

Telescopic overdenture for oral rehabilitation of ectodermal dysplasia patient

CHARU GUPTA, MAHESH VERMA¹, REKHA GUPTA¹, SHUBHRA GILL¹

Abstract

Reduced number of teeth with underdeveloped alveolar ridges poses a greatest prosthetic challenge in rehabilitation of ectodermal dysplasia patients (ED). Furthermore, surgical risks and financial constraints may preclude the implant supported prosthesis, the most desirable treatment option in an adult ED patient. Long edentulous span does not permit fixed dental prosthesis (FDP) as well. Telescopic denture by incorporating the best of both fixed and removable prosthesis can be a viable treatment alternative for ED patients with compromised dentition and limited finances. A 21-year-old young girl presented with chief complaint of esthetics and mastication due to missing upper and lower teeth. A provisional diagnosis of ED was made based on familial history, physical, and oral examination. This clinical report describes management of an adult ED patient by means of telescopic overdenture prosthesis in mandibular arch and FDP in maxillary arch which restored esthetics, function, and social confidence of the patient in a cost effective manner.

Keywords: Ectodermal dysplasia, hypodontia, telescopic overdenture

Introduction

Ectodermal dysplasias (ED) are a group of hereditary disorders affecting structures derived from the embryonic ectoderm, first described by Thurnam in 1948 and later in the 19th century by Ramesh *et al.*^[1] Clinical signs include trichodysplasia (abnormal hair) in 91% of cases, tooth agenesis in 80%, onychodysplasia (abnormal nails) in 75%, and dyshidrosis (abnormal sweat glands) in 42%. There are two major types of this disorder: Hypohidrotic ED, in which sweat glands are either absent or significantly reduced in number, and hidrotic ED, in which sweat glands are normal. The most frequently reported ED syndrome is the anhidrotic or hypohidrotic type, which usually shows X-linked recessive inheritance severely affecting males while females are showing only minor defects.^[2] Orofacial characteristics of this syndrome include anodontia or hypodontia, hypoplastic conical teeth, underdevelopment of the alveolar ridges, frontal bossing, a depressed nasal bridge, protuberant lips,

and hypotrichosis. Thus, dentists may be the first to diagnose ED since hypodontia in either of the dentitions may be the only sign of what can be a potentially life-threatening condition.

Oral rehabilitation of ED has historically evolved from partial and complete removable prosthesis to osseointegrated dental implants.^[3,4] Financial constraints and other priorities may restrict the patient from choosing the most desirable treatment. Telescopic retainers in addition to being cost-effective, expands the range of treatment alternatives in patients with reduced dentition, by combining the advantages of both fixed and removable prosthesis.^[5,6] It refers to the use of a primary full-coverage casting (coping/male telescopic portion) luted to the prepared tooth with a secondary casting (superstructure/secondary crown/female telescopic portion), which is a part of the denture framework and is connected by means of interfacial surface tension over the primary casting.^[7,8]

Department of Dental Surgery, Deen Dayal Upadhyay Hospital,
¹Department of Prosthodontics, Crown and Bridge, Maulana Azad
Institute of Dental Sciences, New Delhi, India

Correspondence: Dr. Charu Gupta,
Department of Dental Surgery, Deen Dayal Upadhyay Hospital,
New Delhi, India.
E-mail: docswtgupta@gmail.com

This case report describes the prosthetic management of ED through the strategic use of telescopic retainer in the mandibular arch and fixed prosthesis in the maxillary arch.

Case Report

A 21-year-old young female reported with a chief complaint of esthetics due to missing upper and lower teeth and

Access this article online	
Quick Response Code:	Website: www.contempclindent.org
	DOI: 10.4103/0976-237X.166821

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Gupta C, Verma M, Gupta R, Gill S. Telescopic overdenture for oral rehabilitation of ectodermal dysplasia patient. *Contemp Clin Dent* 2015;6:S258-61.

difficulty in mastication. Dental history revealed that teeth were congenitally missing. Familial history revealed that close relatives including grandmother on the mother's side and cousins were afflicted with the same condition.

Extraoral examination

Revealed sparse fine hair, dry skin, scant eyelashes and eyebrows, reduced vertical height of facial lower third, and prominent chin.

Intraoral examination

Revealed partial anodontia, conical shaped central incisor, canine, and underdeveloped alveolar ridge. 12, 13, 14, 15, 16, 21, 23, 24, 25, 26, 34, 35, 36, 43, 44, 45, and 47 teeth were present (Federation Dentaire Internationale tooth numbering system) [Figure 1a-c].

Radiographic examination

Orthopantomograph confirmed the absence of other permanent tooth buds and underdeveloped maxilla and mandibular ridges.

The clinical findings, hypodontia as confirmed by panoramic radiography, as well as the familial history matched typical features of ED.

Treatment plan

A Treatment option that appeared most suitable, in this case, was metal-ceramic fixed partial denture for maxillary arch and telescopic overdenture prosthesis for the mandibular arch. The patient was explained about the treatment procedure and the expected outcome. A written consent was obtained from the patient.

Fabrication procedure

Maxillary and mandibular diagnostic impressions were made with irreversible hydrocolloid (Zelgan, Dentsply

India Ltd.), and casts were poured with type III gypsum product. Maxillary and mandibular casts were mounted on a semi-adjustable articulator (Hanau H2) with the help of facebow and centric relation record. The wax-up was done on the lower abutments to develop proper occlusal contacts. The maxillary arch was restored with metal-ceramic fixed partial denture due to small edentulous span according to esthetics and phonetic demands of the patient using 13, 12, 21, and 23 as abutments [Figure 2a and b]. Mandibular teeth were prepared for the fabrication of telescopic copings. Tooth preparation was done by preparing a chamfer finish line of 0.7 mm with a taper of approximately 8–10°. Teeth 36 and 47 were not included in telescopic overdenture prosthesis but were restored separately with metal ceramic crowns to avoid the excessive bulk of the prosthesis. The impression of prepared abutments was made with putty relined technique, and first master model was made for the fabrication of the primary copings. The wax patterns for primary copings were fabricated and milled to obtain a frictional surface for retention and then cast in nickel chrome alloy. Once the primary copings were evaluated for fit, the copings were luted with temporary cement (zinc oxide eugenol) [Figure 2b] and an overimpression was made using the medium viscosity addition silicone impression material and the second master model was made. This model would be used for fabrication of the cast partial superstructure. The second master model together with the primary copings was duplicated, and the refractory model was prepared.

Fabrication of mandibular telescopic superstructure

The design of the framework included overlay copings on 34, 35, 43, 44, 45, and mesh for the acrylic spanning anterior edentulous segment. The pattern was cast using Co-Cr alloy (Bellabond plus BeGo, Germany) [Figure 2c]. After evaluating the fit of the framework in the mouth, it was used

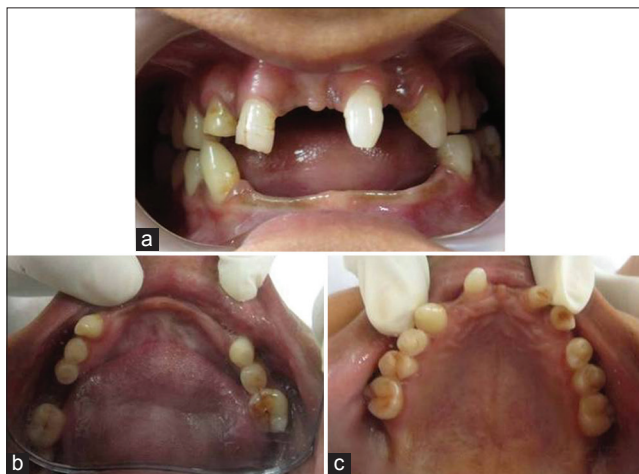


Figure 1: (a) Intra-oral view showing conical incisors and underdeveloped mandibular alveolar ridge. (b) Intra-oral mandibular occlusal view (c) intra-oral maxillary occlusal view

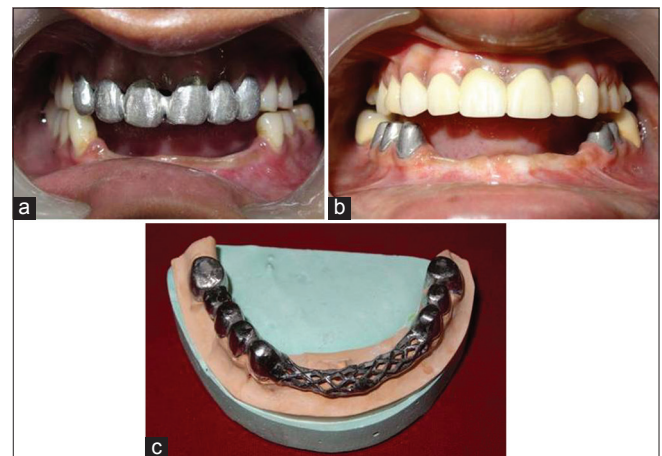


Figure 2: (a) Metal try-in for maxillary fixed partial prosthesis. (b) Completed maxillary prosthesis in place, try-in of primary copings in mandibular arch. (c) Metal framework with secondary copings on cast

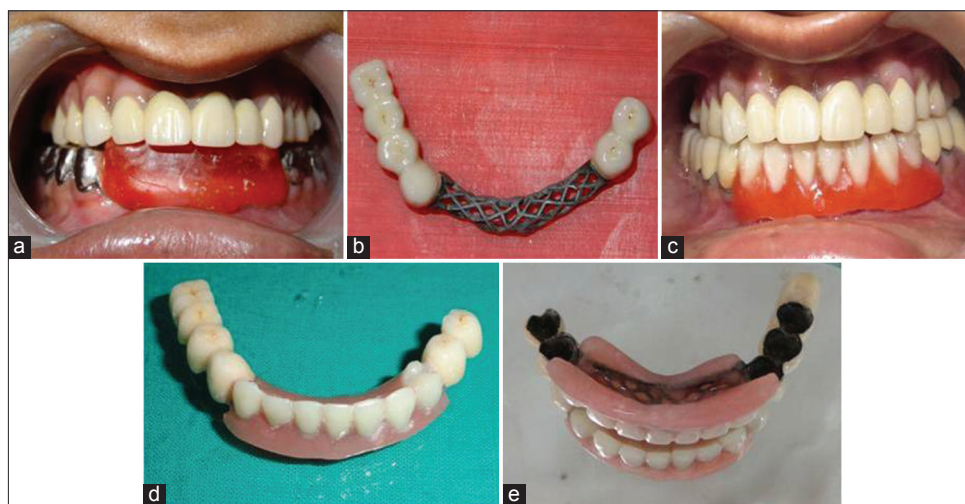


Figure 3: (a) Metal framework with occlusal rim for jaw relation recording (b) metal framework with porcelain application on secondary copings (c) anterior try-in (d) final prosthesis occlusal view (e) final prosthesis intaglio view

as a carrier for cementing the primary copings in place with glass ionomer luting cement (type I; GC Fuji). Jaw relation record was made with framework [Figure 3a]. Master casts were mounted on semi-adjustable articulator with the help of facebow and centric relation record. Porcelain application was done on the overlay copings according to the diagnostic wax-up [Figure 3b].

Try-in and delivery of mandibular prosthesis

A wax rim was prepared on the framework, and acrylic teeth were set with the same shade as were veneered over the secondary coping following esthetics and phonetics demands of the patient. Try-in was taken in the patient's mouth to verify fit, esthetics and to take patient's consent before acrylization of the final prosthesis [Figure 3c]. Finally, after curing, finishing and polishing, the mandibular telescopic removable prosthesis was delivered to the patient after occlusal adjustments [Figures 3d and e and 4a-c].

Postinsertion instructions and recall

Postinsertion instructions were given to the patient that included maintenance of meticulous oral hygiene and she was put on a 6 months follow-up regimen. At each follow-up visit, the patient was evaluated for effectiveness of oral hygiene, retention, and stability of the prosthesis.

Discussion

The physiologic and psychosocial value of prosthetic dental treatment for the self-esteem and social well-being of ED patients has been well-emphasized in the literature.^[9] Treatment of ED patients vary with age, dental agenesis, malformed teeth, growth, and development of the stomatognathic system.^[4] Treatment with partial or complete dentures is critical during the growth period.^[3] Once full growth is attained, a fixed partial denture or an endosseous implant therapy can be performed in these patients.^[10,11]



Figure 4: (a) Intra-oral view of final prosthesis (b) final prosthesis in occlusion (c) postoperative patients view

In this case, though growth is attained, fixed dental prosthesis was ruled out in the lower arch, as it would have resulted in excessive forces on the remaining teeth due to long edentulous span and compromised abutments. Further, knife edge ridge and lower bone density, in this case, needed extensive bone grafting for an implant supported prosthesis. The cost and surgical morbidity ruled out this option too. A removable cast partial denture was ruled out as the remaining abutments required full coverage restoration in order to develop proper occlusal contacts and because of several advantages of the telescopic prosthesis over the removable partial prosthesis. Underdeveloped alveolar ridges seen in ED patients, as well as in this case demands more forces to be borne by the abutments as satisfied by use of crown and sleeve prosthesis. A telescopic denture was chosen for this patient as it features the advantages of both fixed and removable prostheses in terms of better distribution of stresses, rigid bilateral splinting, good retentive, and stabilizing properties, as well as better oral hygiene around the abutments.^[6-8,12] Yalisove and Dietz

showed that in telescopic crown-sleeve-coping restorations, the effective crown-to-root ratio is reduced at the point where the telescopic over crown rotates.^[13] It is able to withstand a much greater occlusal load without movement as the denture literally sits on teeth “pilings” instead of the movable mucous membrane. Other advantages includes loss of weaker abutment in the future does not compromise the entire prosthesis and use of the pink base material in the superstructure ensures better esthetics in restoring compromised tissues in these patients.^[6,13]

Greater skill, complex laboratory procedures, and increased bulk are some of the disadvantages with double crown systems.^[12] These obstacles are insignificant in light of many advantages it offer and with the introduction of cheaper and less dense casting alloys. Though the recommended alloy for fabrication of copings is type III gold alloy, but technique sensitivity and high cost made us chose Co-Cr alloys which though not ideal but was a cheaper substitute.

Summary

The telescopic denture can be a viable treatment option for the rehabilitation of ED patients with a reduced number of teeth and with limited finances. By combining the advantages of both fixed and removable prosthesis, it has cost-effectively restored the esthetics, function and social confidence of the described patient. Development of proper occlusal contacts ensured a better masticatory ability to the patient. However, long-term success depends on regular follow-up and meticulous oral and prosthesis hygiene.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors have obtained the necessary patient consent

forms where the patients have given their approval for participation in the investigation, followed by representation in the concerned article. The patients do understand that the authors will ensure that their identities won't be revealed, however anonymity cannot be guaranteed.

References

1. Ramesh K, Vinola D, John JB. Hypohidrotic ectodermal dysplasia – Diagnostic aids and a report of 5 cases. *J Indian Soc Pedod Prev Dent* 2010;28:47-54.
2. Deshpande SN, Kumar V. Ectodermal dysplasia – Maxillary and mandibular alveolar reconstruction with dental rehabilitation: A case report and review of the literature. *Indian J Plast Surg* 2010;43:92-6.
3. Gupta S, Tyagi P. Prosthodontic management of anhidrotic ectodermal dysplasia. *Indian J Dent Res* 2011;22:348-51.
4. Huang PY, Driscoll CF. From childhood to adulthood: Oral rehabilitation of a patient with ectodermal dysplasia. *J Prosthet Dent* 2014;112:439-43.
5. Schwindling FS, Dittmann B, Rammelsberg P. Double-crown-retained removable dental prostheses: A retrospective study of survival and complications. *J Prosthet Dent* 2014;112:488-93.
6. Breitman JB, Nakamura S, Freedman AL, Yalisove IL. Telescopic retainers: An old or new solution? A second chance to have normal dental function. *J Prosthodont* 2012;21:79-83.
7. Weaver JD. Telescopic copings in restorative dentistry. *J Prosthet Dent* 1989;61:429-33.
8. Langer A. Telescope retainers for removable partial dentures. *J Prosthet Dent* 1981;45:37-43.
9. Roff JD, Wirt RD. Childhood social adjustment, adolescent status, and young adult mental health. *Am J Orthopsychiatry* 1984;54:595-602.
10. Anuroopa A, Abdulla J, Lovely M. Oral rehabilitation of a young patient with hypohidrotic ectodermal dysplasia: A clinical report. *Contemp Clin Dent* 2012;3 Suppl 1:S33-6.
11. Yap AK, Klineberg I. Dental implants in patients with ectodermal dysplasia and tooth agenesis: A critical review of the literature. *J Prosthet Dent* 2010;104:97.
12. Isaacson GO. Telescope crown retainers for removable partial dentures. *J Prosthet Dent* 1969;22:436-48.
13. Yalisove IL, Dietz JR. *Telescopic Prosthetic Therapy*. Philadelphia: George F Stickley Co.; 1977. p. 11.