MASTER VOLUME (2nd Edition)

INDEX

MASTER VOLUME- CLINICAL FIXED PROSTHODONTICS

INDEX

MASTER VOLUME- CLINICAL FIXED PROSTHODONTICS

In perfected occlusion, while all teeth contact simultaneously during centric closure, only the anterior teeth contact during excursive movements. This means, a combination of condylar guidance (at the back) and anterior guidance (at the front) brings about posterior disclusion during front-to-back and side-to-side movements.

? What do we desire in the final occlusion?

The anatomic design of each tooth is highly specialized for effortless execution of function. The exact inter and intra-arch relationships of teeth are extremely important as they greatly influence the health and function of the masticatory system.

Stability depends on the direction of stress and the distribution of centric holding contacts. For this, Class I occlusion is most ideal as mandibular cusp tips contact the mesial marginal ridges of maxillary posteriors, which allows them to move through lateral excursions with the least possibility of encountering interferences. Although Class I relationship is ideal, it is not necessary for stability.

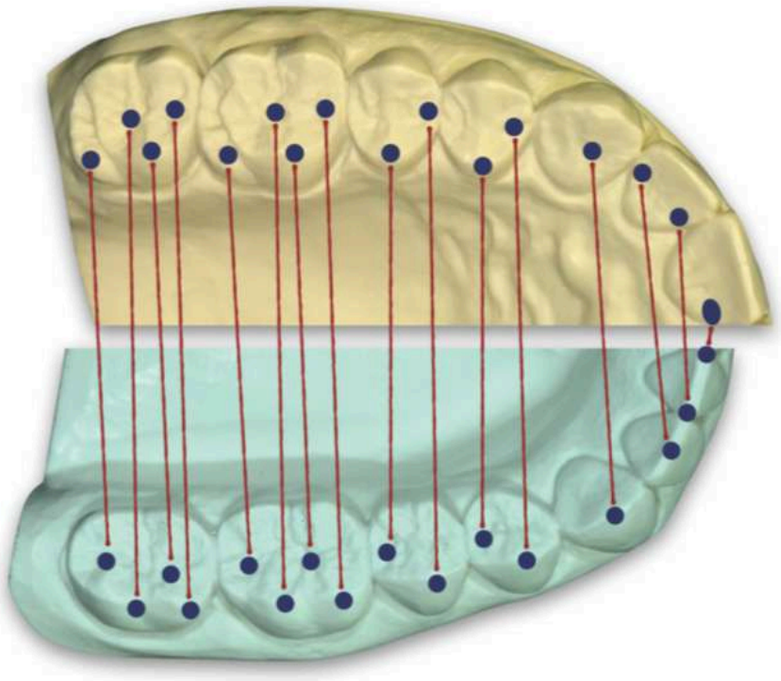

Fig. 1.9: Interarch relationship of a Class I molar occlusion showing typical occlusal contact points.

Because there are many different arch-to-arch relationships, variations exist in standard intercuspation patterns and static occlusal contact relationships.

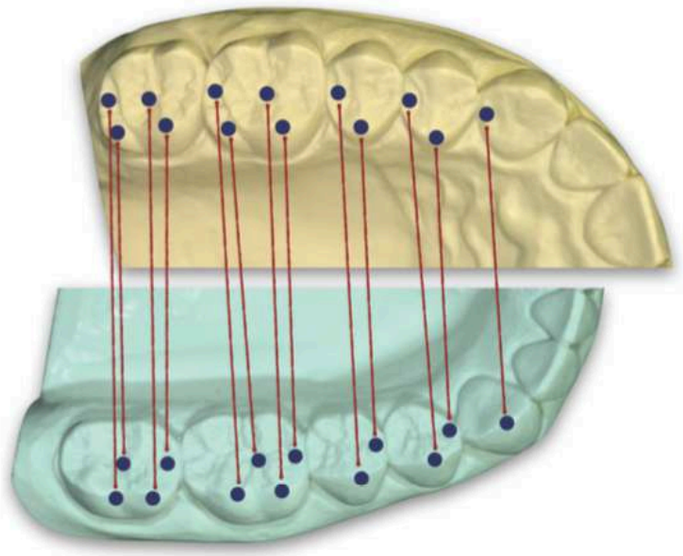

Fig. 1.10: Interarch relationship of a Class II molar occlusion showing typical occlusal contact points.

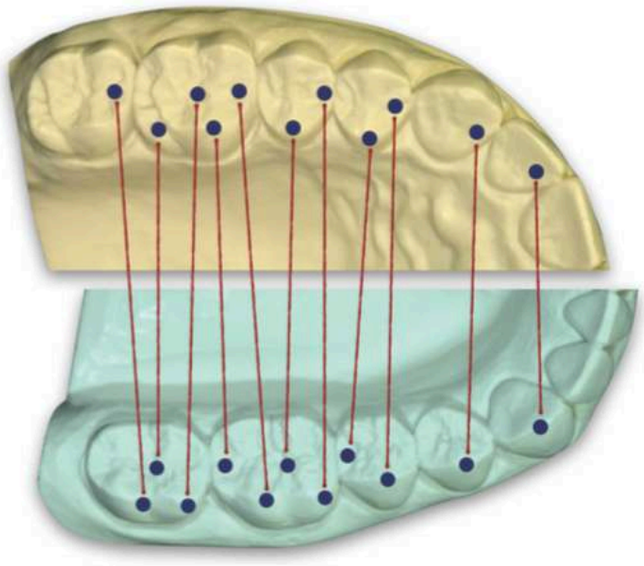

Fig. 1.11: Interarch relationship of a Class III molar occlusion showing typical occlusal contact points.

Note: These static occlusal contact schemes serve as a reference when reconstructing dentitions.

It is not necessary to place cusp tips in a stereotyped position, rather what is important is that centric contacts are shaped and located in a manner that directs forces as parallel as possible to the long axis of both upper and lower teeth.

In most clinical situations, indirect prostheses (or direct fillings) are designed to conform to the pre-existing occlusal scheme. In other words, the restorations are designed such that they duplicate the shape of the natural tooth being replaced. In order to ensure this, one must reduce sufficient amount of tooth to accommodate for the prosthesis.

Failure to do so results in an over-contoured restoration, which increases the risk of introducing deflective contacts, as explained next.

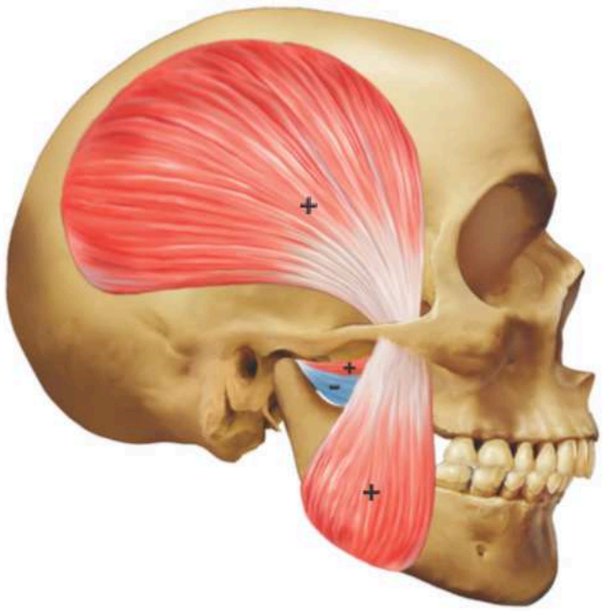

Fig. 1.31: Pre-treatment condition.

Note, upon closure the elevator muscles are active (+), while the depressor muscle (inferior lateral pterygoid) is relaxed (-).

Such a patient is said to have 'Coordinated Muscle Function'.

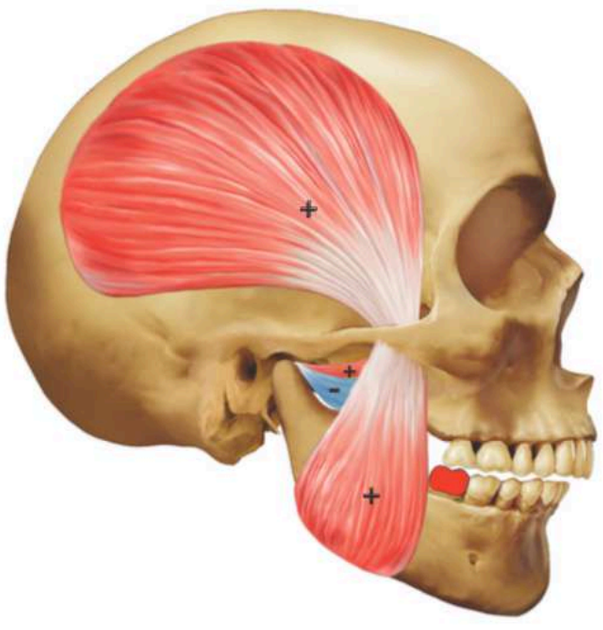

Fig. 1.32: Prosthetic crown on a mandibular second molar.

Often posterior crowns seat 'high' upon initial placement. Such prostheses need to be adjusted in order to ensure that it 'fits' into the pre-existing balance of the stomatognathic system. However if left to 'settle', the body responds with a cascade of adaptive changes.

In an attempt to masticate, such a patient begins to clench on the prosthesis, which precipitates into a 'hit and slide' occlusion.

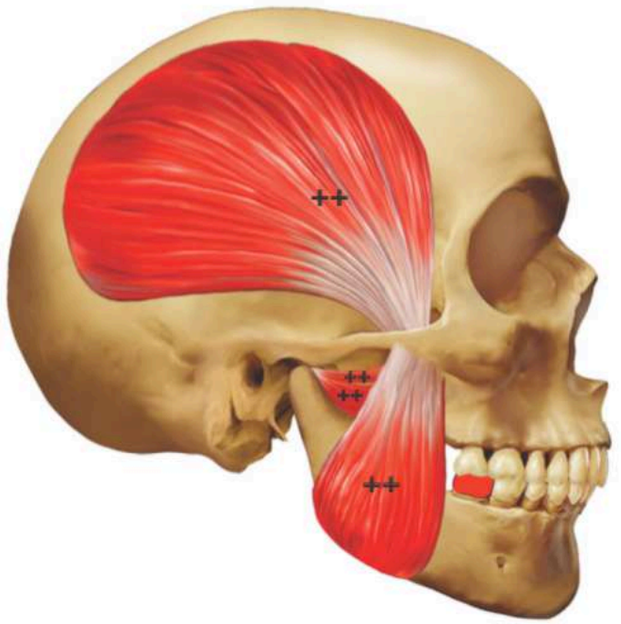

Fig. 1.33: The act of clenching causes the elevator muscles to undergo spasmodic contractions (++), while the slide forces the lateral pterygoid muscles to contract simultaneously (++).

This way, an interference to closure results in 'Incoordinated Muscle Hyperfunction'.

Let us try and understand the same thing from a different perspective.

When the patient with an interference attempts to close the mouth, the high crown alone comes in contact and does not allow the remaining arch to gain intercuspation. At this point, although there is orthopaedic stability there is orthodontic instability.

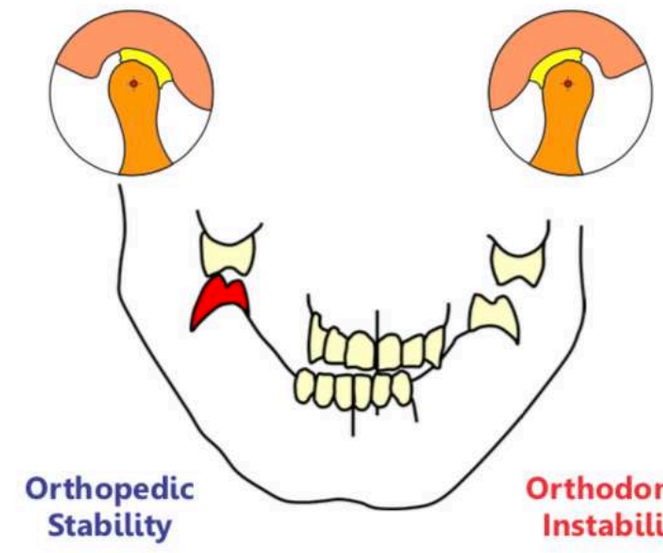

Fig. 1.34: Note the presence of a deflective contact on the posterior tooth. Here the condyles are in their comfortable position, but the teeth fail to meet in MIP.

The labio-incisal edge of lower anterior teeth constitutes one half of the anterior guidance surface. Their correct orientation, inclination and contour are paramount for achieving the desired posterior disclusion.

The correct spatial relationship between the upper and lower incisal edges is critical for clear pronunciation of the letter 's'.

? What considerations need to be addressed when restoring the lower anteriors?

Correct pronunciation of words with the letter 's' requires air to be constricted into a uniformly flat and wide band between the upper and lower anterior teeth. Correct inter-incisal orientation is key to achieving this, as incisal edges need to come very close to each other without making physical contact.

Individuals can be clustered into two primary groups on the basis of their mandibular position when pronouncing the letter 's', as influenced by their envelope of function.

a. Those who pronounce 's' in an anterior overlap position

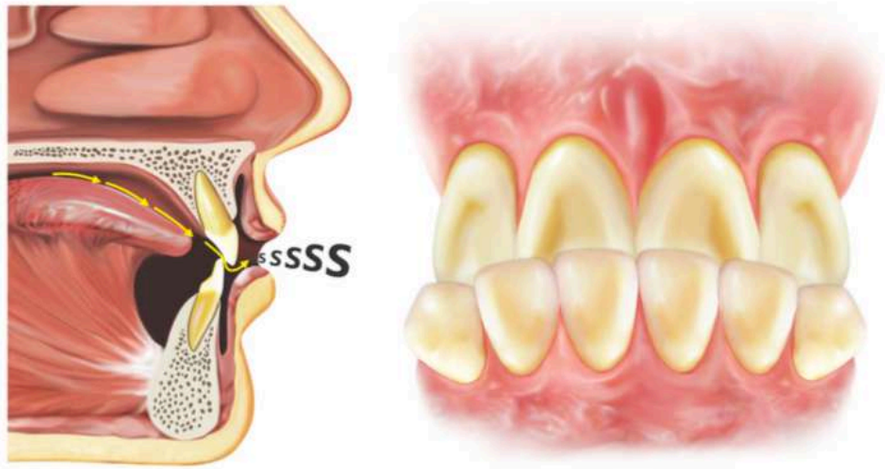

Fig. 2.49: These are individuals who move their mandible upwards, to position their lower incisal edges behind the maxillary teeth. When fabricating mandibular anteriors for these patients, the incisal plane needs to be designed as a slightly convex curve so it can correctly fit the palatal contour of the upper anteriors.

b. Those who pronounce 's' in an anterior edge-to-edge position

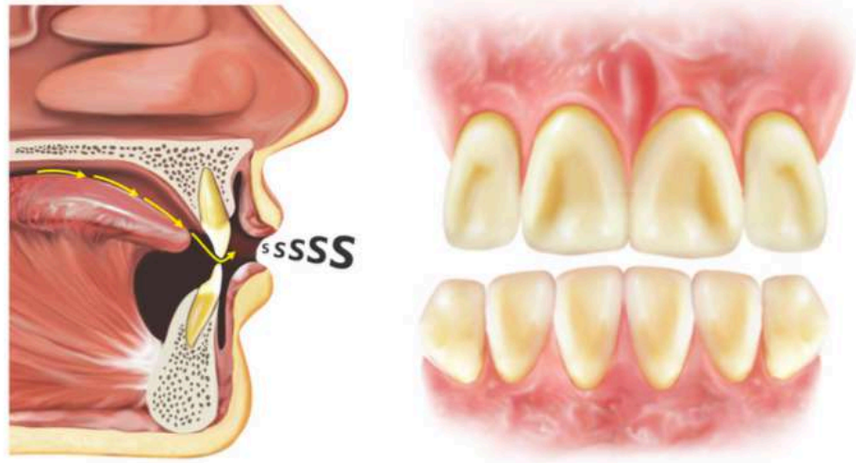

Fig. 2.50, 2.51: These are individuals who move their mandible downward and forward, to position their lower incisal edges along the same plane as the maxillary teeth. When fabricating mandibular anteriors for these patients, the incisal plane needs to be kept flat in order to match the upper incisal edges.

Errors and their implications

Fig. 2.52: If the lower incisal plane is designed convex for a patient who habitually pronounces 's' at an edge-to-edge position, clarity of sound gets compromised, as air tends to leak out through the sides.

Fig. 2.53: On the other hand, if the lower incisal plane is designed flat for a patient who habitually pronounces 's' at an overlap position, clarity of sound again gets compromised, as air tends to leak out through the center. Such patients often complain of a whistling sound when pronouncing words with the letter 's'.

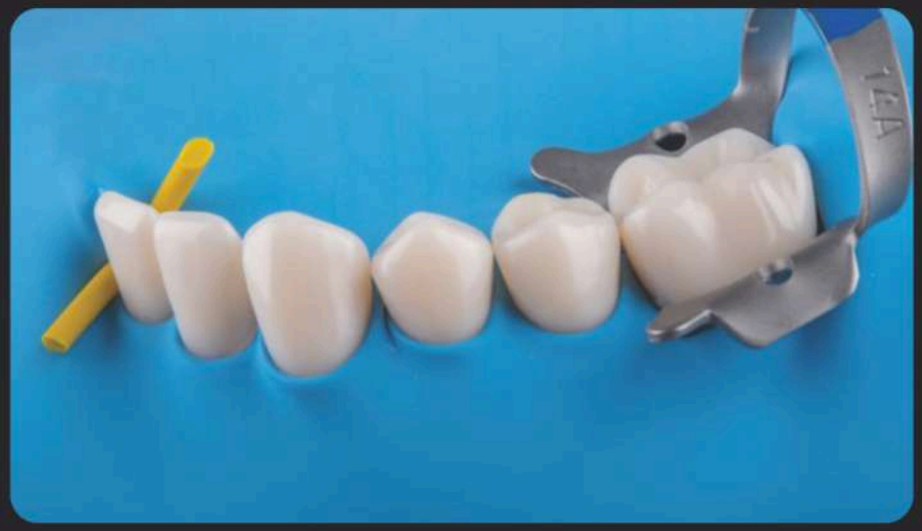

Fig. 3.123: The final assembly providing 'absolute isolation'.

Fig. 3.124: If required, dental floss is passed behind the bow of the clamp, in order to push the sheet interdentally on the distal aspect.

Advantage of this technique

- ▲ It is fairly quick and easy to manage by a single operator.

TECHNIQUE 2 (SHEET AND CLAMP TOGETHER)

In this technique, wingless clamps are used and the frame is attached last in the sequence.

Fig. 3.125: After completion of common steps, the clamp is mounted on the sheet such that the clamp bow extends outwards towards you while the rest of the clamp is below the sheet.

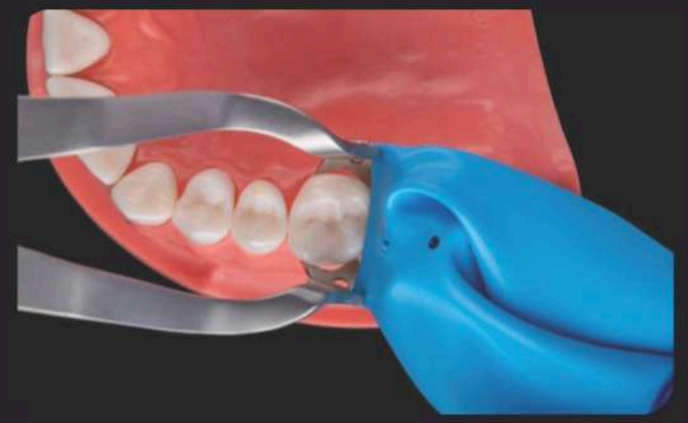

Fig 3.126: The sheet is then wrapped with one hand to expose the clamp holes which are engaged by the forceps and positioned on the desired tooth. This needs to be done carefully, so as to prevent the sheet from slipping off the clamp bow.

Fig. 3.127: Next, the sheet is released under the clamp and all other punch holes are passed through interdental contacts.

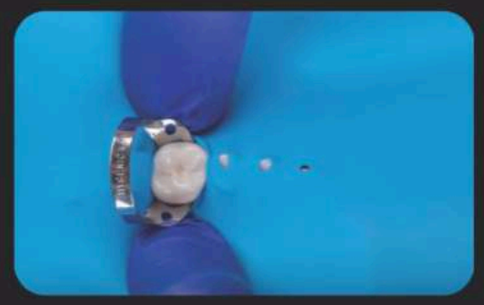

Fig. 3.128: Unique to this technique, the frame is mounted last and the dam sheet is pulled and secured onto it. The rubber dam margins are then inverted, as explained in the previous technique.

Advantages

- ▲ Ideal for teeth where winged clamps interfere with dam placement.
- ▲ There is less tension on the sheet with reduced chances of tearing.

Disadvantages

- ▼ The step of releasing the dam sheet under the clamp can cause momentary discomfort to the patient.
- ▼ Chairside assistance is required with this technique.

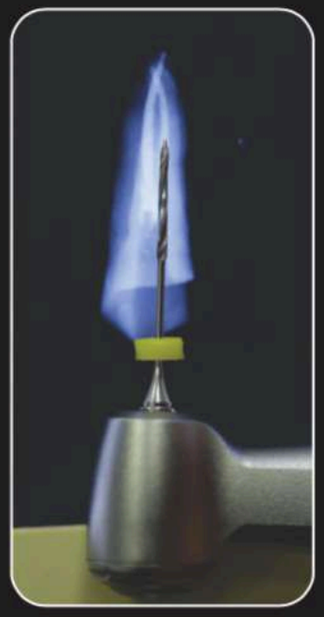

Fig. 4.48: The post length is tentatively determined on an IOPA radiograph using a peeso reamer. The tip of the buccal cusp (in this case) is chosen as the anatomic landmark from which measurements are made. The palatal canal is chosen as the primary canal and prepared up to the predetermined length using the # 1 peeso reamer in a slow speed contra-angle handpiece.

Fig. 4.49: RelyX Fiber post from 3M was chosen for this documentation. This system is available in three different sizes with corresponding post drills.

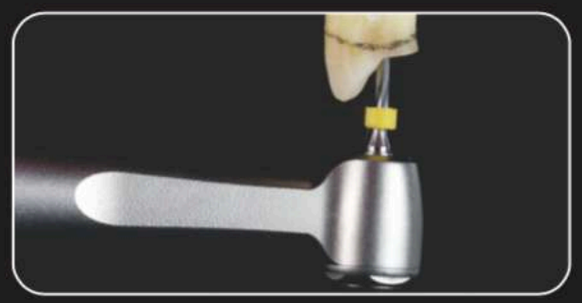

Fig. 4.50: Following primary access with the peeso reamer, the size #1 post drill is used to shape the canal space to the pre-determined length.

Fig. 4.51: RelyX Fiber post #1 is then tried to check the fit and an IOPA/RVG is taken to verify the same (red arrow). Note, about 2 mm of gutta percha has been removed from the buccal (secondary) canal (yellow arrow).

Fig. 4.52: The excess post is then cut using a high speed diamond bur with air-water spray. Scissors, scalpels or similar tools should not be used to cut the post as these tend to crush the fiber and ruin their structure and stability.

Fig. 4.53: The post is then seated in the prepared canal and the length is verified again. Next, the canal is cleaned with 2.5-5.25% sodium hypochlorite solution.

Hydrogen peroxide and EDTA solution should not be used as their residue tends to impair the bond strength and curing reaction of the resin cement.

Fig. 4.54: For ease of handling, the post is secured with a tweezer. Endo-tweezer from WAM was used for this documentation.

STANDARD PREPARATION TECHNIQUE

Bearing in mind that PLVs are bonded restorations, the primary goal in any PLV preparation is the conservation of tooth structure.

The right maxillary central incisor is used for this documentation. As shown below, different pre-treatment indices are made using silicone putty (prior to tooth preparation).

Fig. 5.32: A specialized index which is sliced into three horizontal sections. This is used to gauge the amount of reduction at different planes along the labial surface.

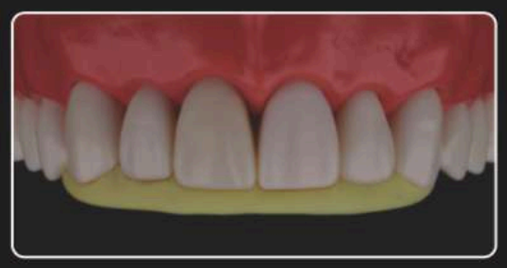

Fig. 5.33: Incisal index as seen from the labial view. This index is used to gauge the amount of incisal edge reduction.

Fig. 5.34: A mid-saggital index as seen from the lateral view. This index is used to gauge the amount of reduction along the labial, incisal and palatal aspects.

PLV preparation has been discussed here under 6 different phases:

Phase 1: Depth orientation grooves.

Phase 2: Labial reduction.

Phase 3: Proximal preparation.

Phase 4: Incisal reduction.

Phase 5: Palatal chamfer preparation.

Phase 6: Finishing and polishing.

PHASE 1: DEPTH ORIENTATION GROOVES

Fig. 5.35: A PLV of 0.5 mm was planned and hence a PLV 0.5 bur is used to score a horizontal groove in the gingival third of the tooth. This groove extends from the mesial to the distal aspect of the facial surface, taking care not to traumatize the adjacent teeth.

This bur leaves a groove that is 0.5 mm in depth and 1 mm in width. The non-cutting shank that extends ahead of and behind the cutting edge of the bur ensures absolute certainty in depth orientation, regardless of the labial contour of the tooth.

Fig. 5.36: Two more grooves are made using the same bur along the middle and then the incisal third of the tooth.

Fig. 5.37: The base of each groove is then colored (for contrast) with a pencil or a marker.


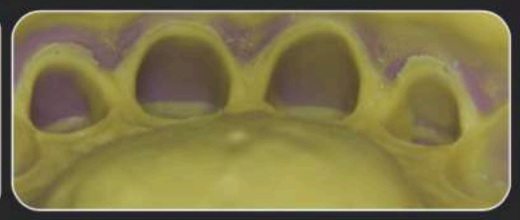

Fig. 5.175, 5.176: Following chemical tissue retraction, A-Silicone impressions were made using the 2-step foil technique.


Fig. 5.177, 5.178: Next, the patient was given immediate chairside provisionals that were spot bonded.



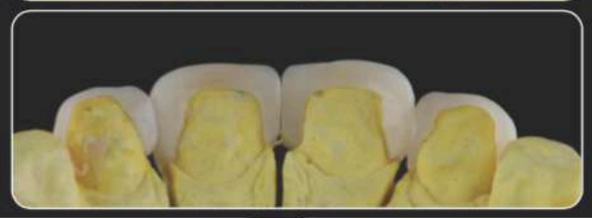

Fig. 5.179-5.183: Final PLVs from multiple views.

Fig. 5.184: These were tried intraorally to evaluate fit and overall aesthetics.



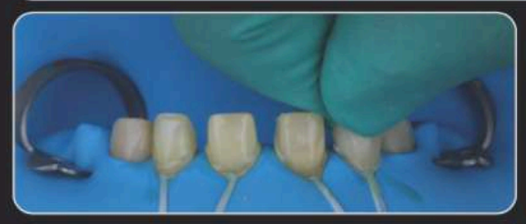
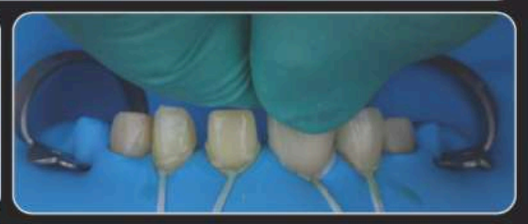
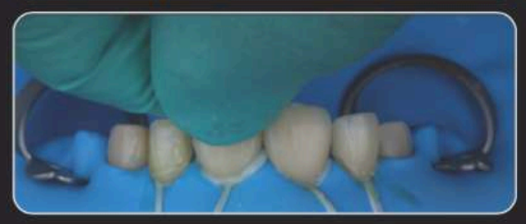


Fig. 5.187-5.190: Bonding was then undertaken using rubber dam to maintain absolute isolation.

CASE 10: ALL CERAMIC ENDOCROWN FOR MANDIBULAR FIRST MOLAR USING THE TABLETOP PREPARATION DESIGN

Fig. 6.115, 6.116: When preparing teeth for tabletop restorations it is often difficult to protect the adjacent teeth from inadvertent damage. In such a scenario, using a matrix band becomes essential. FenderWedge, a novel design from Directa Dental was used for this patient.

Fig. 6.117-6.119: Final tabletop endocrown preparation from multiple views.

Fig. 6.120: Monolithic endocrown fabricated using IPS e.max.

Fig.6.121, 6.122: Post bonding view from different views showing the inconspicuous nature of biomimetic restorations.

CONCLUSION

Changing one's thought process and pushing beyond the comfort zone is part of the learning curve. This is especially true with bonded partial restorations as it challenges our core traditional beliefs of crown retention.

It is a great time to be practicing dentistry, as we have been blessed with the opportunity to witness and be a part of this new era of minimally invasive dentistry; where bonding, digitalization and the tremendous improvements in material sciences have made dentistry more exciting, efficient and truly predictable.

With bonded restorations, we no longer have to destroy teeth in an attempt to save them.

? What are the differences between clenching and bruxism?
How can a clencher be differentiated from a bruxer clinically?

Although both represent a form of dysfunction that can have a secondary central nervous system (CNS) influence, the primary differentiating factor between a bruxer and a clencher lies in the direction of pathofunction.

	CLENCHER	BRUXER
Direction of Force	Clenchers typically engage in centric or vertical 'gator-like' pathofunction, with no noticeable jaw movements.	Bruxers typically engage in eccentric or horizontal 'cow-like' pathofunction.
Pattern of Wear	Angular attrition with reversal of the curve of Wilson, as (selectively) only functional cusp tips undergo loss of tooth structure.	Flat attrition across the entire occlusal table.
Anterior Guidance	Usually maintained, especially for patients with a deep anterior overlap.	Typically worn with possible anterior edge-to-edge contact.
Type of Load	Compressive in nature.	Shear loading of teeth and supporting structures.
Condylar Guidance Angle	As clenching does not involve displacement of the condyles, most patients present with fairly steep condylar guidance angles.	As the bruxing activity requires frequent displacement of the condyles from CR position, patients typically present with flatter condylar guidance angles.
Soft-Tissue Signs	Typically associated with linea-alba and indentations of teeth on the lateral border of the tongue.	No such obvious soft-tissue correlations.
Post-Reconstruction Prognosis	Good, as forces are distributed axially and over multiple teeth, thereby reducing the load per tooth. Owing to a vertical envelope of function, anterior guidance can be designed with a steep guidance profile that can be maintained stable over time.	Guarded, as forces are non-axial and distributed over fewer (contacting) teeth during translation, thereby increasing the load per tooth. Owing to a horizontal envelope of function, anterior guidance can be restrictive in nature, especially when designed as a steep overlap, which compromises its stability over time.

Although clenching and bruxism are considered as two separate entities, in reality, most individuals do not necessarily function in a pure vertical or horizontal envelope. Rather, they show an overlap in signs and symptoms, pointing to a possible co-existence of both forms of pathofunction. This often makes diagnosis, treatment planning and maintenance even more challenging.

Owing to these profound variables of maxillary position in all 3 spatial planes (sagittal, coronal and transverse), precise recording of the maxillary arch orientation becomes an essential step in functional and aesthetic reconstructions.

As maxillary cast mounting is the starting point of articulation, the accuracy of all other relationships depend on getting this requirement right.

Fig. 8.28-8.36: Note the variable position of maxillary (and accordingly) mandibular casts from different perspectives. Top: Front-to-back, Middle: Side-to-side, Bottom: Superior-inferior view. A facebow helps record and relate these spatial variations to the articulator and helps to orient the maxillary cast in all 3 dimensions.

With aesthetics at the forefront, there are very few errors or inconsistencies that affect appearance more negatively than a canted incisal plane. Such problems can be avoided with use of a facebow by aligning the U-frame parallel with the inter-pupillary line. Such a set-up auto aligns the incisal plane parallel to the horizon, allowing the technician to correct a cant (when present) and more importantly, avoid creating one.

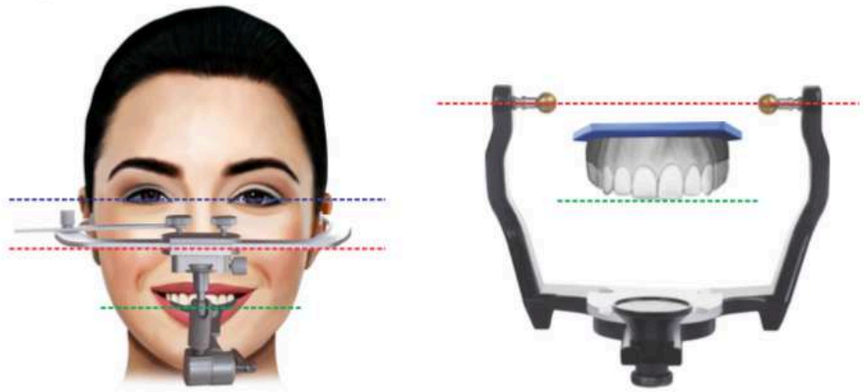

Fig. 8.37, 8.38: When a facebow record is made in such a way that the U-frame aligns parallel with the patient's inter-pupillary line (left), the maxillary cast gets automatically aligned with the inter-condylar axis of the articulator (right).

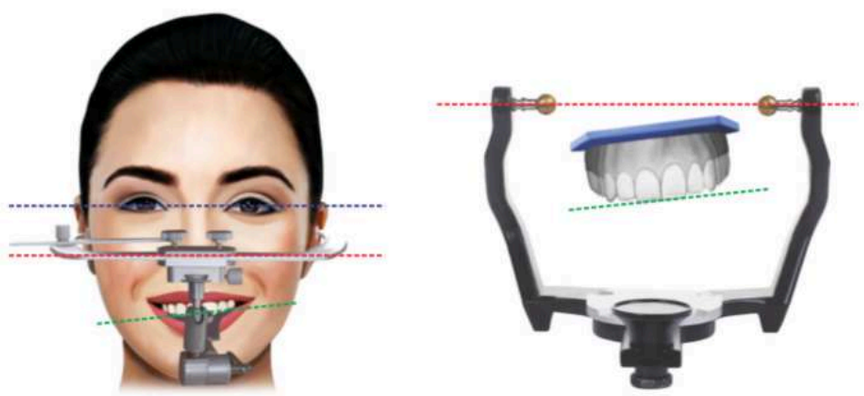

Fig. 8.39: This becomes especially important in patients with a pre-existing cant, as alignment of the U-frame with the eyes results in a transfer of the true cant on to the articulator. This allows the technician to correct the anomaly and create an aesthetically pleasing incisal plane.

A concern arises when the patient's ears are not positioned along the same horizontal plane as the eyes. This means, when the ear-pieces are in position the U frame does not align parallel with the eyes. If this relation is transferred to the articulator, the maxilla would get mounted at an incorrect orientation, possibly resulting in major mishaps.

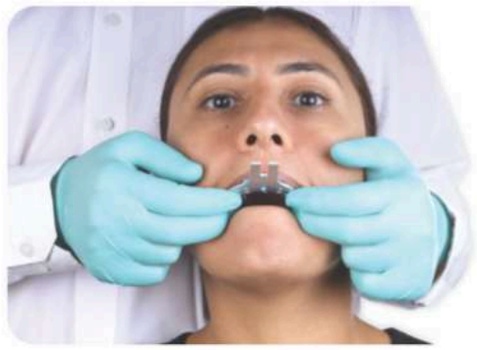
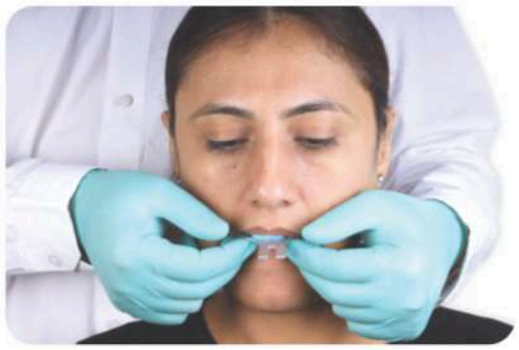

Fig. 9.21, 9.22: Subsequently, the bite tray is seated intraorally making sure it is aligned with the patient's facial midline. The plate is stabilized using a 4-point contact until the material hardens. **Note:** Philtrum of the upper lip is the ideal soft tissue landmark for the assessment of facial midline. Dental midlines are often off axis and should not be considered during this step.

Do not seat the plate too firmly, as it can lead to tooth-plate contact and/or a drag, which can affect correct seating of the stone cast.

Fig. 9.23: Once the material is set, the patient is asked to stabilize the plate by holding it firmly using both thumbs (and keeping the fist closed). This secures the bite plate and prevents it's rocking. I personally do not like patients biting onto the plate, as this can cause it to 'tip off' and disengage from the recorded indentations.


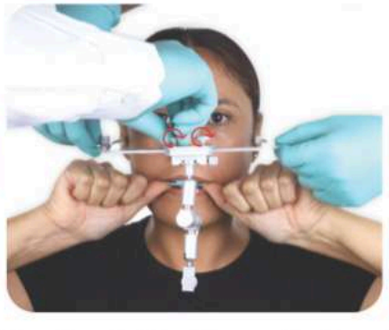

Fig. 9.24, 9.25: Next, the chairside assistant (standing behind the patient) positions the earpieces of the U-frame into the patient's external auditory meatus (left). Once the patient confirms positive seating, the U-frame is locked by tightening the thumb nuts located at its front end (right). This secures the U-frame in position and establishes the two posterior reference points.



Fig. 9.26-9.28: The free end of the transfer assembly is then connected to the bite plate (top) and locked using the finger screw (bottom). It is important to slide the transfer assembly all the way into the midline slot of the bite plate. With this done, the transfer assembly is engaged to the U-frame above and the bite plate below.

Fig. 9.29: Next, the orbitale pointer is opened and the U-frame is raised or lowered until the pointer aligns with the orbitale mark on the face.

Fig. 9.30: The pointer can be kept slightly away from the face as there is no need for it to physically contact the skin. This prevents accidental injury to the eye when altering the vertical position of the U-frame.

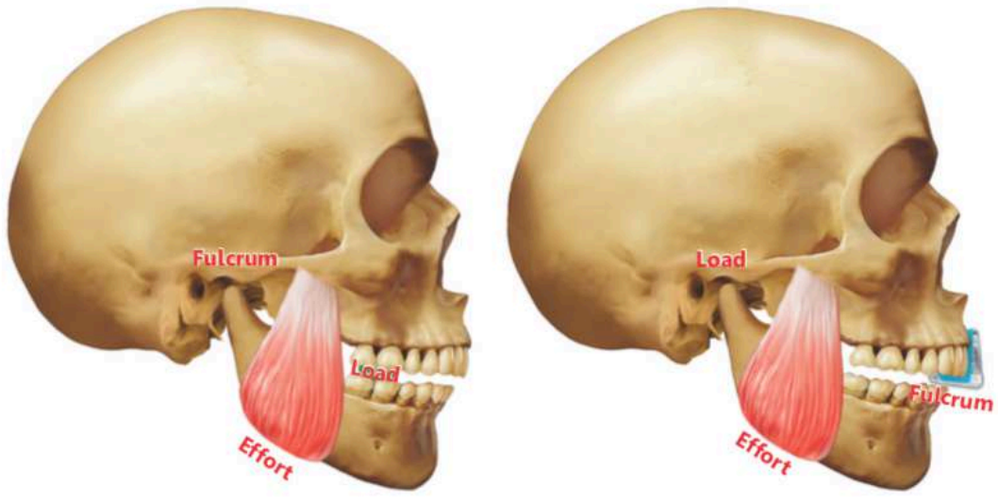

Fig. 10.23, 10.24: Note the exchange in position of fulcrum and load with use of an anterior stop appliance.

As the anterior discluding device helps separate the back teeth, it halts the conduction of proprioceptive response to the inferior lateral pterygoid muscle.

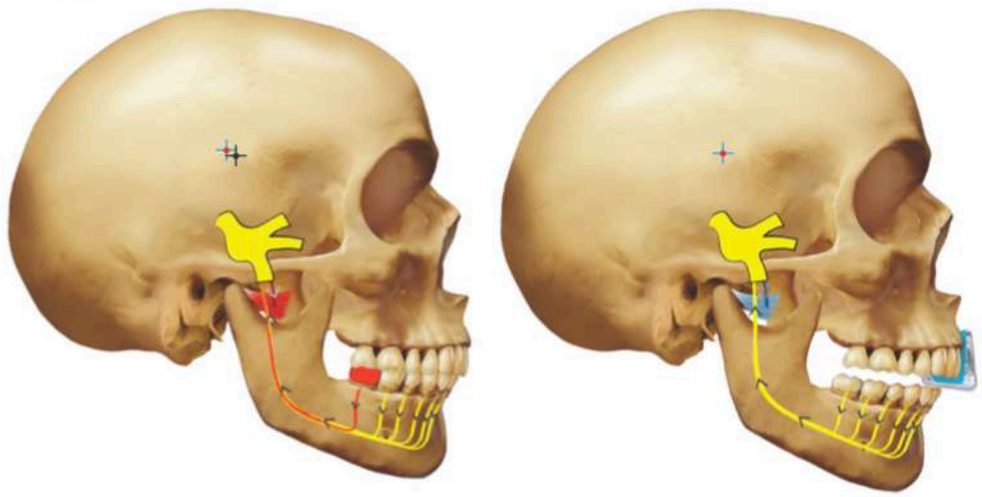

Fig. 10.25, 10.26: Note the change in condylar position and depressor muscle activity following deprogrammation.

Once the proprioceptive feedback mechanism gets arrested, the influence of deflective tooth contacts on discoordinated muscles get interrupted. This allows the inferior lateral pterygoids along with 2/3rd of the elevator muscles to release their contraction. The condyles that are now free to move, readily slip backward and upwards into their CR position under the influence of residual elevator muscle activity.

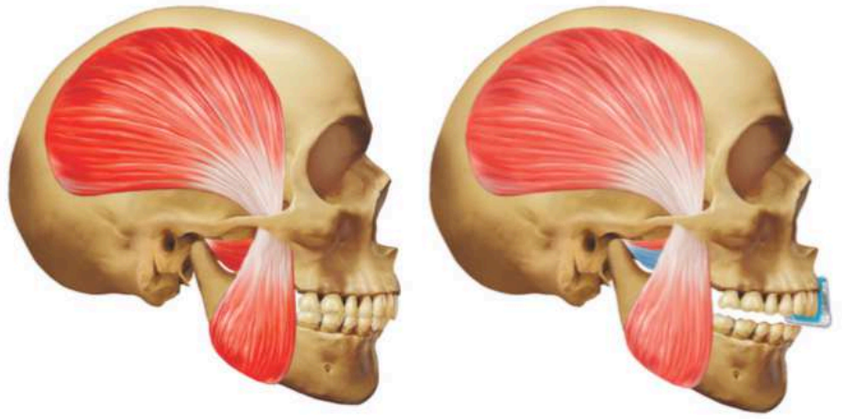

Fig. 10.27, 10.28: Left: Without deprogrammer, Right: When deprogrammation is completed. Note the change in condylar position and muscular activity. With the use of an anterior deprogrammer, both condyles can slip into their respective CR position without being affected by tooth interferences, uncoordinated muscles and/or operator error.

Although anterior stop appliances can be used for any patient with anterior teeth, their ideal indications include:

- Difficult to manipulate patients. These are individuals who have tense musculature and find it tough to relax their oro-facial muscles.
- Patients with periodontally compromised posterior teeth.
- Patients with missing posterior teeth.

Contraindication

- Patients with true TMDs, intra-capsular disc displacement disorders or other joint pathologies. As stated earlier, in such patients, deprogrammation can worsen the condition as it redirects forces onto extremely sensitive retrodiscal tissues. Such a patient may complain of acute pain almost immediately upon wearing the appliance.

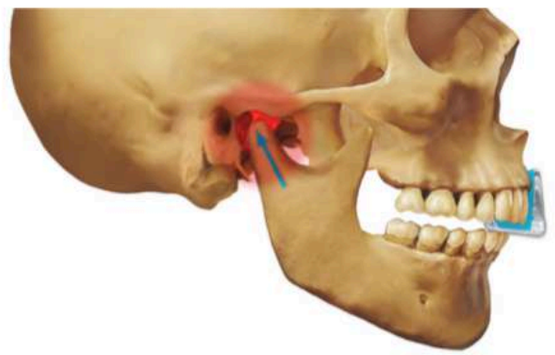

Fig. 10.29: Anterior deprogrammers are designed to take condyles upward into CR position.

This movement compresses the retrodiscal tissue in a patient with active joint disease.

Fig. 10.48: Polymer and monomer are then mixed into a thick consistency. Pink acrylic was used for photographic purposes. Alternatively, clear acrylic can be used to improve the aesthetics.

Fig. 10.49: Once the material reaches dough stage, it is placed into the hollow cavity of the deprogrammer.

Note: Monomer should not be coated on the inner cavity of the deprogrammer as this can weaken the appliance.

Fig. 10.50, 10.51: Next, Unwind is re-seated onto the upper central incisors and the patient is asked to bite onto a DT Aligner (MIK Dental).

Fig.: 10.52: DT Aligner is a specifically shaped medical grade SS plate that auto-aligns the discluding table parallel to the occlusal plane. It is available for purchase on www.mikdental.in.

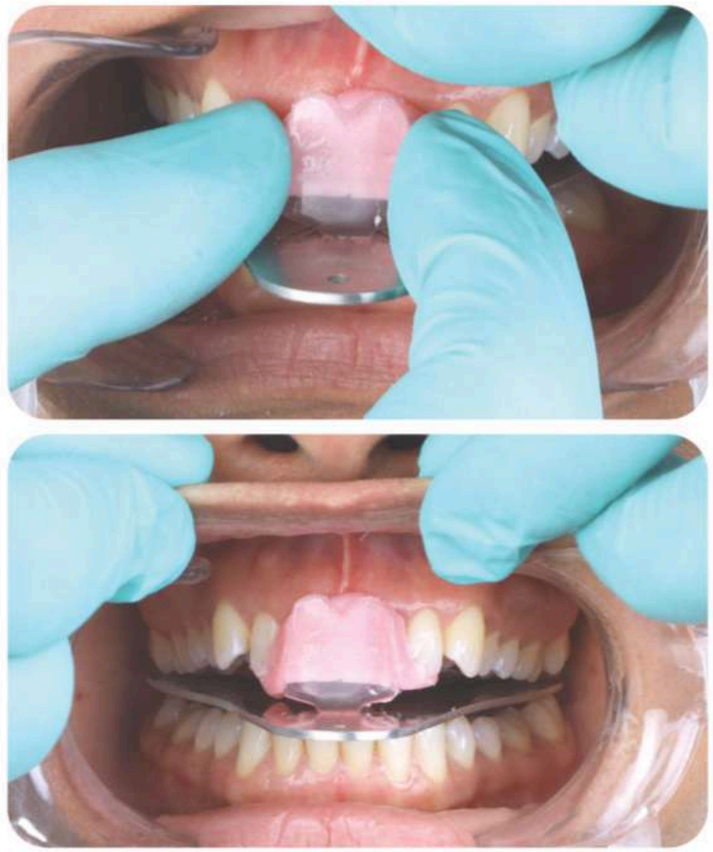

Fig. 10.53, 10.54: Following this, excess material is moulded peripherally (to ensure close adaptation) by applying gentle finger pressure. Additionally, the sensitive labial frenum is manipulated (like border moulding) to ensure it is not traumatized by the overhanging acrylic.

Let us understand that if MIP is associated with a downward displacement of the condyles, it is at this jaw relationship that RCL of elevator muscles establish the VDO. Hence upon deprogrammation, as the condyles slip upwards into their CR position, the zygoma-to-angle distance decreases. In other words, when the condyles reposition into CR, the RCL of the masseter muscle undergoes shortening.

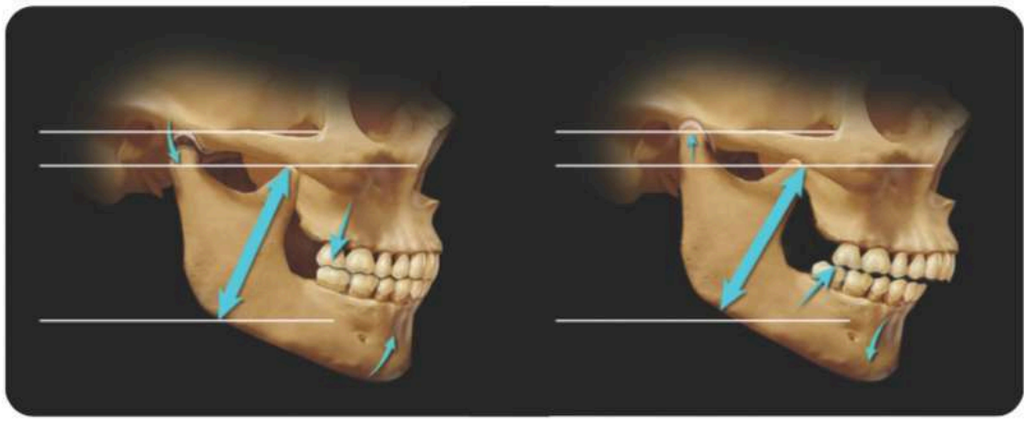

Fig. 12.43, 12.44: Left: In MIP, note the repetitive contracted length of the masseter muscle as designated by the broad blue arrow. Right: In CR, note the reduction in length of the masseter muscle.

This means, when VDO is increased on the articulator, it does not necessarily invade into the contracted length of the elevator muscles. Hence, often when the bite is opened along the CR arc, the increase does not cause the masseter muscles to over-stretch, thereby allowing for the case to be constructed without enforcing any adaptive response within the system.

However, there is a limit to which the bite can be opened using this philosophy, and it involves physically measuring the amount of decrease in masseter length following deprogrammation. Although such a measurement is not possible, an equivalent change in condylar displacement can be measured on the articulator and used to assess the limit to which VDO can be increased till the RCL of the muscles is reached. The procedure for this is explained under the section 'How to measure the amount of vertical condylar translation on the articulator following deprogrammation?', on page 276.

Although alterations in vertical have an influence on both anteriors and posteriors, the decision towards the final VDO is largely influenced by the anterior teeth.

Accordingly, when finalizing the vertical dimension, two questions need to be answered in the sequence listed:

- ★ What is the relation of anterior teeth (horizontally and vertically) at RCP?
- ★ Can anterior teeth be lengthened at this vertical, without creating a steep disclusion pathway?

Scenario 1: Deprogrammation repositions the anterior teeth into a favorable horizontal and vertical overlap relation.

This is the best case scenario, as reconstruction can be planned without altering the RCL of the elevator muscles. This is because:

- ▲ The new horizontal relation allows us to design the desired anterior guidance,
- ▲ The new vertical relation allows us to lengthen the anterior teeth without steepening the guidance profile,
- ▲ The elevator muscles would not be stretched during function,
- ▲ The freeway space would not be encroached upon,
- ▲ The mandible would be free to relax at any comfortable resting position, and
- ▲ There would be a lesser need for occlusal adjustments following completion of the reconstruction.

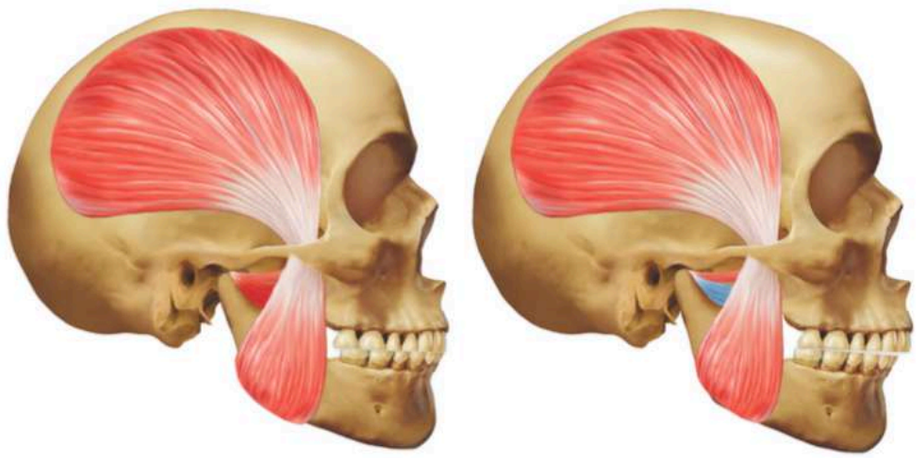

Fig. 12.45, 12.46: A favorable horizontal and vertical relation achieved post deprogrammation. Such a situation allows us to work at RCP, without the need for opening the bite.

Fig. 13.22-13.24: Frontal, right lateral and left lateral view: Additive test drive showing a pleasing correlation between MIP and CR in static occlusion.

Fig. 13.25: Inferior view: Note the presence of anterior stops, which are essential for achieving immediate separation of posterior teeth during translation.

Fig. 13.26-13.27: Occlusal view showing recreation of the lost functional anatomy. **Note:** While the excess flash towards the palate is fairly thin, the excess material towards the lingual aspect of all mandibular teeth tends to bundle up. This is because, the putty index cannot be physically compressed in this region. It is advisable to cut off the excess carefully, as sharp edges can traumatize the sensitive tissues and cause discomfort to the tongue.

Fig. 13.28-13.30: Additive test drive: Protrusion, right lateral and left lateral guidance view showing the desired posterior disclusion. If needed, posterior teeth can be assessed for static and dynamic occlusion using slightly thick (100 microns) horseshoe shaped articulating paper.

There is no doubt that a diagnostic wax-up is an indispensable guide for selecting the most appropriate treatment option, however with respect to anterior teeth, a diagnostic wax-up can never be trusted blindly (regardless of how beautiful it looks).

Remember, an articulator can never function like a patient, no matter how sophisticated it is. It has no lips, no cheeks, no tongue, no periodontal ligament, no muscles too, and it cannot mimic a human personality. Thus, all wax-ups made on an articulator are at best an 'educated guess', and all final determinations pertinent to the incisal edge position, incisal plane, labial contour, anterior guidance and aesthetic outcome need to be 'edited' intraorally. Using the Silverman speaking space technique, correctness of the VDO can also be assessed during this appointment. Further details in this regard are presented on page 293.

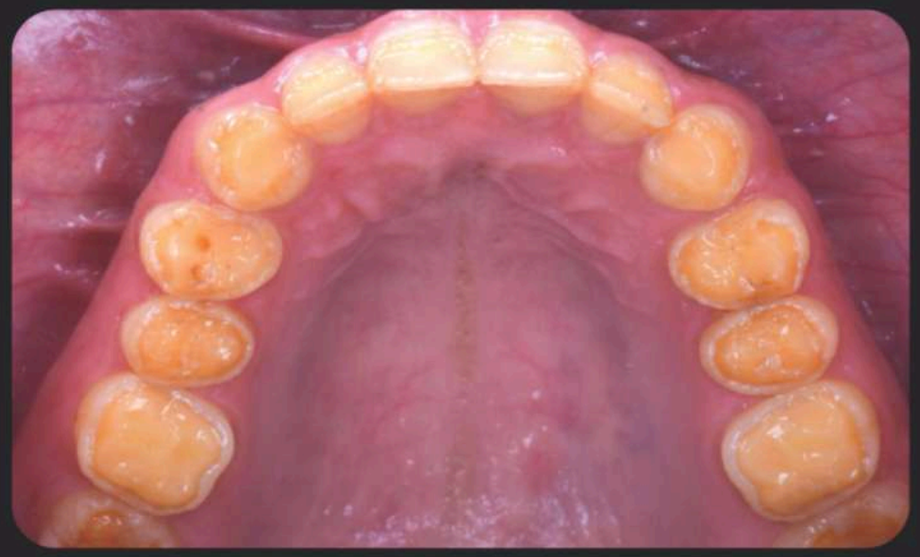

Fig. 16.20, 16.21: Pre-treatment maxillary and mandibular occlusal view.

- ★ Tooth material loss was greater on the maxillary arch as compared to the mandibular arch.
- ★ Owing to lost tooth anatomy, he was unable to masticate properly.
- ★ Due to loss of incisal edges, maxillary tooth display was deficient and the incisal plane was uneven.
- ★ During wide smile, he had greater gingival display towards the right side as compared to the left side.
- ★ He presented with no noteworthy periodontal issues.
- ★ His bite had collapsed intraorally, but this was not evident from an extra-oral view at rest.

Treatment Plan

A full mouth reconstruction using full coverage restorations was planned for this patient, keeping in mind the severity of tooth structure lost and the compromised nature of tooth enamel.

Although partial bonded reconstructions are a conservative treatment modality, they are not the most viable option for patients with Amelogenesis Imperfecta. This is because, the remaining enamel material is often poor in quality and can result in guarded long-term prognosis.

As an aesthetic end result was of prime importance, it was decided to take a digital protocol for improved planning, communication and final milling of the prostheses. Also it was decided to plan and execute one arch at a time, starting with the maxillary, as this allowed us to fulfil one of his primary desires for an improved smile.

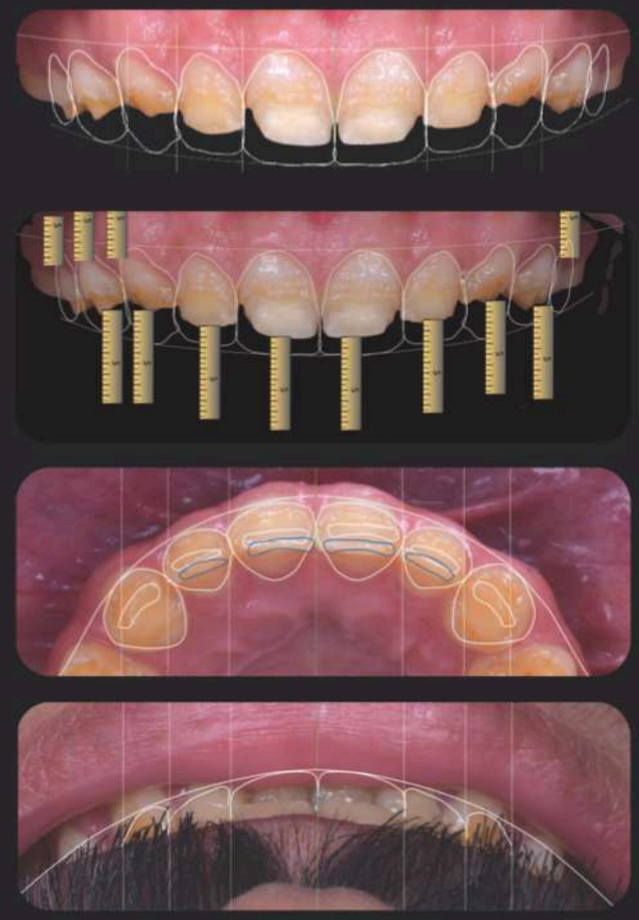

Fig. 16.22-16.25: Shows the 'smile project', where DSD planning software was used to design a 2D template for smile reconstruction.

- ★ Premolars: These teeth were prepared for v-top prostheses, as both aesthetics and function can be improved with this design.
- ★ Molars: All four molars were prepared using the occlusal veneer or table top preparation design, which involved reduction only along the occlusal surface. No preparation was done on the buccal surfaces as these teeth were not part of the patient's visible window. However, small groves were placed on the buccal and palatal face of all molars. These were made for the purpose of orientation, as with a table top design, alignment of the prosthesis over the underlying tooth can often be challenging. In this regard, grooves provide a definite path of seating and anti-rotation, thereby ensuring correct positioning of the restoration.

Note: Proximal contacts were opened only in areas with incipient caries and/or pre-existing black triangles from gingival recession. Although all posterior teeth were reduced about 1.5 mm occlusally, effective tooth reduction was only 1 mm, as the remainder 0.5 mm was accounted for by the bis-acryl resin.

Fig. 17.144: Close-up view of preparations for the first quadrant.

Fig. 17.145: Close-up view of preparations for the second quadrant.

As a 360 degree ring of enamel provides for over 90% of the bond strength, every effort should be made to keep preparation margins in enamel. Supra-gingival margins help in this regard, as the further away preparation margins are from the gingival crest, greater is the thickness of enamel substrate available to provide the necessary bond strength.

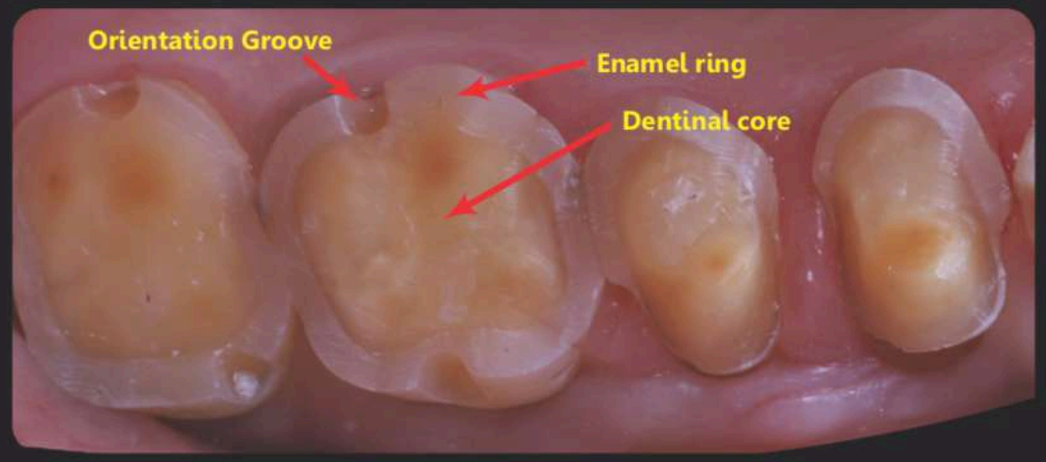

Fig. 17.146: Magnified image of the posterior preparations. Note the presence of white ring of enamel along the periphery of the shaped teeth.

Following completion of all maxillary preparations, Gluma (Kulzer) was applied to achieve immediate dentin sealing. Subsequently, the mandibular arch was prepared using a similar conservative approach.

Fig. 17.147-17.149: Depth grooves were first made along the labial and occlusal surfaces using appropriate burs and their bases were marked using a pencil.

Teeth were then prepared though the bis-acryl material to the marked depth using the DC 1.0 bur and finished using the DC 1.2F bur.