



## FIXED PROSTHETIC RECUPERATION IN A 9-YEAR-OLD CHILD WITH RARE HYPODONTIA- A CASE PRESENTATION

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### ARTICLE INFO

#### Article History:

Received 15<sup>th</sup> May, 2020

Received in revised form 7<sup>th</sup> June, 2020

Accepted 13<sup>th</sup> July, 2020

Published online 28<sup>th</sup> August, 2020

#### Key words:

Anodontia, Fixed Prosthesis, Zirconia, Oral hygiene.

### ABSTRACT

**Introduction:** Anodontia is a common developmental disturbance that requires prosthetic rehabilitation in children with the motive to improve their normal growth and development of orofacial structures, psycho-emotional social and physical growth of a child. The fixed zirconium prosthesis gives the advantage of being more strong and stable in the mouth with good esthetics and requires less maintenance.

**Case presentation:** 9-year-old girl with anodontia and poor oral hygiene reported to our department. She was treated first for oral hygiene and then prepared for lower zirconium fixed partial prosthesis to restore occlusion, masticatory functions and aesthetics.

**Conclusion:** Correct prosthetic restoration in a growing child must not in any way hamper proper growth and development of alveolar jaw bones, and eruption of permanent teeth, rather it should preserve the oral and peri-oral tissues, steer growth of permanent dentition in a most inert way.

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### INTRODUCTION

Developmentally missing teeth are one of the most common dental anomalies reported in the literature and it is very uncommon in deciduous dentition. Hypodontia is associated with reduced alveolar ridge development and retained primary teeth with increased free way space and is thought to be involved with mutation of *AXIN2* gene.<sup>1</sup>

Absence of teeth may cause masticatory difficulties, nutritional deficiencies, speech problems, and compromised facial appearance. Prosthetic treatment can play an important role in these children in order to achieve the desired function and esthetics. In contrast to conventional removable complete and partial prosthesis, fixed prostheses are patient-friendly and provide a more even and enhanced hygienic and aesthetic result. Fixed prostheses help in improving vital functions like speech and mastication and have fewer negative consequences than other prostheses, which makes them the perfect choice for young patients.<sup>2,3</sup>

#### Case presentation

A 9-year-old girl came to the Department of Pediatric and Preventive Dentistry, along with her parents with the chief complaint of mobility in her lower front teeth region with no history of trauma.

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The child was diagnosed with poor oral hygiene with severe calculus deposition (Fig 1) but no other medical conditions were stated. The mother reported that the child did not brush regularly. The patient's intraoral examination revealed that she had one retained mandibular left primary central incisor which showed grade 3 mobility held in place by large chunks of calculus. The occlusal contact was between the upper and lower permanent canines, and molars were found to be in Class I relationship. The patient's oral mucosa was normal otherwise.

Radiographic investigations included an intraoral periapical radiograph that revealed absence of both permanent mandibular central incisor tooth germs. The upper and lower permanent canines were erupted to the normal occlusal level. Treatment options included removable partial denture, fixed partial denture or an implant. Removable partial dentures are the most common treatment modality in children with congenitally missing teeth, but these prostheses can have retention problems, require frequent adjustments and many children do not want to remove and wear the prosthesis every time leading to compromised oral hygiene maintainance.<sup>2</sup> Implants were not cost effective hence both the options were excluded.

Considering the parent's request for a more conservative and long lasting option, the last treatment that was discussed with the family was the fixed partial denture.

The parents preferred a fixed prosthesis. The lower arch was planned for a 4-unit full ceramic zirconium bridge considering

the two abutments as lower permanent lateral incisors hence replacing the missing central incisors.

The treatment plan scheduled was oral prophylaxis followed by extraction of retained mobile primary tooth, followed by tooth reduction for fixed prosthesis.

Once oral prophylaxis and extraction were completed uneventfully, (Fig 2) occlusion was checked and was noted. 2-mm occlusal reduction of the lower permanent lateral incisors was required to obtain the incisal clearance and allow the coverage of the lower lateral incisors with zirconium ceramic crowns.

At the patient's next appointment, the parents were informed about the procedure. The patient's mandibular lateral incisors were carefully reduced using a high-speed diamond fissure bur to create a 2- 2.5 mm free space between the upper and lower permanent lateral incisors. Shade selection was done with the VITA classical shade guide (VITA North America, USA), and the shade B2 was selected. (Fig 3)

Upper and lower primary alginate impressions with perforated metal tray, alginate and wax bite registration were taken and sent to the laboratory for fabrication. (Fig 4)

Temporary acrylic crowns were placed on the vital reduced teeth and instructions were given to avoid consuming sticky and hard food, and oral hygiene instructions were given. The child's parents were informed that she might experience some discomfort.

After 1 week, the girl was called up for the prosthesis fixation. Intraoral examination revealed that gingival remodeling has further occurred around the extraction socket. The lower FPD was tried in the mouth.

Retention, resistance, esthetics, phonetics, occlusion and function were checked, and the bridge was cemented with Fuji Type 1 luting cement. Dietary and oral hygiene instructions were reinforced. (Fig 5)

Re-establishment of occlusion led to a favorable increase in vertical dimension with an increase in the height of the lower third of the face. The girl's parents were instructed to encourage her to speak out loud to improve her phonetics. They were informed about the possibility of discomfort, difficulty in eating, and unclear pronunciation in the first few weeks.

After 1 month of patient follow-up, the mother reported that the girl had slight difficulty in pronouncing some specific words and numbers, in addition to food accumulation around the lower fixed prosthesis.

Oral hygiene instructions were reinforced, and the use of interdental proxa brushes and floss were given to help clean around the abutment. Follow up appointments were scheduled after 3 months. (Fig 6)



Fig 1 Represents Poor Oral Hygiene of the patient



Fig 2 Post Oral Prophylaxis and extraction



Fig 3 Post Crown reduction



Fig 4 Alginate Impression of lower arch



Fig 5 Cementation of zirconia prosthesis



Fig 6 After 3 months follow up

## DISCUSSION

There are many treatment modalities that have been reported for children suffering from anodontia/ hypodontia or oligodontia. Removable conventional complete or partial denture, were usually the treatment of choice owing to ease of fabrication and modification in a growing child.<sup>3,4,5</sup> However, retention and stability can be compromised because of the underdevelopment of alveolar ridges and the dryness of oral mucosa, which requires frequent relining or replacement, especially when a decreased vertical dimension of occlusion or abnormal mandibular posture is detected.<sup>2</sup> Fixed prosthesis in children are gaining popularity because of their superior aesthetics, and improved retention and stability.

Zirconia crowns are relatively new in dentistry, as it was first introduced by Suttor *et al* in 2001, although the material itself has been in use for orthopedic hip surgeries since 1960s. Zirconia used in dental crowns is yttrium stabilized zirconia. The advantage of this is that it provides the dental zirconia with highest flexural strength of all zirconia based materials, alongside high chemical and erosion resistance. Moreover the material is biocompatible, hypoallergenic, and with similar durability as natural enamel.<sup>6</sup>

These crowns cannot be adjusted unlike stainless steel crowns, zirconia crowns for primary teeth as it comes prefabricated with specific characteristics. Because of this reason the zirconia based fixed prosthesis was trial-fitted before permanent cementation, to check proper margin and occlusion.<sup>6</sup>

Another advantage for zirconia crowns are that unlike traditional ceramic, zirconia crowns for primary teeth demonstrate low wear on the opposing dentition. Zirconia and stainless steel crowns demonstrate lowest wear rates amongst materials for full coverage paediatric dental crowns, along with excellent esthetics of prefabricated zirconia crowns makes them fully usable in restorations in both anterior and posterior regions with good durability and lifespan.<sup>6</sup> A review carried out by Gabrovskaja *et al*, suggested that in 2007 first preformed zirconium crowns were fabricated for children who had severely damaged, discoloured, malformed, or completely missing teeth.<sup>7</sup>

Ou-Yang *et al* used FPDs with stainless steel bands cemented on primary molars to restore multiple missing teeth in two 3-year-old twin girls with Ectodermal Dysplasia. Their reasoning behind this appliance design was lack of anterior abutment teeth and flat alveolar ridges. They reported a favorable increase in occlusal vertical dimension and lip support leading to a superior aesthetic outcome.<sup>2</sup>

FPDs with rigid connectors are usually avoided in young, actively growing patients because they could prevent jaw growth, especially if the prosthesis crosses the midline and certain factors like inadequate form or color, marginal smoothness, marginal discoloration, tooth sensitivity post crown reduction, and occlusal evenness should be taken into consideration while going for a fixed all ceramic prosthesis.<sup>8</sup>

However, transverse skeletal and alveolodental changes are less pronounced in the mandible than in the maxilla, and it is widely accepted that the transverse growth of the anterior mandible ceases before one year of age and is completed by the age of three.<sup>2,9</sup>

According to Barrow and White, intercanine width is established between the ages of 5 and 8 years. It is caused by distal migration of the primary canines into the primate spaces to accommodate the erupting permanent incisors.<sup>2</sup>

Keeping all these factors in mind, the lower permanent incisors were absent in our patient and the permanent canines were already erupted in the oral cavity, little intercanine growth was expected and as most of the growth will be occurring distal to the primary dental arches to accommodate the developing permanent teeth in an otherwise healthy patient, fixed partial dentures are indicated in anterior region of the 9 year old child.

## CONCLUSION

Children come across a period of intense growth and development of orofacial region. In such dynamic period, replacement of missing teeth is of utmost importance.

Correct prosthetic restoration in growing children must not in any way hamper proper growth and development of alveolar jaw bones, dental arches and eruption of permanent teeth, rather it should preserve oral tissues, steer growth of permanent dentition in the least invasive way.

Fixed prosthesis in childhood influences the normal growth and development of orofacial structures, psycho-emotional social and physical growth of a child, and with proper oral hygiene maintenance with regular dental checkups, it also restores normal masticatory functions and sound articulation and favour proper development of speech and communication skills.

## References

1. Neville B.M, Damm D.D, Allen C.M, Bouquot J.E, "Oral and Maxillofacial Pathology" 2<sup>nd</sup> Edition, Elsevier; New Delhi; 2002, Pages 69-73.
2. AlNuaimi R, Mansoor M. Prosthetic rehabilitation with fixed prosthesis of a 5-year-old child with Hypohidrotic Ectodermal Dysplasia and Oligodontia: A case report ; Journal Of Medical Case Reports; 13: 329,2019.
3. Marques NCT *et al*, Prosthetic Rehabilitation in Children: An Alternative Clinical Technique. Hindawi Publishing Corporation Case Reports in Dentistry; Volume 2013, Article ID 512951, 5 pages.
4. Derceli JDR, Pinelli LAP, Giro EMA, Cabrini J, Castanharo SM, Fais LMG. Oral Rehabilitation in a patient with special needs. Rev Gauch Odontol, Porto Alegre; 63(1):337-342, 2015.
5. Zavaree MA, Morshedi E, Hakimaneh SMR. *Full Mouth Rehabilitation of a 12-year-old Patient with Hidrotic Ectodermal Dysplasia with Removable Partial Denture: A Case Report*. Biomed J Sci & Tech Res 3(4):2018.
6. Vulicevic Z, Beloica M, Kosanovic D, Radovic I, Juloski J, Ivanovic D. Prosthetics in Paediatric Dentistry; Balk J Dent Med; 2017:78-82.

7. Gabrovska MD, Dimitrova D, Mitronin VA. Prosthetic treatment with crowns and implants in children – Literature Review. *J of IMAB*. 2018 Jul-Sep; 24(3):2166-2171.
8. Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JYK. Clinical complications in fixed Prosthodontics. *J Prosthet Dent* 2003; 90:31-41.
9. Andriani JW, Sotto-Maior BS, Assis NMSP and Ribeiro CG. Full-Mouth Rehabilitation of a 9 Year-Old Ectodermal Dysplasia Patient: A Seven Year Follow-Up. *Austin Dent Sci*. 2016; 1(1): 1002.

**How to cite this article:**

Dr. Ishita Banerjee *et al* (2020) ' Fixed Prosthetic Recuperation in A 9-Year-Old Child With Rare Hypodontia- A Case Presentation', *International Journal of Current Advanced Research*, 09(08), pp. 23034-23037.  
DOI: <http://dx.doi.org/10.24327/ijcar.2020.23037.4555>

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