International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 12 Issue 10, October 2025, Impact Factor: 8.325

Case Report: Rehabilitation of Congenitally Missing Mandibular Incisors Using a Groper Appliance in a 10-Year-Old Female — One-Year Follow-Up

Dr Akshita Bansal[1], Dr. Arun Kumar[2], Ritu Namdev[3]

[1]MDS
[2]MDS, Professor, Post Graduate Institute of Dental Sciences, Rohtak, Haryana.
[3]MDS, Senior Professor and Head, Department of Paediatric and Preventive Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India.

ABSTRACT

Congenital absence of mandibular incisors can pose functional, esthetic, and psychological challenges during childhood. This case report describes the prosthetic rehabilitation of a 10-year-old female patient presenting with missing lower permanent incisors and a thin anterior alveolar ridge. The patient also had a medical history of chest tuberculosis treated with anti-tubercular therapy (ATT) one year prior. A modified mandibular Groper appliance was fabricated using bands on the first permanent molars and an anterior looped wire framework. Acrylic teeth were arranged following a diagnostic wax-up and processed using heat-cured acrylic resin. The appliance was cemented using glass ionomer cement (GIC). One-year follow-up demonstrated excellent esthetics, appliance stability, and satisfactory function.

INTRODUCTION

Congenitally missing permanent mandibular incisors are among the less common dental anomalies but can significantly impact a child's appearance, speech, and self-esteem. Early prosthetic replacement maintains arch integrity, prevents neuromuscular dysfunction, and supports psychosocial well-being. The Groper appliance, commonly used for anterior tooth replacement in children, offers a conservative, non-invasive solution suitable for growing patients. This report highlights its use in a medically stable pediatric patient with a history of tuberculosis.

Case Report

Patient History

A 10-year-old female presented with the chief complaint of missing lower front teeth affecting her appearance.

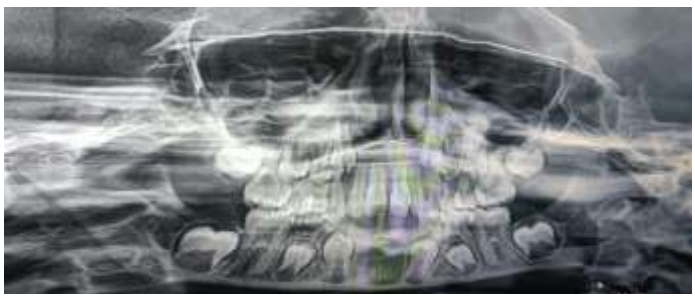
- **Medical history:** Chest tuberculosis at age 9, treated completely with ATT; no current symptoms.
- **Dental history:** Exfoliation of deciduous incisors with no eruption of permanent successors.

Clinical Examination

- Extraoral examination revealed no abnormalities.
- Intraoral examination showed **agenesis of all four permanent mandibular incisors (31, 32, 41, 42)**.
- The **anterior mandibular ridge was thin and narrow**, making future implant planning more sensitive.
- Good oral hygiene and healthy soft tissues were noted.

Radiographic Findings

An orthopantomogram (OPG) confirmed the **absence of permanent mandibular incisor tooth buds** with normal development of other permanent teeth.



Treatment Planning
Given the patient's age, thin ridge morphology, and medical stability post-ATT, a **Groper appliance** was selected to restore esthetics and function while maintaining space and preventing collapse of the anterior arch.

Procedure
1. Banding and Impression
Bands were adapted on the **mandibular first permanent molars (36 and 46)**.
A mandibular impression was made with bands in situ.

2. Appliance Design
The appliance framework was constructed with:
- A **lingual arch–type stainless steel wire** connecting the molar bands
- **Anterior loops** incorporated in the region of 31–41 to support prosthetic teeth
- Ensuring minimal palatal/lingual interference and optimal tongue space

3. Diagnostic Wax-Up and Tooth Arrangement
A wax-up was done in the lower incisor region following natural esthetic proportions. Acrylic teeth matching shade and size were positioned on the loop framework.

4. Laboratory Processing
The waxed-up segment was **heat-cured using acrylic resin**, finishing and polishing completed as per standard protocols.

5. Appliance Delivery
- The appliance was tried in, ensuring proper fit, phonetics, and lip support.
- Cementation was done using **type I GIC**.
- Post-cementation instructions were given regarding hygiene and appliance maintenance.

Outcome and Follow-Up
The patient was reviewed at 1 week, 3 months, 6 months, and 1 year.
- The appliance remained **stable and intact**.
- The patient reported **improved esthetics and confidence**.
- No soft tissue irritation or functional difficulties were noted.
- Growth changes were periodically monitored, confirming continued suitability of the appliance.

DISCUSSION

Early replacement of anterior teeth in children is crucial to address esthetic concerns and to support speech development and social confidence. The Groper appliance is advantageous because it is fixed, minimally invasive, preserves arch length, and adapts well to growth changes.

In this case, the presence of a thin ridge ruled out removable prostheses due to poor retention. The fixed Groper appliance offered a stable and esthetic interim solution. The patient's past history of chest tuberculosis did not pose any contraindication as she had completed ATT and was medically stable.

CONCLUSION

The Groper appliance proved to be an effective and conservative modality for rehabilitating missing mandibular incisors in a growing child. It restored esthetics, preserved space, and provided functional harmony over a one-year period. Such fixed prostheses serve as valuable interim options until the patient reaches an age suitable for definitive treatments such as orthodontic space distribution, ridge augmentation, or implant-based rehabilitation.

REFERENCES

[1]. Groper R. A pediatric mandibular incisor appliance. J Clin Orthod. 1984;18(7):530–531.
[2]. Nagaveni NB, Umashankar K. Management of missing mandibular incisors in children: A clinical perspective. J Indian Soc Pedod Prev Dent. 2011;29(3):249–252.
[3]. Andreasen JO, Kjær I. Etiology and clinical implications of dental agenesis in the permanent dentition. Textbook and Color Atlas of Tooth Impactions. 2nd ed. Copenhagen: Munksgaard; 2009. p. 93–102.
[4]. Polder BJ, Van't Hof MA, Van der Linden FP, Kuijpers-Jagtman AM. A meta-analysis of the prevalence of dental agenesis of permanent teeth. Community Dent Oral Epidemiol. 2004;32(3):217–226.
[5]. Bergendal B. When should we treat missing teeth in children? A systematic approach. J Oral Rehabil. 2017;44(6):434–446.
[6]. Santos L, Campos V, Line SRP. Congenital absence of permanent teeth and dental anomalies in children: A review. J Dent Child. 2012;79(3):101–106.
[7]. Proffit WR, Fields HW, Larson BE, Sarver DM. Orthodontic management of space problems. In: Contemporary Orthodontics. 6th ed. St. Louis: Mosby; 2018. p. 388–415.
[8]. Thilander B, Pena L, Infante C, Parada SS, Mayorga C. Prevalence of tooth agenesis and related dental anomalies in Latin American children. Angle Orthod. 2001;71(2):145–152.
[9]. Chung JH, Kim JT, Ahn YS. Prosthetic rehabilitation of missing mandibular anterior teeth in children using fixed functional space maintainers. Pediatr Dent. 2008;30(1):47–51.
[10]. Kumar S, Shetty RM, Dixit U. Groper appliance as an esthetic solution for anterior tooth loss in young children: A case report. J Indian Soc Pedod Prev Dent. 2015;33(2):159–162.