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RESEARCH ARTICLE

THE ROLE OF ALTERED CAST IMPRESSION TECHNIQUE IN ACHIEVING ACCURATE PROSTHETIC FIT: A CASE REPORT

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Abstract

In dental practice, posterior bilateral edentulous spaces are most commonly encountered situations. Removable prosthesis generally is tooth or tissue borne or in combination. But the distal extension cases obtain their support from both the teeth and tissue adjacent to ensure equal distribution of forces on the teeth and the soft tissue. In this case report altered cast technique for fabrication of removable partial dentures has been described in detail. It is best alternative for impression making especially in distal extension cases for its better tissue adaptability, better support, uniform stress distribution, and stability of the prosthesis. Thus, increases patient comfort and function.

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Introduction:-

De Van in 1936 said that our aim should be directed towards the preservation of what still exists, rather than painstakingly replacing what has been lost.¹ A removable partial denture can acquire support from teeth, as seen in Kennedy's Class III and Class IV situations, or it may rely on both tooth and tissue support, as seen in cases like distal extension base RPDs, such as Class I and Class II of Kennedy's classification.^{1,2}

Impression materials such as alginate or elastomers are used along stock trays for Class III or IV situations, whereas for tooth-tissue supported RPDs, relying solely on anatomical impressions is inadequate.³ It becomes crucial to capture the residual ridge in its functional state. As a result, various functional impression techniques have been introduced by different authors, including Mclean's, Hindel's, and the fluid wax impression technique.

The altered cast technique is a method that effectively captures the functional form of the residual ridge. This involves modifying the original cast framework to create a new cast that incorporates the functional recording of the ridge, especially in posterior edentulous areas.⁴

This case report describes the various steps involved in altered cast technique.

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Case Report:

A female patient aged 38 years reported to the Department of Prosthodontics and Crown & Bridge, at Coorg Institute of Dental Sciences, Virajpet with the complaint of missing upper and lower back teeth since 3 years due to caries and periodontal problems. On examination 16, 17, 23, 27, 36, 37, 46, and 47 were found to missing with Kennedy class I edentulism with adequate residual ridge support. (Fig 1)

The patient was explained with various treatment options which included implant supported prosthesis, precision attachment supported prosthesis and cast partial denture. Patient was willing for a removable prosthesis and it was decided to treat the patient with cast partial denture.

The procedures for the fabrication of prosthesis included:

1. Diagnostic impressions were made with irreversible hydrocolloid and study cast were poured using type III dental stone. The cast were surveyed and design was planned for the cast framework.
2. Mouth preparation was done followed by final impression made using elastomeric impression material and secondary casts were obtained.
3. Refractory casts were obtained by duplicating the master cast. Wax patterns were made for the cast framework. Investing and casting was done. (Fig 2) The completed cast framework was checked for proper fit and passivity in the patient.
4. Once the fit was assessed the cast was altered to record the tissue surface of the ridge. Border molding was done using green stick impression compound and secondary impression made using zinc oxide eugenol impression paste.
5. Later, beading and boxing was done and the master cast obtained. The record bases were fabricated and jaw relation recorded in the conventional manner.(Fig 3 and 4)
6. Teeth arrangement and try-in procedure were carried out.
7. Final dentures were processed, finished and polished. (Fig 5)
8. The processed Cast partial dentures were delivered to the patient and post-insertion instructions were given. (Fig 6)
9. Follow-up was done at 24 hours, 1 week and 3 months post-insertion.



Fig 1:- Pre-op images.



Fig 2:- CPD Framework.

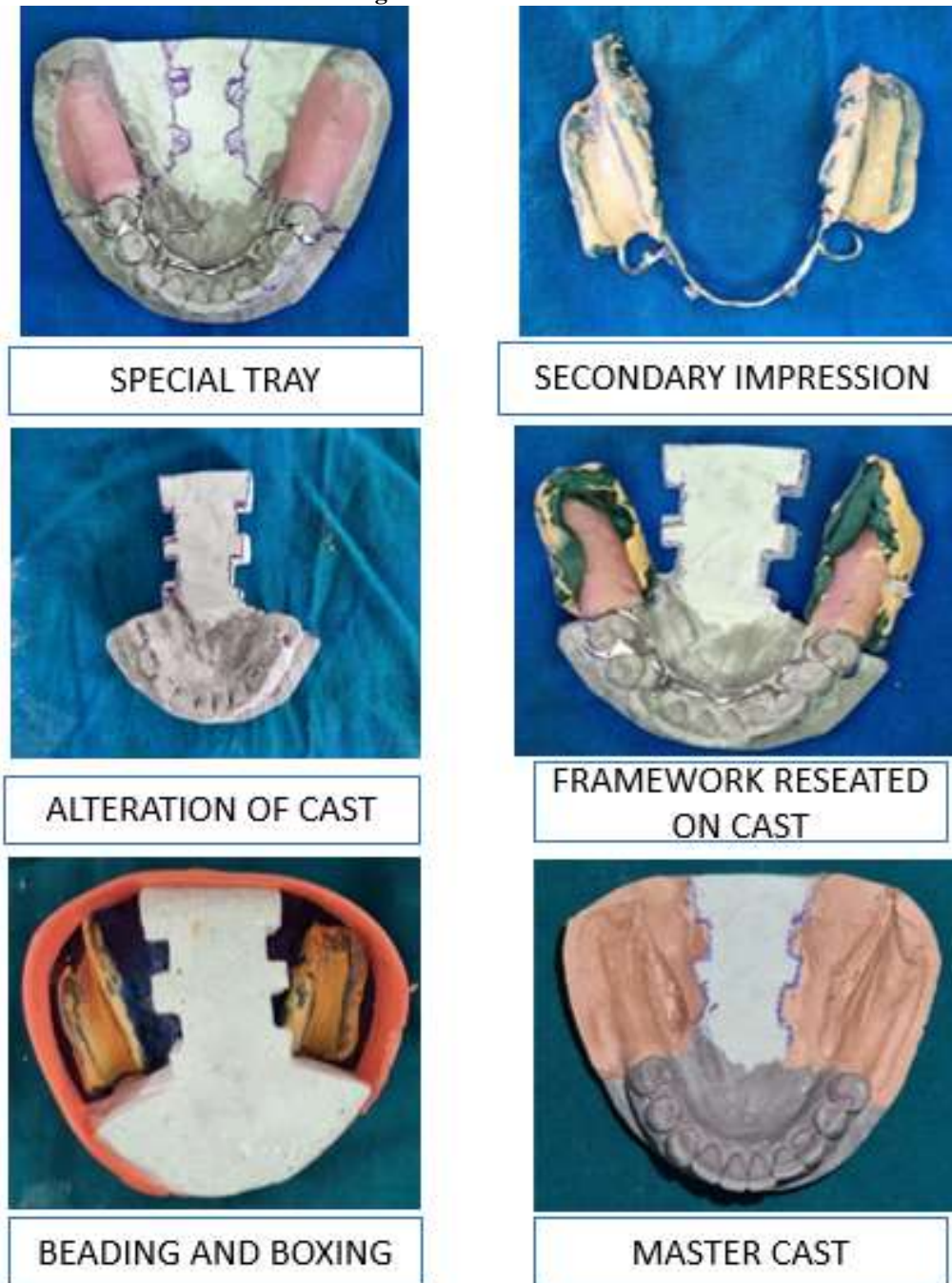


Fig 3:- Altered cast impression technique.

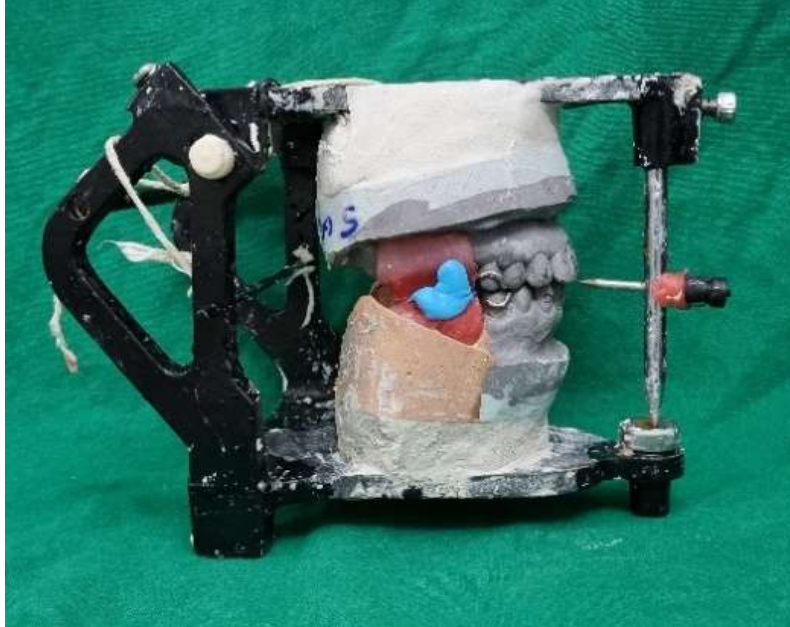


Fig 4:- Jaw relation.



Fig5. Final prosthesis



Fig 6:- Prosthesis Delivered.

Discussion:-

A removable partial denture can receive support from teeth, as seen in Kennedy's Class III and Class IV situations, or it may rely on both tissue and teeth for support, such as in cases of distal extension base RPDs, for example, Kennedy's Class I and Class II situations.

When creating impressions for Class III or IV cases, alginate or elastomeric materials can be used in a standard tray. However, for tooth and tissue supported RPDs, a mere anatomical impression is inadequate. It becomes crucial to record the functional impression of the residual ridge in addition to the anatomical features.¹

The altered cast technique is one of the method which involve recording the functional state of the residual ridge, resulting in an adjusted original cast framework. This process yields a new cast that incorporates a functional representation of the ridge recording.^{1,2}

This method offers advantages that include a potential reduction in postoperative appointments, preservation of residual ridges, enhanced stress distribution, lowered occurrences of food entrapment, and decreased torsional forces on abutment teeth.^{4,5} all these factors enhance the patient's quality of life with optimal oral health.⁶

Conclusion:-

In contrast to implant-supported prostheses, the altered cast technique is characterized by its simplicity and efficiency, demanding less chairside hours and reduced laboratory expenses. Through the implementation of the altered cast technique, a well-extended denture base serves to stimulate the underlying bone appropriately. This results in the even distribution of forces and support drawn from both the teeth and the denture base.

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