

**INNOVATIVE TECHNIQUE OF ACRYLIC OVERLAY DENTURE FABRICATION IN PROSTHETIC REHABILITATION OF PATIENT WITH CLEIDOCRANIAL DYSTOSIS****Dr. Raghvendra Adaki<sup>1</sup>, Dr. Shridevi Adaki<sup>2\*</sup>, Dr. Amol karagir<sup>3</sup> and Dr. Dayananda Huddar<sup>4</sup>**<sup>1</sup>Professor and HOD, Dept of Prosthodontics B. V. D. U. Dental College, Sangli – 416414<sup>2</sup>Professor, Dept of Oral Medicine and Radiology, B. V. D. U. Dental College, Sangli – 416414.<sup>3</sup>Assistant Professor, Dept of Oral Medicine and Radiology B. V. D. U. Dental College, Sangli – 416414.<sup>4</sup>Professor, Dept of Prosthodontics B. V. D. U. Dental College, Sangli – 416414.**\*Corresponding Author: Dr. Shridevi Adaki**

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Article Received on 18/08/2020

Article Revised on 08/09/2020

Article Accepted on 28/09/2020

**ABSTRACT**

Cleidocranial dysplasia is a developmental anomaly of the skeleton and the teeth which is inherited or transmitted as dominant trait. It presents with a wide range of features, characterized by clavicular aplasia or hypoplasia, short stature, supernumerary teeth, skeletal abnormalities like skeletal defects of several bones, such as late closure of the fontanelles, presence of open skull sutures and multiple wormian bones. Clinical significance of this condition to dentistry is due to the involvement of the facial bones, altered eruption patterns and multiple supernumerary teeth. The goal of prosthetic rehabilitation in such cases is to enhance functional ability and esthetics. Here reporting case of 25-year-old Indian male, who presented with the typical features cleidocranial dysplasia. The prosthetic rehabilitation was done with acrylic overlay dentures fabricated with innovative flasking method in which we packed two different heat cure acrylics together and of course enhanced function and esthetics by restoring the vertical dimension.

**KEYWORDS:** Acrylic overlay denture, Marie and Sinton disease, flasking technique.**INTRODUCTION**

Cleidocranial dysostosis (CCD) is a disease characterized by a triad: hereditary transmission, clavicular hypoplasia or aplasia, and delayed ossification of the fontanelles and sutures of the vault of the skull.<sup>[1]</sup> Alterations are seen with teeth and jaw which include delayed resorption of deciduous teeth and delayed eruption of permanent teeth, supernumerary teeth, tooth impaction and possible formation of follicular cysts.<sup>[2,3]</sup>

Treatment modality in such cases is to restore function and esthetics. Many probable treatment modalities were suggested. Initially, it was suggested to extract all unerupted teeth due to possible cyst formation.<sup>[2]</sup> Later, more conservative approach was established where unerupted teeth were left undisturbed till they show some changes like cyst formation.<sup>[1]</sup> These unerupted teeth serve a purpose in preserving alveolar ridge and also decrease the rate of bone resorption, which enhances the stability and retention of a removable prosthesis.<sup>[1]</sup> Kelly and Nakamoto<sup>[4]</sup> listed the objectives of prosthetic treatment as 'restoring the vertical dimension of occlusion, establishing a functional occlusion, improving appearance and phonation, and improving patient's mental well-being.' It could also be said that esthetics is definitely not less important than function even for the patients with such a complex problem.<sup>[1]</sup>

The alterations seen in teeth in such cases include the number, size, shape and structure. Therefore, CCD is disease that needs complex rehabilitation and the assistance of several specialists and also meticulous planning is required along with patient's compliance. Goal of the treatment was to achieve good esthetics and function in conservative way. Hence maintaining existing dentition deriving support from the same was difficult task. Same is explained in detail in the present case report.

**CASE REPORT**

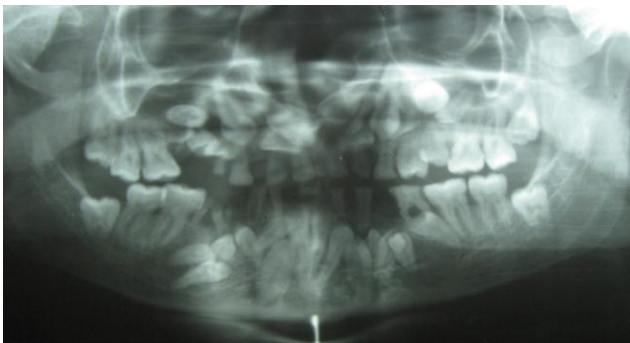
A 21 year old male patient reported to department of prosthodontics with chief complaint of difficulty in chewing and unpleasant look. The patient was diagnosed case of cleidocranial dysostosis with typical features of prolonged retention of deciduous dentition and impacted permanent teeth, mandibular prognathism along with other skeletal abnormalities like shrugged shoulder and the absence of clavicles.

Intraoral examination revealed over-retained maxillary anterior deciduous teeth and missing mandibular anterior teeth. (Fig 1) Other findings noted were excessive freeway space, reduced distance between tip of nose and chin, which indicated collapsed vertical dimension at occlusion. Radiographic examination showed multiple

impacted teeth and over-retained deciduous teeth that had short roots. (Fig 2)



**Fig 1: Intraoral photograph showing over-retained maxillary anterior deciduous teeth and missing mandibular anterior teeth.**



**Fig 2: Panoramic radiograph showing multiple impacted teeth and over-retained deciduous teeth with short roots.**

The treatment goal here was to restore esthetics and function by restoring vertical dimension at occlusion. Different treatment modalities tried in such cases were overlay dentures, implant supported prosthesis, total extraction followed by the complete denture.

As patient was very young total extraction was not advisable. The implant supported prosthesis was not opted because of multiple impacted teeth which require surgical extraction leading to more of bone loss. Hence the prognosis of dental implant therapy becomes poor. Coping sleeve prosthesis was also not opted as abutment teeth have short clinical crowns and roots. Hence the treatment option opted was interim prosthesis in deciduous teeth and once teeth get exfoliated, we can do orthodontic extrusion using orthodontic implants followed by definitive prosthesis. The detailed treatment procedure was explained to the patient and consent was taken for the same.

#### **Mode of treatment**

Diagnostic impression was made with alginate impression material and impressions were poured with type III dental stone. Once the diagnostic cast was procured; surveying was done to check the height of contour of teeth. Unfavourable undercuts were marked on the cast and provisions were made to remove the

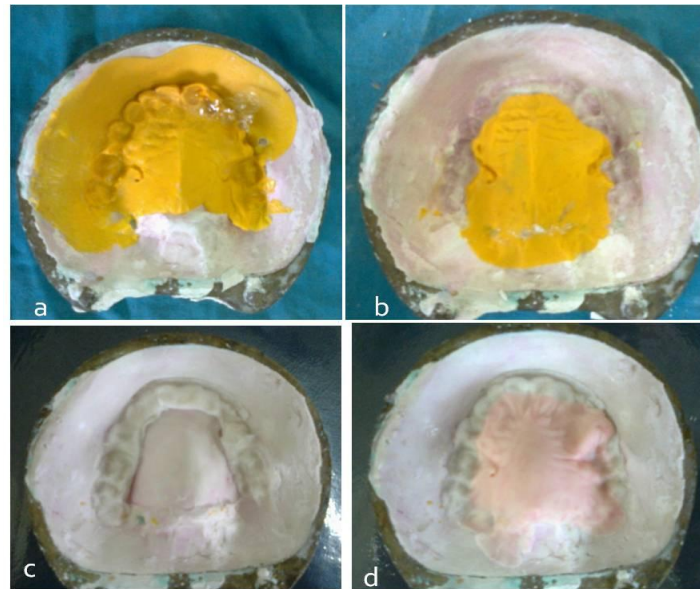
same. Mouth preparation was done to move the height of the contour more apically without perforating the enamel. All the prepared teeth were treated with tooth mousse remineralizing agent. Final Impressions were made using elastomeric impression material then impressions were poured with type IV gypsum.

Record blocks were prepared on master cast. As patient had collapsed vertical height, vertical height was restored while recording vertical relation. Bite was verified with phonetics and aesthetic technique. Vertical relation was recorded with Niswonger technique verified with phonetics and esthetic technique. The freeway space was 7 mm earlier. Restoration of vertical dimension was done by keeping 3 mm freeway space thus restoring vertical dimension at occlusion by 4mm. Centric relation was recorded with static check bite technique.

Orientation relation recorded with Hanau spring mount facebow, relation was transferred to Hanau wide view articulator. After recording vertical and centric jaw relation, this relation was transferred to articulator.

Unique feature of this case was instead of doing teeth arrangement, wax patterns were carved on casts as per incisal plane and occlusal plane. Mandibular patterns were carved first, so that occlusal anatomy of mandibular teeth articulates with maxillary teeth. Try in was done to verify retention, stability, aesthetics, vertical and centric relation. Patient consent was recorded.

Another unique feature of this case was the technique of flasking. Task was to pack pink acrylic and white acrylic together and not to cause overlapping pink acrylic over tooth coloured acrylic, achieving the same was very difficult. To achieve it, in first step complete counter was covered with light body (Fig 3) (3M) and base was pressed against it under hydraulic press. After 8 minutes counter was separated from the base flask. Now light body was removed from the tooth surface, separating medium was applied and packed with tooth colored acrylic and was kept under hydraulic press for two minutes, flask was opened and the light body was removed from palatal surface and separating medium was applied to all flange area and palatal surface and packed with pink acrylic, put under mechanical press, after bench press flask was kept under pressure by clamp and acrylisation was done using slow curing cycle. After bench cooling deflasking was done. Dentures were retrieved (Fig 4), finishing and polishing was done. Denture insertion was done. Occlusal corrections were done. Post insertion instructions were given regarding hygiene maintenance and use of prosthesis. Patient was very happy with aesthetics. (Fig 5) Follow up was done immediately after 24 hours, after one week and after a fortnight. Patient was happier with chewing efficiency and aesthetics.



**Fig 3: Packing with light body and heat cure acrylic.**



**Fig 4: Photograph showing the occlusal and palatal and lingual aspect of denture.**



**Fig 5: Post insertion photograph showing increased vertical dimension at occlusion.**

#### **DISCUSSION**

The treatment of a patient with CCD can be more challenging and complicated. An interdisciplinary dental approach plays an important role to achieve the best treatment outcome and satisfaction of patients in such cases.<sup>[5]</sup>

In the present case report the process of interim acrylic overlay denture fabricated with innovative flasking technique was described in detail. Until the fabrication of definitive prosthesis, this interim prosthesis helps the

patient to maintain the function and also to have the restored vertical dimension at occlusion.

The treatment used in this case is a relatively non-invasive and conservative solution that allowed an esthetic and functional rehabilitation. This technique can be useful as an interim measure and allows for the possibility of more involved and complex procedures to be considered at a later time.

The overlay removable denture is a viable alternative, with biological advantages, reversibility, and simplicity of treatment.<sup>[6]</sup> This is a prosthesis, which covers the surfaces of the teeth without additional preparation to support the prosthesis in order to restore the occlusal surfaces of the teeth and the chewing.<sup>[6]</sup> It is worth mentioning the importance of this prosthesis as an aid in making the diagnosis and prognosis and planning the final oral rehabilitation treatment in patients with reduced VDO, allowing the evaluation of aesthetics, function, and patient acceptance, prior to implementing permanent changes in natural dentition. It was considered particularly applicable as an efficient solution for the treatment of patients with congenital and acquired defects or as transient or interim prosthesis.<sup>[6]</sup>

### CONCLUSION

In the previous case reports the definitive treatment plan was explained in detail. The procedure of interim treatment was mentioned but details of it were not elaborated. In the present case, this interim prosthesis served the purpose of maintaining esthetics, function and vertical dimension at occlusion for nearly 5 years. This type of interim prosthesis with innovative flasking technique modified the prosthesis in such a way as to enhance the esthetic and satisfaction of the patient.

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