PriMera Scientific Surgical
Research and Practice
Volume 6 Issue 5 November 2025
DOI: 10.56831/PSSRP-06-219
ISSN: 2836-0028

Regaining Space in A Case with Reduced Crown Height Space: A Case Report and Literature Review

Type: Case Report
Received: September 23, 2025
Published: October 27, 2025

Citation:
Monika Nandan., et al. "Regaining Space in A Case with Reduced Crown Height Space: A Case Report and Literature Review". PriMera Scientific Surgical Research and Practice 6.5 (2025): 05-10.

Monika Nandan*, Harmeet Singh and Gautam Khatak

Department of Dental, A.B.V.I.M.S and Dr. R.M.L Hospital, New Delhi, India

***Corresponding Author:** Dr. Monika Nandan, DR. Harmeet Singh, Room No. 154, 1ST Floor, O.P.D Building, A.B.V.I.M.S and Dr. RML Hospital, New Delhi-110001, India.

Abstract

The crown height space has a vital role in the rehabilitation of patients using dental implants. It determines the prosthetic treatment options as well as the outcome for the patients. There are various ways of creating crown height space. This case report presents a situation where management of a case with reduced crown height space was performed.

Keywords: cement-retained prosthesis; coronoplasty; crown height space; dental implant; screw-retained prosthesis

Abbreviations

CHS: Crown Height Space.
CBCT: Cone Beam Computed Tomography.

Introduction

Treatment options for missing teeth are removable prosthesis or fixed prosthesis. Fixed prosthesis can be either tooth-supported or implant-supported. In cases of distal extension situations rehabilitation using removable cast partial situation is a challenging situation. Implant-supported prosthesis in such situations is the best treatment option as it provides retention, stability and support. However, in cases of long-standing distal extension situations supraeruption of teeth of the opposing arch can lead to decreased crown height space for rehabilitation. 'Crown height space is the distance in implant dentistry which is measured from the crest of the ridge to the occlusal surface of the posterior teeth or the incisal edges of the anterior teeth' [1, 2]. It is one of the important parameters that determine the choice of implant prosthesis connection in prosthodontics, hence influencing the treatment option. Increased crown height space beyond a certain limit can act as a vertical cantilever and decreased crown height space leads to decreased strength of the prosthesis [3, 4]. The various methods to alter the crown height space are: orthodontic tooth movement, onlay grafting, intentional root canal treatment of teeth on the opposing arch followed by coronoplasty or placement of crown and osteoplasty [5, 6].

The present case report presents a distal extension situation having mandibular ridges of proper height and width. However, because of the supra-eruption of the teeth on the opposing arch, there was a collapse in the crown height space. In this case the crown height space was created by mild odontoplasty of the maxillary molars and osteoplasty of the mandibular ridge.

Case Report

A patient reported to the Department of Dental Surgery with the chief complaint of missing teeth and difficulty in chewing food. On examination it was found that the second premolar, first molar, and second molar teeth were missing in the right lower back tooth region. The patient had undergone extraction 4 years back, and the chief reason for extraction was carious teeth. The patient wanted a fixed dental prosthesis.

In this case of distal extension on the mandibular right side, dental implants were considered as the best treatment option. However, on intraoral examination it was found that crown height space was less than 6.5mm. There was mild supra-eruption of the maxillary teeth (Figure 1a & b).

Figure 1a: Intra-oral examination showing reduced Crown Height Space and ***1b:*** Measurement of Crown Height Space.

An impression was made in alginate for both the arches and an intermaxillary bite record was made and the cast was mounted on the articulator.

The patient was advised to get CBCT done of the mandibular arch. On evaluation the distances from the mandibular canal were 14mm, 14mm and 12mm in the mandibular 2nd premolar, 1st molar and 2nd molar. Since the distance of the ridge from the mandibular canal was sufficient, it was planned that osteoplasty would be done before placing the implant. Screw-retained implant supported prosthesis was planned.

On the day of the surgery, informed consent was taken from the patient. Odontoplasty of the maxillary right premolar and molars was done to reduce the tooth structure by 0.5mm with the help of putty index (Figure 2). During the surgical procedure approximately 2.5 to 3mm of bone was trimmed to create a leveled platform (Figure 3 a & b). Odontoplasty and osteoplasty were done to increase the crown height space (Figure 4 a & b). After bone reduction, three implants of dimension 4.5mm*10mm, 5mm*10mm and 4.5mm*10mm were placed at 2nd premolar, 1st and 2nd molar respectively. Primary closure of the flap was done, and suturing was done using 3-0 silk suture. After 1 week, the silk suture was removed. After 4 months the patient was called for second-stage implant surgery. Gingival formers were placed and left for healing for 2 weeks. After 2 weeks the gingival formers were removed and open tray impression copings were placed (Figure 5 a & b). Impression was made using polyether. Jig trial of the provisional was done (Figure 6). Non- splinted screw-retained porcelain fused to metal crowns were given (Figure 7-7a & b). Patient was given oral hygiene instructions to clean the area using interdental brush and superfloss. The patient was followed up once every month for six months. The patient was satisfied with the prosthesis.

Figure 2: Putty index to guide coronoplasty.

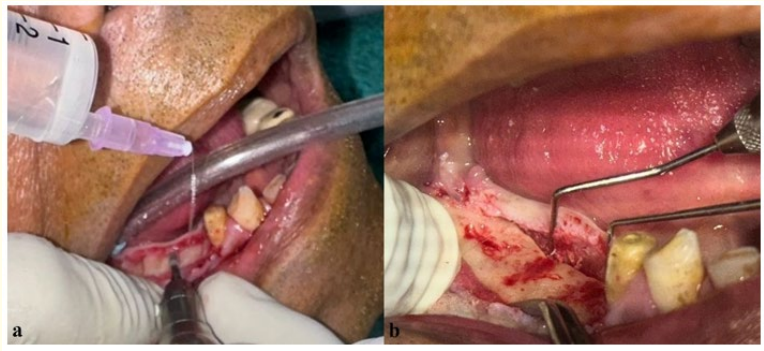

Figure 3a: Osteoplasty done to increase crown height space ***3b:*** Uniform bone level created after osteoplasty.

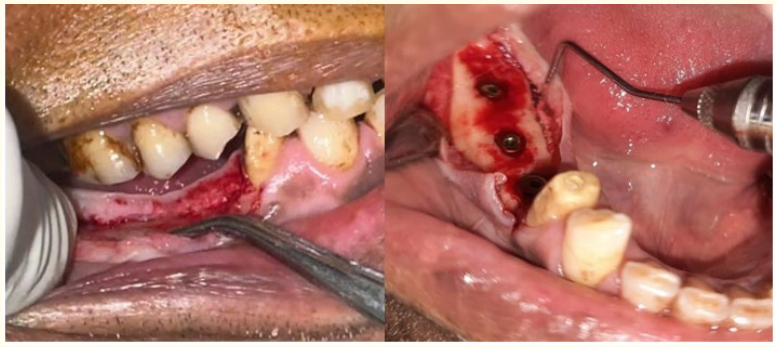

Figure 4a: Increased crown height space after osteoplasty and ***4b:*** Placement of implants.

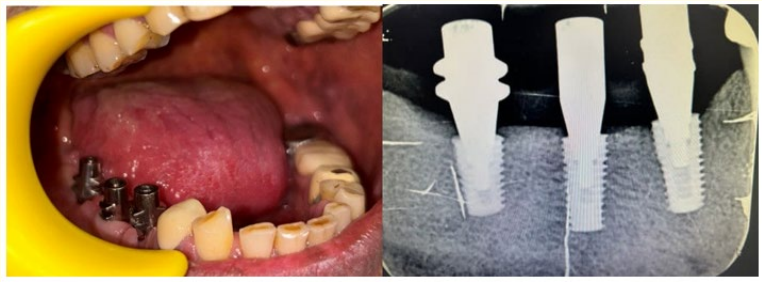

Figure 5a: Placement of impression copings and ***5b:*** IOPA to check the fit of the coping.

Figure 6: Splinting of the impression coping with dental floss and pattern resin.

Figure 7: Final Prosthesis.

Discussion

"Crown Height Space" in implant dentistry is a measure from the crest of the ridge to the occlusal surface of the posterior teeth and the incisal edge of the anterior teeth. It acts as a vertical cantilever and hence it is important in determining the type of connection in the implant prosthesis [2]. In prosthetic planning in implant dentistry the CHS is decided after obtaining the occlusal vertical dimension.

The two types of connection in implant prosthodontics that are determined by crown height space are screw-retained and cement-retained prosthesis. The most favourable height is 8-12mm for screw-retained connections and cement-retained connections for crown height space of 12-15mm and more. The abutment in screw-retained can be separate (two piece) or combined during fabrication procedure. The clinical and technical issues taken into consideration while fabricating a prosthesis are- ease of fabrication, precision, passivity of the framework, retention by cement and abutment, occlusion, esthetics, accessibility, retrievability associated complications and cost [7]. It is often noted that cement-retained prosthesis have shown more biological complications whereas screw-retained prosthesis have shown more technical complications [8]. Cement-retained pose biological problems due to the problem of excessive cement in the sulcular space. Studies have shown higher incidences of bleeding on probing (BOP) in cement-retained prosthesis as compared to screw-retained prosthesis. The presence of cement causes peri implant mucositis or peri-implantitis [9]. The major benefits offered by cement-retained prosthesis are- compensation for implant movement, position discrepancy. Passivity of fit, improved esthetics and ease in control of occlusion [8].

The clinical crown height which influences the type of connection is considered as one of the biologic factors for screw loosening, fracture of implant or prosthesis or implant failure. Both increased and decreased CHS influence the prosthetic plan. Reduced CHS possess biomechanical issues which influence the strength, flexibility and retention of the restoration. It weakens the prosthetic components. As a result, implant failures, increased bone loss and prosthetic failures are the major complications that arise. An increased CHS tends to put more force on the implant prosthetic system [1, 2]. Along with the effect of CHS the height of the abutment also effects the retention and resistance of the cement-retained prosthesis [6].

In the present case report, the initial CHS was assessed to be approximately 6.5 mm. After CBCT analysis of the patient it was found that the distance from the mental foramen and other vital structures were 14mm. In this case an osteoplasty was planned approximately 3mm creating a space of 8.5mm which was suitable for non-splinted screw-retained prosthesis. Other methods of increasing CHS are orthodontic or surgical repositioning. Surgical repositioning techniques to alter CHS include block onlay graft, interpositional bone graft or distraction osteogenesis [2].

Conclusion

Reduced crown height space can lead to prosthetic failure in the long run despite proper implant placement. Increased as well as decreased prosthetic space can be detrimental for the survival of the prosthesis. Hence, treatment should be planned wisely, and prosthetic space should be evaluated once implant placement is planned.

Conflict of interest

There is no conflict of interest.

References

1. Misch CE., et al. "Consensus conference panel report: crown-height space guidelines for implant dentistry-part 1". Implant Dent 14.4 (2005): 312-8.
2. Misch CE., et al. "Consensus conference panel report: crown-height space guidelines for implant dentistry-part 2". Implant Dent 15.2 (2006): 113-21.

3. Ferreiroa A., et al. "Cemented and screw-retained implant-supported single-tooth restorations in the molar mandibular region: A retrospective comparison study after an observation period of 1 to 4 years". J Clin Exp Dent 7.1 (2015): e89-94.
4. Manfredini M., et al. "Clinical Factors on Dental Implant Fractures: A Systematic Review". Dent J 12.7 (2024): 200.
5. Verma A., et al. "Mechanical failures of dental implants and supported prostheses: A systematic review". J Oral Biol Craniofacial Res 13.2 (2023): 306-14.
6. Bernal G, Okamura M and Muñoz CA. "The effects of abutment taper, length and cement type on resistance to dislodgement of cement-retained, implant-supported restorations". J Prosthodont Off J Am Coll Prosthodont 12.2 (2003): 111-5.
7. Wittneben JG, Millen C and Brägger U. "Clinical performance of screw- versus cement-retained fixed implant-supported reconstructions--a systematic review". Int J Oral Maxillofac Implants 29 Suppl (2014): 84-98.
8. Staubli N., et al. "Excess cement and the risk of peri-implant disease - a systematic review". Clin Oral Implants Res 28.10 (2017): 1278-1290.
9. Lv XL., et al. "Clinical, radiographic, and immunological evaluation of angulated screw-retained and cemented single-implant crowns in the esthetic region: A 1-year randomized controlled clinical trial". Clin Implant Dent Relat Res 23.5 (2021): 692-702.