procedure. Among the contraindications observed in this type of technique performed with the Xt Lifting®, we can mention the extraction of residual roots structurally very vulnerable, very tuned dentinal walls, internal resorption or wear for installation of metal cores, among others. However, some of the innovations that are being developed exclusively for the Xt Lifting® system emerged with great success, in order to ensure the implementation of atraumatic extractions in a wider range of clinical situations. (Vescovi *et al*., 2011). Added to this, with respect to cardiology, there is the atraumatic restorative treatment (ART) that does envision several minimally traumatic treatment options, depending on factors such as aesthetics, tooth function, patient expectations, cost of restoration and optimization of surgical techniques . Thus, several authors as Frencken, Holmgrem (2001) (4.5) and Baker (2007) (Barreto, 2007) showed the advantages of TRA as better preservation of tooth structure, curative and preventive technique in a single procedure, preservation of dentine more inner, reduced trauma, reduced risk of pain, pantry the use of anesthesia, decreased anxiety of the patient, higher acceptance by adults and children, lower cost, speed of execution, possibility of improper technique correction good clinical performance restores a face, possibility of execution in social spaces such as schools, day care centers or home.

Conclusion

We conclude that several attempts in the world and in Brazil take place in order to minimize the professional effort, reduce surgical time and minimize bleeding and inflammation, swelling, pain and bruising that can affect patients. Thus, one must seek the maximum preservation of the integrity of adjacent soft tissue and the prosthetic spaces to preserve the alveolar bone to achieve minimizing surgical trauma.

Competing Interests

The authors declare que they have no competing interests.

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