Autotransplantation of Developing Third Molar In Place Of Grossly Destructed First Molar – A Clinical and Radiological Study

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Abstracts: **Aims And Objectives:** To evaluate the success rate of auto transplanted third molars. To consider the possibility of auto transplantation, in selected cases, as a good alternative to prosthodontic rehabilitation including implant insertion, when closing a gap in the dental arch. **Materials And Methods:** Ten patients of either sex with the age group between 15 to 19 years with developing third molars, having half or two third root development and simultaneously having first molar area in which the tooth is grossly destructed or heavily filled or which is indicated for extraction; with adequate bone support and which is free from acute infection and chronic inflammation are considered. The surgical procedure is performed under local anesthesia with strict aseptic measures. The transplanted tooth is stabilised with an open cap splint with coverage on the occlusal surface of the transplanted tooth. The splint is then secured in place by interdental wiring. **Results:** Out of 10 cases, **c**linically, all cases showed marked improvement and radiographically, one case exhibited replacement resorbtion and nine cases showed signs of continued root development but not much of root development was appreciable within one year duration. No abnormality was detected in relation to pulpal, periapical, periodontal conditions. All patients were able to carry out normal function over the transplanted area. **Conclusion:** Auto transplantation of teeth, when properly indicated and technically carried out with great care, will provide excellent results. It is worth consideration in any case in which there is suitable donor tooth available and so, in selected cases, this method should be preferred over prosthetic rehabilitation. [Pankajakshi K NJIRM 2014; 5(2) :119-126]

Key Words: Tooth transplantation, Autogenous tooth transplantation, Homologous tooth transplantation, Reimplantation

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Introduction: Autogenous tooth transplantation, or autotransplantation, is the surgical movement of a vital or endodontically treated tooth from its original location in the mouth to another site in the same individual. Transplantation of organs is an important branch of surgery extensively used in different specialities. The principles being the same it has been attempted in oral cavity for replacing the lost teeth. The other conditions in which transplantation could be considered include grossly destructed tooth, tooth agenesis, traumatic tooth loss, atopic eruption , root resorption, large endodontic lesions, cervical root fractures, localised juvenile periodontitis and other pathologies[1].

Transplantation of teeth is an age old procedure. The earliest reports of tooth transplantation involve slaves in ancient Egypt who were forced to give their teeth to their Pharaohs[2]. However, allotransplantation– the transplantation of a tooth from one individual to another, was eventually abandoned because of problems of histocompatibility and was replaced with autotransplantation.

Autotransplantation has been performed arbitrarily for many years[3]. It was first well documented in 1954 by M.L.Hale. The major principles of his techniques are still followed today[4]. Scientific ground rules were first laid down in the 1960's and since then several reports have appeared in the literature of clinical studies of autogenous transplants[3].

While there are many reasons for autotransplantation of teeth, tooth loss as a result of dental caries is the most common indication, especially when first molars are involved. First molars erupt early and are often heavily restored or grossly destructed and are very often indicated for extraction. So, to maintain the functional

integrity of the arch it should be replaced at once by physiologic, orthodontic or prosthodontic means. Autotransplantation in this situation involves the removal of third molar which may then be transferred to the site of an unrestorable first molar.

Orthodontic guidance of the second and third molars has a very slow progress and not very practicable in many cases. Prosthodontic rehabilitation using dentures and implants has its own disadvantages; like for eg: RPD causes pschychologic discomfort to the patient; FPD compromises the adjacent tooth structure and cannot be considered until late adolescence; Dental implants are highly uneconomical, their placement are delayed for sometime after two stages of surgery and are not feasible for children as their bones are still growing. On the other hand, transplants are economical, provides an immediate tooth replacement and allow for continued alveolar development in children.

So, when a tooth in the dental arch has to be extracted for any reasons and a non-functional tooth is available in the jaw, then the autotransplantation of the non-functional tooth to the site of the extracted diseased tooth could be considered.

Materials And Methods: This prospective study was conducted in the Department of Oral and Maxillofacial Surgery, Government Dental college, Bangalore and was approved by our local institutional review board[IRB] " Rajiv Gandhi University of health sciences".

Patient selection: Patients of either sex with the age group between 15 to 19 years who visited the department for extraction of first molars were screened by using intra-oral periapical radiographs to confirm the presence of developing third molars. Ten patients with developing third molars, who were in good health, able to follow post operative instructions, who demonstrated an acceptable level of oral hygiene, who fulfilled the requirements of recipient site and donor tooth criteria were selected for the study.

Intra oral periapical radiographs and orthopantomograph were used to measure the dimensions of the donor tooth and the tooth in the recipient site, and also to assess the pathology associated with the donor tooth and the recipient site.

Recipient site criteria: First molar area in which the tooth is grossly destructed or heavily filled or which is indicated for extraction; with adequate bone support and which is free from acute infection and chronic inflammation are considered.

Donor tooth criteria: Third molars with half or two third root development which were impacted or which would get impacted in future or those which did not have an opposing tooth are considered.

Splint preparation: Alginate impression is taken of the lower arch, cast poured and model prepared. First molar to be extracted is trimmed to the infraocclusal level on the cast. To maintain splint rigidity 7mm stainless steel wire is adapted over the buccal surface of the teeth extending posteriorly from distal aspect of first premolar, passing around the second molar and adapting to the lingual surface of the teeth. Self cure acrylic resin is then adapted over the buccal and lingual surface of the teeth from first premolar to second molar region exposing the occlusal surfaces except in the first molar region wherein the acrylic covers the trimmed occlusal surface. The acrylic over the trimmed region should be upto the occlusal level. Once acrylic is set it is removed and trimmed to eliminate the sharp margins.

Surgical procedure: (Fig1-Fig12): The surgical procedure is performed under local anesthesia with strict aseptic measures. Once sufficient anesthesia is obtained the donor tooth which is unerupted is exposed by flap elevation, bone removal, and gentle removal of the follicle from around the crown. Care is taken not to damage the periodontal ligament at any point of time during the procedure. Traumatic injury to the root surface of the donor tooth will impair the success of the transplant due to inadequate periodontal ligament regeneration. This is important for integration at the recipient site. Immature teeth are usually

Fig.1. Preoperative

Fig.2. Exposure Of Third Molar

Fig.3. Extraction Sockets Of Third Molar And First Molar

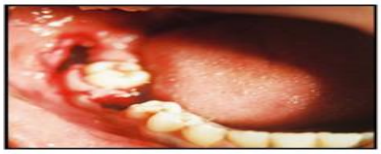

Fig.4. Developing Third Molar With Follicle

Fig.5. Transplanted Third Molar In First Molar Region And Wound Closure In Third Molar Region

Fig.6.Splint Secured In Place

Fig:7. Splint Secured By Means Of Interdental Wiring- Demonstration On Model

Fig:8. Pre Operative Intra Oral Periapical Radiograph

Fig:9. Immediate Post Operative Iopar After 6weeks

Fig:10. Post Operative Iopar- After 6 Months

Fig:11. Post Operative Iopar- After 1year

covered by a thick follicle or periodontal ligament and little force is necessary to remove the tooth.
The donor tooth was normally removed first so if it was unsuitable for transplantation, the surgery could be aborted. Once the donor tooth is exposed, it was fully mobilised and was left loose in the socket .The tooth in the recipient site is then extracted in an atraumatic fashion so as to retain as much bone and periodontal support as possible. The recipient site is then prepared by irrigating the alveolar socket with physiologic saline to remove any residual debris.

The donor tooth, is then elevated from the socket without damaging the follicular attachment and taken out as atraumatically as possible using tissue foreceps. Once removed, care is taken to handle the donor tooth as little as possible and to touch only the crown. The tooth is then placed in the recipient socket and seated in place with firm finger pressure. Minimal delay between extraction and transplantation is important to ensure maintainence of periodontal membrane vitality. If further adjustment of the recipient socket is required, the donor tooth should be stored in its oiginal socket or in saline. Once the tooth is in its final position, occlusion is checked. The tooth should be in slight infraocclusion to allow it to erupt into proper occlusion over the next few months. The donor site is then closed with sutures.

The transplanted tooth is stabilised with an open cap splint with coverage of the occlusal surface of the transplanted tooth. The splint is then secured in place by interdental wiring by using interdental space distal to second molar and mesial to second premolar..

Post operative instructions and squeal are similar to those following the removal of an impacted tooth. A soft diet is followed for a couple of days after surgery and the patient is instructed to avoid mastication on the transplant. They are instructed to maintain optimal oral hygiene, and clorhexidine gluconate mouth rinse to be used as an adjunct to oral hygiene. Analgesics and antibiotics are prescribed.

The patients are reviewed the day after suregry to ensure the transplant has retained its new position, the splint is stable. and that swelling, edema, and hematoma formation are within normal limits. They are seen at weekly intervals for one month if there are no complications. The splint is removed after 6 weeks. After removal of the splint, patient`s were requested not to bite hard on the tooth for eight weeks and the transplanted

tooth are reviewed with radiographic examination and pulp vitality testing at 3rd month, 6th month and one year. During this period the tooth was evaluated for the mobility, vitality, onset of pulpal breakdown seen as intrapulpal calcification, periapical radiolucency, or root resorption.

Results: A total of 10 developing third molars were transplanted in place of grossly destructed first molar or first molars which were indicated for extraction.

The nature of the donor tooth; and the recipient area & it`s tooth are shown in *table-1*. The type of impaction with the amount of bone coverage is given by considering Pell and Gregory classification of impaction.

The follow-up period included recordings of the clinical parameters, like colour,mobility, probing periodontal pocket depth, probing attachment level, tenderness on percussion, and percussion sound. Radiographs were taken after 6 weeks, 6 months, and 1year after surgical procedure.

Clinically, all cases showed marked improvement exhibiting no colour changes, no mobility with good gingival attachment, no gingival inflammation and no tenderness on percussion. The percussion sound was normal for all teeth at 6th month followup and at 1 year followup one case exhibited metallic sound. Although all teeth showed negative response to vitality test at 6th week; by 6th month four teeth exhibited positive response and at the end of one year seven teeth exhibited positive response and three teeth negative response.

Radiographically, one case exhibited replacement resorbtion and nine cases showed signs of continued root development but not much of root development was appreciable within one year duration. No abnormality was detected in relation to pulpal, periapical, periodontal conditions.
All patients were able to carry out normal chewing over the transplanted area. Post operative clinical and radiographic evaluation of the transplanted tooth and its periodontal tissues are shown in *table-2 and table-3* respectively.

A successful result was recorded if the transplanted tooth was firm and of good colour with no clinical or radiographic pathology as determined by clinical examination and radiographs. A satisfactory gingival condition and lack of periodontal disease was also necessary to record a successful results.

Discussion: Autotransplantation of teeth as a clinical entity has been more and more accepted in oral rehabilitation. Despite worldwide successful use of Titanium implants, autotransplantation still has its own field of application[1].
The prerequisite for autotransplantation is the existence of a useful transplant object and a suitable transplant site. Although the indications for autotransplantation are many[1], this study confines to the substitution of first molar which is indicated for extraction by a developing third molar.
Age at transplantation, type of donor tooth, stage of eruption, the surgical technique, type and length of extra-alveolar storage, stage of root formation, clinical contamination of the root surface, type of cleansing procedure of the root surface, type and length of splinting and the use of antibiotics are considered as most important prognostic factors[12,15,23].
The ideal time for tooth transplantation is when teeth are 50%-70% of their final length[3,11,14,18]or when 2mm to 5mm of root formation is present apical to the crown[2,3]. Although, marked success rate is shown for the autotransplantation of fully developed teeth[7,15] many authors have demonstrated 90-100% success rate in developing teeth[7,10,11,15,21] as well and have substantiated the selection of immature teeth for transplantation. Advantage of trasplanting immature teeth is that immature teeth are usually covered by thick follicle or PDL and little force is necessary to remove the tooth. Thus the PDL may sustain minimal damage. Extraction of a fully erupted tooth with a strong attachment may leave some areas of the root surface devoid of vital PDL cells. This iatrogenic damage to the PDL may manifest itself as root resorbtion after transplantation[2]. Teeth with fully developed roots

Table 1- Preoperative Status

TABLE – 1
PREOPERATIVE STATUS

Case no.	Age/Sex	Donor tooth	Amount of root development	Type of impaction	Nature of the tooth (1st molar)	Periodontal status
1	18/F	38	2/3rd	Mesioangular, Class-II, Position B.	Grossly destructed	Normal
2	20/F	38	1/3rd	Mesioangular, Class-I, Position B.	Deep dental caries with pulpal involvement	Normal
3	18/F	38	1/4th	Mesioangular, Class-II, Position B.	Grossly destructed	Normal
4	19/F	38	1/4th	Mesioangular, Class-II, Position B.	Grossly destructed	Normal
5.	17/M	48	3/4th	Mesioangular, Class-I, Position A.	Grossly destructed	Normal
6	18/F	48	3/4th	Mesioangular, Class-II, Position B.	Deep dental caries with pulpal involvement	Normal
7	17/M	38	1/2	Mesioangular, Class-I, Position B.	Deep dental caries with pulpal involvement	Normal
8	18/F	38	3/4th	Mesioangular, Class-II, Position B.	Grossly destructed	Normal
9	16/M	48	1/2	Mesioangular, Class-I, Position B.	Grossly destructed	Normal
10	17/M	38	3/4th	Mesioangular, Class-II, Position B.	Grossly destructed	Normal

Table 2- Clinical Evaluation Of The Transplants And Their Periodontal Tissues

TABLE – 2
CLINICAL EVALUATION OF THE TRANSPLANTS AND THEIR PERIODONTAL TISSUES

	Colour			Gingival inflammation			Tenderness on percussion			Percussion sound			Epethelial attachment			pocket depth (in mm)			Evidence of contact in centric occlusion			Proximal contact			Mobility			Thermal & electric pulp vitality		
Case. No.	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr
1.	N	N	N	A	A	A	A	A	A	N	N	M	F	F	F	7	4	4	A	P	P	P	P	P	GI	A	A	-ve	-ve	-ve
2.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	2	2	1	A	P	P	A	A	A	A	A	A	-ve	+ve	+ve
3.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	7	4	4	A	A	P	P	P	P	GI	A	A	-ve	-ve	-ve
4.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	4	2	2	A	P	P	P	P	P	GI	A	A	-ve	+ve	+ve
5.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	4	4	4	A	A	A	P	P	P	GI	A	A	-ve	+ve	+ve
6.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	6	2	2	A	A	A	A	A	A	A	A	A	-ve	-ve	+ve
7.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	6	5	1.5	A	A	P	P	P	P	GI	A	A	-ve	-ve	-ve
8.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	3	1	1	A	A	A	P	P	P	A	A	A	-ve	-ve	+ve
9.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	6	2	2	A	A	A	P	P	P	GI	A	A	-ve	-ve	+ve
10.	N	N	N	A	A	A	A	A	A	N	N	N	F	F	F	4	3		A	A	P	P	P	P	A	A	A	-ve	+ve	+ve

Wk = Week Mt = Month Yr = Year N = Normal A = Absent P = Present F = Formed NF = Not formed +ve = Positive -ve = Negative GI = Grade I mobility mm = Milimeter

Table 3 - Radiological Evaluation Of The Transplants And The Alveolar Bone

TABLE – 3
RADIOLOGICAL EVALUATION OF THE TRANSPLANTS AND THE ALVEOLAR BONE

	Pulp obliteration			Evidence of laminadura formation			Changes in the alveolar bone			Angular bone loss			Periapical condition			Root resorbtion			Root development			Change in root length (in mm) w.r.t. pre. op			Width of apical foramen		
Case. No.	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr	6th Wk	6th Mt	1st Yr
1.	NE	NE	NE	A	A	A	NC	D	D	A	A	A	N	N	N	A	A	RR	NE	E	NE	NC	0.5	0.5	NC	DC	DC
2.	NE	NE	NE	P	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	4.0	4.5	NC	DC	DC
3.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.3	0.8	NC	DC	DC
4.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.7	1.0	NC	DC	DC
5.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.2	0.8	NC	DC	DC
6.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	NC	0.6	NC	DC	DC
7.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.2	1.5	NC	DC	DC
8.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.5	0.8	NC	DC	DC
9.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	NC	0.3	NC	DC	DC
10.	NE	NE	NE	A	P	P	NC	D	D	A	A	A	N	N	N	A	A	A	NE	E	E	NC	0.3	1.5	NC	DC	DC

Wk = Week Mt = Month Yr = Year w.r.t. = with respect to pre. op = preoperative N = Normal A = Absent P = Present D = Deposition RR = Replacement resorption E = Evident NE = Not evident NC = No change DC = Decreased mm = Milimeter

should be subjected to endodontic treatment within one month after transplantation and teeth with partially developed roots, do not need endodontic therapy unless the pulp is necrotic. So, considering the advantages of the transplantation of developing teeth, all cases selected for this study were immature teeth with root development varying from 1/4th to 2/3rd formation. Surgical procedures are described by various authors[4,17,18] . Although, transplantation should be done with minimal manipulation of reciepient socket[23] , acceptable results are shown with manipulation of the reciepient bed with bur and by splitting osteotomy of the alveolar region[16]. In this study, alveolar socket was widened in only one case by trimming the inner part of the socket on the buccal side. This case in later followup period showed replacement resorption leading to ankylosis of the teeth.

Opinion differs as to which tooth to be removed first. Few authors removed the donor tooth first so that if it was unsuitable for transplantation, the surgery could be aborted[3]. In this study first the developing third molars were dislodged from the socket and then the first molar extracted.

Storage time of either wet storage (saliva and/or saline) or dry extraalveolar storage of donor teeth is known to have a monotonous effect on pulpal revascularization. Increased length of the storage time decreases the chance of pulpal revascuralization[12]. Based on these findings, immediate transplantation after brief cleansing in either tap water or saline is recommended[12]. In this study third molars were immediately transplanted after brief clensing in saline.

Various methods of immobilisation[1,16,20] of the transplanted tooth are by using orthodontic wire and acrylic strings, acrylic splints, arch bar, acid etch resin or only sutures. Choice of fixation method depends on initial stability of the transplant[20]. As it is shown in other studies[2,3,24] that non rigid splinting provides physiologic movement of the tooth, thus minimising the risk of ankylosis, in our study, nine cases were stabilised by using open cap acrylic splint with coverage on the transplanted tooth which protected the tooth from biting forces and which did not hamper the physiological movement of the transplanted tooth. The splint was secured in place by interdental wiring. All these teeth showed normal pulpal and periodontal healing exhibiting the signs of continued root development. But in one case, considering the instability of the donor tooth in the recipient bed the tooth was stabilised by using arch bar. This tooth in later follow up period was ankylosed. But previous studies[25,26] shows good prognosis of the teeth stabilised by using arch bar.

In various studies fixation time varied from 1 week to 6 weeks[1,16,20] and followup period varied from 3 months to 10 years[1,7] to assess the continued root development. Opinions differ about whether or not tooth tranplantation patients should be given antibiotics[2,7,8] but such drugs generally seem to be recommended. It is vital that the patient is placed on antibiotics preoperatively so that a level of bacteriocide is present in the pulp chamber of the transplanted tooth. This should allow aseptic necrobiosis of the pulpal contents to occur, thereby giving the best chance for the ingrowth of a new vascular and neural supply[3]. In various studies, prophylactic antibiotic therapy was routinely used to avoid postoperative complications[1] and in most cases, they were given for one week, begining one day before the surgery[2] and oral hyiegiene with complimentary rinsing showed satisfactory outcome[1]. Considering this study, all cases were given amoxicillin 500mg tid, begining one day before surgery for 5 days along with clorhexiediene mouth wash. All cases showed normal post operative sequelae.

The persistence of pulp vitality and continuous root development have been demonstrated by various authors[10,11,22].

The factors that influence pulpal healing are, the stage of root development at the time of transplantation, diameter of apical foramen and avoidance of bacterial contamination during surgical procedure[7]. Radiographic presence of pulpal obliteration is known to be an earlier sign of pulp healing than the detection of pulp vitality with an electrometric test[14] and it is shown that total pulp canal obliteration takes place in 3 to 9 months after transplantation[12,14]. In this study, findings were in contrast with the study conducted by Andreasen et.al. [12] and Paulsen et.al. [14] as not much of alteration in the size of the pulp chamber was evident at the end of the first year. But, it

supported the study conducted by Lownie J.F. et.al. [27] where in there was no alteration in the size of pulp chamber for the first two years. Pulp necrosis is known to be evident only after 3 weeks[12]. None of the cases in this study showed the clinical signs of pulpal necrosis.

Studies have shown that positive pulpal sensibility is observed only after 6 months[12] and it takes minimum 4 months for reinnervation of the autotransplanted teeth with incomplete root formation although it varies in different individuals[9,28]. There is no significant association between electric pulp testing and bone formation[9]. Only four cases in our study showed positive pulpal sensibility test at six months followup and three of the cases showed negative response to pulpal sensibility testing even after one year.

Previous studies have shown that the pulp tissue of autotransplanted teeth with partly formed roots becomes necrotic after the operation, and that revascularization occurs through the ingrowth of new, well vascularized, cell-rich connective tissue[29,30] thus maintaining the vitality of the teeth[5]. Pulpal revascularisation is more frequent in teeth with shorter distance from foramen to the pulpal horns[12]. So, considering this, three cases in this study which exhibited negative pulpal sensibility test even after one year does not indicate that the tooth is non vital because the vitality could be maintained by revascularization. The reason for the negative sensibility testing could be delayed nerve innervation.

Completed root development subsequent to transplantation is related to pulpal revascularization[13] and Variation in root growth are associated with damage to the Hertwig's epithelial root sheath[13,14]

Root resorption is usually diagnosed within 6 months[8].These are divided into surface, inflammatory and replacement resorbtion (ankylosis). The trauma to the periodontal ligament of the transplant is the explanatory factor for the development of root resorption. In this study one case for which arch bar was used for stabilisation and for which recipient bed was modified exhibited replacement resorption. Since, earlier studies support the use of arch bar[25,26] and manipulation of the recipient bed[23], the reason for one of the cases in this study exihibiting ankylosis could be damage to the Hertwigs epethelial root sheath or periodontal ligament.

Normal mobility of the transplanted tooth which correspond to bone formation is seen within 3 months and normal bone healing within 6months[22]. Periodontal healing is known to be completed after 8weeks [8,12]. Similar findings were observed in this study.

Maximum rates of eruption of autotransplanted teeth are found to occur between 30 and 60 days after transplantation[19]. Contrast to these findings all cases in this study did not show much of root development within this period and appreciable amount of root development was evident at 6 months followup period.

Our definition of success is based on the conclusions reached by Kristersson in his thesis[31]. All cases in this study showed normal signs and symptoms of healing in the three critical stages explained by Kristersson[6]. But only one case exhibited replacement resorption. The type of resorption present is important in determining the prognosis[24]. The presence of inflammatory resoprption is associated with a rapid destruction of the tooth root often leading to the early loss of the tooth; whereas replacement resorption involves a much slower destruction consistent with long term retention of the transplanted tooth. Cserepfalvi[32], Mezrow[33], and Hansen & Fiback[34] have reported cases where the ankylosed autotransplanted teeth has retained for many years. Hence, considering this the tooth in this study which exhibited ankylosis with no periapical pathology could be considered under success category.

The success rate for autotransplantations of various teeth differ widely with reported results ranging from 0% to near 100%[15,18]. However, in various studies, lower molar transplants have shown the best success rate ranging from 85% to 98%[9,16,20,21].The reasons for this is not clear but may include the fact that the lower third molar often has a root pattern similar to the first molar, whereas the upper third molar often has fused

roots that do not fit well into a three- rooted upper first molar socket. Unerupted upper third molars are difficult to stabilise and the periodontal ligament may get easily traumatised during removal[3].

Various authors have emphasized that autotransplantation of teeth is as successful as endoseous implant placement[17,18,21]. So, it becomes imperative to consider the advantages of autotransplantation over dental implants[2].

The success of tooth transplantation must be weighed against alternative methods of treatment including root canal therapy and crowning of the teeth, osseointegrated implants and exposure and orthodontic alignment of unerupted teeth, that might otherwise be candidates for transplantation.

Conclusion: Though large sample size and long follow up period would give a appropriate conclusion over the use of auto transplantation as a treatment option, considering the criteria's of success given by a few authors for a follow-up period of one year and also the success achieved in various studies worldwide, one can conclude that autotransplantation of teeth, when properly indicated and technically carried out with great care, will provide excellent results. Our results indicate that autotransplantation of teeth is a reliable method, with good prognosis for donor teeth with open apices. It is worth consideration in any case in which there is suitable donor tooth available and so, in selected cases, this method should be preferred over prosthetic rehabilitation in this era of implants.

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