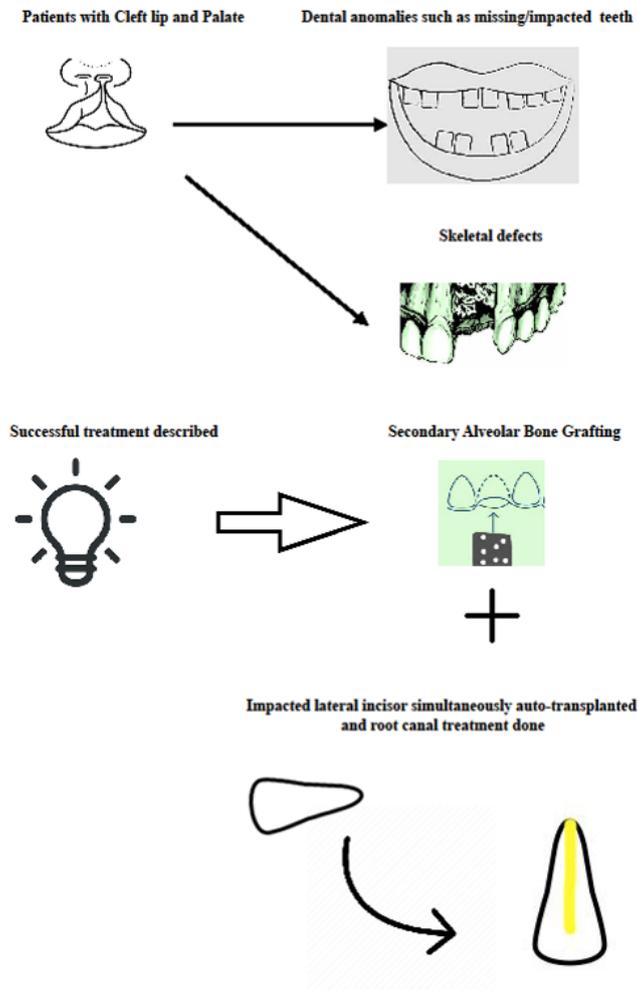


Simultaneous auto-tooth transplantation of an impacted lateral incisor to the alveolar bone graft site

N.S.S. Jayasuriya, S. Ratnapreya*, R.M.S.H.B. Medawela and M.P.P.K Cooray



Highlights

- In cleft patients, secondary alveolar bone grafting provides stability to the maxilla.
- Impacted and missing teeth pose a challenge in developing stable occlusion.
- Case report describes the simultaneous auto-tooth transplantation with secondary ABG.
- Only one such previously reported case in scientific literature.
- This treatment option provides aesthetically and functionally stable results.

CASE REPORT

Simultaneous auto-tooth transplantation of an impacted lateral incisor to the alveolar bone graft site

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Abstract: Secondary alveolar bone grafting (ABG) in cleft patients with a cleft alveolus provides stability to the maxillary arch. Occlusal anomalies accompanying the cleft, such as impacted and missing teeth pose a challenge. A 10-year-old girl with a right-sided cleft alveolus had her ipsilateral lateral incisor horizontally impacted. At the time of the ABG, the impacted lateral incisor was auto-transplanted followed by root canal treatment. Two years and eight months after treatment, the transplanted tooth was aesthetically and functionally stable. Secondary ABG with simultaneous auto-tooth transplantation is an option for alveolar cleft treatment, especially for severely malpositioned teeth with little scope for orthodontic alignment.

Keywords: Bone graft; secondary alveolar bone graft; cleft lip palate; tooth transplantation; orthodontics.

INTRODUCTION

Secondary Alveolar Bone Grafting (ABG), has a very high success rate (Mahajan *et al.*, 2017). This coincides with the spontaneous eruption of the permanent canine through the cleft and in most cases subsequent complete closure of the space. When teeth are congenitally missing or impacted, obtaining a well-aligned dental arch may be difficult. In these patients, the space is traditionally closed by means of prosthodontics including dental implants. Delayed auto-tooth transplantation (ATT) of teeth to the ABG site had been successful and recommended by some clinicians and the mandibular premolar teeth had been a popular choice (Aizenbud *et al.*, 2012).

For ATT to be successful when performed at the time of an ABG, a complete bone cover, water-tight closure, and good post-operative stability are necessary. The first report of successful autogenous tooth transplantation to an alveolar cleft at the time of the ABG is described by Miura *et al.* (2015). Though ATT of teeth into an alveolar cleft at the time of ABG seems a better option, it runs the risk of compromising the primary alveolar bone graft surgery leading to potential failure. Therefore, in order to recommend ATT as a routine procedure, more cases need

to be studied to evaluate prognosis and to understand the challenges. We believe this unusual case of auto-transplanting of an impacted lateral incisor to the alveolar bone graft site would contribute to proving the success of this procedure.

Case Report

A 10-year-old girl with a history of nonsyndromic right-sided cleft lip and palate had an impacted right lateral incisor placed horizontally in an unfavorable path of eruption (Figure 1). She had undergone cleft lip repair and cleft palate repair at the ages of 3 months and 10 months respectively. Past medical history was insignificant. Cone Beam CT scan showed no root curvature of the impacted tooth, thus atraumatic extraction was considered possible through the available space. Furthermore, the impacted tooth was well away from the roots of the other permanent teeth and no root resorption was noted. The cleft space was occupied by a tilted deciduous canine and the central incisor and adequate space for the lateral incisor was gained by pre-surgical orthodontics.



Figure 1: DPT radiograph; before preoperative orthodontic treatment.

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At the time of the ABG, the lateral incisor was harvested atraumatically and transplanted into the alveolar cleft. Platelet-rich plasma (PRP) and cancellous bone, harvested from the anterior tibia were used for the ABG. The transplanted tooth was splinted to the adjacent teeth for stability with good occlusal clearance (Figure 2).



Figure 2: Intra-operative photograph; after transplantation of lateral incisor splinted with wire and composite.

Endodontic treatment was performed in the second postoperative week followed by the removal of the splint (Figure 3). By the end of three years, the tooth showed good stability with no radiological evidence of root resorption. Informed consent of the patient and the parents were obtained for treatment as well as for clinical photographs.



Figure 3: Upper occlusal radiograph after 3 months; root canal treatment completed, satisfactory osteogenesis around lateral incisor.

DISCUSSION

In patients with alveolar clefts, ABG would provide a base for a stable occlusion that is functional and aesthetically pleasing. In a significant proportion of patients with a cleft

alveolus, dental anomalies are seen at the cleft site (Nicholls, 2016). This makes conventional orthodontic treatment alone inadequate in closing the dental gaps. Clinicians traditionally use fixed and removable prosthodontics to provide a stable occlusion (Van Nhan *et al.*, 2018). Fixed prosthetic methods are usually delayed until the patient completes the growth. ATT is a good alternative in such situations as it allows a natural space closure from the time of the surgery. ATT with mandibular premolars has been successfully performed to achieve a more natural treatment (Aizenbud *et al.*, 2013). This is done as a second surgery after the initial success of the ABG.

ATT into normal dental arches has good success rates. Tsukiboshi's (2002) sample of 220 cases that were followed up for 6 years showed a survival rate of 90% and a success rate of 82%. Bae *et al.*, 2010 reported only 3 failures out of 19 cases with a success rate of 84%. For a successful ATT without root resorption, the critical factor is the presence of intact periodontal ligament on the tooth surface in addition to minimal extra alveolar time (Andreasen, 1981). Complications of this procedure include ankylosis and root resorption (Rohof *et al.*, 2018). In contrast to the traditional method, ATT at the time of the ABG is more challenging. Therefore, more evidence is needed to comment on the prognosis. In the case discussed above, at the time of secondary ABG, root formation of the canine was incomplete. Thus, it was decided to auto-transplant the lateral incisor and plan treatment for the canine at an appropriate time. Furthermore, the clinical team concluded that a natural occlusion including a lateral incisor was preferred for this child.

CONCLUSION

In conclusion, ATT at the time of ABG surgery showed good clinical stability for almost three years. Current literature on this technique is scarce. We clearly found this treatment modality useful, especially, when an impacted tooth is found at the site of the alveolar cleft.

ETHICAL CLEARANCE

None of the clinical photographs is identifiable. Patient consent was taken for surgery and research.

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DECLARATION OF CONFLICT OF INTEREST

We have no conflicts of interest.

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