

Coronoplasty

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Abstract: Coronoplasty is the selective reduction of occlusal areas with the primary purpose influencing the mechanical contact, conditions & the neural patterns of sensory input. In addition to establishing an ideal occlusion, premature contacts & occlusal disharmonies are eliminated. It is believed that ideal occlusion permits functions that is physiologically compatible with the Periodontium, the TMJs & muscles of the mastication. Occlusal adjustment not only responsible for eliminating injurious occlusal forces, but an equally important to provide the functional stimulation necessary for the preservation of periodontal health. This paper addresses the procedures & importance of coronoplasty in periodontal therapy.

Keywords: Occlusion, Occlusal analysis, steps in coronoplasty.

I. Introduction

Coronoplasty is the mechanical elimination of occlusal supra contacts that may be present during functional movements^[1]. It is the selective reduction of occlusal areas to establish functional relationship favourable to the Periodontium by reshaping the teeth (grinding), restorative procedures, intra occlusal appliance therapy & orthodontic movement and orthognathic surgery. Local environment at the periodonium is affected by the occlusion of the teeth. One of the environmental pollutants that have an adverse impact on Periodontium is the altered occlusal force. Coronoplasty is done to eliminate undesirable forces and to produce forces favorable to the Periodontium.

Tooth position and arch are maintained by the balance among the forces of occlusion and oral musculature. When this balance gets disturbed, changes in the functional environment may be deleterious to the Periodontium occurs. This paper deals with the role of coronoplasty in the management of periodontal disease.

II. Occlusion

According to strang-normal occlusion may be defined as the relationship of the occlusal inclined planes to the teeth when the jaws are closed, accompanied by the correct proximal contacts and axial positions of all the teeth and the normal growth, development, location and correlation of the various associated tissues and parts.

Three classes of functional occlusion have been identified: physiological occlusion, non physiological occlusion and therapeutic occlusion. The optimal goal of a therapeutic occlusion is the elimination of undesirable occlusal supracontacts and the creation of a stable mandibular position^[3].

The basic guidelines for a therapeutic occlusion are

1. Premature evaluation of dental occlusion
2. Planning occlusal changes
3. Post treatment evaluation of the dental occlusion.

III. Principles Of Coronoplasty

1. Tissue damage & tooth mobility caused by occlusal forces are resolved when undesirable occlusal forces are eliminated by coronoplasty.

2. coronoplasty should be done only after the control of inflammation surrounding the tooth

Objective of coronoplasty is to eliminate mechanically all occlusal supracontacts in function & parafunction

INDICATIONS

Trauma from occlusion

Preventive occlusal adjustment.

Planned occlusal reconstruction.

To improve functional relationship between teeth.

IV. Coronoplasty In Treatment Planning

The occlusion is usually adjusted after gingival inflammation subsides. Pathogenesis and healing aspects of trauma from occlusion suggests that the benefits of coronoplasty are not complete if the inflammation is not eliminated first.^[4]

If the inflammation is eliminated before coronoplasty, enhancement in the clinical attachment loss may be obtained^[5]. If the occlusion is adjusted before the inflammation is alleviated, it may have to be readjusted after health is restored.

This sequence of treatment is modified under the following conditions-

1. In infrabony pocket, 2. in mucogingival surgeries, 3. in case of excessive tooth mobility & if a cracked tooth is suspected.^[6]

SIGNIFICANCE OF THE RELATIONSHIP BETWEEN Inter Cuspal Position (ICP) & Retruded Contact Position (RCP)

Selection of an intraborder position as the end point in coronoplasty is logical, as there is little doubt that the ICP is the functional endpoint of the occlusion^[7]. Moller has characterized ICP as a working position because of its importance as an entry and exit point position in chewing. Instability in ICP causes reflex inhibition of the masticatory musculature & promotes increased neuro-muscular control over mandibular positioning.^[8]

RCP as the sole occlusal endpoint for coronoplasty is rarely indicated because it more positive muscle activity than the ICP.^[9] The discrepancies between ICP & RCP of more than 2mm in magnitude should be carefully evaluated for CP as they induce increased muscle activity^[10].

V. Occlusal Analysis

Prior to coronoplasty, casts should be made. It may be a useful record during the procedure & at follow up visits. Trial curing of the casts allows rehearsal of the planned adjustment with greater confidence & efficiency.

Material needed to identify abnormal tooth contacts & to do coronoplasty are

1. Occlusion registration strips
2. Occlusion indicator wax
3. Blue articulator paper
4. Green red marking ribbon
5. Micromotor

VI. Informed Consent

The clinician should explain that the teeth are not going to be ground down but shaped so that they will function better. The reshaping is done in areas where tooth decay rarely occurs.

Occlusal Guidance Scheme

Balanced occlusion and canine protected occlusion comes under occlusal guidance scheme.

VII. Balanced Occlusion

The term balanced occlusion refers to simultaneous contact between right and left posterior segments of the arch in lateral excursion of the mandible and between the posterior and anterior segments of the arch in protrusive excursion. Mesiotrusive contact during function may introduce the risk of damage to the Periodontium^[11]. Korioto et al stated that the higher compressive condylar forces occur with balanced occlusion.^[12]

Canine Protected Occlusion

De Amico stated that the maxillary canines are to guide the mandible so that posterior teeth come into closure with minimum horizontal forces occlusion like any other physiologic body processes in variable and changes with age^[13]. The dentist should consider the needs of individual occlusion rather than attempting a standard occlusion for all the patients.

The clinical goals of ICP & RCP adjustment are to reduce supracontacts. Consisting of grooving, spheroiding and pointing.

VIII. Steps

1. Retrusive prematurities are eliminated.

This step is to eliminate the supracontacts that interfere with posterior border closure of the mandible to a stable bilateral RCP. Locating RCP is the key to controlled coronoplasty. Chin grasp technique & Dawson's technique are followed for it.^[14]

One can say the retrusive ranger adjustment is complete only when the following conditions are achieved.

1. Contact pattern is bilaretal with multiple pointed contacts.
2. Deflective shift with lateral thrust from RCP to ICP has been eliminated.
3. Both the RCP and ICP approach the same vertical dimensions of occlusion.
4. The pathway from RCP to ICP should be in sagittal direction.
5. Repeated closure of the teeth together in the hinge position produces a sharp resonant sound.

2. Adjust ICP to achieve stable, simultaneous contacts.

It is a major step in comprehensive coronoplasty. The purpose is to achieve a stable ICP & to refine occlusal anatomical relationships. Identification of supracontacts without the guidance of the operator's hand is the main feature of this step.

The goal of ICP adjustment is to achieve occlusal stability. Two major conditions must be met to fulfill the objective of ICP adjustments.

If the contact is at an unfavourable position on the tooth, the correction is made to favor a more ideal contact position & if a supra contact is present, one should either create fossa, depth or remove cuspal height.

3. Test for excessive occlusal contact on the incisors in ICP. According to Mac Donald et al, the incisor teeth should be slightly out of contact or in light contact over the maximum no. of teeth.^[15]

4. Elimination of posterior protrusive contacts.

The objective of this step is to attain bilateral well distributed contact on the incisal edges in the maxillary and mandibular incisor teeth. The protrusive contacts are reduced to provide a bilateral, smooth contact guide along the path approaching the previously established protrusive position.

5. Reduce mediotrusive prematurities

It is very essential to identify the mesiotrusive interference arising from RCP & ICP. According to Helsing et al, the probability of mediotrusive supra contacts is about 84.2% of healthy individuals which is routinely observed as an oblique facets on 1st and 2nd molar teeth^[16].

6. Laterotrusive prematurities

In healthy adults, the lateral guidance is dominated by the canine & 1st premolar. The canine tooth is most frequently involved^[17].

The lack of adequate guidance in the canine area increase the risk of single tooth molar supracontacts that may produce trauma in functional and parafunctional movements the grinding should be better limited to the maxillary cusps because grinding of the mandibular cusps jeopardizes the functional ICP cusps.

At this point of coronoplasty, all targeted supracontacts have been removed or lessened. Undesirable gross occlusal factors should be modified. Care should be taken to avoid changing or removing previously attained occlusal contact relationships.

Undesirable gross occlusal factors include extruded teeth, plunger cusps, uneven adjacent marginal ridges, rotated, malposed & tilted tooth, facets & flat occlusal wear etc. Elimination of the above said gross occlusal disharmonies at the beginning of the CP may be important and is permissible, but without destroying the future stability of the occlusion.

7. Gross occlusal disharmonies

8. Recheck Contact relationships.

Tooth contact relationships in all positions and movements are rechecked.

9. Polish all depressed surfaces to make the patient feel comfortable, the occlusal surfaces are smoothed and polished.

IX. Conclusion

The main objective in occlusal therapy is to maintain or achieve occlusal stability. The first concern in occlusal treatment planning is whether to alter the mandibular position by coronoplasty. If the mandibular

position is judged to be adequate, the goal is to maintain the existing occlusion to remove isolated interferences in the course of therapy. There is an evidence that coronoplasty provides better stability if occlusion and the method of occlusal adjustment creates a permanent occlusal relationship. The occlusion must be checked periodically and the patient should be advised accordingly.

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