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## A Simplified approach for rehabilitating a compromised edentulous patient with increased inter-arch space.

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**Abstract:**It Is The Prosthodontist's Responsibility To Fabricate A Prosthesis Incorporating Stability, Retention And Support Which Ultimately Provide Satisfaction To The Patient. But In The Certain Conditions Such As Long Lip Length Or Severely Resorbed Ridges With Increased Inter Ridge Distance, The Weight Of A Maxillary Denture Is Often A Dislodging Factor. Hence, A Light Weight Denture Is Required For Better Retention.The Laboratory Procedure Generally Used In The Construction Of A Hollow Maxillary Denture Is Rather Complicated. A More Simple And Accurate Method For Fabrication Of A Hollow Maxillary Denture Is Described In This Case Report Which Has Advantages Over Previously Described Techniques.

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### I. Introduction

Extreme Resorption Of Maxillary And Mandibular Edentulous Ridges Lead To Narrow And Constricted Ridge Which Compromises The Retention, Stability And Support Of Complete Denture.Rehabilitating Is Always A Challenge For The Prosthodontist In These Cases.<sup>1</sup>A Resultant Large Interarch Space Between The Maxillary And Mandibular Residual Ridge And Long Lip Length Adds To This Problem.This May Result In Heavy Maxillary And Mandibular Denture,Increased Leverage Effect Which Further Decrease The Retention And Stability Of Complete Denture.<sup>2</sup>

The Prosthodontist Should Use His Specialized Training And Prosthetic Abilities To Overcome The Above Stated Problems With Simple Techniques. To Decrease The Leverage, Reduction In The Weight Of The Prosthesis Would Be Beneficial.<sup>3,4</sup>Various Weight Reduction Approaches Have Been Achieved Using A Solid Three Dimensional Spacer,Including Dental Stone,<sup>5</sup> Cellophane Wrapped Asbestos,<sup>6</sup>silicone Putty<sup>7</sup> Or Modelling Clay<sup>8</sup> During Laboratory Processing To Exclude Denture Base Material From The Planned Hollow Cavity Of The Prosthesis. In All The Techniques, Removal Of Spacer Material Was Difficult To Achieve.Furthermore, Openings Had To Be Made On The Distal Aspect Of Denture For Removal Of Spacer Which Had To Be Repaired With Autopolymerising Denture Base Resin.

In This Case Report, Edentulous Old Male Patient With Severely Resorbed Maxillary And Mandibular Ridges , Increased Inter-Ridge Distance And Long Lip Length Was Treated With Special Modification Like Hollow Maxillary Denture Fabricated Using A Simplified Technique,Optimum Coverage Of Basal Seal Area ,Decrease Leverage,Enhancing The Stability By Giving Balanced Occlusion.

### II. Case Report

A 70 Year Old Male Patient Reported To The Department Of Prosthodontics, Government College Of Dentistry,Indore, With Chief Complaint Of Inability To Chew Food With His Old Denture And Desired The Replacement Of The Same. The Medical History Of The Patient Revealed That He Was Suffering From Diabetes Since Last 10 Years And The Patient Was On Medication For The Same. Dental History Revealed That Patient Was Edentulous Past 15 Years. Teeth Were Lost Due To Periodontal Reasons And Ever Since Patient Was A Denture Wearer.Patient Was Unsatisfied With His Previous Denture.On Examination, It Was Found That Patient Was Dolicocephalic. His Facial Form Was Square Tapering And Had Prognathic Facial Profile.Both Maxillary And Mandibular Ridges Were Severely Resorbed. His Upper Lip Was Long (25 Mm),The Inter-Ridge Distance Was More Than 37mm And Vertical Dimension Of Occlusion(VDO) And Vertical Dimension At Rest (VDR) Were More Than Average. Mucosa Of The Patient Was Healthy, Firm And Resilient.The Previous Denture Of The Patient Was Poor In Retention , Stability & With Decreased Vertical Dimension Of Occlusion. Hence, It Was Decided To Fabricate A New Set Of Denture For The Patient. The Treatment Options For Complete Denture Available To The Patient Were: Implant Supported Complete Denture, Conventional Complete Denture With Some Special Modification .

After Thorough Intraoral, Extraoral, Radiographic Examination And Evaluation, It Wasdecided To Fabricate Conventional Complete Denture With Some Specific Modification.

### III. Technique

Preliminary Impression Of Maxillary And Mandibular Basal Seat Area Were Made Using Conventional Techniques With Modelling Plastic Impression Compound. A Special Tray Was Fabricated With Spacer Design Suitable For Selective Pressure Impression.Final Impressions Were Made In Accordance With Tissue Conditions Presentutilizing Selective Pressure Impression Technique Using Zinc Oxide EugenolImpression Paste. Maxillary Occlusal Rim Was First Adjusted In Accordance With Aesthetics Of The Patient With Long Upper Lip.HeightOf The Rim Was Reduced Compromising The Esthetics With In Limit Of Acceptance By Patient . Mandibular Occlusal Rim Was Adjusted To Provide Proper Vertical Dimension Of Occlusion With 3-4 Mm Interocclusal Space And Verified With Patient's Esthetics And Phonetics.20 Semi-Anatomic Teeth Were Selected And Arranged In Balanced Occlusion And Try-In Was Done First For Anterior Teeth And Then For Posterior Teeth.

For Making The Maxillary Denture Hollow,Identical Interchangeable Flasks Were Used. The Trial Dentures Were Processed In The Conventional Manner Upto The Wax Elimination Stage(Fig. 1).An Approximately 1mm Thickness Of Baseplate Wax Was Added To Impression Surface And Polished Surface Of The Denture In Respective Halves Of Flasks To Establish The Desired Thickness Of Acrylic Resin(Fig. 2). Waxed Surface Was Covered With Wetcellophane To Make A Trial Closure. There Should Be Metal-To-Metal Contact.NowThe Separated Halves Of The Flask With Polished Surface And Impressionsurface Were Flaked With Identical Interchangeable Respective Halves Using ColoredPlaster.WaxElimination Procedure Was Carried In Conventional Manner For Both The Flasks(Fig.3).



**Fig. 1.**Trial Denture Processed Upto Wax Elimination Stage In Conventional Manner.



**Fig. 2.**Baseplate Wax Adapted To The Impression And Polished Surface And Flaked With Identical Interchangeable Flasks.



**Fig. 3.**Wax Elimination Procedure Carried Out In Conventional Manner For Both The Flasks.

Separating Medium Was Applied. Now Acrylic Resin In Dough Stage Was Placed On Both The Halves Of Respective Flask Separately. Wet Cellophane Sheet Was Placed And Respective Halves Were Closed And Bench Pressed Till Metal To Metal Contact Was Achieved. Curing Was Done Without Removing The Cellophane. The Cellophane Facilitates Separation Of Flasks. Any Wrinkles In The Acrylic Resin From The Cellophane Will Provide Better Union With The Added Acrylic Resin In The Second Processing Procedure. Upper And Lower Halves Will Come Apart More Easily (Fig. 4). Now Reapproximate The Impression And Polished Surfaces In The Respective Halves Of The Flasks. If There Is Any Extra Acrylic Flash Which Prevent The Metal To Metal Contact Of Flask, Remove It.



**Fig.4.** Heat Polymerised Impression And Polished Surfaces Of Complete Denture.

A New Mix Of Acrylic Resin Was Made And Placed Along The Edges Of The Two Parts (Fig. 5). Trial Closure Was Made To Ensure Sufficient Acrylic Resin, Cellophane Was Removed And Denture Was Processed. Mandibular Denture Was Processed In Conventional Manner. The Dentures Were Then Polished In Usual Manner (Fig. 6). The Dentures Were Inserted In The Patient's Mouth And Instructions Were Given (Fig. 7).



**Fig.5.** A New Mix Of Heat Polymerised Acrylic Resin Placed Along The Edges Of Two Parts Of Denture.



**Fig.6** Hollow Maxillary Complete Denture On Articulator.



**Fig.7** Complete Denture Insertion

#### **IV. Discussion**

Rehabilitation Of Patient With Severely Resorbed Ridges And Long Lip Length Is A Challenge To The Dentist. Even Though, The Choice For Rehabilitation Can Be Implant Supported Overdenture, And Ridge Augmentation But Many A Times The Patient Who Come With Such A Problem Are Geriatric Patients With Systemic Illness, Economic Constraints, Possess Reluctance For A Long Duration Treatment Procedure And Unwillingness For Any Kind Of Surgical Procedure. Hence, The Best Way Is To Rehabilitate Them With The Conventional Way. Apart, From Modifying The Impression Technique To Get Optimum Denture Bearing Area, Modifying The Type Of Denture May Also Be Better Accepted By The Patient. In Present Case Report, The Patient Was Wearing A Denture With Decrease Vertical Dimension Of Occlusion Which Lead To The Compromised Esthetics And Less Stability To The Denture. Moreover, Retention Was Also Compromised Due To Maxillary Resorbed Ridge. In General, A Conventional (Heavy) Denture Whether Maxillary Or Mandibular Is Likely To Cause Poor Denture Retentive Ability. Extensive Volume Of The Denture Base Material In Prosthesis Provided To Patients With Large Maxillofacial Defects Or Severe Residual Ridge Resorption Is Always A Challenge To Prosthodontists. To Increase The Retention And Stability Of Heavy Prosthesis, Many Methods Have Been Tried Like Utilising The Undercuts, Modifying The Impression Technique, Use Of Magnets, Use Of Implants, Etc.<sup>9</sup> The Prosthodontic Treatment Plan Chosen For This Patient Was Based On Several Findings Noted During Case History And Examination. Resorbed Residual Ridge (Compounded With Long Lip) Length Resulted In Increased Interridge Distance. If Conventional Maxillary Denture Was Constructed Then It Would Have Resulted In Increased Weight Of The Maxillary Denture That May Result Into Resorption Of Maxillary Edentulous Foundation At A Higher Rate.

Reducing The Weight Of Maxillary Prosthesis, However, Has Been Shown To Be Beneficial When Constructing Prosthesis For Rehabilitation Of Edentulous Patient. This Can Be Achieved By Making The Maxillary Denture Hollow. The Method In This Case Report Has Advantages Over Previously Described Techniques Like Using Silicone Putty, Using Dough Of Pumice-Plaster And Lost Salt Technique For The Hollow Denture Fabrication. In The First Two Techniques, It Is Impossible To Remove All Putty And Mix Pumice-Plaster And Later Holes Have To Be Repaired With Autopolymerising Resin. In Lost Salt Technique, Salt Is Dispersed During Packing Irregularly And Result In Compromised Esthetics. The Technique Described In Present Case Report Is More Simple And More Precise To Fabricate Hollow Denture And Complete Denture Is Fabricated With Heat Polymerised Denture Base Material. The Thickness Of The Resin Can Be Controlled By Adapting An Even Thickness Of Wax Sheet All Around After Measuring It With Wax Gauge. This Will Ultimately Ensure Even Depth Of Resin To Prevent Seepage And Prevent Deformation Under Pressure Of Flask Closure.

The Advantages Of Hollow Dentures Are Reduction In The Excessive Weight Of The Acrylic Resin, Resulting In The Lighter Prosthesis Making The Patient More Comfortable. Facial Appearance Of The Patient Was Improved After Optimum Vertical Dimension Was Achieved In The Definitive Prosthesis. Patient Had No Notable Complaints About The Prosthesis And Was Able To Speak And Function Better.

#### **Summary**

Hollow Maxillary Denture Providing Optimum Coverage With Selective Pressure Impression And Reduced Vertical Dimension Is The Best Method Of Rehabilitating The Patient With Severely Resorbed Ridge And Long Lip Length. It Not Only Reduces The Weight Of The Denture But Also The Leverage Action Of The Same. This Ultimately Results In Increased Retention And Stability And Upto Some Extent It Is Also Possible To Preserve The Existing Residual Alveolar Ridge. A Simple, Accurate Method For Processing A Hollow Maxillary Complete Denture Is Described.

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