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A Review on Atraumatic Extraction for Implant Placement

Asmita Saha[1], Dr. Md Jalaluddin[2], Souvik Kar[3], Manisha Sarangi[4]

Department of Periodontics and Oral Implantology, Kalinga Institute of Dental Sciences, Bhubaneswar, Odisha, India

Abstract: ***Dental implants that are usually utilized for the substitution or absent teeth for the last twenty to twenty - five years. Most usual causes for loosening of teeth can be because of periodontal and gingival disorder and fracture in the teeth. Atraumatic removal and socket management comes under predictable procedure for therapeutic functions. Implant is a well - tested dental procedure that obtained enormous attention and popularity edentulous domain. This review report is intended to explore the distinct domain of Atraumatic extraction for implant procedure. To comprehensively enhance the understanding regarding the theme of the review, the study focuses on various techniques present in the clinical dentistry world for suitably performing extraction and implant. Further, the review paper also keenly provides the usual procedure practiced by the dentist for atraumatic extraction. For this, research selected 100 articles but in the final selection for writing the review 31 articles were considered and the review paper was prepared smoothly. In the discussion, section is bifurcated into two segments the first segment deals with the procedure used to perform while removing the tooth "Severe the connective tissue fiber, Minimize Soft Tissue Reflection, Subdue Contact Area, Utilizing Conventional Forceps" and the another segment deals with the various techniques that are presently utilized for extraction and implantation whether it is immediate or delay such as "Socket Shield Technique (SST), Partial Extraction Therapy (PET), Implant Drill, Benex Extraction System (BES) ". Eventually it may be extracted that all these techniques are an alternative approach and performed significantly in comparison to conventional approach, that requisites the surgical process and decreases morbidity incidence and decreases overall expenses and time incorporated with the procedure.***

Keywords: Atraumatic Extraction, Immediate Implant, Atraumatic Extraction techniques, Atraumatic Extraction procedure

1. Introduction

Dental implants that are usually utilized for the substitution or absent teeth for the last twenty to twenty - five years. Most usual causes for loosening of teeth can be because of periodontal and gingival disorder and fracture in the teeth [1]. Implant is a well - tested dental procedure that obtained enormous attention and popularity edentulous domain [2]. After teeth loss or missing teeth space is vacant for a long time, its bone density and dimension step - down frequently by resorption. After teeth loss the alveolar bone reduces its dimension as near to 2 mm vertically and near 4 mm horizontally within 6 months [3]. If the patient did not go with any clinical trial, bone loss will be perceived and 60% of total ridge volume may take place within 3 years.

Usual time required for implant is around three to six months after operative to osseointegrate followed by a surgery to bring out of implant and ratification of its anchorage in bone [4]. In anterior teeth gingival tissues are declined and responsible for a number of esthetic changes that create obstacles for the rehabilitation of teeths. The alternation in the dimension of gingival is identified as its thickness is declining toward margin and transforming in configuration of root canal and intermandibular papilla deprivation due to availability of black spot [5]. One of the most challenging parameters for dental implantation is time requirement and the cost desired to fulfill the whole therapy. Once the placement takes place the implant is conventionally blended under the soft tissue to alleviate the accomplishment of osseointegration. After completing the first step 3 to 6 months is required for next therapy for the vulnerability of the implant and configuration of its anchorage in bone [6].

To enhance the healing capacity of oral bones and regenerate procedure the dentist must acknowledge several fundamentals involving how to manage hard and soft tissues after an exposure [7]. Presently it is peremptory, that medicine understands the outcome of teeth extraction regarding tissue whether it is hard or soft. It comes under the oral care and oral hygiene standard to conserve these tissues in order to assure long term oral wellbeing, functions, and aesthetics [8]. Ridge conservation is a critical fundamental which occurs after extraction circumstances particularly if the case is premeditated for an upcoming oral implant. Atraumatic removal and socket management comes under predictable procedure for therapeutic operation [9].

The lesion procedure involved a complex cascade of biochemical and histological function. After removal the BB plate demonstrates a broader range of bone reduction than lingual plate, this effectively shows the alternate positioning of remaining ridges [10]. This negatively influences plant positioning and is responsible for creating complexities in successful placement of implant retained and its location. Hence, it is crucial to comprehensively examine the approach of teeth removal in an atraumatic procedure to optimum and control the density of hard and soft tissue and encourage further implant success.

The atraumatic extraction implant placement in the port of the educe tool is the promising option to manage the width and color of "gingival tissue" and it is cost effective. It declines the procedural time as patients need to wait for an extra 3 months to avail socket heel and then implant its position [11]. The conservation of alveolar bone take place in particular span for removal of tooth, dental implant in "alveolar socket" can be accomplished to desire stability when it was applied in apical direction, this reflect the flap which was carefully used to adapt provincial crown on

engraft and wellness of engraft tissue being the vital factor for successfully accomplishment the procedure [12].

This review report is intended to explore the distinct domain of Atraumatic extraction for implant procedure. To comprehensively enhance the understanding regarding the theme of the review, the study focuses on various techniques present in the clinical dentistry world for suitably performing extraction and implant. Further, the review paper also keenly provides the usual procedure practiced by the dentist for atraumatic extraction. For this, research selected 100 articles but in the final selection for writing the review 31 articles were considered and the review paper was prepared smoothly.

2. Discussion

Discussion segment the research divided into two parts. The first part dealt with the latest procedure utilized for accomplishing atraumatic extraction, another part discussed the latest techniques used for extraction of tooth based on atraumatic approach.

Procedure for Atraumatic Extraction

The prominent component that might lead to success in an atraumatic extraction is removal of existing teeth. The process of tooth extraction is time taken and might be responsible for damaging to other associate oral anatomy. However, a surgical approach that is used for extracting the teeth can accomplish the task through distinct instruments with small changes. Conventionally, instruments like forceps and elevators are utilized for removal procedures. With the use of forceps usually the teeth revolve in the buccal lingual direction, and are responsible for weakening or fractures the plate. Followed by the elevator instrument which is used to insert destiny with leveraging force which is very traumatized and affects hard and soft tissues. This painful extraction leads to the adverse effect of the procedure as responsible for bony wall loss, disruption of blood flow, compromised recovery, rapid inflammation, infection and damage to soft tissue [2 - 5]. Hence, dentists should take appropriate measures to provide the least problematic condition for oral care and conserve residual tissues. In order to conveniently accomplish extraction procedures without harming patient atraumatic tooth extraction and conserving tissues take place by using four fundamental approaches.

The following steps for successful complete atraumatic extraction of tooth -

Severe the connective tissue fiber

Initially in automatic extraction procedure the first step is to exclusively cut the associated tissue fibers by inscribing orthogonally surrounding the tooth. Normally various types of connective tissue fiber, 13 in number, are compiled together around a tooth out of which 6 are known as Sharpey fiber which is directly linked with dental alveolus of the tooth and the alveolar bone [8]. If the procedure of removal started without cutting these fibers it would be very traumatic because affecting soft tissues and vigorously pulling them damages healing, excessive bleeding, affects postoperative discomfort, and harms distinct bones around the extraction. Thus, the procedure was started with a severe where “periodontal ligament fibers” that can be cut out by operating a surgical blade [1, 7].

Minimize Soft Tissue Reflection

Soft tissues are located around the teeth which are negatively impacted by the observation of the “periosteum and often adapted to the residual ridge” form [8, 10]. These tissues are more valuable to surgical trauma and also this in - convenient goes to hard tissues. It is the responsibility of the dentist to assure that the soft tissue did not disturb during the extraction procedure and protect further for dimensional loss [3, 5]. Extra efforts should be taken to preserve the papilla area. The normal procedure was started without contacting the buccal plate by a flap, this flat raised and envelope flap is used without vertical extension. If the vertical procedure takes place it leads to reduced recovery and limited blood flow. Henceforth, conservation of tissue must be sure before forwarding with the extraction procedure.

Subdue Contact Area

The procedure of tooth extraction can lead to several challenges because of the positioning of surrounding teeth at the extraction site. If the surface of the tooth is mesial and distal responsible for putting pressure on the chip of enable and residual arena of the adjacent tooth responsible to change the route of takeout and causes fracture on the route or bone [10]. This procedure is responsible for adverse effects like pain, blood loss and is very traumatic for post operative measures. The alternative method to reduce the damage is to limit the connecting area of the tooth which needs to be pulled out. This only leads to loss of the tooth and makes it convenient for enabling a less traumatic path for removal of the tooth [4, 8].

Utilizing Conventional Forceps

When a tooth is in a mobilized situation, it can be extracted by conventional dental forceps. This procedure cannot be accomplished until the tooth is in a mobility position in order to preserve the BB plate. Once the moving is assured the dental forces are employed to clutch and purposely move the tooth left right direction until the tooth is conveniently pulled out from the socket [10].

After this atraumatic removal process takes place that appropriately and successfully utilizes to conserve ridge process. The quality and the quantity of the bone that is prerequisite to conserved is dependent on the technique used for implant placement and atraumatic extraction. This eventually led to providing more accurate results to identify implant positioning and its placement. It also provides relief from conventional issues like blood loss, traumatic healing and adverse impact of soft and hard tissues. Hence, now the study emphasizes different techniques used to accomplish atraumatic extraction.

Atraumatic Extraction Techniques

Immediate implant placement support to alleviate issue by subduing the number of procedures required to assure the aesthetic and operational advantages like decreasing time required for removing and definitive prosthetic restoration, conserving bone reception and protecting alveolar ridge in anatomic proportion [11]. This procedure comprehensively utilized a proposed number of other atraumatic approaches.

In order to provide better treatment consequences from a patient and clinical perspective. Most marginally intrusive approach based on "exertion of forces to the periodontal ligament" of the teeth. This creates "hyaluronic acid" and is responsible for formulating space in periodontal ligament [12]. This provides an opportunity to dissolve the ligament and help the acid to release pressure in the socket. Followed by appropriate movements that need to be performed to deliver the tooth.

Atraumatic Extraction: A Conventional technique -

In conventional procedure periotome is used for non surgically assessed in the removal of single rooted teeth. The study used Amron periotome with a blade attachment to detect the gingival fiber and advancing into PDL space then the tooth was removed using extraction forceps. The consequences of the procedure is to conserve thin alveolar plate and soft tissue while removing teeth and retaining root [15]. Both types of placement like immediate and delayed implant process can be assessed by using this method.

Periotome procedure is based on the principle of welding and serving to perform teeth removal activity. It is formulated by a very thin metallic blade that keenly wedges down the PDL area in a repeated circumferential manner. It uses the Sharpey fiber which preserves the socket and tooth. Because the process is achieved by minimal damage and conserving soft tissue [13 - 15].

Sample	Method	Finding	Reference
200	Non - surgically Periotome	The method assist to conserve soft tissue, gingival contour and preservation of bone volume	[13]
100	Non - surgically Periotome	The method supports in resolving post extraction. Discomfort and pain.	[14]
15	Surgical Extrusion using Periotome	It supports the preservation of the "interproximal papilla, gingival margin position and no marginal bone loss".	[15]
61	Surgical Extrusion	The method effectively supports apparently nonrestorable teeth, irrespective of patient age	[16]

Advance Techniques

Sufficient alveolar ridge height and volume is crucial for obtaining the long term medicinal advantage of oral implant. After removal the large amount of bone loss takes place in the Buccal Bone (BB) plate, because the bone has thinner walls which are formulated by bundle bone vascularized by the periodontal tooth membrane [18]. The traditional approach is based on restricted BB degradation which is conserved by "alveolar sockets, soft tissue transplant, palatal wall modification of the implant, BB wall protection, and supervised bone regrowth with membrane".

Socket Shield Technique (SST)

Another alternative approach is socket shield technique. It is a process which is used to protect the PDL incorporated with the BB plate of the tooth and the vascular supply. The approach is significantly performed to prevent BB wall resorption. The technique is best suitable in the region where the buccal cortical plate was very thin by keeping the route fragment attached to the bone and placement of immediate implant to maintain the ridge counter [18]. It is appropriately utilized for immediate implantation in the removed socket of teeth with healthy periodontal tissue. It is one of the significant approaches to conserve alveolar bone in both horizontal and vertical dimension from degradation. Most of the research [19 - 21] utilizes that technique to conserve the root segment to protect alveolar bone resorption.

SST was framed for implant placement to shield BB and to get the proper sensuous form. The 2mm buccle scrap of the tooth was connected and the implant was linked with the tooth segment. After follow - up of 3 months, the finding shows that appropriate recovery and wellness in peri - implant tissue was identified after processing SST with immediate implant placement. This shows that the procedure is a suitable alternative to protect BB particle plate and implant placement specifically in the sensuous region [20].

Sample	Follow - up	Method	Finding	References
20	1 - 7 month	Socket Shield Technique	It effectively works in protecting BB.	[17]
40	6 months	Socket Shield Technique	It assists in reducing the labial bone loss.	[18]
10	12 Months	Socket Shield Technique	It effectively works in protecting BB.	[19]

Partial Extraction Therapy (PET)

It is a collective technique which is based on the approach that is effectively utilized to maintain post extraction ridge. It is a procedure in which the decoronation of the tooth that is identified for the removal and need to protect hole or a partial root such as periodontal tissue incorporated with it are conserved [21]. It is a technique which is a combination of four distant approaches which is used for teeth extraction comprising root submergence, socket shield, pontic shield, and proximal socket shield. In this technique the portion or the crown is removed from the teeth while the remaining portion is divided into two parts mesiodistally. After that, the palatal root is carefully removed without interference from the BB root. The BB position of the root is subdue in dimensions and width. Followed by an intermediate implant is processed in the residual space of the root [22].

PET is an alternative approach that requisites the surgical process and decreases morbidity incidence and decreases overall expenses and time incorporated with the procedure. The procedure specifically utilized the anterior position of jaws for the teeth that cannot be restored [23]. The technique is unable to provide its services in certain cases like when patients suffer with periodontal dysfunction, unstable or widening of the PDL, having fracture either in vertical or horizontal or in both, teeth that exhibit internal or external removal or endodontic apical pathology [24].

Implant Drill

Implant drill took place in the root canal to compress the root wall in the way to remove limited force by subsiding the risk of trauma over the thin BB. The implant site was processed with prescriptive drill using the bony wall for pathfinder and dentally [25]. Once the site was ready, a periodontopathic examination was conducted to analyze and determine the reliability of the bony wall of the alveolar and periapical radiograph to assure the entire extraction of the

root. The largest and the widest potential is considered after the BB dental level of bone crown without reckoning the bone sized mesial and distal level [26]. All implant places exhibited effective and better constancy. The function of the implant drill to ratify the root was provision atraumatic removing guarding the thin BB. The therapy site is prepared and the placement is proceeding. The cutting effectiveness of a "rotatory implant drill is medically relevant and the surface roughness and the loss of sharpness at the cutting edge and corner of the drill can predict the cutting efficiency and the durability" [27, 28].

Benex Extraction System (BES)

The BES is fashioned to remove wide - ranging mangled teeth with no enlargement of the socket by "putting a force vector along the long axis of the tooth being removed". The BES provides various benefits over the secondary manner of tooth removal as it is suitable for restoration of compromised teeth. The atraumatic extraction minimizes the amount of chroma to the surrounding periodontium [29]. The approach provides various benefits to the patient and the medicinal component, the ability to predictable sustain the durability and probity of the alveolar socket after removing the tooth, as the instrument has a potential to provide a vertical sharing exclusive force only. The axial force along with oblique oblique force is usually used to minimize the after effect, this reduce the capability of compresses trauma to the associate "periodontal ligaments and the risk of resorption defect", because it is positively associated which determines among the handling impairment of the periodontal complex and ensuring defect [30].

Samples	Method	Finding	Success Rate	References
38	BES	It exclusively recovers soft - tissue and declines pain.	89%	[29]
56	BES	It is beneficial for minimally invasive tooth extraction	95%	[30]
72	BES	It exclusively recovers soft - tissue and declines pain.	89%	[31]

These are some significant approaches covered in the discussion section which are suitably and effectively performed in the present dentistry world. As the discussion section is bifurcated into two segments the first segment deals with the procedure used to perform while removing the tooth and the another segment deals with the various techniques that are presently utilized for extraction and implantation whether it is immediate or delay.

3. Conclusion

In anterior teeth gingival tissues are declined and responsible for a number of esthetic changes that create obstacles for the rehabilitation of teeths. The alternation in the dimension of gingival is identified as its thickness is declining toward margin and transforming in configuration of root canal and intermandibular papilla deprivation due to availability of black spot. One of the most challenging parameters for dental implantation is time requirement and the cost desired to fulfill the whole therapy. The atraumatic extraction implant placement in the socket of the educe tool is the promising option to manage the width and color of "gingival tissue" and it is cost effective. It declines the procedural time as patients need to wait for an extra 3 months to avail socket heel and then implant its position.

Conventionally, instruments like forceps and elevators are utilized for removal procedures. With the use of forceps usually the teeth revolve in the buccal lingual direction, and are responsible for weakening or fractures the plate. Followed by the elevator instrument which is used to insert destiny with leveraging force which is very traumatized and affects hard and soft tissues. This painful extraction leads to the adverse effect of the procedure as responsible for bony wall loss, disruption of blood flow, compromised recovery, rapid inflammation, infection and damage to soft tissue.

To overcome the challenges associated with conventional approaches, distinct advanced techniques are proposed and ratified by the dentistry world. In this paper, the motive is to explore the distinct domain of Atraumatic extraction for implant procedure. To comprehensively enhance the understanding regarding the theme of the review, the study focuses on various techniques present in the clinical dentistry world for suitably performing extraction and implant. The techniques that are presently utilized for extraction and implantation whether it is immediate or delay such as "Socket Shield Technique (SST), Partial Extraction Therapy (PET), Implant Drill, Benex Extraction System (BES)".

Subsequently, it was acknowledged that the complications associated with the conventional procedure for extracting the tooth can be significantly and suitably replaced by impressive and emerging alternative options presented in this review.

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