

## ORAL REHABILITATION OF PATIENT WITH CLEIDOCRANIAL DYSPLASIA WITH A POLYAMIDE BASED REMOVABLE PARTIAL PROSTHESIS: A CASE REPORT

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### Abstract

The aim of this case report is to present the oral rehabilitation of a 22-year-old female patient with Cleidocranial Dysplasia (CCD) who applied to our clinic. Also, it is to discuss the treatment alternatives that can be applied in patients with CCD and the advantages and disadvantages of these alternatives. Although the common opinion for the dental treatment of individuals with CCD is multidisciplinary treatment, factors such as the patient's medical and dental status, the patient's socioeconomic status, complications that may be occurred in multidisciplinary approaches, and the time required for treatment may affect the treatment option. In addition to conventional two-dimensional imaging methods, using cone-beam computed tomography images, which offer three-dimensional imaging in patients with CCD, allows for more effective determination of complications that may occur during and after the operation, and thus allows more accurate guidance to the treatments to be applied. In this case, considering the surgical and orthodontic limitations and the socio-economic status of the patient, dental treatment was completed with the application of polyamide-based removable partial prosthesis, and the patient's functional phonation and aesthetic needs were met.

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**Keywords:** Cleidocranial Dysplasia, polyamide-based removable partial prosthesis.

### Introduction

Cleidocranial Dysplasia (CCD) is a rare genetic disease in the autosomal dominant skeletal system associated with the RUN X2 gene(1) and its incidence is reported to be 1/100000 in the population (2). CCD is a disease that affects both the skeletal system and the teeth. Skeletal symptoms reported that short stature, absence of one or both clavicles or underdevelopment of the clavicles, formation of pseudo-joints, small scapula, drooping of the shoulders, hypermobility of the shoulder joints, delayed/absent closure of the anterior fontanelles of the cranium, enlargement of the cranial sutures, cranial ectasia, and scoliosis. (3, 4). Among the facial and oral findings of CCD are hypertelorism, underdeveloped paranasal sinuses, flat nose, persistent primary teeth, delayed eruption of permanent teeth, multiple

supernumerary teeth, malocclusion, anterior openbite, facial dysmorphism. (2, 3, 5). Clinical and radiographic dental findings facilitate diagnosis.(6). Dental treatment in patients with CCD requires multidisciplinary approach. (5, 7-9). The correct timing of the intervention and the multidisciplinary work of the relevant physicians (maxillofacial surgeon-orthodontist-prostodontist) increase the success of treatment in patients with CCD (3, 5, 7-9). The aim of this case report is to present the prosthetic treatment of dental problems observed in a patient with CCD and to discuss alternative treatment options for the oral rehabilitation of patients with CCD.

### Case Report

A 22-year-old female patient applied to Dicle University Faculty of Dentistry, Department of Prosthetic Dentistry due to aesthetic and functional complaints. In

the extraoral examination, the typical face shape and short stature of the patient were remarkable. Intraoral examination revealed multiple missing permanent teeth and presence of persistent primary teeth. When these findings were evaluated together, it was thought that the patient might have 'Cleido Cranial Dysplasia' (Figure 1). In the intraoral examination, it was observed that there were no permanent teeth except for teeth 16-26-36 and there were many persistent primary teeth in the mouth. (Figure 2). Panoramic radiography showed multiple impacted teeth and radiopaque images consistent with compound odontoma (Figure 3). Then, dental volumetric tomography images were requested in order to evaluate the localization of impacted teeth and their relationship with neighboring anatomical structures in three dimensions. When the multiplanar tomography sections (axial, coronal and sagittal) were examined, in addition to the existing impacted teeth, a large number of impacted supernumerary teeth (Figure 4) and enlargement of the cranial sutures were observed in the sagittal tomographic sections. It was determined that the patient had function, phonation and aesthetic problems due to persistent primary teeth and permanent tooth deficiency, and the prosthetic solution of these problems was presented as a case. (Figure 1-6)

of surgical treatment after the operation (nerve damage, fracture of the maxilla and mandible) and during the operation (bone fracture, excessive bleeding).



Figure 2. Intraoral view.

Considering the patient's socio-economic status and rejection of long-term treatments, prosthetic treatment was recommended to the patient. For prosthetic treatment, it is planned to make a 'polyamide-based partial removable partial denture' supported by teeth without root resorption and excessive crown destruction.

Firstly, the routine oral preparation before the prosthetic treatment was completed. While primary teeth with mobility and root resorption were extracted, primary teeth with well prognosis were restored and oral hygiene training was given to the patient. Due to their position in the dental arch, the primary teeth 53-63 were given the morphology of the permanent teeth numbered 12-22 and a jacket crown restoration was made in order to provide aesthetics and increase retention.



Figure 1. Typical facial appearance of a patient with CCD.

### Clinical Management

Primarily surgical and orthodontic evaluation was performed for multidisciplinary treatment. As a result of the orthodontic evaluation, it was decided that sufficient anchorage could not be obtained for the eruption of impacted teeth, since the number of permanent teeth in the mouth was low. C There was a risk of complications

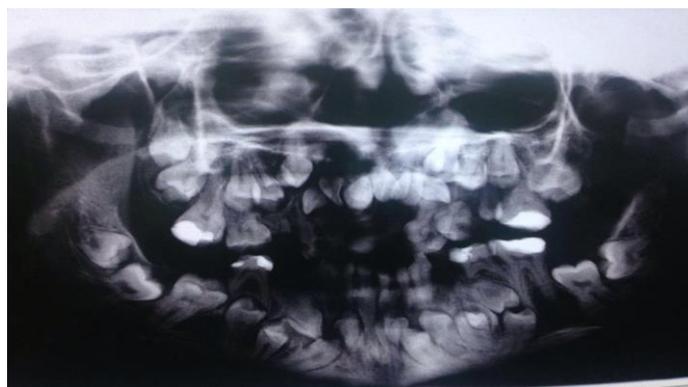


Figure 3. Panoramic radiography of the patient.

Since there are not enough permanent teeth to be supported in the mouth, a removable partial denture



By surgical operation extraction of impacted supernumerary teeth can cause complications such as bleeding, paresthesia, and fracture. In order to reduce these complications and increase the success of treatment, it is recommended to evaluate the preoperative area with advanced imaging methods (such as CBCT) (13, 14). Recently, thanks to the widespread use of dental implant treatments, implant-supported fixed and removable prosthetic treatment alternatives have been added to the dental treatment options of patients with CCD (3, 4). However, since the mutation of the RUNX2 gene is thought to adversely affect the osteoblastic activity around the implant, there are few number of case reports in the literature in which patients with CCD were treated with implants (15). Various factors may affect the treatment of patients with CCD, such as the patient's age, medical condition, socioeconomic status, the patient's expectation from treatment, whether the patient accepts the multidisciplinary treatment option, and the presence of surgical and orthodontic limitations (3, 16). In cases such as the presence of surgical and orthodontic complications risks and the the patient's rejection of multidisciplinary treatment, oral rehabilitation can be provided with prosthetic approaches. (3, 17).

In this case, our patient did not accept the multidisciplinary treatment approach for oral rehabilitation. Dental implant treatment could not be applied to the patient due to surgical limitations and socioeconomic status of the patient.

In this case report, a conservative, economical, easy-to-clean, removable prosthesis that does not exert damaging force on the abutment teeth was applied to the patient in order to provide acceptable function, aesthetics and phonation. (3). One of the problems experienced in removable partial or full dentures in patients with CCD is mucosal irritation. In this case, the use of lining material is recommended to reduce mucosal irritation. (long-term soft denture lining LTSDL) (3, 18). However, it is important to periodically renew the LTSDL. Compared to polymethyl methacrylate-based acrylic prostheses, polyamide prostheses have superior properties in terms of halitosis, mucosal irritation, bacterial involvement, fracture resistance and patient comfort. (19, 20). Therefore, in this case, a polyamide-based flexible base was preferred instead of polymethylmethacrylate.

Although the treatment of patients with CCD requires multidisciplinary approaches, in some cases, as in this case report, non-invasive, easy-to-apply, less time-consuming and low-cost treatment procedures ensure that the patient's needs are met. However, longer follow-ups

and more clinical case reports are needed to determine the ideal therapeutic approach for patients with CCD.

### Conclusion

The more complex the ideal treatment plan, the lower the chance of success and the higher the likelihood of complications. In this case report, the patient's phonation, function and aesthetic needs were met by using a polyamide-based flexible partial removable partial prosthesis. The minimally invasive treatment procedure was planned considering the socio-economic status of the patient and the patient's refusal to accept the multidisciplinary treatment approach.

### Data Availability

The data that support the findings of this study are available upon reasonable request.

### Consent

Informed consent was obtained from the patient. Written informed consent was obtained from the patient before the study.

### Conflicts of Interest

No conflicts of interest.

### References

1. Puvabanditsin S, February M, Mayne J, McConnell J, Mehta R. Cleidocranial dysplasia with 6p21. 1-p12. 3 microdeletion: A case report and literature review. *The Cleft Palate-Craniofacial Journal* 2018; 55(6):891-4.
2. Ma Y, Zhao F, and Yu D. Cleidocranial dysplasia syndrome with epilepsy: a case report. *BMC pediatrics* 2019; 19(1):1-6.
3. Ghomi AJ, Soufdoost RS, Barzegar MS, Hemmati MA. Oral Rehabilitation with Removable Partial Denture of a Patient with Cleidocranial Dysplasia. *Case Reports in Dentistry* 2020.
4. Atil F, Culhaoglu A, Kocyigit ID, Adisen Z, Misirlioglu M, Yilmaz B. Oral rehabilitation with implant-supported fixed dental prostheses of a patient with cleidocranial dysplasia. *The Journal of prosthetic dentistry* 2018; 119(1): 12-6.
5. DasGupta R, Jebasingh FK, Asha HS, Thomas N. Cleidocranial dysostosis. *Case Reports*, 2015, bcr2015211308.
6. Suda N, Hattori M, Kosaki K, Banshodani A, Kozai K, Tanimoto K, Moriyama K. Correlation between genotype and supernumerary tooth formation in cleidocranial dysplasia. *Orthodontics & craniofacial research*, 2010; 13(4), 197-202.
7. Suba Z, Balaton G, Gyulai-Gaál S, Balaton P, Barabás J, Tarján I. Cleidocranial dysplasia: diagnostic criteria and combined treatment. *Journal of Craniofacial Surgery*, 2005; 16(6); 1122-6.
8. Ayub NAFM, Hamzah SH, Hussein AS, Rajali A, Ahmad MS. A case report of cleidocranial dysplasia: A noninvasive approach. *Special Care in Dentistry* 2021; 41(1): 111-117.
9. Ambard AJ, Clemens S, and Phillips DS. Multidisciplinary implant rehabilitation of a patient with cleidocranial dysostosis: a journey from age 13 to 21. *Journal of Prosthodontics*, 2019; 28(4): p. 361-4.
10. Noh K, Kwon KR, Ahn H, Paek J, Pae A. Prosthetic rehabilitation of a cleidocranial dysplasia patient with vertical maxillofacial

- deficiency: a clinical report. *Journal of Prosthodontics*, 2014; 23(1): 64-70.
11. Berg RW, Kurtz KS, Watanabe I, Lambrakos A. Interim prosthetic phase of multidisciplinary management of cleidocranial dysplasia: "the Bronx Approach". *Journal of Prosthodontics: Implant, Esthetic and Reconstructive Dentistry* 2011; 20: 20-25.
  12. Kelly E and Nakamoto RY. Cleidocranial dysostosis—a prosthodontic problem. *The Journal of prosthetic dentistry* 1974; 31(5): 518-526.
  13. Gopinath A, Reddy NA, and Rohra MG. 3 Dimensional Diagnosis Unravelling Prognosis of Multiple Impacted Teeth—A Case Report. *Journal of international oral health: JIOH* 2013; 5(4): 78.
  14. Sutthiprapaporn P, Kongsomboon S, and Pisek P, Use of cone-beam CT in a patient with cleidocranial dysplasia dramatically reduced the operation time. *Oral Radiol*, 2010; 26(1): 52-5.
  15. Petropoulos VC, Balshi TJ, Balshi SF, Wolfinger GJ. Treatment of a patient with cleidocranial dysplasia using osseointegrated implants: a patient report. *International Journal of Oral & Maxillofacial Implants*, 2004; 19(2).
  16. Tsuji M, Suzuki H, Suzuki S, Moriyama K. Three-dimensional evaluation of morphology and position of impacted supernumerary teeth in cases of cleidocranial dysplasia. *Congenital anomalies*, 2020; 60(4): 106-14.
  17. Martins A, Caixeirinho P, and Fernandes A. Case of odontoma-related infection in a cleidocranial dysplasia. *BMJ case reports* 2019; 12(7).
  18. Chladek G, Żmudzki J, and Kasperski J. Long-term soft denture lining materials. *Materials* 2014; 7(8): 5816-42.
  19. Delgado AH, Carvalho J, Borrecho G, Nascimento T, Silva ME, Félix SA, Mendes JJ. In situ multispecies colonization of an acrylic resin: Comparison to oral microbiome and potential for inflammatory response. *Contemporary clinical dentistry*, 2018; 9(3): 400.
  20. Pavithra AS, Jayalakshmi Somasundaram AK. Reinforcement in Denture Base Resins-A Review. *Annals of the Romanian Society for Cell Biology*, 2021; 6261-74.