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Compare between Immediate Implant Placement at Pristine and Infected sites

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Abstract **Original Research Article**

***Background*:** Immediately after tooth extraction, placing of dental implants has become an increasingly prevalent approach for bone preservation and treatment time reduction. This method not only reduces therapy time but also enhances esthetics by maintaining surrounding soft tissue. ***Objectives*:** Comparing and determining proof for the survival and achievement rates of implants in pristine and infected locations. ***Materials and Methods*:** An electronic search for papers released between April 2013 and December 2018 was performed on the PubMed website, Medline database. The titles and abstracts of these findings were read in order to recognize studies under inclusion and exclusion criteria. All review articles, case series and case reports have been excluded. In English only papers were made. ***Results*:** Originally 62 documents were made by the search strategy. The selection criteria included four trials. Manual search supplied additional records. Five studies have finally been included. ***Conclusion*:** This research suggested that after thorough debriding and use of the appropriate operating method, it could be feasible to place the implant immediately on infected sockets.

Keywords: Infected sites, infected sockets, Periapical lesion, Periodontitis, Periodontal lesion, Immediate implant, Endodontic lesion, Pathology.

INTRODUCTION

The objective of contemporary dentistry is to re-establish patients' teeth to normal contour, esthetics, function and speech, whether through caries removal from the teeth or replacing multiple teeth. A removable partial denture, fixed partial denture or dental implant may replace the missing teeth. Immediate positioning of dental implants is described as the positioning of the dental implant instantly after dental extraction. Schulte and Heimke [12] initially suggested the immediate post-extraction positioning of a dental implant and Lazzara recorded his first clinical treatment for the clients [1]. The types of infected lesions in this evaluation are the periapical, periodontal, endodontic or periodontal lesions. After 6 months the crestal bone can be absorbed by 23% and the inner ridge contour can be lowered [2]. Protect your bone from painful failure, which should be performed during immediate positioning [5] in cases where the implant is effective [3, 4]. Primary implant stability should have been accomplished. The direct positioning of the implants in new excision sockets allows for implants to be implant-placed through the same process during which the tooth is extracted, thus reducing the time and coast for therapy, improving dental implant position, maintaining gingival esthetics by stopping alveolar ridge atrophy and improving patient convenience, since no further therapy is required. The implants ' survival and achievement are different and distinct, and both definitions are sometimes missed. Implant loss or only survival can lead from misconceptions. The survival of the implant means that the implants remain in the patients ' mouth during the examination, regardless of their condition or fulfillment. Successful implants make implants not only functional and satisfactory in the mouth of the patients.

MATERIAL AND METHODS

Strategy of Searching & Source of Data

The search was carried out on the PubMed website (Medline database (National Library of Medicine, National Institute of Health), in electronic format, between April 2013 and December 2018. The search was restricted to randomly or not clinical studies of humans and only English-language journals. In addition, the following journal was searched manually; Clinical Oral Implant Research, Clinical Implant Dentistry and Related Research; Clinical Periodontology Journal; International Journal of Implant Dentistry; International Journal of Oral and

Maxillofacial Implant; Journal of Oral Implantology; Journal of Integrated Medicine Research.

Criteria of Inclusion

- Human adult with decent general health (18 years and above).
- Four ossic alveoli walls were present.
- Publication in English language is available in dental literature.
- Studies on survival and immediate implant rates of success.
- Sites with radiological or clinical signs of infections (periodontal, periapical, endodontic, endo-periodontal wounds). Sites with infection.
- Implant stability details.
- Studies compare between pristine and infected sites.

Exclusion criteria

- Various rates of instant implant rate are not known.
- Instant implant numbers are not known.
- Patients with coagulation disorder, drug or alcohol abuse, uncontrolled diabetes, and chronic systematic disease.
- Studies on animals.
- Instant implant has no report
- Review articles, case series and case control.
- Studies that compare between two infected sites.

Collection of Data and Study Selection

Adult patient 18 years of age or older who must be positioned with immediate dental implant on extracted sockets. The paper was released between April 2013 and December 2018. For research that meets eligibility requirements, two writers read the titles and abstracts. Studies where title and abstract were not relevant to the instant implant or the inclusion criteria were rejected during main screening. The complete report was acquired and evaluated when the title and abstract fulfilled the earlier inclusion criteria. Contact with writers was not conducted for feasible missing information. Disagreement over the incorporation or exclusion of the papers obtained was settling through a debate among writers.

Extraction of Data

Data extraction was carried out using a Cochrane checklist template information extraction technique for information collection and information extraction [6]. From each research, the information was collected and included in the form. The data included were; authors, year of publication, number of patients, study design, type of infection, follow up, implant placement, therapy, success of implant, implant failure, loss of marginal bone and region prosthesis.

The results

The primary PubMed-MEDLINE database search conducted from April 2013 to December 2018 contains 62 papers. After studying the title and abstract, a total of fifty-one research were dismissed because they were not applicable to placement of immediate implant at pristine & infected sites. The researchers verified and omitted another seven papers after full text articles evaluated for validity. They were dismissed as one case report, one review paper, four surveys compared between infected sites and one did not satisfy the requirements for the inclusion criteria. Finally, four papers were selected. With additional manual hand searching, altogether there were five studies (Figure1.1).

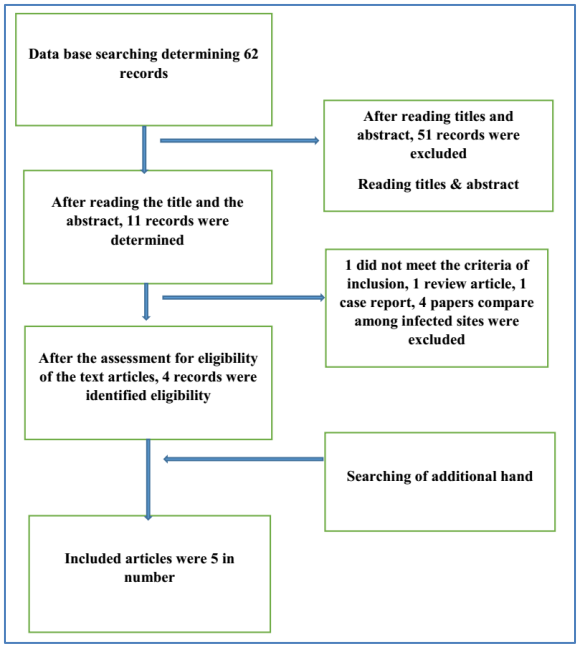

Fig-1.1: Process of Study Screening

Intervention

The hopeless removal of teeth and surgical region were prepared in line with a conventional protocol to place instant implants on infected and uninfected locations. Table 1.1 Intervention of the installation in pristine and infected locations of the instant implant:

Study	Intervention	Antibiotics & Mouth rinse
Montoya-Salazar *et al.* [9]	Socket with 90 percent hydrogen peroxide, curetted, debrided and cleansed. Laser irradiated YSGG and GBR (TG) executed.	4 days before the surgery and was held for a total of 10 days, Amoxicillin 500 mg or clindamycin 300 mg TID. 0.12 percent chlorhexidine twice a day for two weeks.
Blus *et al*. [8]	Atraumatic extraction, curetted with ultrasound surgical device for removing any granulation tissue and implant bed.	Clavulanic acid amoxicillin 1 g BID 5 days before extraction beginning 6-12 hours.
Hita-Iglesias *et al*. [11]	Curettage thorough to remove the TG tissue of granulation. Saline solution irrigation. When the split between implant and plug wall was more than 3 mm, a bone graft was used.	Clavulanic acid (875/125 mg) or penicillin-allergic Clindamycin 300 mg TID one day before operation and prolongation of surgery 4 days after surgery.
Zuffetti *et al*. [10]	Socket curetted to extract tissue from granulation using manual tools, then piezo-surgery inserts and irrigated with a sterile solution of saline. Bovine bone (Bio-) is used to fill the implant and socket wall gap where appropriate. Collagen (Bio-Gide) membrane used in the graft cover.	2 g amoxicillin with clavulanic acid one h before operation and 1 g TID six days after operation (if allergic, 1 hour prior to operation, and 300 mg BID for 2 weeks after operation). BID wash of chlorhexidine for 2 weeks.
MK Katyayan *et al.* [7]	Minimum invasive socket extraction with traumatic method. Discarding and physiologically rinsing of infected socket.	Amoxicillin and 0.2% chlorohexidine rinse 1 gram 1 hour before surgery. The BID washes the mouth of Amoxicillin 500 mg TID 5 days postoperatively and 0.2% of the mouth of chlorohexidine 10 days later.

BID, 2x a day; TG, group testing; YSGG and yttrium-scandium-gallium garnet; TID, 3x a day

Five studies evaluated in the table 1.1 to investigate the intervention of placement of immediate implant. There were two groups; the infected sockets (test group) & non-infected sockets are used as control group. The results of the research were evaluated at pristine and infected locations for implant survival and achievement. When the oral cord discovers that missing > 3-5 mm lowers the marginal gingiva or fills the gap between the implant and the socket wall, guided bone regeneration is used.

Table-1.2: Studies shows immediate implant placement at pristine and infected sites

Authors	Year of publication	Study design	Patients (n)	Follow up (Months)	Type of infection	Placed implant	Failed implant	Implant success	Mean marginal bone loss (mm)	Sites/ Prosthesis/ condition
Montoya-Salazar *et al*. [9]	2014	CCT	18	36	Endodontic or endo-dontal chronic periapical lesions	36 (N)18 (I)18	1 (I)	(N)100 (I)94.4	0.60±0.16 (CG) 0.53±0.13 (TG)	RDP 2 weeks After operation: maxillary (incisor, canine or premolar). 3 months later, individual restoration of the crown
Blus *et al.* [8]	2015	CCT	86	12	Chronic periapical lesion and chronic infection of periodontal or endo-periodontal and granuloma	168 (N)85 (AI)36 (CI)47	2 (I) 1 (N)	(N)98.8 (Acute I) 94.4 (chronic I) 100	NM	*Incisors, canine and premolars. Maxilla & mandible.*

Table-1.2: continued

Hita-Iglesias *et al*. [11]	2016	Split-mouth design	60	12	Chronic periapical lesion	168 (I)66 (N)102	6 (I) 2(N)	(N)98.1 (I)90.8	NM	Implant loaded after 4 months with single tooth restauration (incisor, canine & premolar).
Zuffetti *et al*. [10]	2017	Multi-center RA	369	53.2 (N) Mean0.9-158.3 50.1 (I) Mean 1.6-146.1	Chronic periapical lesion of periodontal or endodontic origin	527 (N)334 (I)193	3 (I) 7(N)	(N)97.9 (I)98.4	NM	Maxilla &mandible (incisor, canine and premolar) Implant loaded after 3months.
MK Katyayan *et al*. [7]	2017	CCT	15	24	Chronic periapical lesion	20	0	100	0.25±0.77 (CG) 0.25±0.89 (TG)	2 weeks after surgery and 3 months following surgery, Maxillary previous teeth RDP second surgery.

infected group, (N) non-infected group, (CCT) control clinical trial, (RA) retrospective analysis, (CG) control group, (TG) test group, (AI) acute infection, (CI) chronic infection, (NM) not mentioned, (RDP) removable denture prosthesis

Five studies included in this review were shown in Table 1.2, which included three controlled clinical studies MK Katyayan *et al*. [7], Blus *et al*. [8] & Montoya-Salazar *et al*. [9] and one retrospective Zuffetti *et al*. [10] and one split-mouth Hita-Iglesias *et al*. [11]. The survival evaluation and performance levels in all control and study groups have been reported. One of five implant surveys reported was 100% successful and there was no loss of implant MK Katyayan *et al*. [7]. Unlike other documents, implants' survival and achievement differ between studies, and all information is listed in Table 1.2. Only one trial has disclosed that 3 implants have not been integrated [8]. One belonged to the non-infected group; after three weeks of healing it failed. Two belonged to the group of acute infections, one failing 2 months after healing, and the other failing one month later. Only two trials assessed the marginal bone loss from five surveys. The marginal bone loss was assessed 12, 24, 36 months following immediate implantation in the study by [9]. The mesial marginal bone only exhibited considerable differences between groups in the three years' assessment, the test group levels were smaller than control group (P = 0.032). MK Katyayan *et al*. [7] were assessed at a baseline follow up of 12 & 24 months. There was no important distinction between the control group and test group noted at any moment of follow-up.

DISCUSSION

In the case of instant implant placement in infected locations, there was little study [22] and a long-term survey [13]. This assessment evaluated instant clinical and radiological monitoring of implants at infected and non-infected locations with different studies designs. The idea of immediate implant placement with infected sockets following tooth removal is scare in the literature [14-17] and still under discussion. Human clinical studies have suggested the ability & the predictive marker of implant-infection and failure can be record of periodontal or endodontic infection [18, 19]. However, another study illustrates a good survival and success rates where implants were placed in the presence of chronic periapical lesion [7, 8, 10, 20, 21]. In addition, prescribing pre-and post-operative antibiotics may provide a favorable foundation for bone healing and osseointegration [15, 22]. Anyway, studies with a longer follow up period and a bigger sample size must be performed. More trials are needed to define the accurate clinical procedures to manage infected post-extraction sockets effectively with a minimally invasive strategy.

CONCLUSION

A placement of immediate implant into fresh extraction sockets with infected sites gives comparable results with those placed in pristine sites where suitable clinical steps such as antibiotics prophylaxis, surgical sites cleaning and decontamination are conducted prior to surgical procedure.

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