

STARTER VOLUME (2nd Edition)



I N D E X

SECTION 1: APPLIED BASICS

CHAPTER 1: MATERIAL OPTIONS IN FIXED PROSTHODONTICS14

Dr. Moez I. Khakiani, Dr. Irfan Kachwala

CHAPTER 2: BASICS OF DENTAL OCCLUSION39

Dr. Moez I. Khakiani

CHAPTER 3: SHADE SELECTION AND SHADE COMMUNICATION 38

Dr. Mayur Davda, Dr. Moez I. Khakiani, Dr. Akshay Sharma

SECTION 2: CROWN AND BRIDGE DENTISTRY

CHAPTER 4: TOOTH PREPARATION 52

Dr. Moez I. Khakiani

CHAPTER 5: IMPRESSION 111

Dr. Moez I. Khakiani

CHAPTER 6: BITE REGISTRATION 159

Dr. Moez I. Khakiani

CHAPTER 7: PROVISIONALIZATION 171

Dr. Moez I. Khakiani

CHAPTER 8: COPING TRIAL 180

Dr. Moez I. Khakiani

CHAPTER 9: BISQUE TRIAL 188

Dr. Moez I. Khakiani

CHAPTER 10: CEMENTATION 201

Dr. Moez I. Khakiani

CHAPTER 11: RETRIEVAL OF CEMENTED PROSTHESIS 201

Dr. Moez I. Khakiani

SECTION 3: ALLIED

CHAPTER 12: BASICS OF DENTAL PHOTOGRAPHY 352

Dr. Mayur Davda

CHAPTER 13: ERGODONTICS 367

Dr. Moez I. Khakiani, Dr. Ruchi Chhabria

CHAPTER 14: BUILDING YOUR PRACTICE 389

Dr. Sujit Pardeshi, Laila Mandani

CHAPTER 15: MEDICO-LEGAL ASPECTS IN DENTISTRY 398

Dr. Vishwas Puranik

TABLE OF CONTENT

CHAPTER 1: MATERIAL OPTIONS IN FIXED PROSTHODONTICS 1

Dr. Moez I. Khakiani, Dr. Irfan Kachwala

Introduction	2
Fabrication techniques for various material options in fixed prosthodontics	3
Monolithic metal restorations	4
Porcelain Fused to Metal (PFM) restorations	6
Porcelain Fused to Zirconia (PFZ) restorations	9
Monolithic zirconia Restorations	11
Lithium disilicate (LiDiSi) restorations	12
Comparison between various prosthetic material options	17
Other tooth colored prosthetic material options	18
Feldspathic porcelain	18
Composite Resins	18
Choosing a prosthetic material	18
Location of the tooth	18
Length of the edentulous span	19
Compromised inter-occlusal space	19
Need for bonding	19
Parafunctional habits	20
Color of the underlying tooth	20
Size of the pulp chamber	21
Allergies	21
Competence of the laboratory technician	21
Conclusion	21

CHAPTER 2: OCCLUSION 22

Dr. Moez I. Khakiani

Introduction	23
Understanding occlusion	23
Static Occlusal Relationship	24
Posterior teeth	24
Anterior teeth	25
Dynamic Occlusal Relationship	25
Protrusion	25

Lateral excursion	26
Group function occlusion	27
Canine guided occlusion	27

Mutually Protected Occlusion	28
------------------------------	----

Conclusion	37
------------	----

CHAPTER 3: SHADE SELECTION AND SHADE COMMUNICATION 38

Dr. Mayur Davda, Dr. Moez I. Khakiani, Dr. Akshay Sharma

Introduction	39
Understanding color	39
Attributes of color	40
Hue	40
Chroma	40
Value	40
Techniques for shade selection	40
Visual method: Shade Guides	40
VITA classical A1-D4: Conventional set-up	41
VITA classical A1-D4: Value based set-up	42
VITA Toothguide 3D-MASTER	43
VITA Linearguide 3D-MASTER	45
Natural Die material shade guide	46
General principles for shade selection	46
Standardizations prior to shade selection	46
Standardizations during shade selection	47
Drawbacks associated with shade tabs	47
Instrumental technique	48
Communication of the selected shade	48
Written	48
Photographic	49
Direct	49
Communication of true color	49
Grey card	50
Conclusion	51

CHAPTER 4: TOOTH PREPARATION 52**Dr. Moez I. Khakiani**

Introduction 53

Desired amount of tooth reduction on the basis of prosthetic material used:

- PFM crown for an anterior tooth 53
- PFM facing crown for an anterior tooth 54
- Metal free (LiDiSi/PFZ) crown for an anterior tooth 54
- PFM crown for a posterior tooth 55
- PFM facing crown for a posterior tooth 55
- Metal free (LiDiSi/PFZ) crown for a posterior tooth 56
- Full contour metal/zirconia crown for posterior tooth 56

Finish line architecture 57

- Modified shoulder margin 57
- Deep chamfer margin 57

Margin placement with respect to the gingival crest 58

- Supra-gingival 58
- Equi-gingival 58
- Sub-gingival 58

Burs to be used for tooth preparation 59

- Crown, Bridge, PLV preparation kit by MIK Dental 59

Checking for adequacy of clearance achieved 65

- PrepGauge from MIK Dental 65

Preventing prosthesis dislodgement 67

- Retention form 67
- Resistance form 68

Management of Short Clinical Crowns 69

- Secondary resistance features 69
 - Grooves 70
 - Boxes 70
- Monolithic restorations 70
- Sub-gingival margin placement 70
- Resin cements 70
- Crown Lengthening Procedure (CLP) 70
- CAD/CAM prosthesis 70

Importance of finishing the preparation 71

Preparing a margin in difficult to access areas of the oral-cavity 71

Tooth preparation for multi-unit bridge prosthesis 72

Pontic design 73

- Ridge lap pontic 73
- Modified ridge lap pontic 74
- Sanitary pontic 74
- Ovate pontic 75

Recommended pontic designs 75

Step-by-step tooth preparation protocols

- Mandibular molar preparation for a PFM crown 76
- Central incisor preparation for a LiDiSi crown 89
- Canine preparation for a PFM crown 97
- Maxillary molar preparation for a monolithic metal/zirconia crown 102
- Lower incisor preparation for a monolithic LiDiSi/zirconia crown 105
- Maxillary premolar preparation for a PFM/PFZ facing crown 108

CHAPTER 5: IMPRESSION 111**Dr. Moez I. Khakiani**

Introduction 112

Soft tissue management 113

Gingival tissue retraction 113

Techniques for tissue retraction 114

Mechanical technique: Retraction cords 114

- Knitted cord 114
- Braided cord 114
- Twisted cord 114

Techniques for cord retraction 115

- Single cord technique 115
- Double cord technique 116

Choosing the size of retraction cord 117

Packing the cord into the sulcus 117

Choosing a cord packer 118

Pack and roll technique 118

Duration of time the cord remains in the sulcus 119

Removal of the cord from the sulcus 119

In how much time should the impression be made? 119

Haemostasis 120

- Ferric sulphate 120
- Aluminium chloride 120
- Pre-impregnated cords 120
- Immersion technique 120
- Scrub technique 121

Sulcular cleaning 121

Drawbacks of retention cords 121

Chemical/chemico-mechanical methods 121

- Expasyl from Kerr 121
- 3M retraction capsule 122
- Magic foamCord from Coltene Whaledent 122
- Traxodent from Premier Dental Products 123

Surgical methods 124	
Lasers 124	
Electrosurgery 124	
Rotary curettage 124	
Impression materials and techniques 125	
Impression techniques using Addition Silicone 125	
One-step technique using two different viscosities 125	
Two-step technique using a foil spacer 131	
Two-step technique using a bleaching tray as the spacer 133	
Two-step impression using the putty cut back technique 134	
Impression techniques using polyether 137	
One-step technique using a single viscosity 137	
One-step technique using two different viscosities 139	
Impression techniques using Condensation Silicone 140	
One-step technique using two different viscosities 140	
Two-step technique using a foil spacer 141	
Disinfection of impressions 142	
Silicone based impression materials 142	
Polyether 142	
Impression trays 143	
Tray material 143	
Metal stock tray 143	
Plastic stock tray 143	
Custom Tray 143	
Self-cure 144	
Visible light-cure 144	
Retention mechanism 144	
Perforated tray 144	
Rim lock tray 144	
Tray adhesive 145	
Tray coverage 146	
Full arch tray 146	
Quadrant tray 146	
Triple tray 146	
Triple tray impression using A-Silicone 148	
Triple tray impression using polyether 150	
H & H technique 151	
Gagging and its clinical management 153	
Avoidance of trigger zones 153	
Distraction techniques 153	
Reduction of intra-oral time 154	
Allied 154	

Troubleshooting in impressions 155
Visible flaws 155
Voids at the margin or on the occlusal surface 155
Drag marks at the margin 156
Lack of detail around the preparation margin 156
Tearing of the impression material upon retrieval 156
Tray-tooth contact 156
Detachment of the impression from the tray 157
Invisible flaws 157
Distortion of the set impression 157
Conclusion 158

CHAPTER 6: BITE REGISTRATION 159

Dr. Moez I. Khakiani

Introduction 160
Is bite registration a must with every FPD case? 160
Material options for bite registration 162
Bite registration techniques 163
Occlusal open mouth technique 163
Bite registration technique for a single unit prosthesis 164
Bite registration technique for a bridge scenario 165
Technique using PVS bite registration paste 166
Technique using Aluwax 167
Bite registration technique for bilateral preparations 168
Lateral closed mouth technique 168
Triple tray closed mouth technique 169
How to ensure the patient bites into MIP correctly? 169
Use of a wide cheek retractor 169
Reclined chair position 169
Preparatory bite record on the contra-lateral side 169
Use of a thin articulating foil on the contra-lateral side 170
Conclusion 170

CHAPTER 7: PROVISIONALIZATION 171

Dr. Moez I. Khakiani

Introduction 172
Functions of a provisional restoration 172
Techniques for fabrication of provisional restorations 172
Laboratory fabrication of provisionals 172
Chair-side fabrication of provisionals 173

Freehand	173
Using a pre-treatment index/matrix	174
Powder-liquid formulation	174
Paste-paste formulation	175
Single unit provisional	175
Provisional for a bridge scenario	177
Pre-Endodontic Prosthetic Preparation (PEPP)	177
Cementation options for provisional prosthesis	178
Retrieval of provisional prosthesis	179
Conclusion	179

CHAPTER 8: COPING TRIAL 180

Dr. Moez I. Khakiani

Introduction	181
Evaluations to be done prior to coping trial	181
Evaluation of the mounting	181
Evaluation of the die	181
Evaluation of the coping	182
Evaluations to be done at the coping trial appointment	183
Margin fit	183
Stability of the coping on the tooth	184
Occlusal clearance	184
Concept of reduction coping	185
Copings for zirconia bridges	186
Concept of anatomically reduced coping	187
Conclusion	187

CHAPTER 9: BISQUE TRIAL 188

Dr. Moez I. Khakiani

Introduction	189
Evaluation of the prosthesis on the cast	189
Margin fit	189
Proximal contacts	190
Occlusion	190
Aesthetics	190
Patient Try-in	190
Margin fit	191
Proximal contacts	191
Tight contact	191
Open contact	192
Occlusion	193

Phase 1: Static adjustments at MIP	193
Adjusting a single unit prosthesis	194
Posterior crown	194
Anterior crown	196
Adjusting a multi-unit bridge prosthesis	196
Phase 2 : Dynamic adjustments	196
Posterior teeth (single unit and bridge prosthesis)	196
Distal drifting of maxillary 2nd molar	199
Anterior teeth	199
Marking extremely smooth surfaces	199

Aesthetics 200

Conclusion 200

CHAPTER 10: CEMENTATION 201

Dr. Moez I. Khakiani

Introduction	202
Pre-cementation phase	202
Factors influencing prosthetic success at the cementation appointment	202
Pre-cementation preparations	202
Gingival health and isolation	203
Cement selection and cementation technique	203
Zinc phosphate cement	204
Glass ionomer cement (GIC)	204
Resin modified glass ionomer cement (RMGIC)	207
Resin cements	208
According to the adhesive scheme	209
Total-etch resin cement systems	209
Self-etching cement systems	209
Self-adhesive cement systems	209
According to the polymerization mechanism	210
Light cure resin cements	210
Dual cure resin cements	211
Chemical cure resin cements	211
Surface treatment of prosthetic materials prior to cementation/bonding	211
Metal based prostheses	211
Lithium Disilicate restorations	212
Zirconia prostheses	212
Bridge cementation	212
Concept of trial cementation	213
Use of CrownSeater (from MIK Dental) during posterior cementation	213
Post cementation sensitivity and its management	214
Conclusion	215

CHAPTER 11 : RETRIEVAL OF PERMANENTLY CEMENTED PROSTHESIS 216

Dr. Moez I. Khakiani

Introduction 217

Target area for retrieval devices 217

Classification of crown and bridge retrieval systems 217

Conservative techniques 218

Sliding hammer type 218

Spring loaded back action hammer 218

Spring loaded automatic back action hammer 218

Bridge retrieval using loop wire technique

Safe Relax Automatic Crown and Bridge Remover

Semi-conservative techniques 219

WAMKey 219

Non-conservative techniques 222

Burs and Christensen crown remover 222

Factors to be considered when choosing a retrieval system 224

Conclusion 224

CHAPTER 11: PHOTOGRAPHY IN DENTISTRY 352

Dr. Mayur Davda

Introduction 353

Various uses of photography in dentistry 353

Ideal criteria for dental photography equipment 353

Comparison between DSLR and mobile phone camera 353

Equipment selection 354

DSLR camera 354

Camera lens 354

Prime lens 354

Zoom lens 354

Camera flash 355

Professional photography studio lights 355

Twin flash system 355

Ring flash 355

The reverse concept in equipment selection (by DPS) 356

Important settings in dental photography 356

Standardization of settings in dental photography 357

Exposure triangle 357

International Standards Organization 358

Shutter speed 358

Aperture 359

Image evaluation 360

Histogram 360

Intra-oral accessories for dental photography 360

Benefits of ergonomics in dentistry 368

Retractors 361

Mirrors 361

Contrastors 361

Grey card 362

Rubber dam sheets 362

Calibration and protocols for extra-oral photography 362

Calibration and protocol for intra-oral photography 364

Davda's Template for Dental Photography

Conclusion 366

CHAPTER 12: ERGODONTICS: ERGONOMICS IN DENTISTRY 367

Dr. Moez I. Khakiani, Dr. Ruchi Chhabria

Introduction 368

What is ergonomics 368

Work-related musculoskeletal disorders (WMSDs) 368

Physical signs 368

Symptoms 368

Ergodontics 368

Forceful extensions 369

Repetitive motions and prolonged activities 369

Awkward working postures 370

Localized contact stresses and segmental vibrations 371

Organizational and psychosocial work factors 371

Common clinical conditions associated with WMADs 371

Carpal Tunnel Syndrome 371

Tendonitis in various muscles 372

Trigger finger 372

Trigger points and myo-fascial pain disorder 373

Low back pain and sciatica 373

Degenerative spine disorder 373

Prevention and management of WMSDs 374

Adopting an ergonomically correct posture when seated 374

Patient's position in relation to the clinician 375

Backrest 375

Head 375

Headrest 375

Use of an ergonomic dental stool	375
Seat angle, depth and style	375
Back support	375
Seat fabric	375
Stability	375
Use of magnification	376
Through the lens loupes	376
Flip up loupes	376
Workstation design	377
Position of the dental light	377
Position of the bracket table	377
Hand instruments	377
Gloves	377
Scheduling of appointments	377
Stretching tight muscles	378
Conclusion	378
CHAPTER 13: BUILDING YOUR PRACTICE	389
Dr. Sujit Pardeshi, Laila Mandani	
Introduction	390
Why patients say "yes" (or "no") to treatment	390
Rational thought process	390
Emotional thought process	391
Impact of internet and social media on patient's decision making process	391
Stages of a patient's dental cycle and its correlation	392
Stage 1: Exploration	392
Create your own brand	393
Google business page	393
Blogging	393
Website	393
Search engine optimization	393
Social media marketing	394
Friends and family	394
Others	394
Stage 2: Engagement	394
Trained clinical staff	394
Comfortable seating area	395
Understand your patient	395
Gain your patient's confidence	395
Discuss, don't present	395
Assure a compassion based experience	396

Give all treatment options	396
Consultation room	396
Stage 3: Experience	396
Stage 4: Endorsement	397
Conclusion	397
CHAPTER 14: MEDICO-LEGAL ASPECTS IN DENTISTRY	398
Dr. Vishwas Puranik	
Introduction	399
Medico-legal case (MLC)	399
Negligence	
Consent	
Records	
Litigations in crown and bridge prosthesis	400
Conclusion	401
Informed consent: Crown and Bridge prosthetics	401
Informed consent: Removal of crowns and bridges	224

Lithium disilicate restorations are fabricated using one of the following two processes:



Fig. 1.47: IPS e.max CAD block.

a. CAD/CAM MILLING

This involves chairside designing and fabrication of prosthesis where a block of LiDiSi is subjected to subtractive milling. This is then stained and glazed to achieve the final restoration.

b. HEAT PRESSING

This method is similar to the lost wax technique. It involves the fabrication of a wax pattern, which is invested and burnt-out. This leaves a mould into which the molten lithium disilicate is pressed. The restoration is then retrieved, finished, stained and glazed prior to its insertion.



Fig. 1.48: Central incisor fabricated using the heat pressing technique.

LiDiSi restorations can be used in one of the following three designs (Fig. 1.46) based on the clinical requirement:

◆ MONOLITHIC

These are homogeneous LiDiSi restorations and depend on surface staining for an aesthetic outcome. Owing to its monolithic nature, they enjoy the best mechanical properties and are usually used for restoration of posterior teeth.

◆ LAYERED

In this type, a LiDiSi coping is first heat pressed and then layered with compatible porcelain. Although, layering helps achieve lifelike aesthetics, it does reduce the overall strength of the prosthesis. Thus, layered LiDiSi prostheses are usually restricted for use in high demand aesthetic cases with stable occlusion.

◆ CUT-BACK

In this type, the monolithic restoration is cutback at the incisal edge and layered with compatible porcelain (to achieve aesthetics). Thus, cut-back prostheses have advantages of both, the monolithic and the layered design.

IPS e.max from Ivoclar Vivadent is the most widely used LiDiSi material globally. It is available in various translucencies and opacities:

- ★ HT (High translucency).
- ★ MT (Medium translucency).
- ★ LT (Low translucency).
- ★ MO (Medium opacity).
- ★ HO (High opacity).
- ★ Impulse: Exhibits increased opalescence.
- ★ Multi: Has a natural gradation of shade (from enamel to dentin).

Opacity of the ingot is chosen on the basis of the color of the prepared tooth, the thickness of the restoration and the desired optical properties.

CASE 10: COSMETIC REHABILITATION USING LiDiSi RESTORATIONS



Fig. 1.49: Pre-treatment view. Anterior teeth are planned for a combination of partial and full coverage restorations as part of a full mouth rehabilitation. Crown lengthening was planned on 21 and 22.



Fig. 1.50, 1.51: Maxillary and mandibular wax patterns ready for heat pressing.

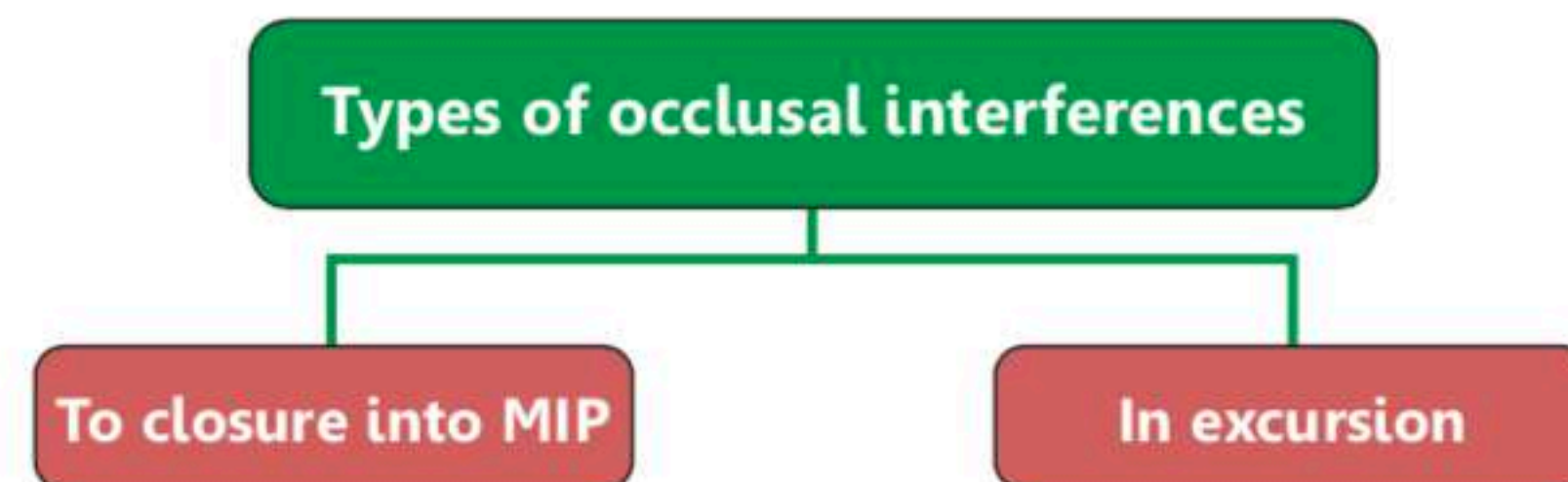
INTERFERENCE IN OCCLUSION

Mandibular movements are supposed to be free of any dental obstacle. An interference is any tooth contact that disrupts the mandibular movement (by getting in the way), thereby not allowing the occlusion to function normally.

The proprioceptive feedback is extremely sensitive, accurate and reactive to noxious stimuli.

Having said this, there are significant differences in the adaptive response by different patients to occlusal abnormality. Some are unable to tolerate seemingly trivial occlusal interferences, whereas others are able to cope with significant malocclusions without any obvious symptoms.

An interference is of two primary types:



a. INTERFERENCE TO CLOSURE INTO MIP

Upon closure into Centric Relation (CR), any contact on an inclined surface causes the mandible to deviate from its desired path of closure, resulting in a 'hit and slide' occlusion. Such an interference incline is termed as a 'deflective contact'.

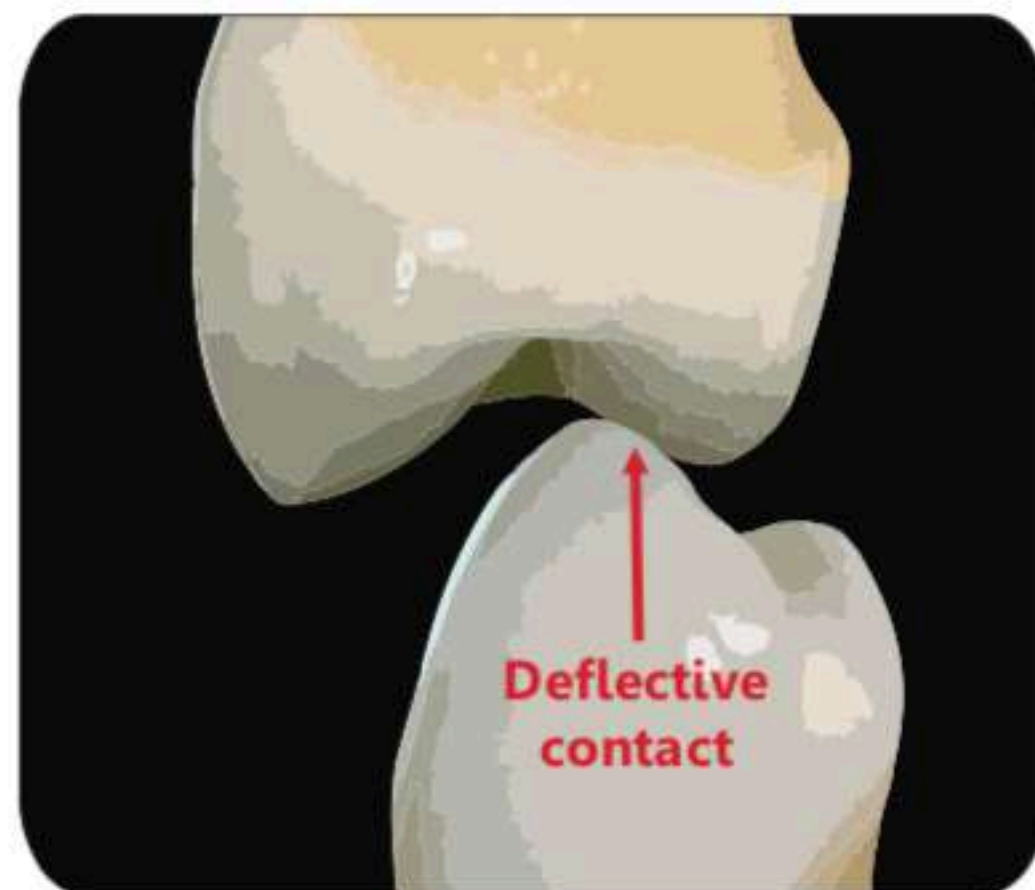


Fig. 2.21: In the presence of a deflective contact, the mandibular cusp contacts a cuspal incline.

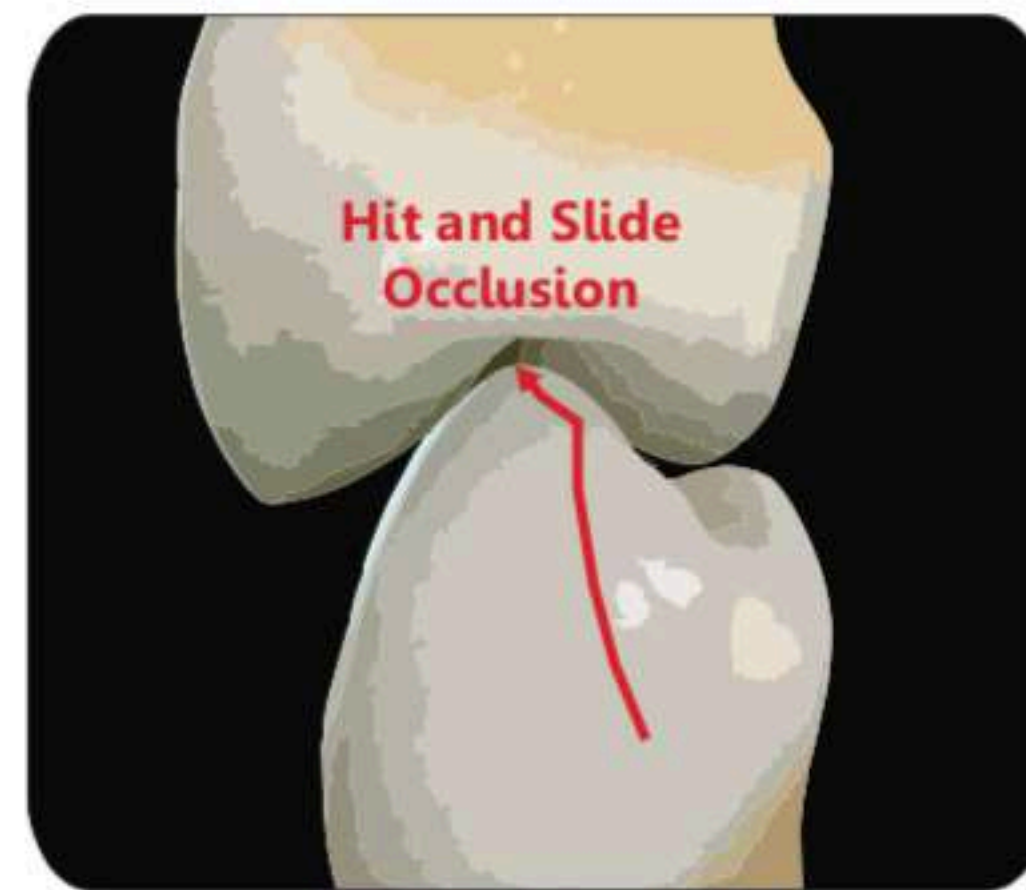


Fig. 2.22: From this point of contact, the mandible slides into MIP.

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 a sufficient amount of tooth to accommodate for the prosthesis.

Failure to do so results in an over-contoured prosthesis, which increases the risk of introducing deflective contacts, as explained in Fig 2.23-2.27.

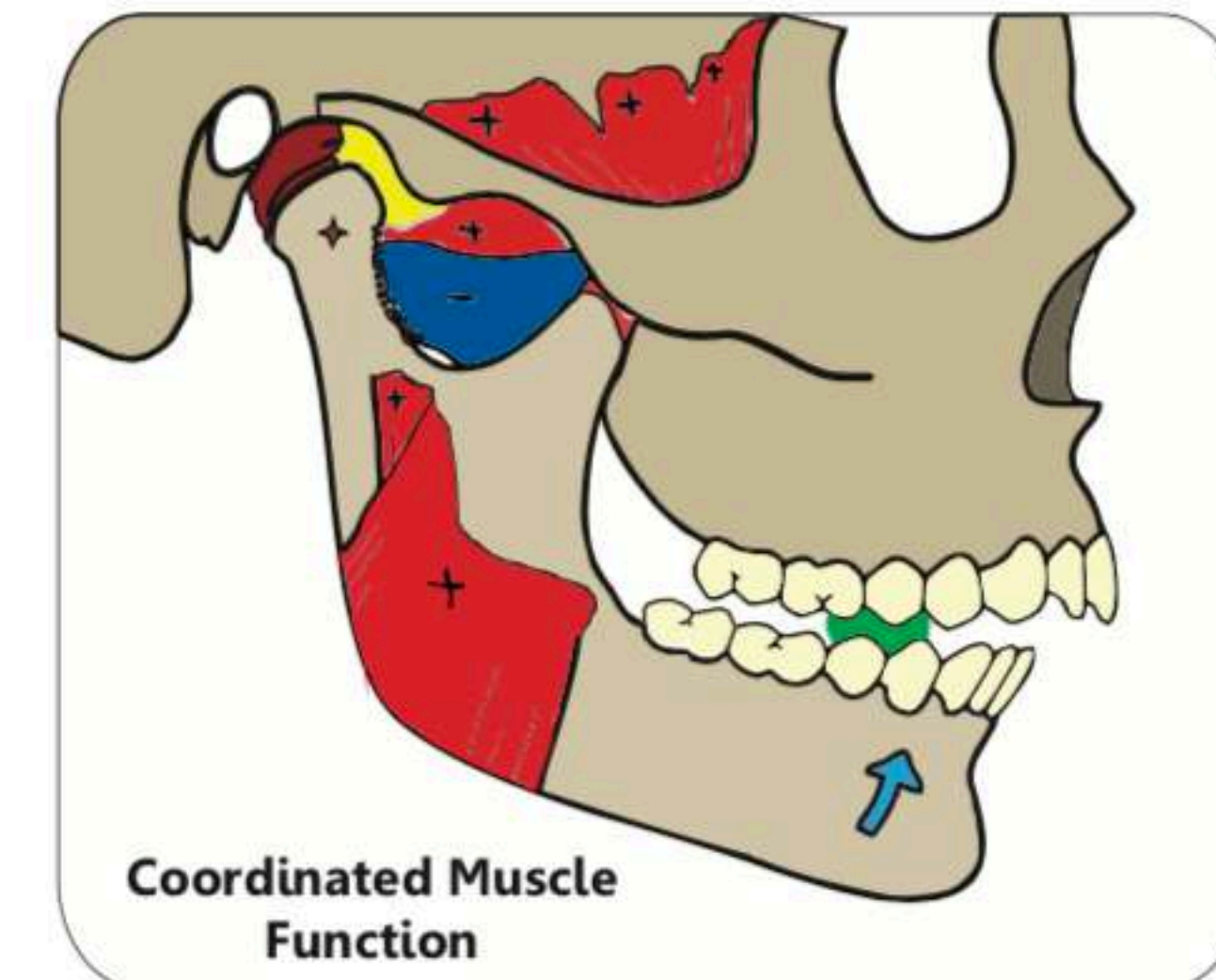


Fig. 2.23: Pre-treatment condition. Note, upon closure the elevator muscles are active (+), while the depressor muscle (inferior lateral pterygoid) is relaxed (-). Such a patient is said to have 'Coordinated Muscle Function'.

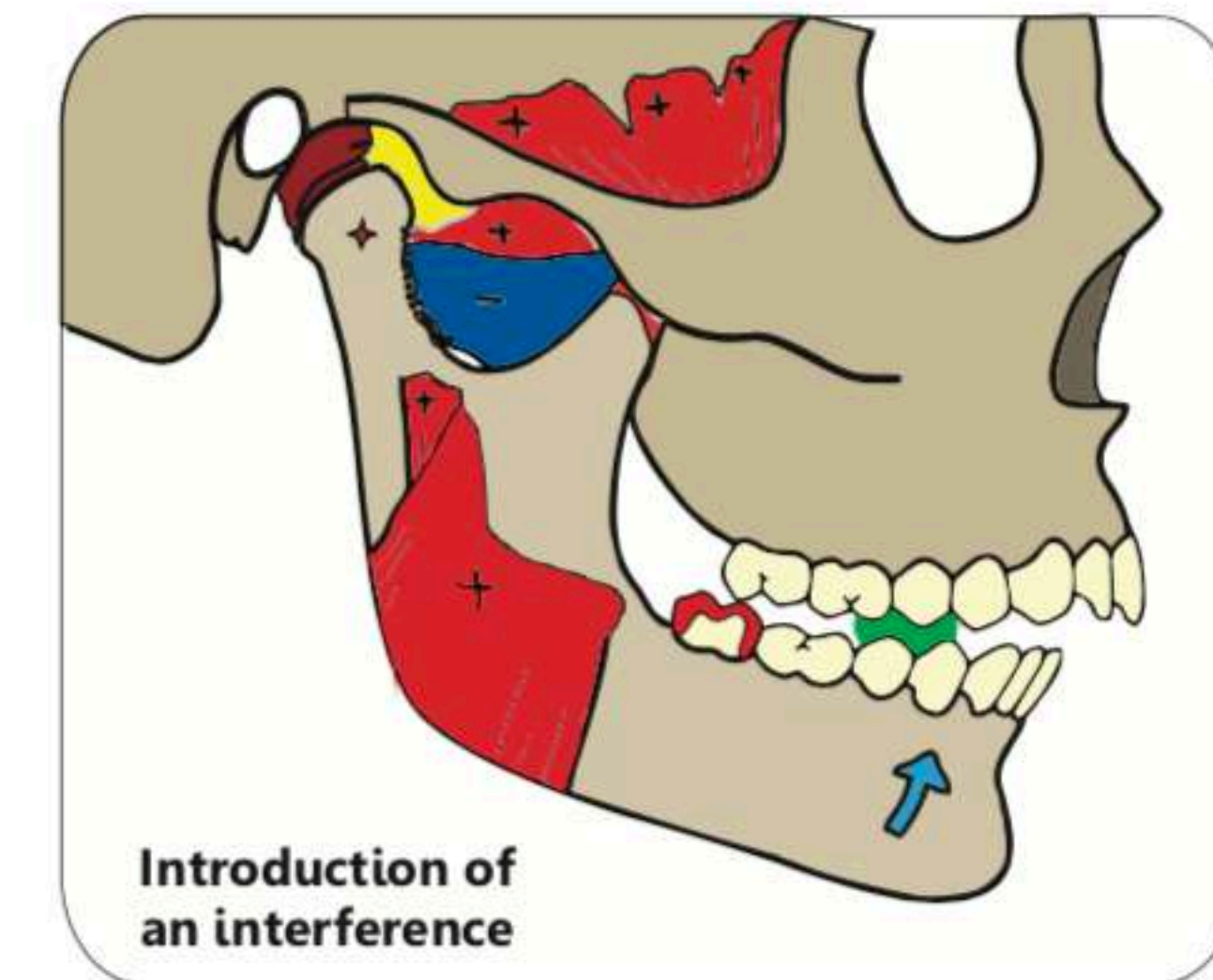
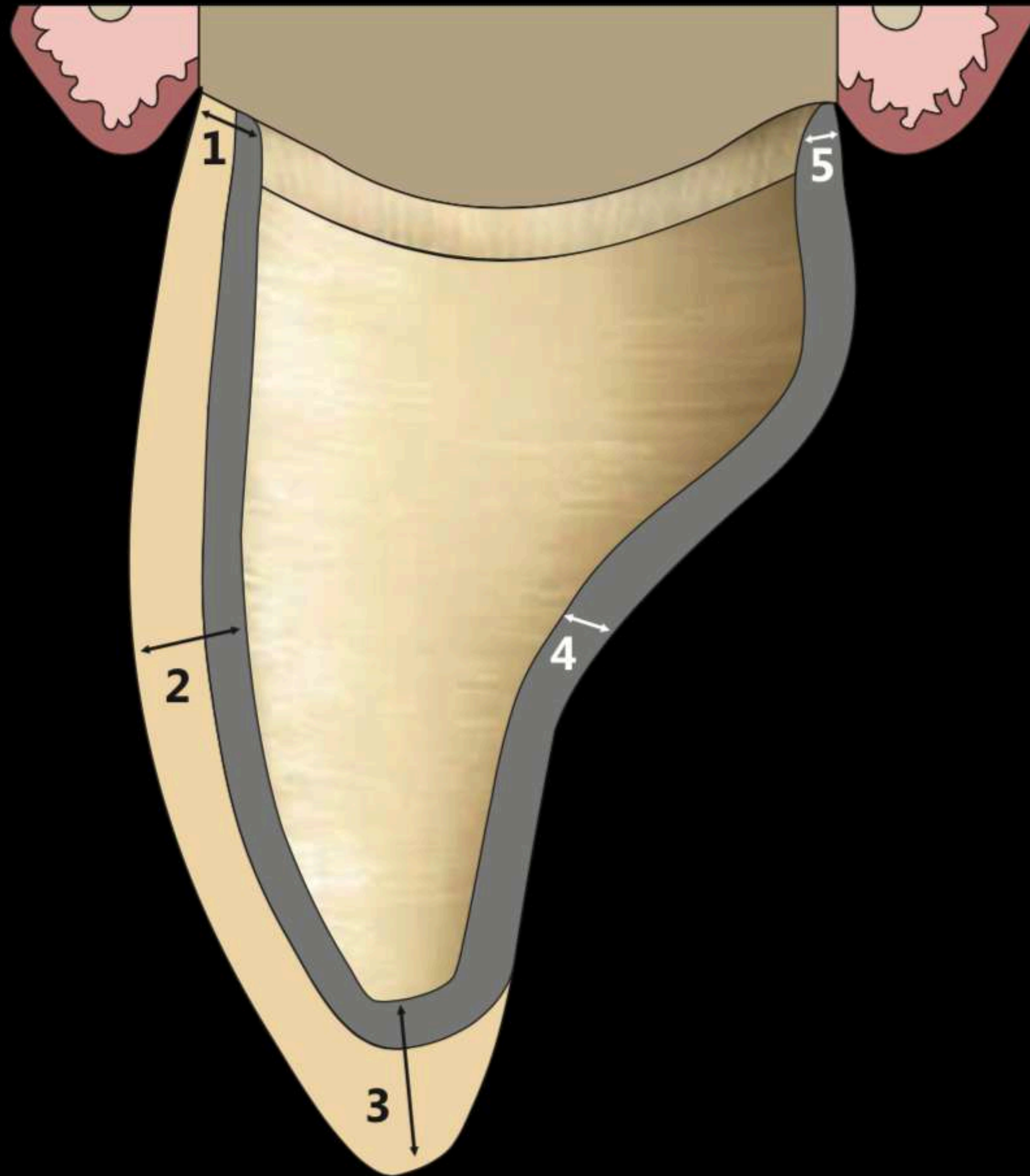


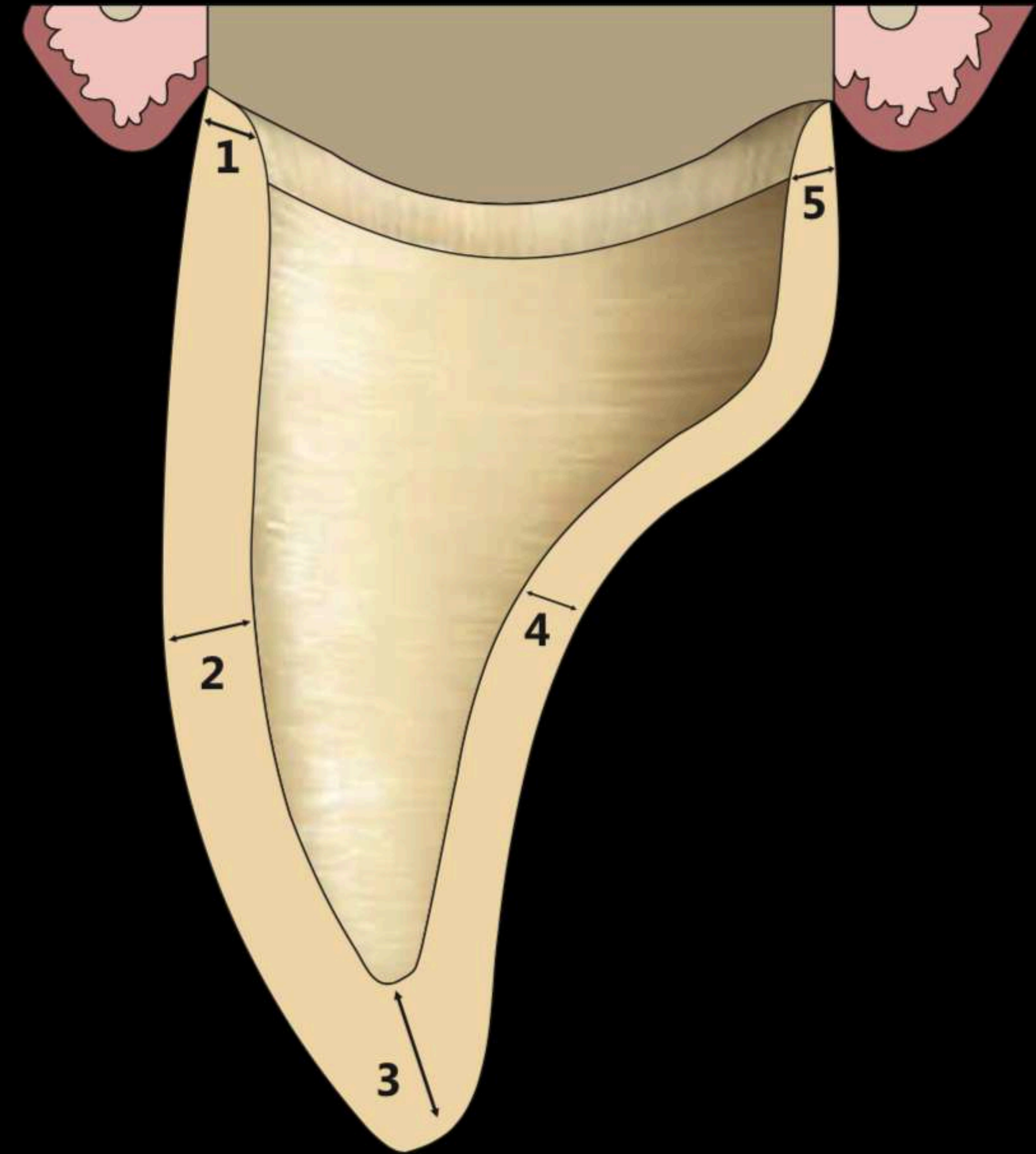
Fig. 2.24: Prosthetic crown on mandibular second molar. Often posterior crowns seat 'high' upon placement. Such a prosthesis needs to be adjusted in order to ensure that it 'fits' into the pre-existing balance of the stomatognathic system. However, if left to 'settle' by itself, the body would have to respond with a cascade of adaptive changes.

Fig. 4.2: **AVERAGE REDUCTION REQUIRED FOR A PFM FACING CROWN: ANTERIOR TOOTH**



1.	Labial margin	1.0-1.2 mm
2.	Labial surface	>1.5 mm
3.	Incisal edge	about 2.0 mm
4.	Palatal/lingual surface	0.5 mm
5.	Palatal/lingual margin	0.5 mm

Fig. 4.3: **AVERAGE REDUCTION REQUIRED FOR A METAL FREE (LiDiSi/PFZ) CROWN: ANTERIOR TOOTH**



1.	Labial margin	0.8-1.0 mm
2.	Labial surface	1.2-1.5 mm
3.	Incisal edge	about 2.0 mm
4.	Palatal/lingual surface	0.5-0.8 mm
5.	Palatal/lingual margin	0.5-0.8 mm



Fig. 4.98: The occlusal reduction bur should be oriented along the pre-existing incline of the tooth.

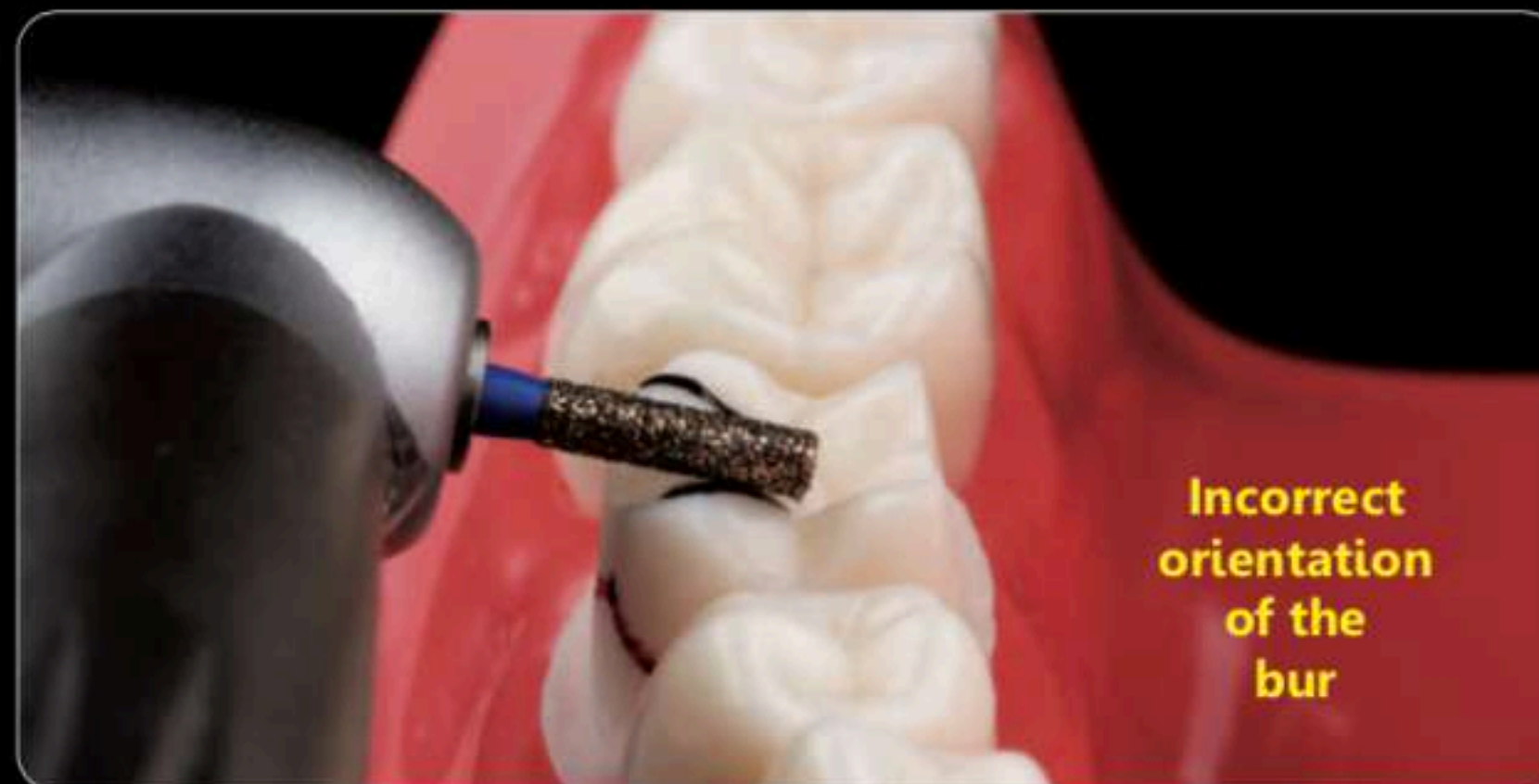


Fig. 4.99: In case the bur orientation flattens out, the occlusal reduction begins to resemble a table-top with greater reduction over the cusp tips and barely any reduction along the central groove. This often culminates into metal exposure or porcelain fracture along this under-reduced area.



Fig. 4.100: As the functional cusp requires 2 mm reduction, the OR 1.6 bur is used to create a depth orientation groove extending from the cusp tip to the base/central developmental groove. This bur needs to be sunken full depth.

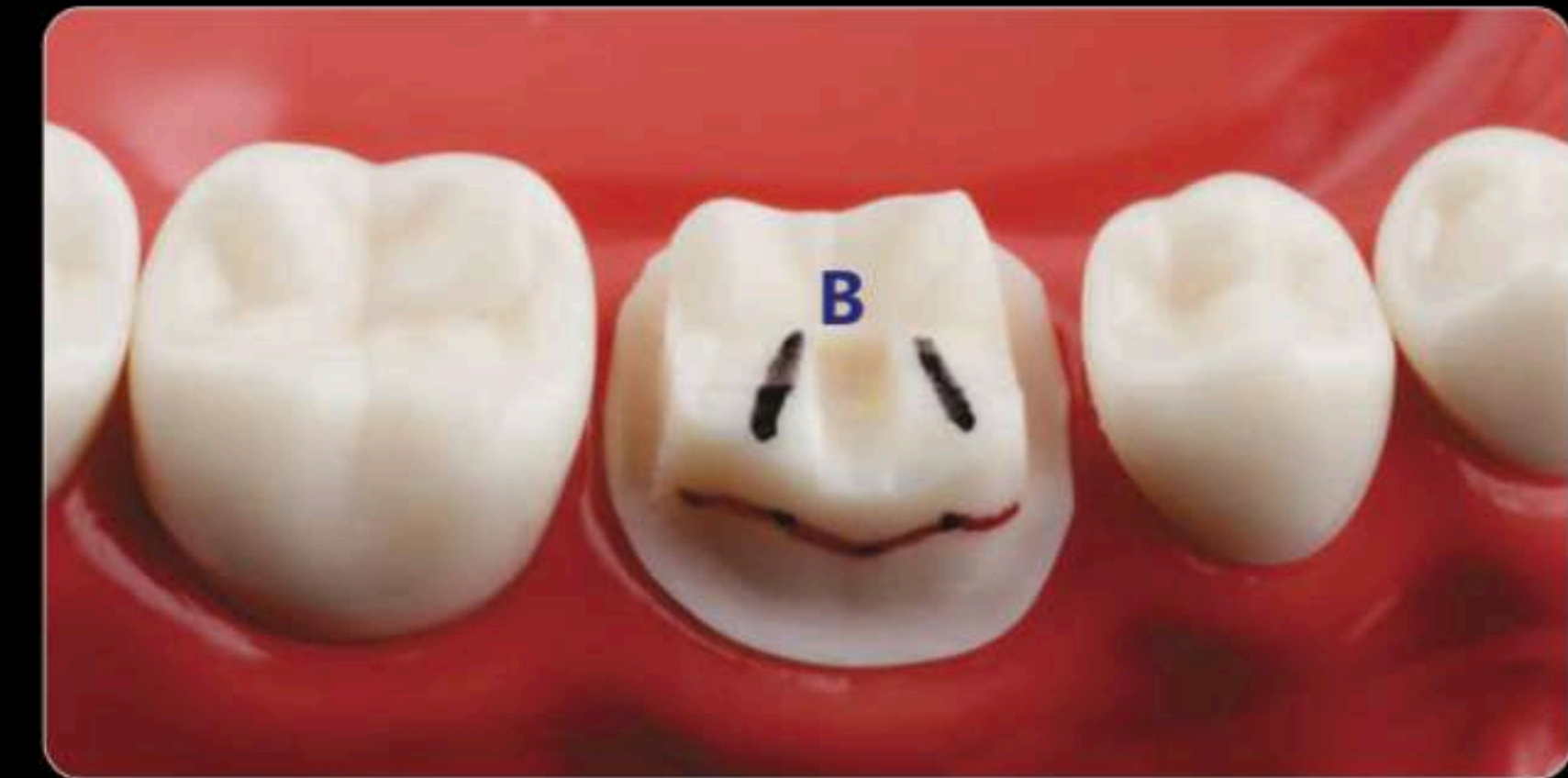


Fig. 4.101: This creates a groove that is 1.6 mm in depth. For descriptive purposes, we shall label this groove as "B".



Fig. 4.102: The same step is repeated on the mesiobuccal and distobuccal cusp ridges. For descriptive purposes, we shall label the mesial groove as "A" and distal groove as "C".



Fig. 4.103: All three grooves as seen from the buccal view.



Fig. 5.83: First, putty is mixed and loaded into the tray. The pre-cut sheet is then placed on top of it and the assembly is seated into the patient's mouth. Portion of the sheet that extends beyond the tray should be folded to prevent tissue irritation while seating. Variotime from Heraeus Kulzer was used for this documentation.

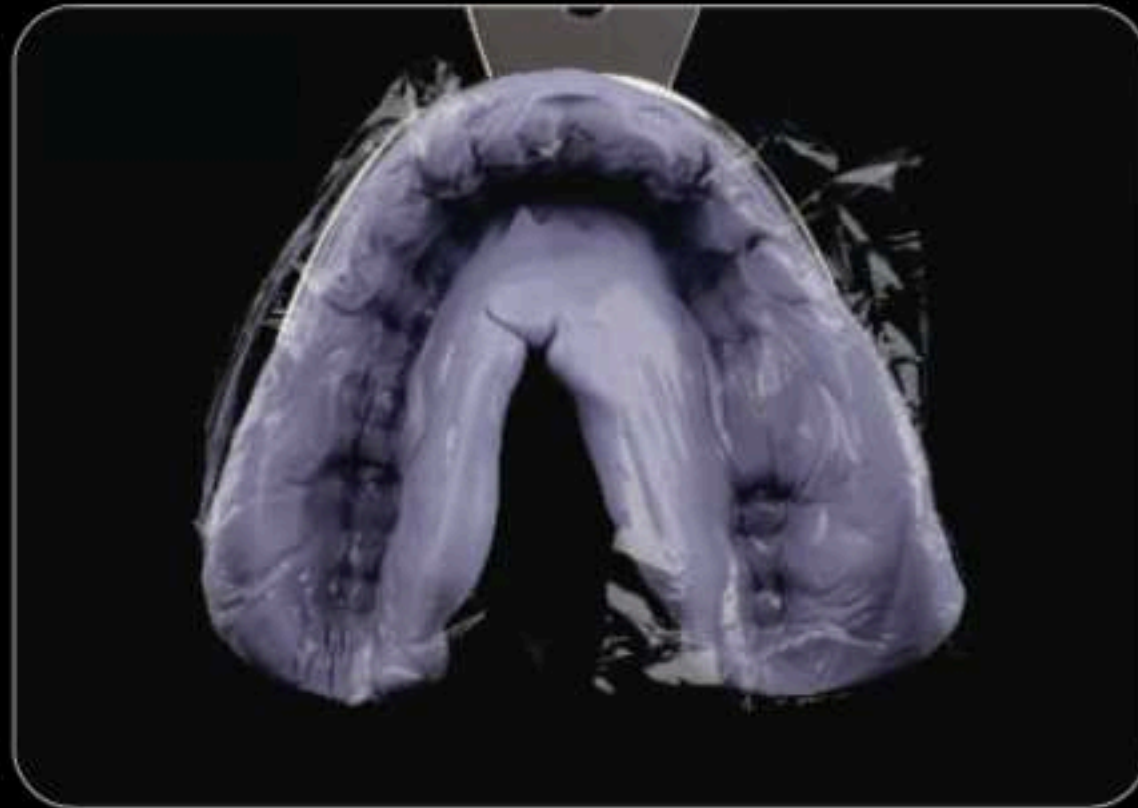


Fig. 5.84: The set putty material records the prepared teeth with the foil interposed between them.



Fig. 5.85: The foil spacer is then peeled off, creating a custom tray in putty.



Fig. 5.86: Following intra-oral isolation, the space created in the impression is then filled with light body and the tray is re-inserted into the patient's mouth slowly. Excessive pressure should not be applied as this can displace the light body, causing putty-tooth contact. This would defeat the very purpose of recording a two-step impression.

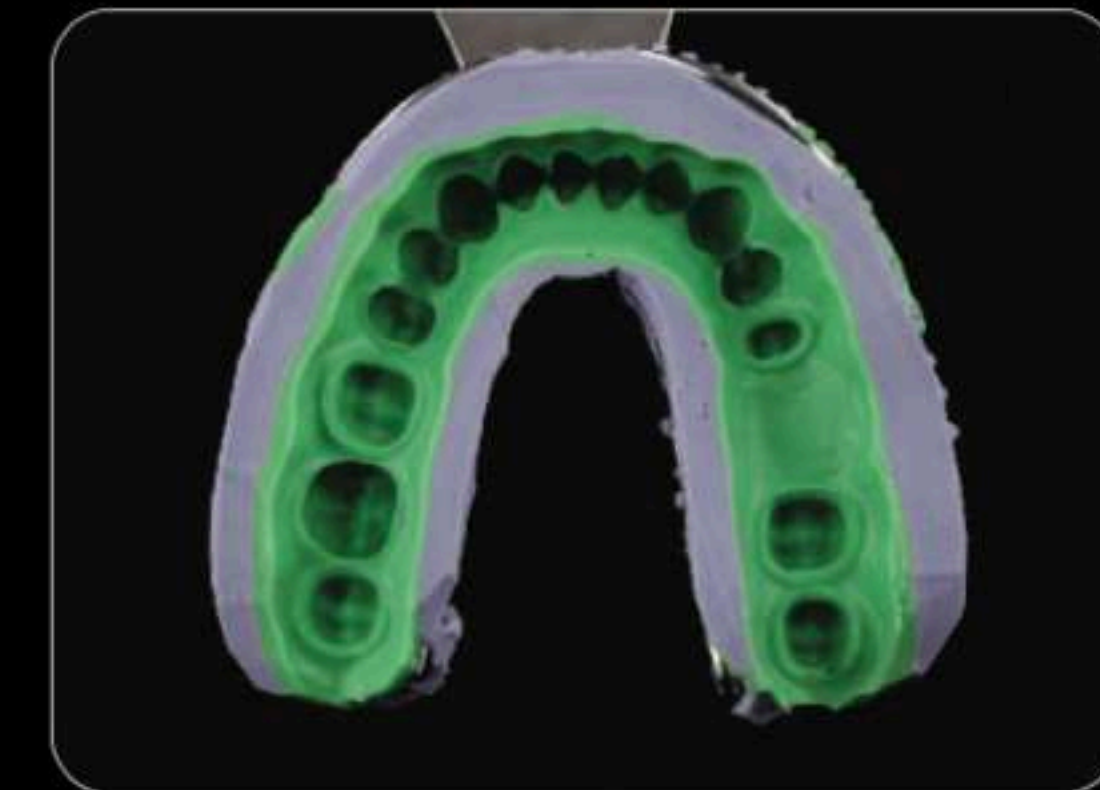


Fig. 5.87: The final impression shows all hard and soft tissues recorded in detail by the light body material.

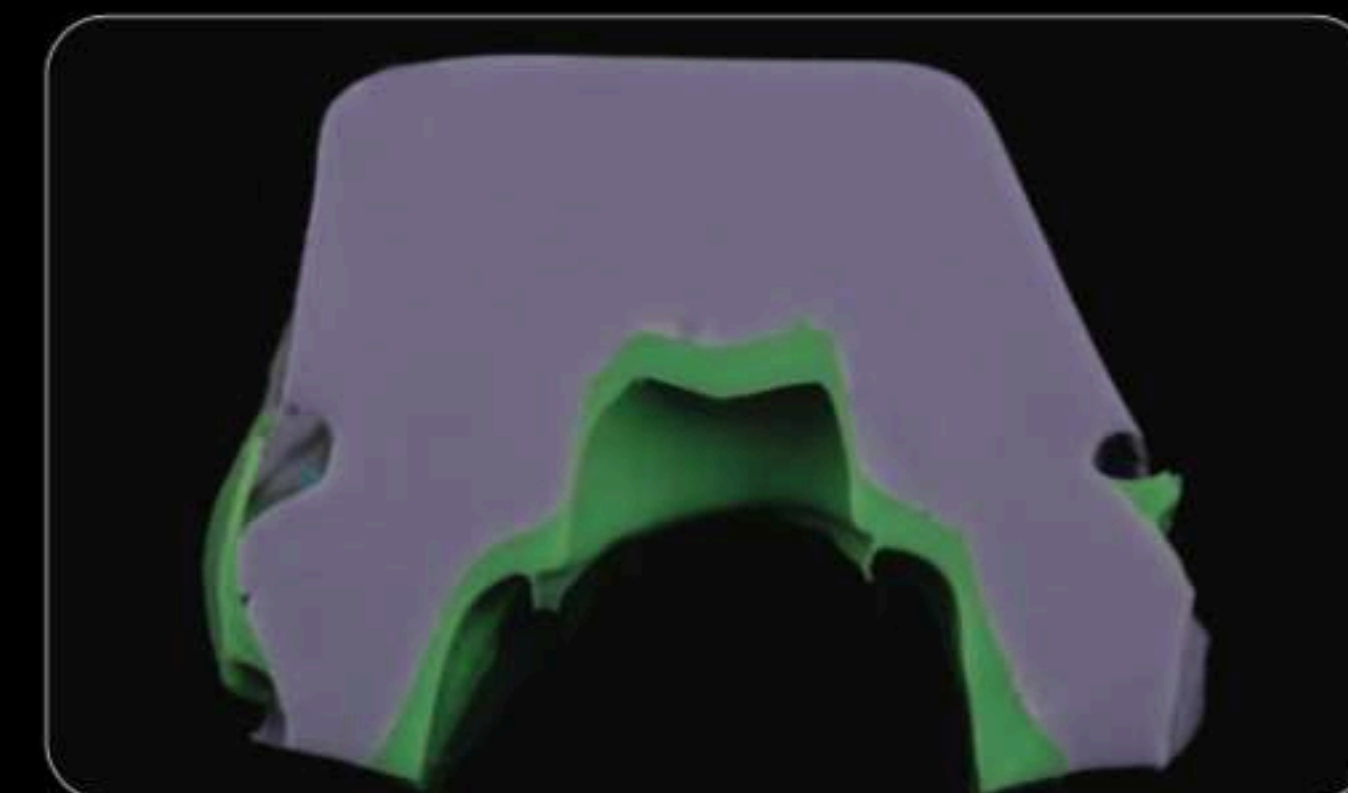


Fig. 5.88: Cross section of the two-step impression shows how details are recorded by the light body material, while the putty/heavy body comprises bulk of the impression.



Fig. 6.4: **Scenario 2:** The two distal most teeth are prepared.

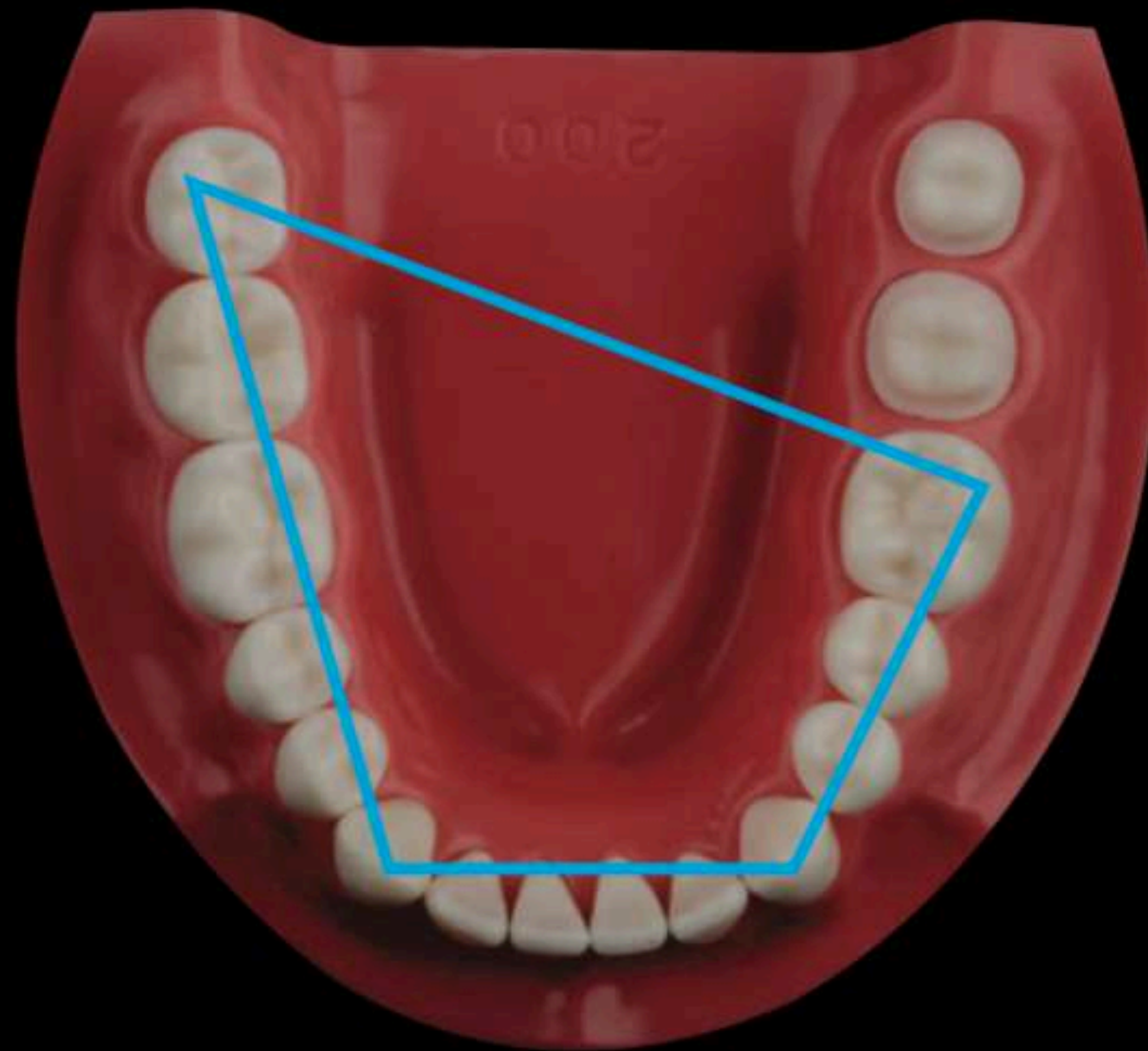


Fig. 6.5: In this situation, there is no occlusal contact posterior to the distal most prepared tooth. Hence, the desired stability during mounting of the cast is deficient and such a case would benefit from bite registration.



Fig. 6.6: **Scenario 3:** In this situation, all three molars in one quadrant have been prepared. Here, the stability on the prepared side is grossly deficient making it difficult for the technician to judge the amount of clearance provided; thereby significantly increasing the possibility of erroneous mounting. Such cases would definitely need a bite registration.



Fig. 6.7: **Scenario 4:** In this situation, teeth have been prepared to receive a bridge. However, there is a tooth distal to the posterior abutment providing a stable occlusal stop. Thus, the four points of contact for accurate mounting are present and such cases would not need bite registration.

DUAL-CURE RESIN CEMENTS

This cement group is polymerized via light activation and also by chemical interaction within their components. Typically, once the resin has been photo-activated, the cement immediately adjacent to the light gets cured while also initiating a self-cure reaction in the remaining cement that has not been illuminated.

Advantage

- ▲ Ensures curing even in areas that cannot be light cured.

Drawbacks

- ▼ Weaker bond strength than light cure cements.
- ▼ Lack of color stability and can darken over time.

Indications

- Where light access to the cement is questionable:
 - ◆ Thick glass ceramic restorations.
 - ◆ Opaque core based restorations, like PFM, PFZ.
 - ◆ Difficult to access areas, like post space.

CHEMICAL-CURE RESIN CEMENTS

These cements are not reactive to light and polymerize by a chemical reaction only when the separate components are physically mixed together.

Advantages

- ▲ Not dependant on light for their activation.

Drawbacks

- ▼ Do not offer much selection in terms of shade and translucency.
- ▼ Have very low early bond strength and require hours to reach full maturity. Thus, immediate post bonding care is essential.
- ▼ Lower bond strength as compared to the light-cure and dual-cure resin cements.

Indication

- Areas where light-curing is not possible.

Table 10.1: Cementation options for various prosthetic materials.

	GIC	RMGIC	Total Etch	Self Adhesive	Self Adhesive with Selective Etch
Full Metal/ PFM Prostheses	✓	✓✓	✓	✓✓	✓✓
Monolithic Zirconia/ PFZ Prostheses	✓	✓✓	✓	✓✓	✓✓
LiDiSi Prostheses	✗	✓	✓✓	✓	✓✓✓
Prostheses with poor retention form	✗	✗	✓✓✓	✓	✓✓✓
Posterior Partial Bonded Restorations	✗	✗	✓✓	✓	✓✓✓
PLVs	✗	✗	✓✓✓	✗	✓✓
Metal Posts	✓	✓	✓	✓✓	✓✓✓
Fiber Posts	✗	✗	✓	✓✓	✓✓✓

SURFACE TREATMENT OF PROSTHETIC MATERIALS PRIOR TO CEMENTATION/BONDING

Surface treatment of prosthesis can play a vital role in improving the longevity at the tooth-cement interface. Treatment is subjective to the material being used:

METAL BASED PROSTHESES

Sandblasting helps increase the micro-irregularities and the surface area of the fitting surface of the prostheses, thereby increasing their frictional resistance to dislodging forces.

Prostheses are usually sandblasted in the laboratory. However, sandblasting can also be performed chair-side, with an air polisher using fine grit aluminum oxide particles.

RETRIEVAL USING THE CHRISTENSEN CROWN REMOVER



Fig. 11.24: An imaginary line can be drawn along which the prosthesis is to be sectioned.

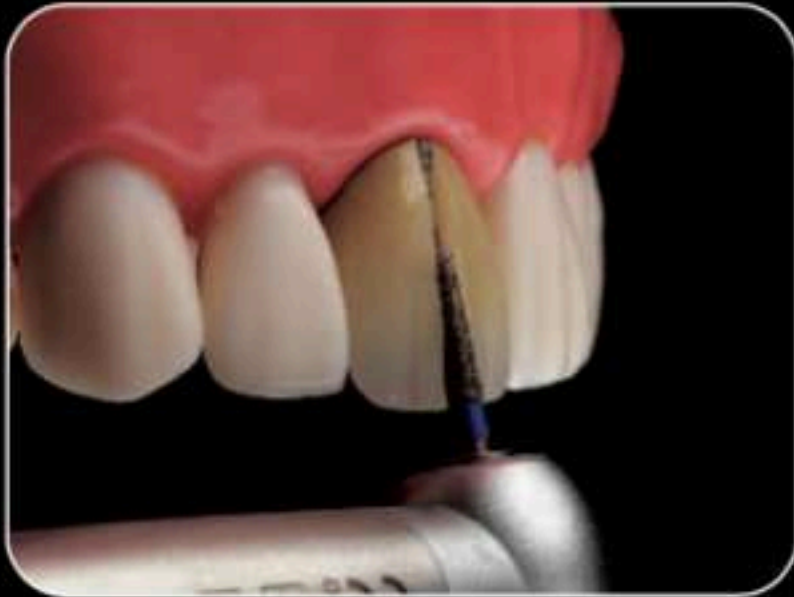


Fig. 11.25, 11.26: A diamond bur is first used to cut through the porcelain, until the metal coping is exposed. The cut is initially made on the labial surface only.

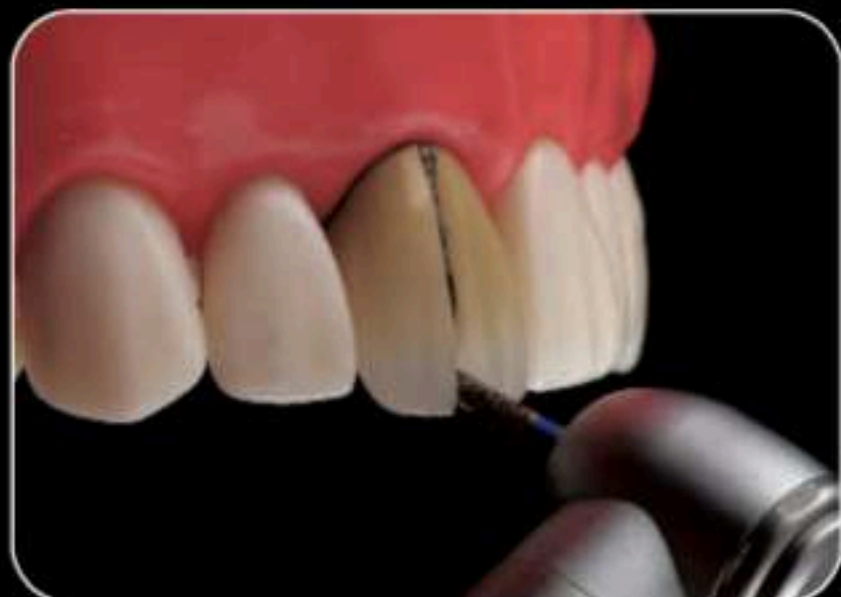


Fig. 11.27: By altering the orientation of the bur, the cut is then extended through the incisal edge.

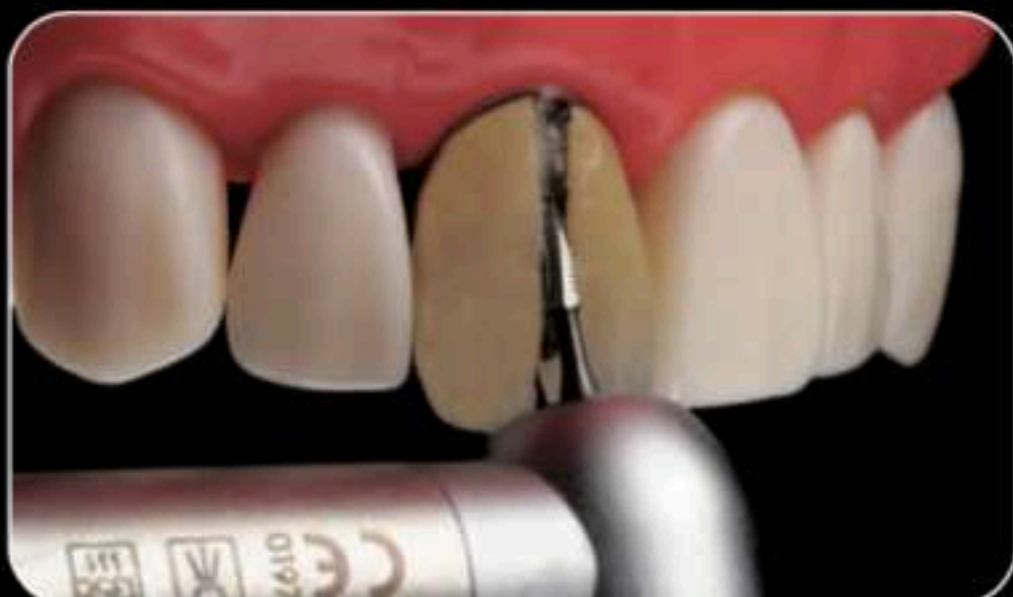


Fig. 11.28: A carbide bur is then used to slice through the metal coping, taking care not to overly hurt the abutment tooth.



Fig. 11.29: The metal coping is cut until the underlying tooth is visible on the labial and incisal surfaces.



Fig. 11.30: Christensen Crown Remover is then placed into the slit and rotated. The straight design is used for anterior teeth.

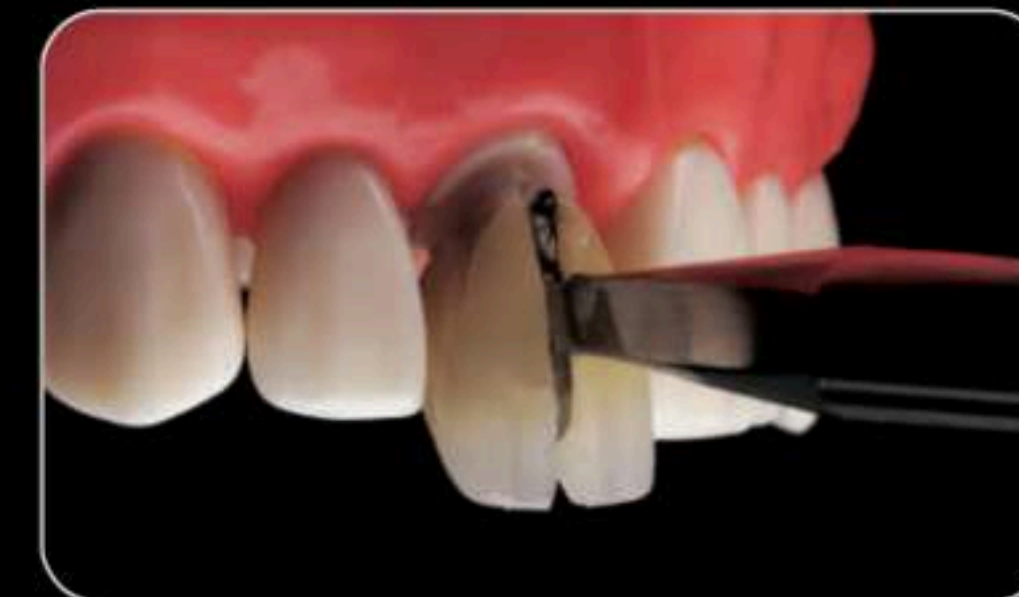


Fig. 11.31: As the two slit edges get pushed apart, the instrument exerts a tensile force on the luting cement (causing it to give way).

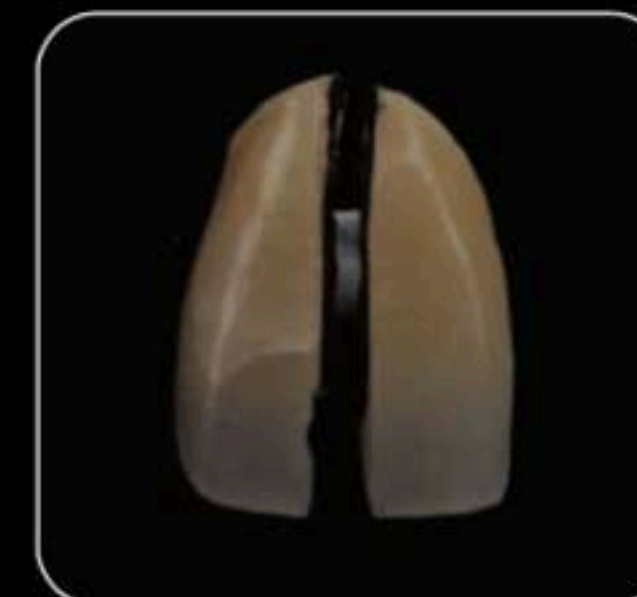


Fig. 11.32, 11.33: Although such a technique destroys the prosthesis rendering it useless, the abutment tooth is subjected to hardly any trauma.

SECTIONAL VIEWS

Sectional images form the most important part of our protocol and are also the most routinely used. Both dental arches are divided into an anterior quadrant and a left and right posterior quadrant. These images are usually made with the help of sectional mirrors at a magnification ratio of 1:1.5-1:2, with the focus point in the center.

Here, it is extremely vital to be perpendicular to the occlusal surface (of the image on the mirror) and to ensure that not a lot of the buccal or palatal surface is seen in the posterior segment images.

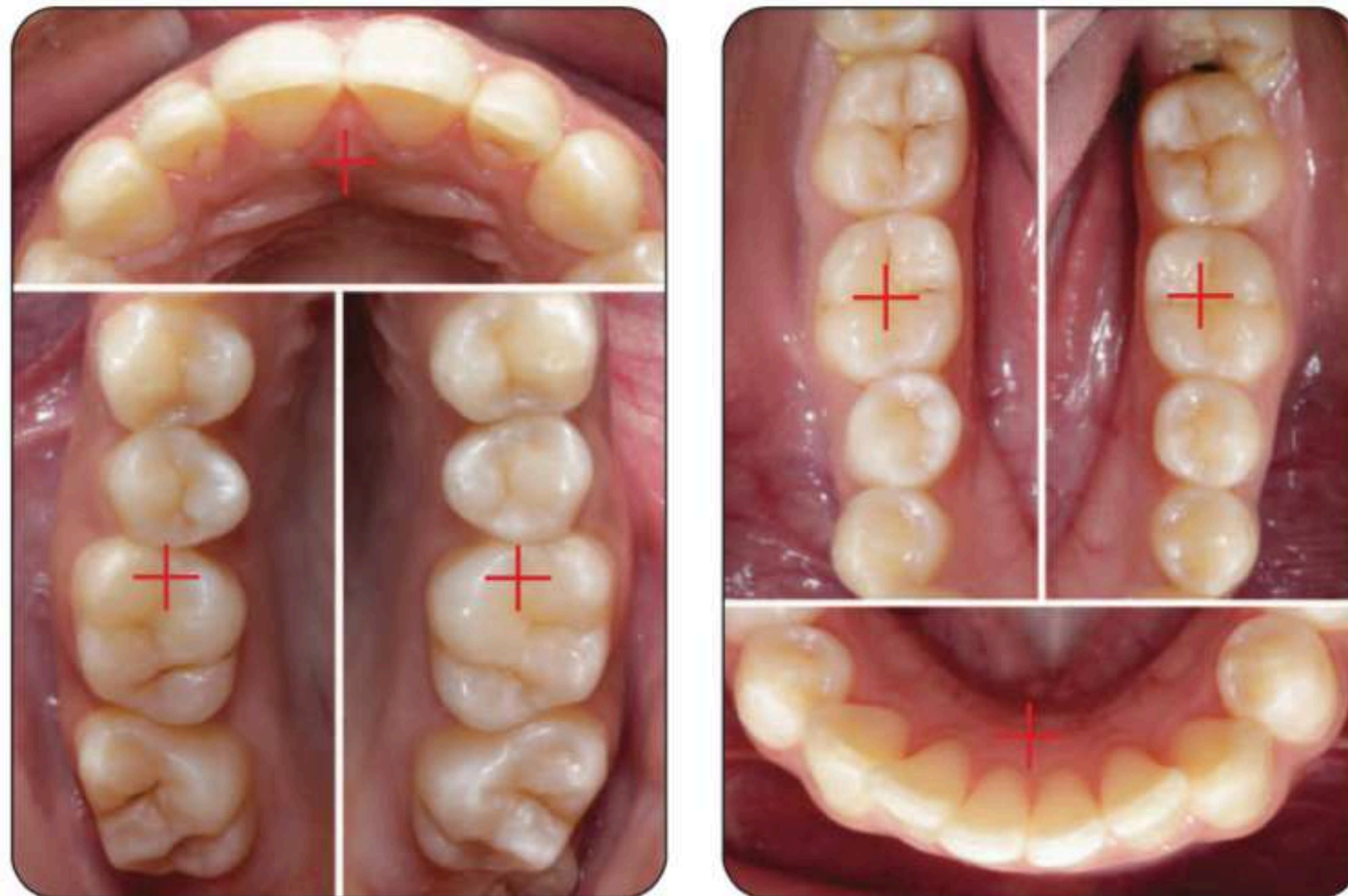


Fig. 19.49-19.50: Sectional/quadrant images. Left: Maxillary; Right: Mandibular.



Fig. 19.51: Image to record the overjet and over bite.

Image is taken from a lower angle, almost parallel to the mandible. It is taken at a magnification ratio of 1:1.5, with the focus point in the center. Because this is a mirror image it has to be flipped.

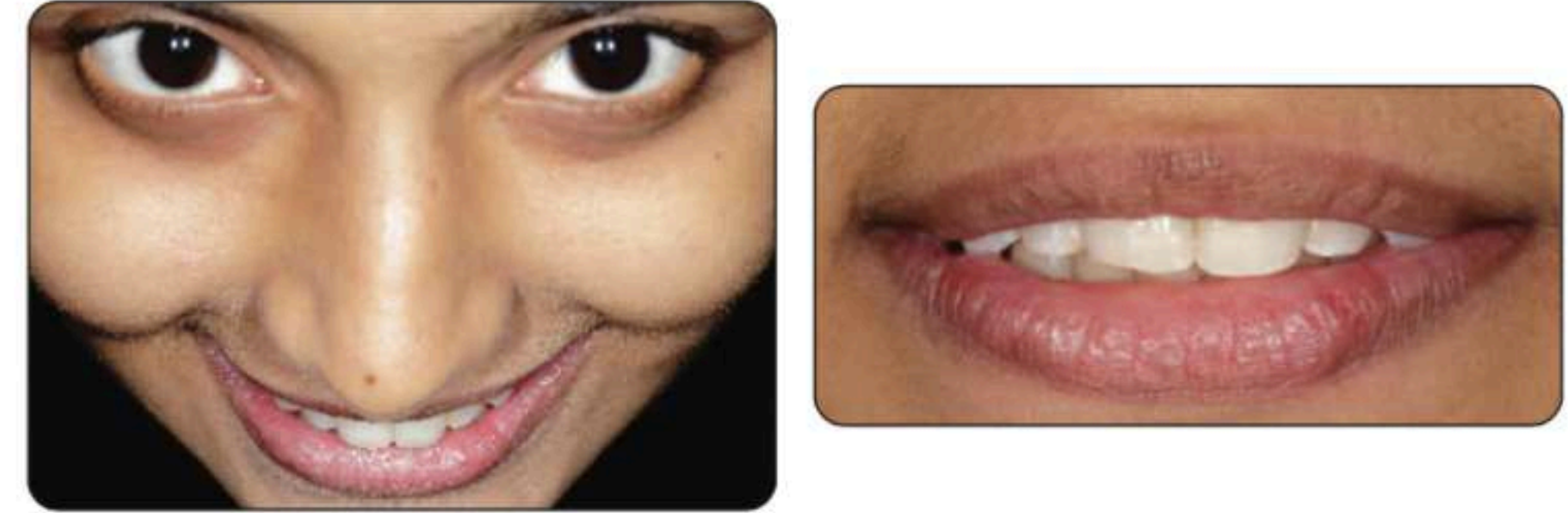


Fig. 19.52-19.53: Images showing the relation of teeth with respect to the vermilion border of the lower lip.

Conclusion

Dental photography is important to uplift one's dental practice. Ideal equipment for documentation is an entry level DSLR, a 100 mm macro lens and a twin flash. It is advisable to avoid use of mobile phones for dental documentation.

Developing a habit of using cameras in their manual mode is vital to achieve consistent results with respect to composition and exposure of the images. Following specific imaging protocols in daily practice helps save time and effort spent in recording the views. If practiced on a routine basis, documentation becomes easy and is a great source of inspiration to help us become better health care providers.

This text provides the basic understanding of all essential settings, equipment and intra-oral appliances and in doing so it attempts to set a constant, so that dental images can be taken accurately and quickly.



Fig. 19.54: Glam shot.

2 B. USE OF MAGNIFICATION

Magnification can improve visualization, postural habits, as well as productivity. Properly selected and adjusted magnification devices can help prevent the clinician from gradually tilting their head and leaning forward.

Dental loupes are the most frequently used form of magnification. As with all microscopes, the higher the magnification the shorter is the depth of field and narrower is the field of vision. Thus, choosing which type of loupes to use is a personal decision based on the procedural requirements and comfort level of the clinician.

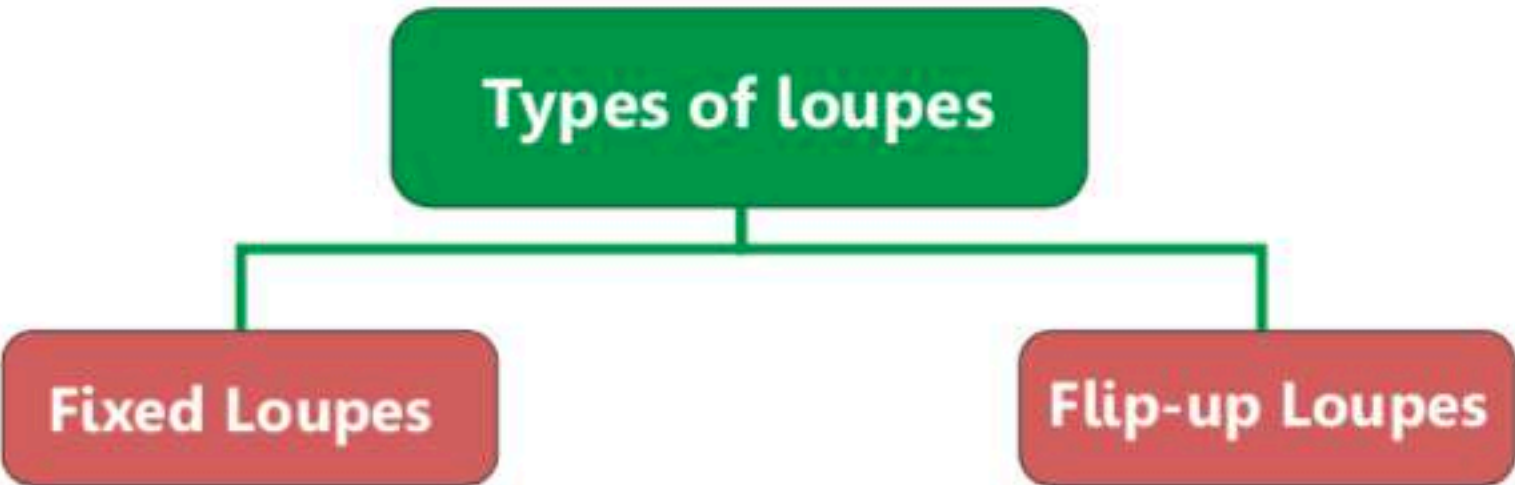
An accommodation period may be required when first using loupes and some eye fatigue or headache may be experienced initially. When first adopting loupes, wearing them for just two to three hours per day and progressively extending the wearing time over a couple of weeks helps with the adjustment process.



Large frames, while less elegant than small oval frames are superior as they sit low on the cheek. This enables lower scope placement relative to the pupils and better head position.

Working distance is quantified as the distance between the front of the clinician’s eye and the patient’s maxillary central incisor.

The difference in working distance ranges from less than 14 inches to greater than 20 inches. Too short a working distance can lead to hunching and too long a working distance can result in stretching. Thus, it is prudent to select loupes that meet your personal working distance (which is subjective to your height).

There are two primary designs for magnification loupes, depending on the mode of attachment of the magnification telescope.



THROUGH THE LENS TYPE	FLIP-UP TYPE
<p>The optical magnification barrels are built on to the carrier lens itself (thus the name).</p> 	<p>The optical magnification barrels are mounted on a hinge mechanism that flips in front of the carrier lens.</p> 
<p>As the distance between the eyes and the optical barrels is less, these provide wider field of view in the same magnification</p>	<p>The presence of an additional hinge increases the distance between the eyes and the magnification barrels, thereby narrowing the field of view.</p>
<p>These types of loupes are lighter in weight and hence can be used for a relatively longer period of time.</p>	<p>These loupes are comparatively heavier because of the hinge and barrels that protrude further. This also creates an uneven balance, requiring the body to compensate for it by pressurizing the neck muscles, especially when looking down. Such a system often requires a cord to be tied around the head in order to stabilize the framework.</p>
<p>The barrels cannot be moved and thus when communicating with the patient, the loupe may have to be removed or the clinician may have to look over the lens (which could be inconvenient).</p>	<p>The barrels can be flipped out of site when not working or when wearing gloves, changing burs, talking to the patient, etc. This makes it convenient for use.</p>
<p>They are individually customized according to the clinician’s working distance, angle of declination and inter-pupillary distance (at the most ergonomic position suitable to the user). Hence is user specific.</p>	<p>They allow adjustable angle of declination and adjustable inter-pupillary distance, making it convenient for multiple users.</p>
<p>Angle of declination is customized and fixed to the user’s requirement and cannot be increased if desired (which is a disadvantage for this system).</p>	<p>The angle of declination is adjustable on the basis of the clinicians focal distance.</p>
<p>It also serves as an advantage, as the user does not have to adjust the telescope each time to reach his/her best ergonomic position.</p>	<p>This can be a disadvantage, as the flip-up mechanism can be knocked out of position and needs readjustment.</p>

Continued onto next page

6. Uncomfortable or strange feeling: This may occur because of the differences between natural teeth and the artificial replacements. Most patients usually become accustomed to this feeling in time.

7. Gingival recession: Periodontal (gum) disease can occur at any age, with or without these restorations. Generally, crown or bridge work does not cause or prevent any gum disease. Dark lines at the gumline may appear in crowns or fixed bridges lined with metal, especially if the gum recedes after placement.

8. Esthetics or appearance: You will be given the opportunity to observe the appearance of the crowns or bridges in your mouth prior to final fixation.

9. It is the patient's responsibility to seek attention from the dentist, should any undue or unexpected problems occur. The patient must diligently follow any and all instructions, including the scheduling and attending of all appointments. Failure to keep the cementation appointment can result in ultimate failure of the crown/bridge which fails to fit properly and an additional fee may be required to correct the situation.

INFORMED CONSENT:

I have been given the opportunity to ask questions regarding the nature and purpose of the crown and/or bridge treatment and have received answers to my satisfaction. I voluntarily assume any and all possible risks, including the risk of substantial harm, if any, which may be associated with any phase of this treatment in hopes of obtaining the desired results, which may or may not be achieved. No guarantees or promises have been made to me concerning the results. The fee for this service have been explained to me and is satisfactory.

By signing this form, I am freely giving my consent to allow and authorize Dr. _____ and his/her associates to render the treatment pertaining to crown and bridge prosthetics considered necessary and/or advisable for my dental conditions, including the prescribing and administering of any medications and/or anesthetic deemed necessary for my treatment.

Date: _____

Patient's name: _____

Signature of patient
or legal guardian.

Readers are urged to get this consent form printed on their own case paper sheets and have your patients sign it prior to starting any irreversible tooth reduction in their mouth.

