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# Prosthodontic rehabilitation of non-syndromic oligodontia case with telescopic prosthesis☆



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ABSTRACT

Oligodontia is the congenital absence of six or more permanent teeth excluding the third molars. Oligodontia of permanent dentition is a rare occurrence. Preservation of the remaining deciduous dentition in such situations is important for both functional and esthetic rehabilitation of the patient. This case report describes the rehabilitation of a 16 year old male with oligodontia of permanent teeth treated by an interdisciplinary team of Prosthodontist, paedodontist and orthodontist. Endodontic treatment of all the remaining deciduous dentition was done. Vertical dimension of deciduous dentition occlusion was assessed. Full mouth single piece porcelain fused to metal telescopic prosthesis for maxillary and mandibular arch was planned with minimal increase in vertical dimension of occlusion. Telescopic prosthesis provided excellent retention, stability, esthetics and stress equalization on the remaining deciduous dentition. Maintenance of oral hygiene procedures was simplified for the adolescent with the telescopic prosthesis. Preservation of remaining deciduous dentition and fabrication of a telescopic prosthesis in this patient provided an effective aesthetic and functional rehabilitation for the patient.

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## 1. Introduction

Oligodontia is a rare entity that can be associated with a genetic syndrome or can occur as a non-syndromic isolated familial trait.[1] Congenital absence of permanent dentition is attributed to environmental factors such as trauma, malignancy, irradiation, hormonal influences, hereditary genetic dominant factors, thalidomide therapy etc.[2] Odontogenesis is mainly controlled by MSX1 and PAX9 genes. Any mutation of PAX9 gene leads to nonsyndromic form of tooth agenesis.[3] Early diagnosis and prompt treatment of a patient with oligodontia is essential to reduce the disabilities in caused at a later date. Disabilities like malocclusion and altered facial appearance can lead to psychological disturbances, difficulty in mastication and speech in the patient. Rehabilitation depends on the extent of oligodontia and other underlying syndromes associated with it.[4]

Management of nonsyndromic oligodontia case is much simpler as compared to those associated with underlying

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syndromes. Ultimate goal of rehabilitation should be to achieve prosthetic and esthetic functionality of the remaining oral structures. In treatment planning, De Van's statement should always be a cornerstone in the mind of the treating surgeon. The goal should be "perpetual preservation of what remains than the meticulous restoration of the missing tooth structures".[5] The deciduous dentition in patients with oligodontia has to be preserved to prolong the long term effects of edentulism caused due to congenital absence of permanent teeth. The major concern for utilizing the deciduous teeth as abutments for fixed dental prosthesis is their innate potential of root resorption. Absence of permanent dentition and rehabilitation with a prosthesis that provides stress equalization amongst the remaining deciduous teeth would certainly prolong the process of root and alveolar resorption.

Telescopic crowns as retainers for removable prosthesis were introduced at the beginning of 20th century. The term coined was crown and sleeve coping or Konuskrone,[6] a German term that describes as a cone shaped design. These crowns exhibit retention by friction when completely seated by using a wedging effect. The smaller the convergence angles of the telescopic copings the greater the retentive force. The retention is further enhanced by supplementary attachments and the functionally moulded denture borders.[7] The transfer of occlusal load to the alveolar bone through the periodontal ligament is the underlying philosophy of telescopic crowns. The proprioception from the periodontal ligament prevents the occlusal overload, resorption of roots and alveolar ridge due to excessive forces.[8] This clinical report presents a unique feature of nonsyndromic oligodontia of permanent dentition. The paper describes rehabilitation of a patient with telescopic crown retained porcelain fused to metal removable dental prosthesis using deciduous teeth as retainers for enhanced functional and esthetic outcome.

## 2. Outline of the case

A 16 year old male patient with non-syndromic oligodontia of permanent dentition reported to one of the nodal military dental centre in India with a chief complaint of unaesthetic appearance, difficulty in mastication and impaired quality of life. Clinical examination revealed presence of multiple retained deciduous teeth and eruption of few permanent teeth [Fig 1]. Panoramic radiograph showed multiple missing permanent teeth. The deciduous teeth present were 52, 53, 55, 61, 62, 63 and 65 in maxillary arch and 71, 72, 73, 74, 75, 81, 82, 83, 84 and 85 in mandibular arch [FDI Two digit notation for primary dentition]. The erupted permanent teeth were 11, 26 (partially erupted) in maxillary arch and 36, 46 in mandibular arch [FDI Two digit notation for permanent dentition]. The tooth numbered 81 had poor prognosis because of decreased crown root ratio and hence was taken up for extraction.

Endodontic treatment of the remaining deciduous dentition and permanent right central incisor was completed. The aim behind preserving the deciduous dentition was to prolong the long term effects of the tooth loss and meticulous preservation of the teeth that remained for successful functional and esthetic rehabilitation. Diagnostic impressions of both arches were made with irreversible hydrocolloid impression material [septodont plastalgin dust free alginate, 3M ESPE, USA]. Face bow transfer [UTS 3D Transfer Bow, Stratos 200, Ivoclar Vivadent, Switzerland] and Vertical dimension of occlusion (VDO) was recorded. The maxillary and mandibular models were articulated on the semiadjustable articulator [Stratos 200, Ivoclar Vivadent, Switzerland] at the existing VDO. Diagnostic wax up was done to plan the fabrication of the permanent prosthesis for esthetic and functional rehabilitation with minimal increase of 3 mm from the existing



**Fig. 1 – Preoperative intraoral.**



**Fig. 2 – Mandibular telescopic copings cementation.**



**Fig. 3 – Maxillary telescopic copings cementation.**

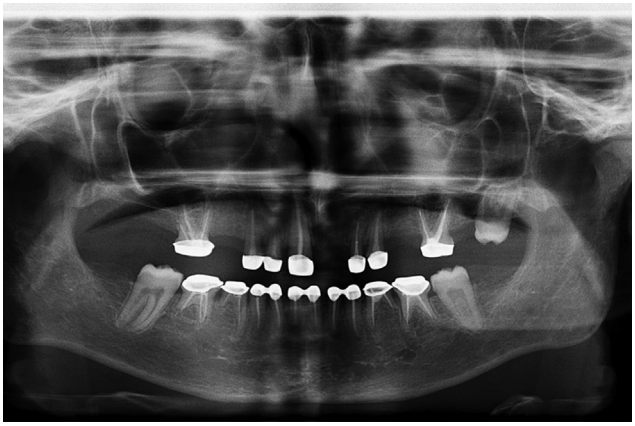


**Fig. 4 – OPG showing cemented telescopic copings.**

vertical dimension of occlusion without jeopardizing the TMJ function.

Custom made Broadrick occlusal plane analyzer was used for analyzing the curve of spee and developing an acceptable occlusion in the diagnostic wax-up. Tooth preparation of remaining deciduous mandibular molars was performed with a shoulder margin and mandibular anterior teeth were prepared with a knife edge margin because of the limited amount of clinical crown available. The maxillary dentition was untouched at this stage for reproducing the existing occlusion at increased VDO. Wax up was done taking into consideration the philosophy of telescopic crowns. All the deciduous mandibular molars received telescopic copings with an average 2–5° taper and the anteriors received metal copings [Fig. 2]. The permanent mandibular and erupting maxillary left second molar was not involved considering the age of the patient and unpredictable prognosis of the retained deciduous dentition. The fabricated telescopic copings were secured on the mandibular teeth. Pick up impression was made to transfer the telescopic copings to the master cast. Surveying and milling of the telescopic copings were performed using a milling machine. After achieving the ideal parallelism, wax up was done over the telescopic copings incorporating a mesh on the lingual flange area for fabrication of a hybrid single unit removable porcelain fused to metal restorations with a lingual flange denture base.

The Broadrick plane measurements recorded during the diagnostic wax-up procedure was used as a guide during porcelain build-up procedure to reproduce the occlusion on mandibular right and left quadrants. The telescopic copings were cemented intraorally and the prosthesis was checked for retention, stability and esthetics. The mandibular prosthesis was removed and an impression of the lower arch with telescopic copings was made. The prosthesis was seated on the prepared cast and articulated with the maxillary counterpart on the semiadjustable articulator. Tooth preparation of the maxillary deciduous teeth was performed. Telescopic copings were fabricated for maxillary molars and permanent maxillary right central incisor with an average 2–5° taper [Figs. 2–4]. The remaining teeth received simple metal copings. Pick up impression was made to transfer the telescopic copings to the master cast. The maxillary master cast with copings was articulated with the lower counterpart at altered VDO. Wax up was done over the telescopic copings incorporating a palatal



**Fig. 5 – Maxillary prosthesis insertion.**



**Fig. 6 – Mandibular prosthesis insertion.**

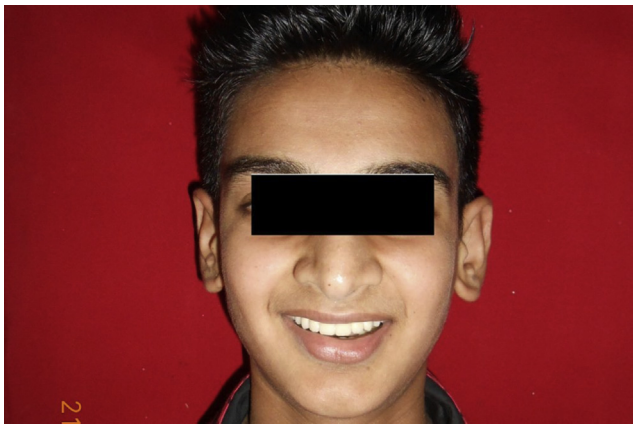


**Fig. 8 – Post operative extraoral.**

mesh for fabrication of hybrid single unit removable porcelain fused to metal restorations with the palatal denture base [Fig. 5–8]. The patient was educated on the oral hygiene and prosthesis maintenance. Post Operative evaluation was done. In the process of evaluation it was noticed that the patient had minimal discomfort during the first few days of prosthesis insertion. He experienced chewing difficulties which gradually returned to normalcy over a period of time. The prosthesis markedly improved the functionality, esthetics and quality of life for the patient.

## 3. Discussion

Treatment planning for a nonsyndromic oligodontia of permanent teeth is a great challenge to the interdisciplinary team.[9] The consequences of missing teeth are speech and masticatory disorders, aesthetic problems caused by disturbed growth and development of orofacial region which can impair the quality of life.[10,11] Accurate diagnosis and careful treatment planning with a preconception of final outcome should be the priority. The case presented in this paper is one of the unique having multiple missing permanent tooth buds and retention of deciduous teeth beyond the specified age limit.



**Fig. 7 – Prosthesis in occlusion.**

Treatment planning was less complicated since the oligodontia was not associated with any other syndrome. In this case preservation of the deciduous dentition was of prime importance because of the absence of multiple permanent teeth. Decreased clinical crown lengths and fragility of the existing dentition for prosthesis load, the deciduous teeth had to be endodontically treated followed by augmentation with telescopic metal copings to preserve the structural integrity of the remaining tooth structure. Prosthetic rehabilitation in children must be adapted to growth and development. It is a general rule that the final prosthetic solution should be avoided until the end of growth and development.[12] In this situation the patient was a borderline case with an age of 16yrs. During the process of treatment the unerupted maxillary left first molar slowly erupted into the oral cavity. In lieu of the eruption there was a sense of doubt created in the mind of treating practitioner and hence the treatment plan was modified accordingly. The permanent mandibular first molars and erupting permanent maxillary left first molar were not a part of the final prosthesis planned, also considering the growth of the patient it was planned to rehabilitate the patient with Porcelain fused to metal removable telescopic prosthesis.

The removable prosthesis had the option of modification for converting to fixed porcelain fused to metal prosthesis by removal of the denture bases once the growth was completed in the patient. The other added advantage of removable telescopic prosthesis was its unique nature of modifications that could be done in case of any deciduous tooth loss. Long term follow up of the patient was planned to evaluate the physiologic changes occurring in the individual and modify the prosthesis accordingly.

## 4. Conclusion

Rehabilitation of nonsyndromic oligodontia cases should always be based on proper diagnosis and prompt treatment planning. This clinical report describes rehabilitation of a nonsyndromic oligodontia patient with porcelain fused to metal removable telescopic prosthesis. There was a significant improvement in the quality of life of the patient. A

coordinated interdisciplinary approach is required for the long term follow up of patients with nonsyndromic oligodontia.

## Conflicts of interest

All authors have none to declare.

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