

## Case Report

### Dental Management of a Patient with Ectodermal Dysplasia using Basal Implants: A Case Report

<sup>1</sup>Vishwanannath Hiremath, <sup>2</sup>Sanjay B Nyamati, <sup>3</sup>Sangeeta J Nair, <sup>4</sup>Sindhu B U

<sup>1</sup>Owner & Senior Consultant, MDS (Oral & Maxillofacial surgeon), Dr Hiremath Hospital, Vijayanagar, Bengaluru, India;

<sup>2</sup>Senior Consultant, MDS (Oral Medicine & Radiology), Dr Hiremath Hospital, Vijayanagar, Bengaluru, India;

<sup>3</sup>MDS, Prosthodontist, Dr Hiremath Hospital, Vijayanagar, Bengaluru, India;

<sup>4</sup>MDS, Periodontist, Dr Hiremath Hospital, Vijayanagar, Bengaluru, India

Received: 10 June, 2025

Accepted: 14 July, 2025

Published: 18 July, 2025

**Corresponding author:** Vishwanannath Hiremath, Owner & Senior Consultant, MDS (Oral & Maxillofacial surgeon), Dr Hiremath Hospital, Vijayanagar, Bengaluru, India

**This article may be cited as:** Hiremath V, Nyamati SB, Nair SJ, BU Sindhu. Dental Management of a Patient with Ectodermal Dysplasia using Basal Implants: A Case Report. *J Adv Med Dent Scie Res* 2025; 13(7):88-92.

#### INTRODUCTION

Implants have become the treatment of choice for a variety of reasons. However, the unique aspects of patients affected with the ectodermal dysplasias need special care while treatment to restore the edentulous condition. Ectodermal dysplasia syndrome is a large heterogenous group of inherited disorder in which two or more ectodermally derived anatomic structures such as skin, hair, nails, teeth, and eccrine glands fails to develop. A common oral finding in these patients is oligodontia, which results in underdeveloped alveolar process with highly resorbed ridges. The most common type is hypohidrotic ectodermal dysplasia.<sup>1</sup> It has an X linked inheritance pattern and shows male predominance.

Edentulous appearance with tendency towards class III skeletal pattern, reduced lower face height and anomalies of tooth shape or microdontia (peg-shaped teeth in both dentitions, talons cusp, taurodontia) are common findings in Ectodermal Dysplasia (ED).<sup>2</sup> Unfavorable ridge anatomy can hamper the prosthetic rehabilitation with conventional procedures in these patients. Although, greatly shortened healing times has been claimed with conventional dental implants, this is not generally accepted in the care of patients with ectodermal dysplasia.<sup>3-5</sup> An alternative approach is to use basal implants in these patients. The usage of basal implants within an atrophied mandibular alveolar ridge is a powerful alternative to using conventional

implant prostheses. These implants may be exposed to moderate loading following instant insertion. Thus, the purpose of this report is to illustrate the oral rehabilitation of a 19-year-old male patient affected by ED and treated with basal implant placement in mandible and maxilla using fixed implant-supported cement retained prostheses, which improved his self-esteem and quality of life.

#### CASE REPORT

A 19-year-old male patient who had been diagnosed with hypohidrotic ectodermal dysplasia reported to the dental department of Dr Hiremath's Hospital, Vijayanagar Bengaluru, for replacement of missing teeth. Extraoral examination revealed sparse hair, depressed nose, small and retrusive malar and maxillary region, lip thickening and prominent chin (Fig. 1).

Clinical and radiographic examination revealed significant underdevelopment of alveolar bone and severe hypodontia in maxilla. Maxillary arch revealed four conical shaped anterior teeth and right and left microdontic first and second molars (Fig 2). Bone support around the maxillary lateral incisor teeth were poor, therefore planned for extraction and root canal treatment were performed in the remaining dentition. There was severe resorption of bone in mandible with inferior alveolar canal located at the

superior border of the mandible (Atwood order VI)(Fig.3).

As the mandible was completely edentulous, it resulted in loss of vertical dimension and forward closure of the lower jaw. Masticatory efficiency of the patient was severely hampered due to the absence of teeth. Prosthetic rehabilitation of dentition was planned with basal implant supported fixed cement-retained prostheses. Four basal cortical screw implants (3.5 mm

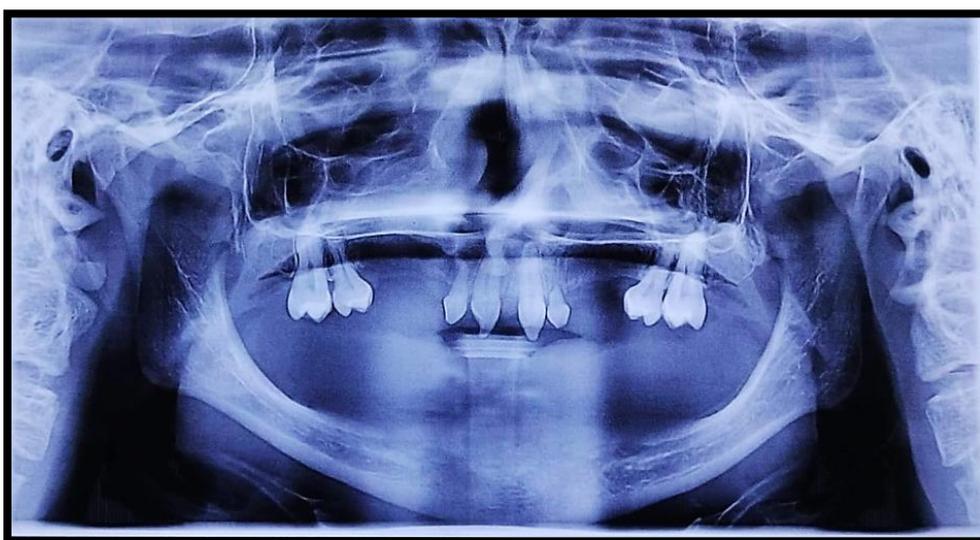
x 18 mm, S.K.12Surgicals implants, India) were placed in 12,13, 22 and 23 regions by flapless surgery in the maxillary arch engaging the basal bone of the nasal floor, using handgrip instruments. Since placement of implants were not possible in the posterior region of mandible without complex procedures such as nerve repositioning and iliac bone graft, 6 basal implants (3.5 mm x 18 mm) were placed in the interforamina region (Fig.4).



**Fig. 1: Lateral Profile of the Patient**



**Fig 2: Intraoral view of the Patient**



**Fig.3: Pre-op OPG of the patient.**

The maxillary and mandibular arches were recorded using intraoral scanner (Runyes3ds intraoral scanner) and the tentative jaw relationships were recorded using modelling wax (Modelling wax, Pyrax, India). On the second day, after the fitting of the metal framework (Co-Cr) in the patient's mouth (Fig.5) and the favorable completion of the metal trial, facebow

transfer was done and cast were mounted on semi adjustable articulator using interocclusal records. The maxillary and mandibular metal splints were recorded using intraoral scanner (Fig.6&7). On the third day, all implants were functionally loaded with both maxillary and mandibular zirconia fixed cement-retained prostheses (Fig.8&9).



**Fig.4: Basal implants placed by flapless surgery**



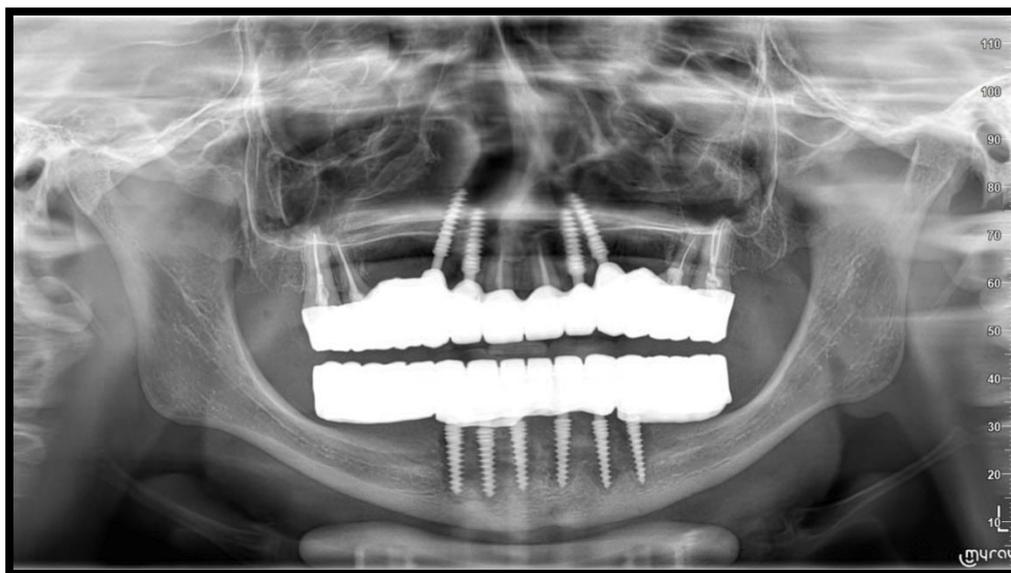
**Fig. 5: Metal framework (Co-Cr) fitted in the patient's mouth.**



**Fig.6&7: The maxillary and mandibular metal splints recorded using intraoral scanner**



**Fig.8&9: Zirconia Fixed cement-retained prostheses**



**Fig. 10: Post-op OPG of the patient**

Patient was recalled for follow-up 1 year after the loading of implants. On clinical examination the peri-implant soft tissues were found to be healthy with no signs of bleeding on probing or pathologic probing depths. The panoramic radiograph confirmed the clinical findings (Fig.10). The marginal bone levels around the implants were stable with no bone loss at the mesial and distal aspects of each implant.

#### **DISCUSSION**

The treatment of patients with ectodermal dysplasia will vary according to the unique conditions presented in each case as ED patients present with dental dysmorphic features that limit the structural reliability of the existing malformed dentition.<sup>6-8</sup> Dental implant treatment modality can be used to replace one or several teeth or provide retention for prosthesis in partial or completely edentulous arches with the unique advantage of conserving adjacent dentition and provide additional support for masticatory function.<sup>9</sup> The lack of bone volume in young patients, owing to failure of development of the alveolar ridges, is a major challenge in providing implant treatment to Ectodermal dysplasia patients. In partially edentulous patients, multiple implant placement is not possible because the bone height and width is not sufficient for implant insertion without advanced surgical approaches, including alveoplasty, sinus lift, and bone grafting. It also involves loading the implants after 4-6 months of placement, leaving the patient toothless for a considerable duration. Basal implants may be the only restorative option in these patients that expedites immediate functional loading with minimal surgical intervention, thereby reducing the overall cost. In the clinical situation described in the case report, the treatment plan focused on the devans principle i.e. “perpetual preservation of what remain is more important than the meticulous replacement of what is missing”. Also,

in this case there was severe resorption of bone and lost vertical dimension, therefore, rigid splinting of the metal framework and cement retained prosthesis was preferred over screw retained because stresses on implant in cement retained is less as compared to screw retained. Guckes et al.<sup>10</sup> achieved 24-month survival rates of 91% in the mandible of patients with ectodermal dysplasia, whereas the success in the anterior maxilla was 71%. Therefore, they can be used for both immediate placement and immediate loading, allowing rapid rehabilitation of the masticatory function.

#### **CONCLUSION**

Prosthetic rehabilitation of patients diagnosed with ED is always quite a demanding task and compel a multidisciplinary approach. Therefore, in such cases, basal implants become the first treatment option. Basal implants are used to support single and multi-unit restorations in the maxillary and mandibular jaw. They can be placed in the extraction sockets and also in the healed bone. Its structural characteristics allow a placement in the bone that is deficient in height and width. Its immediate placement and loading help to reclaim the patient's self-esteem with better masticatory and phonetic competence.

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