

An esthetic point of view in very young children

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Extensive carious breakdown of primary anterior teeth to the cervical level and their loss in very young children invariably leads to lack of confidence and self-esteem and may cause psychological problems. The present paper deals with the management of three such cases by means of biological restorations, anterior fixed space maintainer and over-dentures.
J Clin Pediatr Dent 30(2): 99-104, 2005.

INTRODUCTION

With the growing general awareness, particularly through electronic media, many children, even as young as 3 years, are becoming conscious of their appearance and are prompting parents to report to dentists for esthetic reasons due to missing or discolored front teeth. The loss of esthetically essential anterior teeth in early childhood may affect the child's confidence and can tell upon his normal personality development, if not corrected. The anterior teeth may be lost due to traumatic injuries or extensive caries to the level of root stumps, and are known to cause abnormal habits and speech difficulties. Satisfactory restoration of these teeth, improving esthetics, along with management of space and function has always been a challenge for pediatric dentists. An ever-increasing demand for esthetics has led to innovations and development of newer treatment modalities for these problems. However, one management proto-

col may not fit for all types of patients with the above-mentioned problems. The present paper deals with a few treatment options for the management of such cases.

Case Report I: Biologic restorations

A 4-1/2-year-old girl, conscious of her appearance, presented to the Out Patient Unit of Pediatric Dentistry, Oral Health Sciences Centre, PGIMER, Chandigarh with the chief complaint of poor facial appearance due to discolored and worn out front teeth. On examination, the child was found to have multiple carious lesions with root stumps of the maxillary primary central incisors. Clinically, the root stumps of 51 and 61 were found to be firm, with an extension of the remaining crown of less than 1 mm above the gingival margin. An intraoral periapical radiograph of these teeth showed totally intact roots and normal development of permanent successors. The management of this patient consisted of, giving complete preventive care, along with, restoration of all decayed teeth with composite resin (Figure 1). For her chief complaint of grossly decayed maxillary central incisors, a decision to rehabilitate with biologic restorations was made, and for

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Figure 1. Child's dentition showing broken down 51 and 61.

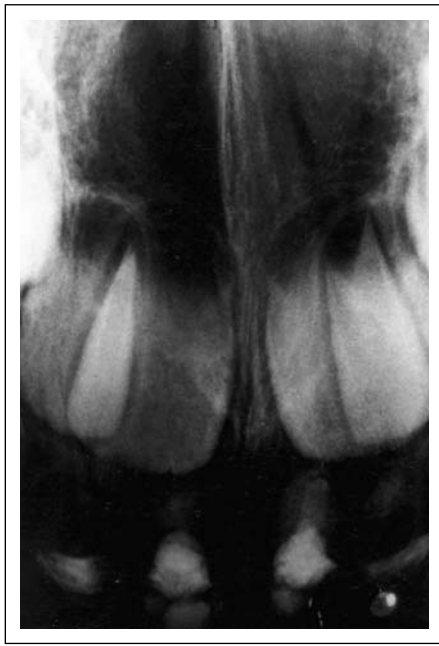


Figure 2. Restored 51,61 with short composite posts.



Figure 3. Biologic restorations in 51 and 52 at 2 months follow up.

this, informed consent from the parents was taken. In order to restore 51 and 61, endodontic treatment of the retained root stumps was carried out using calcium hydroxide as the filling material. After a one-month follow up, the glass ionomer cement seal in these teeth was reduced to expose 1/3rd of the root canal to receive the intracanal short composite posts. Ten percent ferric chloride cords were used for gingival retraction and the canals were prepared by etching and bonding. The composite posts were made by gradually adding composite resin in the prepared canal to have a post extension of about 2-3 mms in the root beyond the cemento-enamel junction and coronally to about 2/3rd the crown length. The crowns, used for replacement were the naturally exfoliated teeth obtained from the tooth bank of the unit of Pediatric Dentistry. These crowns were thoroughly washed and autoclaved prior to use. The natural tooth crowns were trimmed to the level of cemento-

enamel junction, etched with 40% ortho phosphoric acid, bonded and cemented with composite resin on the prepared composite posts. The cervical crown margin was flushed with the root using a tapered composite finishing bur and the restoration was polished with polishing discs. (Figure 3)

Case Report 2: Anterior fixed replacement of a tooth

A 5- year old girl visited the department primarily concerned with a gap due to a recently lost upper front tooth along with a fractured front tooth. On examination 51 was found to be missing and an earlier restored 61 was fractured at the cervical level exposing an arrested dentinal caries, as a result of trauma a few weeks back (Figure 4). The history of the patient revealed that she had been treated 6 months back, in the department for multiple carious lesions involving many primary teeth. At that time, the treatment had included endodontic treatment of the maxillary first molars; composite restorations of all maxillary anteriors and second molars and stainless steel crowns for hypoplastic lower second molars. The patient had not reported for placement of stainless steel crowns on all upper molars. The present fracture of 61 was restored using the biological restoration technique after endodontic treatment as previously described in the case report. For the missing 51, a decision to replace it using a fixed appliance was made. The clinical procedure of appliance fabrication consisted of placement of the stainless steel crowns on endodontically treated 54 & 64. Stainless steel crowns were also placed on grossly carious 55 and 65, previously restored with composite. After impressions the crowns were transferred to the stone casts for the replacement of the missing 51. A 21-gauge stainless steel wire was adapted palatally along the full arch circumference from 54 to 64 and the ends of the wire were soldered to the middle third of the crowns. Another wire extension of similar dimension was soldered to the adapted wire framework so that it extended vertically into the space of 51. An acrylic crown matched with 61 in size, shape, shade and contour was attached to the vertical wire extension using



Figure 4. Pre-operative view showing fractured 61 and missing 51.

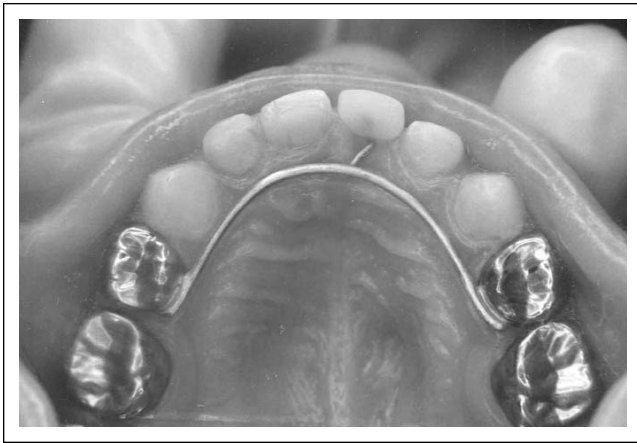


Figure 5. Occlusal view of the wire framework.

cold cured acrylic (Figure 5). The excess resin was trimmed and the crown along with the attached wire framework was finished and polished. The entire framework was then placed into the patient's mouth by cementing the crowns on 54 and 64. Appropriate oral hygiene instructions were given to the patient. The follow-up after 3 months showed the prosthesis to be successfully catering to the esthetic needs of the child. (Figure 6)

Case Report 3: Over dentures

A 5-year old boy reported with the chief complaint of sagging lips with non-healing bruises at the corners of the mouth causing pain, and difficulty in eating due to grossly decayed teeth. On examination, the angles of the mouth were found to be drooping and inflamed due to loss of vertical dimension resulting from a grossly decayed total primary dentition, to the level of root stumps (Figure 7). An orthopantomograph was taken, which revealed presence of all permanent successors with 31 and 41 about to erupt. Clinical examination of the maxillary arch revealed carious but firm root stumps of upper anteriors with missing 61 as a result of caries. On the right maxillary segment molars were cariously exposed with only 1 mm of tooth structure



Figure 7. Mutilated primary dentition.



Figure 6. Biological crown in 61 and fixed replacement of 51.

remaining on all sides. The left side molars were grossly carious and broken down with caries extending subgingivally. The mandibular teeth were likewise carious and broken down but lower central incisor root stumps were carious and mobile. The lateral incisors were carious with slight mobility; and the canines with caries on buccal and lingual surfaces. In the posterior mandibular segments there was gross destruction of the lower molars, with caries extending subgingivally. The treatment planning comprised of endodontic treatment of the firm root stumps with a coronal extension of at least 1mm beyond the gingival margin and extraction of grossly destroyed, carious, mobile root stumps and those about to exfoliate. Based on these criteria, in the maxillary arch, left primary molars were extracted and in the lower arch first and second primary molars on both sides and primary central incisors were extracted. The remaining teeth in the maxillary arch were treated endodontically and sealed with composite resin (Figure 8). In the lower arch, the primary canines and lateral incisors were restored with composite resin. After a one-month follow-up, a decision to fabricate an acrylic over-denture for the maxillary arch and a removable partial denture for the lower arch was taken.

The upper roots stumps sealed with composite resin



Figure 8. Endodontically treated primary roots sealed with composite.

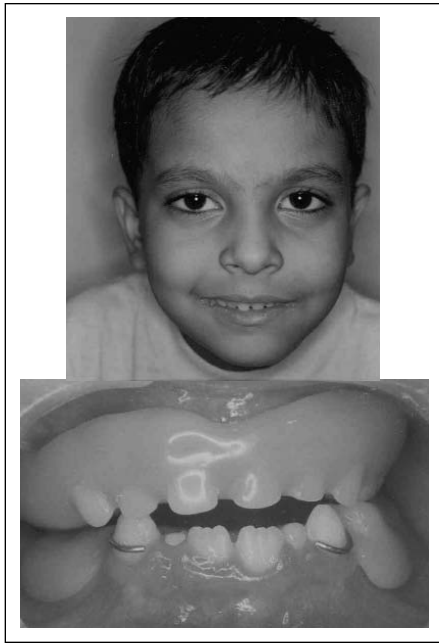


Figure 9. Satisfied patient with upper over denture and lower partial denture.

were trimmed and rounded to remove any sharp edges. Alginate impressions of both upper and lower arches were made and casts poured in stone. Base plates were adapted on the stone casts and border molding was done. The final impression was made in rubber base and poured in dental stone. Following this a wax record bite was registered into the patients mouth and transferred to the final casts. Due to the loss of vertical dimension, the alveolar arches were in contact posteriorly on the right side. The vertical dimension was raised by 2-3mm approximately, to accommodate at least the upper and lower acrylic plates. The casts with transferred bite were articulated, tooth setting was done, dentures fabricated in heat cure and delivered to the patient (Figure 9). A three-month follow up of the patient showed him to be comfortable with the dentures. The lower first permanent molars and central incisor were found to be erupting. The lower plate was trimmed distally to accommodate the erupting molars.

DISCUSSION

Despite a decline in the overall caries prevalence, its incidence still remains high in certain population groups. Incidence as high as 18% in 2 - 4-year-old and 52% in 6-8 years old children has been reported (Kaste et al., 1996).¹ With the high infliction of early childhood caries, the number of children seeking treatment for grossly broken down anterior teeth is quite large as compared to the providers and besides there exist no standardized techniques of restoration of such teeth.

The modality of management of totally broken down anterior teeth consist of two components i) short intracanal support for core build up ii) restoration of

the crown anatomy. For intra-canal support i) composite posts,^{2,4} ii) short wire posts (omega loop),³ iii) short coil spring posts, iv) readymade fiber posts⁴ and v) dentinal posts⁵ have been used. The methods for restoring the crown anatomy are i) direct composite build up by layering method, ii) composite build up using celluloid strip crowns,⁶ iii) open faced stainless steel crowns,⁷ iv) biological facial veneers,⁸ v) and biological shell crowns.^{5,9}

In the present first case report, short composite posts along with biological shell crown restorations were used. The tensile bond strength of the intracanal posts using either composite resin, wire loops or fiberglass material has been shown not to differ significantly.⁴ The technique of short composite posts has been successfully used by many clinicians earlier and is known to give good results due to a strong chemo-mechanical bond created between the resin and the tooth root which become one single unit. Other options is the use of wire posts, which, though successful, needs to be specifically fabricated for each tooth; an additional composite build up around it is anyway required. Following the build up of composite posts, prepared shells of naturally exfoliated primary teeth have been used for building the crown anatomy in the current case report. Ana et al.⁵ (2003) used the natural crowns for rehabilitation of grossly decayed primary anterior teeth and coined the term 'biologic restorations' for such rehabilitations. Mandroli⁹ (2003) also showed promising results with this technique. Busadori et al.⁸ (2003) used a biological labial veneer to mask the gross discoloration of a traumatized primary incisor. A complete natural shell crown however, needs to be used when the tooth contours are lost on all sides. The technique of using biologic restorations holds better promise as compared to the routinely carried out rehabilitations with direct composite resin build up, because of excellent esthetics due to acquisition of natural crown anatomy coupled with less clinical time required. Ana et al. have also reported better gingival health with this technique as a result of lesser plaque retention. It was seen that the restoration carried out with this technique offered a greater satisfaction to the patient, parent and the dentist himself. Biologic crowns, though well accepted, do suffer from limitations on account of not being readily available due to the absence of human tooth banks on a large scale in many countries. They also require pre-operative preparation such as sterilization and preparation of natural tooth shell. Moreover, some parents may find the technique objectionable and may not readily accept it. In the second present case report, a fixed functional space maintainer has been used for restoring a single lost primary central incisor, instead of a conventional removable acrylic plate. It is an effective treatment alternative with dual advantage of aesthetics as well as space maintenance. Unlike a removable acrylic plate, it does not

rely on patient compliance for its use. It is patient friendly, as the young child is unaware of its existence during regular day-to-day wear. In the third case report, where there was loss of coronal portion of the primary teeth to the level of root stumps a lower removable partial denture and an upper complete overdenture were indicated and delivered as fixed space maintainers were not feasible. The removable full and partial denture offered the advantages of restored function and esthetics at an impressionable age of this child patient.

Unlike adult dentition where customary post and core can restore the teeth broken down to cervical level, in the primary dentition, since physiological resorption has to occur, innovations for short retentive posts are needed. Teeth lost in the anterior region infrequently require space maintenance, but there rehabilitation is important for the psychological purposes as many times children suffer without being vocal about it. An intervention, as reported in the present case reports, would help the child to psychologically grow into a balanced personality. With the current interest of clinicians to these problems coupled with the advent of newer modalities and materials many options would become available for the restoration of such teeth.

CONCLUSION

There exist no standardized procedures to restore broken down primary anterior teeth to the gingival level. These grossly broken down or lost anterior primary teeth require a different management solution. The use of biologic restorations over short composite posts after root canal on anterior teeth provides one type of treatment means for such teeth as depicted in the first case report in the present series. In the second case report, where 51 was missing; instead of a removable partial denture a fixed appliance with an anterior pon-

tic taking support from the stainless steel crowns on 54 and 64 with was given. In the third case where teeth were totally broken and there were no teeth to seek the anchorage, complete dentures were given. It is important to restore such anterior broken down primary teeth because in all the three-presented cases discussed here not only the children but also the parents were psychologically disturbed, and were satisfactorily relieved after treatment

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