

# Aesthetic and Functional Rehabilitation for Missing Primary Anterior Teeth: Case Series

Drishti Shrestha,<sup>1</sup> Bandana Koirala,<sup>2</sup> Mamta Dali,<sup>3</sup> Sneha Shrestha<sup>4</sup>

<sup>1-4</sup>Department of Pedodontics and Preventive Dentistry, B.P. Koirala Institute of Health Sciences, Sunsari, Dharan, Nepal

Correspondence :

Drishti Shrestha. Email: drishtishrestha10@gmail.com

## ABSTRACT

The smiles of children shape their lives beyond expectations. Anterior teeth defects (ATDs), such as dental caries, traumatic injuries, or tooth loss can have profound social and psychological effects in children in addition to their functional problems. These problems may be unnoticed or underestimated by the parents/caregivers in children due to the shorter lifespan of primary anterior teeth. However, pediatric dentists are in a unique position to rebuild those lost smiles and restore the spirits of these little ones. Thus, this paper aims to highlight the different modalities of aesthetic rehabilitation of premature loss of primary anterior teeth in children.

In the first case, comprehensive management of severe early childhood caries (S-ECC) was done, followed by aesthetic and functional rehabilitation using the Groper's appliance. The second case shows the aesthetic rehabilitation of pulpally involved maxillary incisors using the omega post and strip crowns after completing the endodontic treatment. In the third case, traumatized maxillary incisors were extracted and rehabilitated using a removable aesthetic space maintainer. This case series thus emphasizes the tailored treatment strategies for aesthetic rehabilitation of anterior teeth in preschoolers, effectively restoring the function and aesthetics, using appropriate modalities.

**Keywords:** Aesthetics; anterior teeth defects; children; psychological.

## INTRODUCTION

Smile is a universal gesture of warmth, and teeth are an integral component of one's smile and facial aesthetics. The most common problems in childhood leading to the structural damage of primary maxillary anterior teeth include early childhood caries and dental trauma.<sup>1</sup>

Anterior teeth play a pivotal role in facial aesthetics, phonetics, maintaining a child's self-esteem, social and physiological adjustment, and the prevention of aberrant oral habits. They also hold equal significance in guiding the eruption of

permanent successors and supporting the perioral musculature.<sup>2-5</sup> The articulation of certain consonant sounds, such as 'v', 'f', 'th', 's', and 'z', develops in early childhood and relies on the presence of the maxillary anterior teeth for their pronunciation.<sup>3</sup>

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Another consequence of premature loss of primary anterior tooth is the development of atypical swallowing, with tongue thrusting occurring in the unnatural space and subsequent malocclusion.<sup>6</sup>

Nowadays, increasing awareness among the general population, particularly through electronic media, has led to younger children, even those under three years old, becoming conscious of their appearance and prompting parents to consult dentists for aesthetic reasons due to missing or discoloured anterior teeth.<sup>7</sup> Children with anterior dental defects are often perceived as less attractive by their peers, which may result in peer bullying, reduced confidence in smiling or laughing, limited social interactions, decreased academic performance, and even an increased risk of developing depression and anxiety.<sup>8</sup>

Anterior teeth restoration with improved aesthetics and function, along with space management, has always been a challenge for pediatric dentists. This has led to innovations and the development of newer treatment modalities to solve these problems. However, a single management approach may

not be suitable for all patients. Considering the importance of rehabilitating early loss of primary anterior teeth, this article reports three cases in which pediatric patients with varying patterns of tooth/teeth defects were successfully rehabilitated with various approaches.

## CASE REPORTS

### CASE 1

A five-year-old female child reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of decayed upper front teeth for five months. It was her first dental visit. Medical history was non-contributory. The behaviour of the patient according to Frankl's behaviour rating scale<sup>1</sup> was negative (-). Her parents were concerned about her aesthetics and difficulty in biting food. On intra-oral examination, multi-surface caries on 55, 53, 63, 75, 74, 84, 85, pulpal involvement in 65, root stumps of 54, 52, 51, 61, 62, 64, labial surface caries on 83, and proximal caries on 71, 81 were noted (Figure 1).



**Figure 1: Pre-operative intraoral pictures; A: Frontal view, B: Maxillary occlusal view, C: Mandibular occlusal view.**



**Figure 2: Pre-operative orthopantomogram.**



**Figure 3: Post-operative intraoral pictures; A: Frontal view, B: Maxillary occlusal view, C: Mandibular occlusal view.**



**Figure 4: Post-operative orthopantomogram.**

After the clinical and radiographic evaluation, the final diagnosis of severe early childhood caries was made. On caries risk assessment,<sup>9</sup> this child was categorized under high risk. Oral hygiene instructions were given, diet counselling and modifications were done, and reinforcement in every visit was carried out.

Deep caries management on 55 and 75, along with pulpectomy on 65, placement of stainless-steel crowns on 55, 65, 75, 74, and 84. Aesthetic restorations using composite on 53 and 63, and GIC restoration on 85, along with disking of 71 and 81, followed by fluoride varnish application, were carried out. Extraction of all root stumps (54, 52, 51, 61, 62, and 64) was done, followed by aesthetic and functional rehabilitation with modified Groper's appliance (Figures 3 and 4).

## CASE 2

A 4.5-year-old female child reported to the Department of Pedodontics and Preventive

Dentistry with the chief complaint of pain in the upper front teeth for 10 days. It was her first dental visit. Medical history was non-contributory. Her behaviour, according to Frankl's behaviour rating<sup>1</sup> was negative (-). History revealed that she was constantly made fun of by her classmates due to her missing front teeth, and thus wanted to get the treatment.

On clinical examination, arrested caries on 54, 64, 74, and 84, deep pits and fissures on 55, 65, 75, and 85, and root stumps of 51, 52, 61, and 62 were present (Figure 5). Final diagnosis of severe early childhood caries was made. On caries risk assessment,<sup>9</sup> this child was categorized under high risk. Oral hygiene instructions were given, diet counselling and modifications were done, and reinforcement on every visit was carried out thereafter.



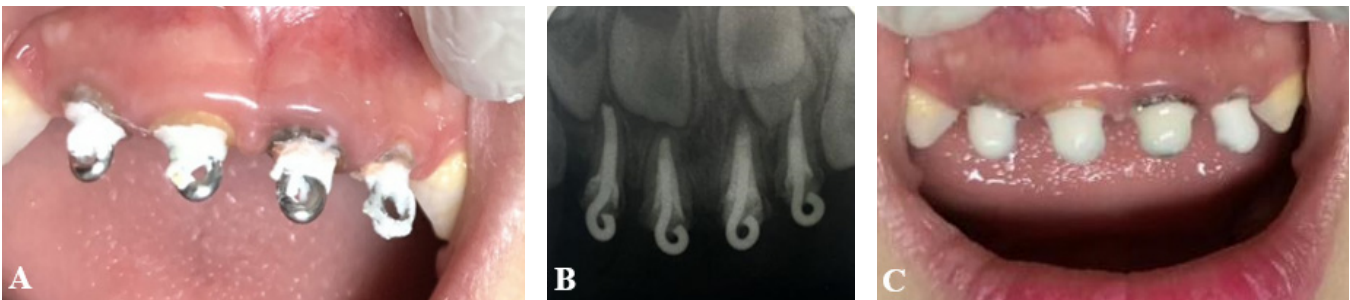
**Figure 5: Pre-operative intraoral pictures. A: Frontal view, B: Maxillary occlusal view, C: Mandibular occlusal view.**



**Figure 6: Pre-operative IOPAR.**

Pit and fissure sealant application on 55, 65, 75, and 85, stainless-steel crowns placement on 54, 64, and 84, and GIC restoration on 74 were done. Pulpotomy was performed on 52, 51, 61, and 62, followed by stainless-steel omega posts fabrication

and cementation using GIC luting cement. Thereafter, the GIC core build-up was done, and final aesthetic rehabilitation of the anterior teeth was achieved using strip crowns (Figures 7 and 8).



**Figure 7: Intra-operative pictures. A: Cementation of omega posts, B: IOPAR after cementation of the omega posts, C: GIC core build-up.**



**Figure 8: Post-operative pictures: A: Frontal view, B: IOPAR after strip crowns.**

### CASE 3

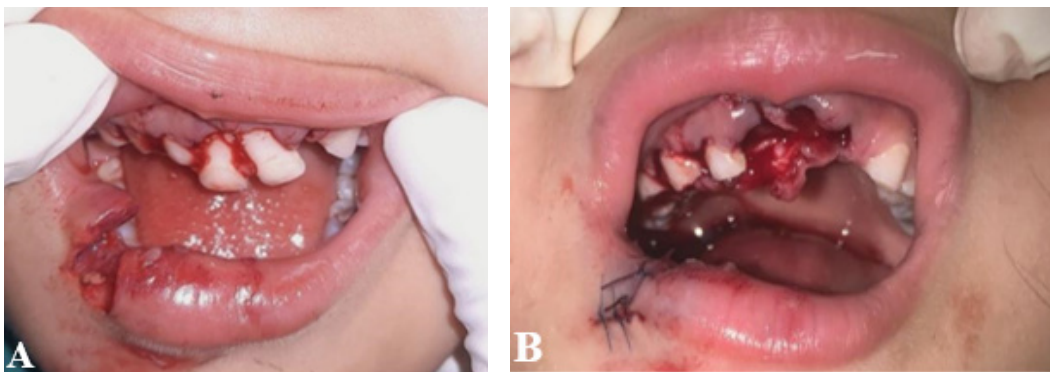
A five-year-old female child had presented to the Pediatric emergency with an alleged history of a road traffic accident one hour back. The medical history of the patient was non-contributory. Behaviour of the patient according to Frankl's behaviour rating scale<sup>1</sup> was negative (-).

On intra-oral examination, soft tissue laceration on the right side of the lower lip, extrusion of 51 and 61, intrusion of 52 with mild palatal displacement, and avulsion of 62 were present (Figure 9A). Extruded teeth 51, 61 were extracted, and soft tissue laceration was repaired using Vicryl 4-0 suture at the Pediatric emergency (Figure 9B).

Analgesics and antibiotics were prescribed, and the patient was advised to perform warm saline rinses and maintain oral hygiene. The patient was kept on regular follow-up.

At one-week follow-up, the patient complained of pain in the lower left back region of the mouth. On intra-oral examination, deep occlusal caries involving pulp on 75, and deep retentive pits and fissures on 36 and 46 were noted (Figure 10).

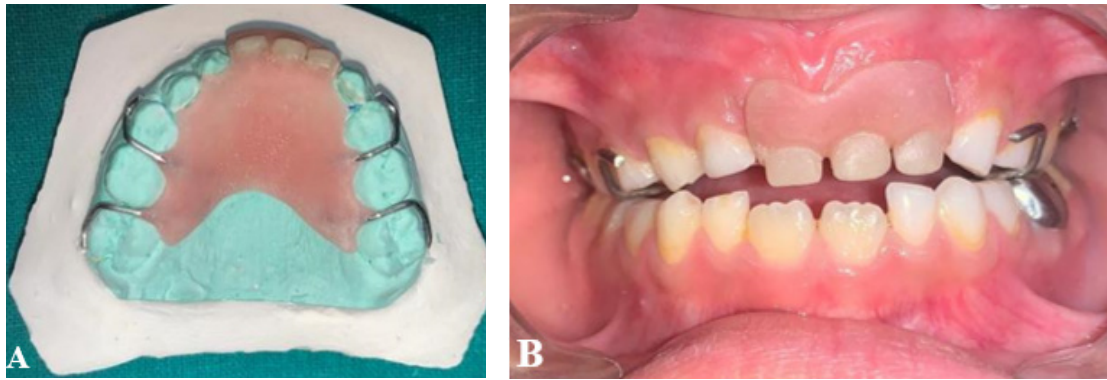
Pit and fissure sealant application on 36 and 46, followed by pulpectomy and stainless-steel crown placement on 75, and anterior aesthetic rehabilitation using a removable aesthetic space maintainer were performed (Figure 11).



**Figure 9: A: Pre-operative picture, B: Immediate post-operative picture after lip repair and extraction of extruded 51 and 61.**



**Figure 10: One-week follow-up intra-oral pictures: A: Satisfactorily healed wound of the lower lip and intra-oral extraction socket, B: Maxillary occlusal view, C: Mandibular occlusal view.**



**Figure 11: A: Fabrication of the removable functional space maintainer, B: Insertion of the removable functional space maintainer.**

## DISCUSSION

Premature loss of primary anterior teeth as early as five years of age often causes aesthetic compromise, poor self-esteem, and the development of deleterious oral habits like the tongue thrusting habit. According to Waggoner and Kupietzky, “first, the strongest factor for placing an anterior aesthetic appliance is parental desire.”<sup>10</sup> In all three cases, parents were very much concerned about their child’s facial appearance. The selection of an appliance depends upon a number of factors, some of which include the child’s stage of dental development, dental arch involved, missing tooth, status of the teeth adjacent to the lost tooth, patient compliance, appliance integrity, maintenance, and modifiability.

In the first case, the Groper’s appliance was delivered following the early loss of primary maxillary incisors. This fixed aesthetic appliance is particularly effective in young children who may not cooperate with the removable appliance. The 10-month follow-up showed good patient and parental satisfaction, compliance, and acceptance. Jalan et al. successfully utilised the same method for aesthetic rehabilitation in a 3.5-year-old child.<sup>4</sup> The second case involved severely mutilated primary anterior teeth with sufficient root structure. The stainless-steel omega loop posts and core were designed to provide intracanal retention for a strip crown. The patient’s aesthetics and, thereby,

the confidence got fully restored, magically transforming the child with a negative behaviour in her first dental visit, into a definitely positive one on the follow-up visits. Gugnani et al. had also used a similar approach for the rehabilitation of primary anterior teeth using strip crowns.<sup>2</sup> In the third case, a removable, aesthetic functional space maintainer was used to replace the multiple missing teeth, offering not just space maintenance but aesthetics, hygiene, and prevention of the development of tongue thrusting habit. Another report by Rai et al. effectively restored the smile of a five-year-old child using a removable functional space maintainer.<sup>11</sup> In the present case series, each method was selected based on the parents’ concern and the patient’s age, cooperation, and clinical condition. This paper highlights a tailored approach, offering a low-cost, minimally invasive, and well-performed alternative measure for the prosthetic rehabilitation of the early loss of anterior primary teeth in pediatric patients.

## SUMMARY

Premature loss of primary anterior teeth is often neglected by the parents because of their short life span and subsequent permanent teeth eruption. However, the problems associated with their early loss are beyond expectations. Thus, considering the child’s aesthetics, phonetics, mastication, social and psychological factors, it is important to restore all these at the earliest possible. In the present case series, rehabilitation of the anterior teeth not only

improved the patients' smile and aesthetics but also helped in maintaining and improving the children's self-esteem and social acceptance, particularly from their peers.

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Department of Pedodontics and Preventive Dentistry, B.P. Koirala Institute of Health Sciences, Sunsari, Dharan, Nepal.

**Conflict of interest:** None



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