

Table 2: Comparison of mobility at different intervals

Interval	Grade 0 (number of teeth)	Grade 1 (number of teeth)	Grade 2 (number of teeth)	Grade 3 (number of teeth)
At 2 nd week	0	18	24	0
At 1 month	0	38	4	0
At 3 months	34	4	4	0
At 6 months	34	0	4	0
After 1 year	34	0	0	0
χ^2 ; P		202.587, <0.001*		

Chi-square test; *Significant at $P < 0.05$ **Table 3: Comparison of ankylosis and resorption at different intervals**

Parameter	Interval	Absent (number of teeth)	Present (number of teeth)	P
Ankylosis	1 month	41	1	0.999 (NS)
	At 3 months	41	1	
	At 6 months	37	1	
	After 1 year	33	1	
Resorption	1 month	42	0	0.045*
	At 3 months	38	4	
	At 6 months	34	4	
	After 1 year	34	0	

Chi-square test; *Significant at $P < 0.05$. NS: Not significant

got extracted due to resorption in the present study which was responsible for lowering the success rate. Ankylosis was seen radiographically as obliteration of periodontal ligament and periodontal ligament space and the absence of lamina dura. Transplanted tooth shows the absence of root resorption and the presence of noninterrupted lamina dura on radiographs. Ankylosis is directly proportional to root damage. Transplantation of tooth with root damage leads to ankylosis.^[3] According to Akiyama *et al.*, periodontal ligament on root cementum plays an important role in ankylosis. Undamaged healthy periodontal ligament leads to transplantation without ankylosis.^[23] Therefore, for successful transplantation, surgeon must preserve periodontal ligament by performing atraumatic extraction without root damage. Time plays a crucial role from the moment; the extraction of the donor tooth is done till it gets implanted into the recipient site. As this period gets increases, damage to the periodontal ligament also increases which may ultimately lead to ankylosis of the tooth.^[10] Therefore, root canal treatment was done after transplantation to reduce this time to get healthy periodontal ligament. Tsukiboshi suggested tight closure of the gingival flap around the tooth to avoid bacterial contamination into the blood in periodontal space and for reattachment of periodontal ligament to the tooth.^[12] In the present study, one tooth was ankylosed, but it showed good prognosis postoperatively. A patient was satisfied with the prognosis.

Tsukiboshi suggested that if donor molar is not fitted in the first attempt of transplantation due to mismatching of dimensions, then 0.5 mm proximal side stripping of the donor molar is

mandatory.^[12] This technique has never been followed because of chances of damage to root cementum and periodontal ligaments.

Impacted third molars covered by follicle or in developing condition are easy to extract. Completely developed impacted third molar requires rotary and bur which may damage the tooth.^[24] Koszowski *et al.* used piezosurgery for transplantation of the third molar to reduce the damage.^[25] Teeth which were either vertical or mesioangular in position and easy to extract without sectioning were transplanted. Due to these reasons, case selection is very important in transplantation of teeth.

CONCLUSION

Immediate autogenous transplantation of the impacted third molar is a good alternative to replace nonrestorable molars with prosthesis which requires cutting of noncarious adjacent teeth. The authors concluded that the third molar transplantation is a very beneficial tooth replacement option using proper case selection and proper technique. For better success rate, root canal treatment should be done 1 month after transplantation.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Reich PP. Autogenous transplantation of maxillary and mandibular molars. *J Oral Maxillofac Surg* 2008;66:2314-7.
- Hale ML. Autogenous transplants. *Oral Surg Oral Med Oral Pathol* 1956;9:76-83.
- Thomas S, Turner SR, Sandy JR. Autotransplantation of teeth: Is there a role? *Br J Orthod* 1998;25:275-82.
- von Arx T. Autotransplantation for treatment of regional odontodysplasia. Case report with 6-year follow-up. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998;85:304-7.
- Josefsson E, Brattström V, Tegsjö U, Valerius-Olsson H. Treatment of lower second premolar agenesis by autotransplantation: Four-year evaluation of eighty patients. *Acta Odontol Scand* 1999;57:111-5.
- Lee SJ, Jung IY, Lee CY, Choi SY, Kum KY. Clinical application of computer-aided rapid prototyping for tooth transplantation. *Dent Traumatol* 2001;17:114-9.
- Mendes RA, Rocha G. Mandibular third molar autotransplantation – Literature review with clinical cases. *J Can Dent Assoc* 2004;70:761-6.
- Bae JH, Choi YH, Cho BH, Kim YK, Kim SG. Autotransplantation of teeth with complete root formation: A case series. *J Endod* 2010;36:1422-6.
- Czochrowska EM, Stenvik A, Bjørcke B, Zachrisson BU. Outcome of tooth transplantation: Survival and success rates 17-41 years posttreatment. *Am J Orthod Dentofacial Orthop* 2002;121:110-9.
- Andreasen JO. Periodontal healing after replantation and autotransplantation of incisors in monkeys. *Int J Oral Surg* 1981;10:54-61.
- Hernandez SL, Cuestas-Carnero R. Autogenic tooth transplantation: A report of ten cases. *J Oral Maxillofac Surg* 1988;46:1051-5.
- Tsukiboshi M. Autotransplantation of teeth: Requirements for predictable success. *Dent Traumatol* 2002;18:157-80.
- Yan Q, Li B, Long X. Immediate autotransplantation of mandibular third molar in china. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010;110:436-40.

14. Akkocaoglu M, Kasaboglu O. Success rate of autotransplanted teeth without stabilisation by splints: A long-term clinical and radiological follow-up. *Br J Oral Maxillofac Surg* 2005;43:31-5.
15. Watanabe Y, Mohri T, Takeyama M, Yamaki M, Okiji T, Saito C, *et al.* Long-term observation of autotransplanted teeth with complete root formation in orthodontic patients. *Am J Orthod Dentofacial Orthop* 2010;138:720-6.
16. Kallu R, Vinckier F, Politis C, Mwalili S, Willems G. Tooth transplantations: A descriptive retrospective study. *Int J Oral Maxillofac Surg* 2005;34:745-55.
17. Huth KC, Nazet M, Paschos E, Linsenmann R, Hickel R, Nolte D, *et al.* Autotransplantation and surgical uprighting of impacted or retained teeth: A retrospective clinical study and evaluation of patient satisfaction. *Acta Odontol Scand* 2013;71:1538-46.
18. Bauss O, Schwestka-Polly R, Schilke R, Kiliaridis S. Effect of different splinting methods and fixation periods on root development of autotransplanted immature third molars. *J Oral Maxillofac Surg* 2005;63:304-10.
19. Kristerson L, Andreasen JO. The effect of splinting upon periodontal and pulpal healing after autotransplantation of mature and immature permanent incisors in monkeys. *Int J Oral Surg* 1983;12:239-49.
20. Bauss O, Schilke R, Fenske C, Engelke W, Kiliaridis S. Autotransplantation of immature third molars: Influence of different splinting methods and fixation periods. *Dent Traumatol* 2002;18:322-8.
21. Newman M, Takei H, Klokkevold P, Carranza F. Clinical diagnosis. *Carranza's Clinical Periodontology*. 12th ed., Ch. 29. St. Louis, Missouri: Elsevier Saunders; 2014. p. 357-74.
22. Trope M. Clinical management of the avulsed tooth: Present strategies and future directions. *Dent Traumatol* 2002;18:1-1.
23. Akiyama Y, Fukuda H, Hashimoto K. A clinical and radiographic study of 25 autotransplanted third molars. *J Oral Rehabil* 1998;25:640-4.
24. Goyal M, Marya K, Jhamb A, Chawla S, Sonoo PR, Singh V, *et al.* Comparative evaluation of surgical outcome after removal of impacted mandibular third molars using a piezotome or a conventional handpiece: A prospective study. *Br J Oral Maxillofac Surg* 2012;50:556-61.
25. Koszowski R, Morawiec T, Bubilek-Bogacz A. Use of the piezosurgery technique for cutting bones in the autotransplantation of unerupted third molars. *Int J Periodontics Restorative Dent* 2013;33:477-81.