

# Prosthetic Rehabilitation with Basal Implant Supported Hybrid Protheses of a Patient Diagnosed with Ectodermal Dysplasia

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## ABSTRACT

*Ectodermal Dysplasia (ED) is a hereditary condition associated with the abnormal development of two or more structures derived from the embryonic ectodermic layer. Intraoral findings in these patients encompasses complete or partial hypodontia, anodontia, retained teeth, loss of VDO, protruding lips, malformed and widely spaced teeth, and underdeveloped alveolar ridges. Consequently, the prosthetic rehabilitation of such a patient is considerably ambiguous. This article presents a clinical case of prosthetic rehabilitation of a patient diagnosed with hypohidrotic ectodermal dysplasia using hybrid maxillary and mandibular protheses supported by basal implants.*

**Key words:** Ectodermal dysplasia, Basal implant, Prosthetic rehabilitation, Immediate loading

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## INTRODUCTION

Ectodermal dysplasia (ED) is a hereditary condition delineated as a large, advanced cluster of disorders defined by the abnormal development of two or additional structures derived from the embryonic ectodermic layer, including skin, hair, sweat glands, and teeth. It is classified into two main types: (1) Hypohidrotic ectodermal dysplasia (HYED)/Christ-Siemens-Touriane syndrome, in which the sweat glands are absent or considerably diminished; and (2) Hydrotic ectodermal dysplasia (HIED)/clouston syndrome, in which the sweat glands are normal. HYED is the most common and severe form associated with dental anomalies; inherited as X-linked autosomal recessive disorders with the gene that maps to Xq12-q13, thus, male are more liable than female. Other forms of ED are inherited as autosomal dominant disorders. Intraoral findings encompasses complete or partial hypodontia, anodontia, retained teeth, loss of VDO with collapsed bite, protruding lips, malformed and widely spaced conical teeth, and underdeveloped alveolar ridges. Congenital absence of multiple teeth (oligodontia or hypodontia), usually manifests with abnormalities in tooth development such as conical or pointed incisors or microdont molars. Lack of tooth bud formation impairs transverse bone growth and maxillary and mandibular sagittal growth, while vertical growth can be affected by

reduction in alveolar height, usually giving individual mature appearance, resulting in notable diagnostic and management challenges. Therefore, ED patients generally compelled a multidisciplinary approach to dental treatment planning to re-establish function, aesthetics and reassurance. This article presents a clinical case for the prosthetic rehabilitation of a patient with hypohidrotic ectodermal dysplasia using basal implants (without using an additional surgical site for graft extraction) supported maxillary and mandibular hybrid protheses [1].

## LITERATURE REVIEW

A 26-year-old male patient with a known case of HYED was referred to a private clinic, Indore, Madhya Pradesh, with the main complaint of difficulty in chewing food and poor dental appearance for 10 years. Extra oral examination showed dry skin, broad and prominent forehead, saddle nose, increased intercantal distance, hypoplastic midface, protruding lips, thin and scanty hair. Intraoral examination revealed a completely edentulous mandibular arch with a thin alveolar ridge along with reduced vertical bone height and loss of vestibular depth. Maxillary arch revealed four conical shaped anterior and right and left microdontic first molars. Radiographic findings also settled the clinical findings. After a full clinical and radiographic examination and comprehensive discussion of the various treatment options with the patient, the treatment was planned as the extraction of the remaining teeth in the maxillary arch due to their poor prognosis, followed by prosthetic rehabilitation of the

maxillary and mandibular arches with basal implant supported hybrid prostheses [2].

The use of basal implants without using an supplementary surgical site for graft extraction for full mouth rehabilitation of the patient. A regular blood test was performed on the patient and the results were found to be within normal limits. Local infiltration with 2% lidocaine (XicaineR, ICPA Health Products Ltd., India) was administered in both the maxillary and mandibular arch. The remaining maxillary teeth were extracted a traumatically and acurettage was performed followed by copious irrigation with povidone iodine. Then, the nine basal cortical screw implants (Simpladent BCS implants, India) were placed by flapless surgery in the maxillary arch and followed by eight basal cortical screw implants in the mandibular arch.

Impression copings were inserted and maxillary and mandibular impressions were made using monophasic silicone impression material (Aquasil Monophase, Dentsply Caulk, USA) using the open tray technique, 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 in the patient's mouth and the favourable completion of the metal trial, definitive intermaxillary records were made. On the third day, all implants were functionally loaded with both maxillary and mandibular hybrid dentures, providing a bilateral balanced occlusion. One year of follow-up showed no loss of the basal implant and a minimal observable alveolar bone resorption. Patient also showed an enhancement in confidence due to enhanced masticatory function, phonetics and facial appearance.

## DISCUSSION

ED is a hereditary condition with abnormal development of structures derived from the ectodermic layer. The incidence of this condition is described as: 100,000. Even though the pathways of peculiarity in ectodermic development are largely understood now, therapy is still restricted to symptomatic measures. The most familiar complaint of patients diagnosed with ED is their concern about dental abnormalities and facial appearance. The adversity of not only the patients themselves, but also their patient families is extensively underrate. Functional rehabilitation and improved aesthetics can help these patients to better contend with their appearance and spur them to lead a routine social and work life. Prosthetic rehabilitation of these patients necessitates a multidisciplinary team approach with good association between an experienced oral surgeon and a prosthodontic team. The treatment of choice is usually a removable partial denture or a complete denture, as these can be easily altered during periods of rapid growth. The administration of conventional endosseous implants often compels ancillary surgical procedures that may be required prior to implant placement, including alveoloplasty, 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.

Our patient was a 26-year-old man and he was extremely morose and wanted his treatment to be done in a minimum time by the least traumatic and fixed alternative [3]. Consequently, we decided to extract the remaining teeth due to their poor prognosis and deliver basal implant supported maxillary and mandibular hybrid prostheses; an alternative option that expedites immediate functional loading with minimal surgical intervention.

Basal implants can be immediately loaded when they are placed in dense cortical bone, considering there they accomplish high primary stability, since the basal bone is a very strong bone that is never resorbed throughout life and constitute the stress-bearing part of human skeleton. Therefore, they are more certain than before, although there are also high probability of loss of crestal bone. Since bone remodelling begins within 72 hours and weakens the peri-implant bone structures, rigid splinting of the metal framework should be performed as soon as possible. Splinting disseminate the masticatory forces from the bone around the implants to other cortical areas as well [4]. This procedure and its principles are known in traumatology. In the present clinical case, nine basal implants were implanted flaplessly in the maxillary jaw engaging the basal bone, using handgrip instruments. Of the nine basal implants, six were placed in the anterior maxillary region engaging the nasal floor, since these were the recently extracted infected alveoli and the remaining three were placed two on the right side and one on the left side in the pterygoid region in the maxillary arch. This region contributes more stability than the anchorage offered by any other part of the maxillary region. Eight implants were placed in the mandibular arch. Of the eight basal implants, four were placed in the anterior region and the remaining four were placed bilaterally in the posterior region. A success rate of approximately 100% can be achieved if basal implants are used in amalgamation with a suitable immediate loading protocol. Basal implants are smooth-surfaced implants that have aggressive threads and can be placed in already infected sockets [5]. An excellent primary stability along the vertical surfaces of the basal implants can be accomplished without the need for corticalization. Therefore, they can be used for both immediate placement and immediate loading, allowing rapid rehabilitation of the masticatory function. This treatment also prevented the patient from having ill-fitting dentures, eliminated the need for bone graft procedures, thereby reducing the overall cost, and improving the patient's quality of life by re-establishing aesthetics, phonetics, and function. In the present clinical case, the patient presents a stable and well-functioning prostheses without biological, aesthetic, functional or mechanical complications, even after 1 year of treatment. Also, his overall contentment level was high.

## CONCLUSION

Prosthetic rehabilitation of patients diagnosed with ED is always quite a demanding task and compel a multidisciplinary approach. Elderly patients undergoing

endosteal implants often necessitate ridge augmentation that not only increases patient costs, but also results are uncertain. 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 helps to reclaim the patient's self-esteem with better masticatory and phonetic competence.

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