BUILDING PROPER CONTACTS

CREATES SUCCESSFUL RESTORATIONS!

AdDent INCORPORATED

Advancing Dental Excellence

INTRODUCTION:

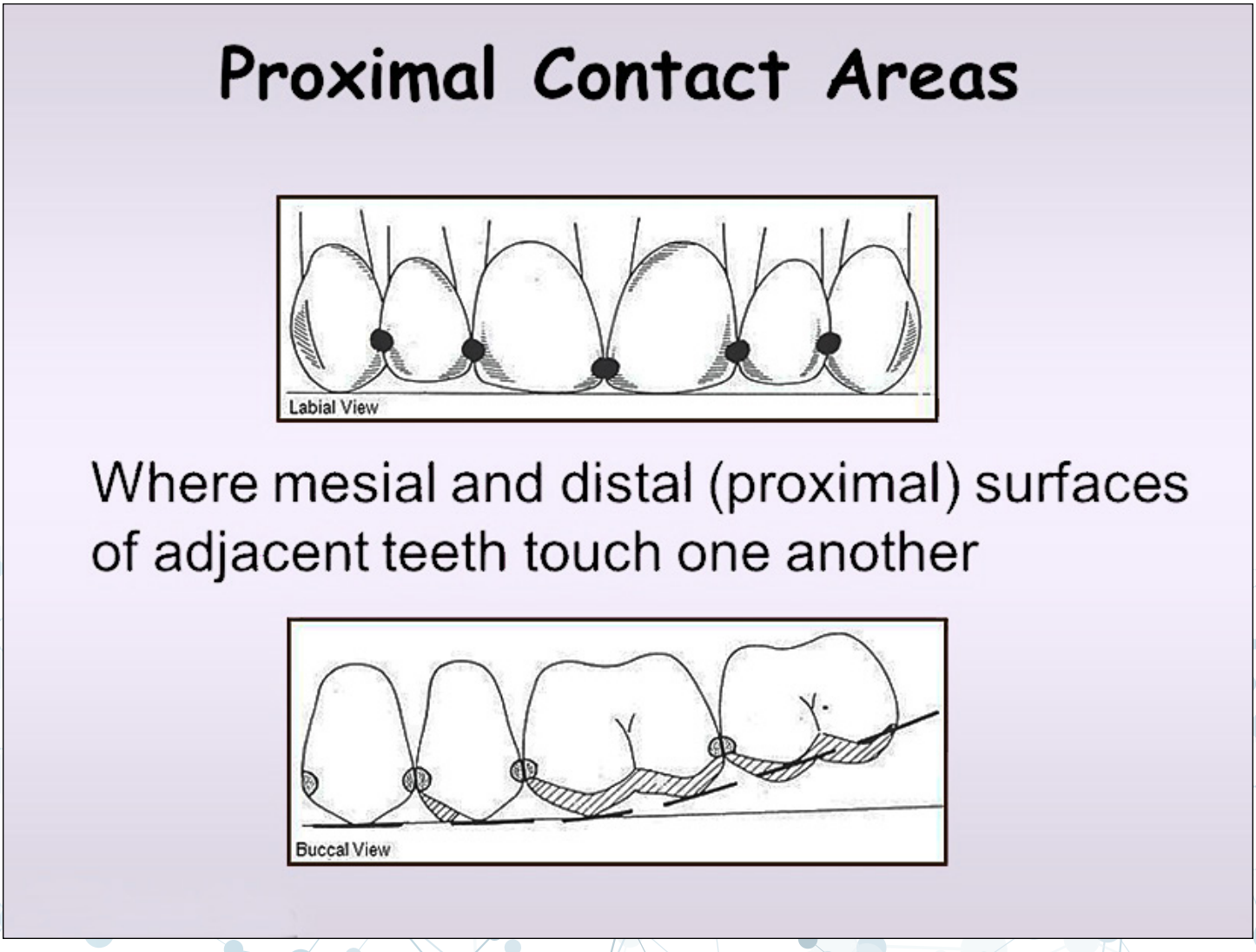
It's important to ensure that the tooth contact area is accurately restored. Understanding the significance of the interproximal contact area and the marginal ridge and how they are interconnected is crucial for creating a successful restoration and ensuring patient comfort and satisfaction.

CHAPTER 1: WHAT IS A CONTACT AREA?

The dental tooth contact area, known as the interproximal contact area (ICA), is where two adjacent teeth in the same arch touch. This area is formed when the mesial surface of one tooth touches the distal surface of the adjacent tooth. The size of the contact area depends on the type of tooth, its anotomic position, and the type of gingival tissue.

Teeth are spaced strategically for proper function and appearance. Good contact between neighboring teeth prevents food trapping, stabilizes the dental arch, and enhances aesthetics by reducing black triangles. Thus, attention should be given to the height where teeth meet.[1]

A tooth may touch its neighboring teeth at the proximal surface, but this alone doesn't protect interdental tissues or prevent decay. Improper proximal contacts can lead to gum disease and cavities.[2]



CHAPTER 2: WHY PROPER CONTACTS ARE IMPORTANT

Patients often become frustrated when poor tooth contacts lead to food impaction. They may not fully understand that these poor contacts can result in decay or periodontal issues. Therefore, it's essential to ensure proper contacts from the beginning to avoid these inconveniences.[3]

Properly contoured and well-positioned proximal contacts are essential for maintaining the integrity of dental arches and the health of supporting structures. The contact areas between primary molars are wider, flatter, and positioned closer to the gums compared to those between permanent molars.[4]

Replicating anatomic form has always been the primary goal of restorative dentistry. Recreating lost dental anatomy is essential not only for replacing missing tooth structures but also for restoring optimal form and function.[5]

An ideal proximal contact prevents food from getting stuck and helps maintain gum health by providing a space for food to escape and allowing for easier cleaning.

An ideal contact serves by:

- Maintaining the dental arch stability by transmitting the force along the long axis of the teeth.
- The correct relationship with the adjacent tooth allows a good support against masticatory forces and promotes the deflection of the food through the embrasure.
- Influences speech and cosmetics, especially in the anterior region.

Improper restoration in the contact area can cause tooth displacement, lifting forces on the teeth, rotation of the teeth, deflected occlusal contacts, and food impaction.[5]

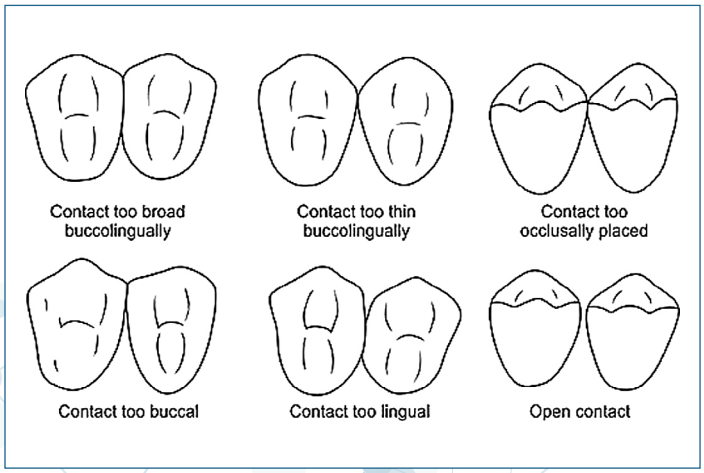
CHAPTER 3: DISADVANTAGES OF IMPROPER CONTACT AREAS

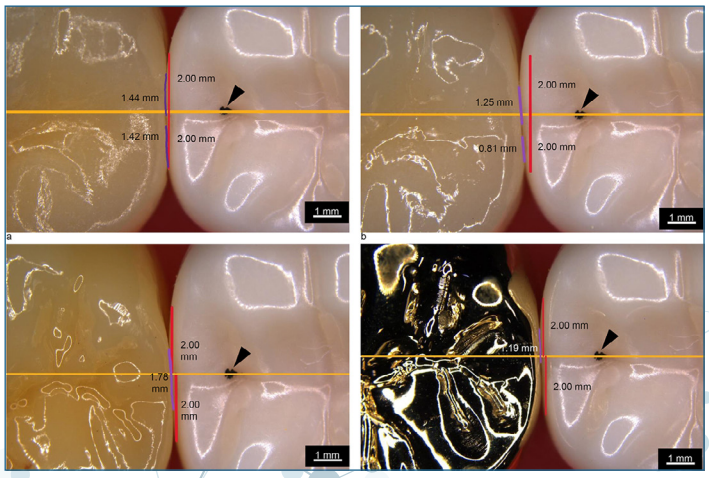
Faulty contacts can lead to restorative defects that affect the health of the periodontium. There are a few ways this can happen:

- If the contact between teeth is too broad in the bucco-lingual or occlusal-gingival direction, it can change the tooth anatomy and cause improper shunting of food, leading to food impingement in the contact area.
- On the other hand, if the contact is too narrow bucco-lingually or occluso-gingivally, it can cause food impaction vertically and horizontally, leading to greater food retention and plaque accumulation.
- Placing the contact area too occlusally, buccally, or lingually, can result in a flattened marginal ridge of the restoration while placing it too gingivally can lead to the increased depth of occlusal embrasure.

It's not uncommon to observe good proximal contact but inadequate contour in a proximal restoration. Similarly, a good contour with poor proximal contact can also occur.[5]

It can be frustrating when poor or open contact is unintentionally created. If ignored or left untreated, the problem will lead to food packing, secondary caries, halitosis, and periodontal disease. This means that the contact point must be re-done immediately. It also may reduce the confidence that the patient has in the dentist.[6]





CHAPTER 4: IMPORTANCE OF THE MARGINAL RIDGE

Marginal ridges of the posterior tooth are considered to be of primary importance in providing structural strength to the crown. It has a greater thickness of enamel than other areas. Loss of one or more marginal ridge weakens the tooth.

It is imperative to have a marginal ridge of proper dimension, compatible to the occlusal anatomy creating a pronounced adjacent triangular fosse and occlusal embrasure. Marginal ridge should always form in two planes bucco-lingually meeting at a very obtuse angle. This feature is essential when an opposing functional cusp occludes with the marginal ridge. These essential features are necessary to prevent food impaction which causes damage to the periodontium.

CRITERIA FOR RESTORATIONS OF THE MARGINAL RIDGE:

1. In the absence of a marginal ridge:

The forces will be directed towards the proximal ridge of the adjacent tooth and force is directed onto the same tooth, so the horizontal forces and will act on the same tooth, which will tend to drive the two teeth away from each other. The vertical component and can impact the food intraorally.

2. Adjacent marginal ridge not compatible with height:

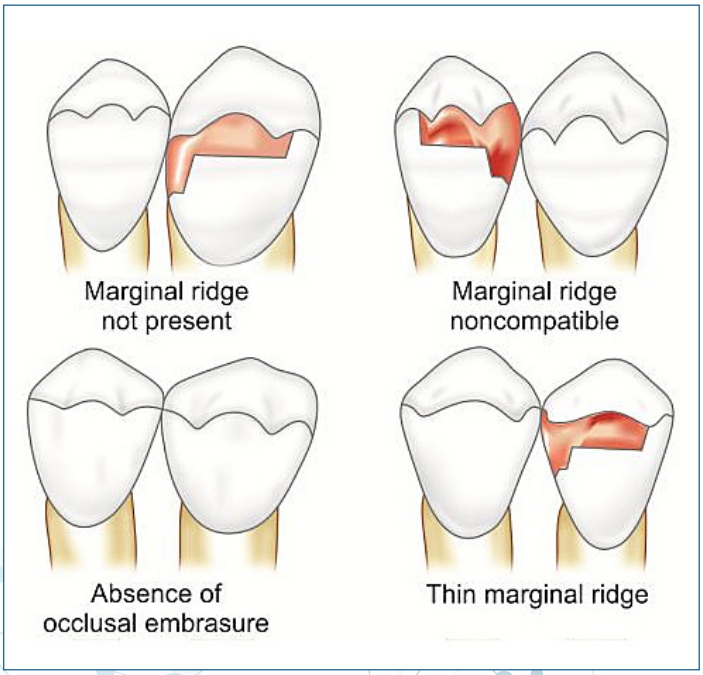
Restoring the marginal ridge higher than the adjacent one will allow force on the proximal surface of the restoration, the horizontal component will drive the restored tooth away from the contacting tooth and the vertical component will push debris interproximally even in the presence of force with its horizontal component acting on the adjacent marginal ridge there is some separation of the teeth as force is too small as compared to force. By restoring the marginal ridge lower than the adjacent one we can expect the same movement of the tooth but the major movement will be non-restored tooth.

CHAPTER 4: IMPORTANCE OF THE MARGINAL RIDGE

CRITERIA FOR RESTORATIONS OF THE MARGINAL RIDGE:

3. Single flat marginal ridge in bucco-lingual direction

This can create premature contact during both function and static occlusion, one flat marginal ridge increases the depth of adjacent triangular fossa by increasing the stress in this area and also increases the height of the marginal ridge at the center, and this will deflect the food away from the spillway.



4. Thin marginal ridge in mesio-distal bulk:

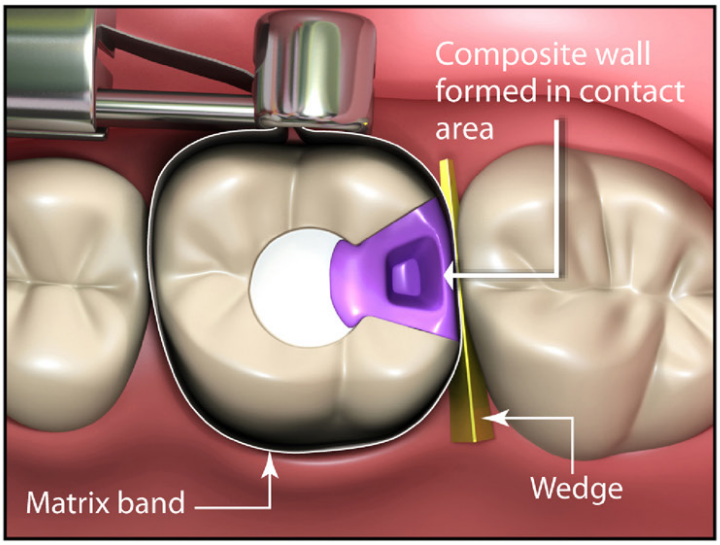
Will be susceptible to fracture or deformation leading to the problems of a previously mentioned faulty marginal ridge (discussed in point 1, 2, 3 and 4)[5]

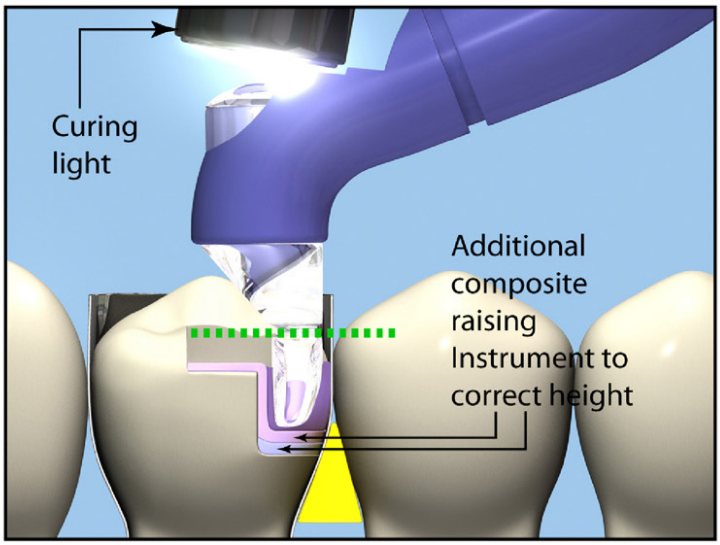
The marginal ridges of posterior teeth are crucial for providing structural strength to the crowns. These ridges have a thicker layer of enamel compared to other areas, so any loss of tooth structure in this region due to restorative procedures can significantly weaken the teeth. If one or both marginal ridges are lost, the tooth becomes more vulnerable to fractures.[7]

CHAPTER 5: TRIMAX CONTACT INSTRUMENT AIDS IN CREATING PROPER CONTACTS

Achieving proper contacts and an appropriate proximal contour, while minimizing sensitivity and recurrent decay, as well as ensuring color matching and effective curing in a relatively short timeframe, poses a significant challenge. However, the recent introduction of new composites, matrix retainers, wedges, and contact-forming instruments has led to techniques that expedite the process and enhance the predictability of composite placement.

The Trimax instrument features a removable and disposable insert that is placed into the composite material. It should be pushed into position until the marginal ridge guide aligns with the adjacent tooth. The insert measures 4 mm from the marginal ridge guide to the tip and can be shortened by cutting the end if necessary. Choose the largest insert from the three available sizes that will fit into the proximal box. This selection will minimize the bulk of the resin composite and help wedge the composite against the walls of the preparation and toward the bonded surface. If the insert is too wide, it can be tapered to ensure a proper fit.[8]





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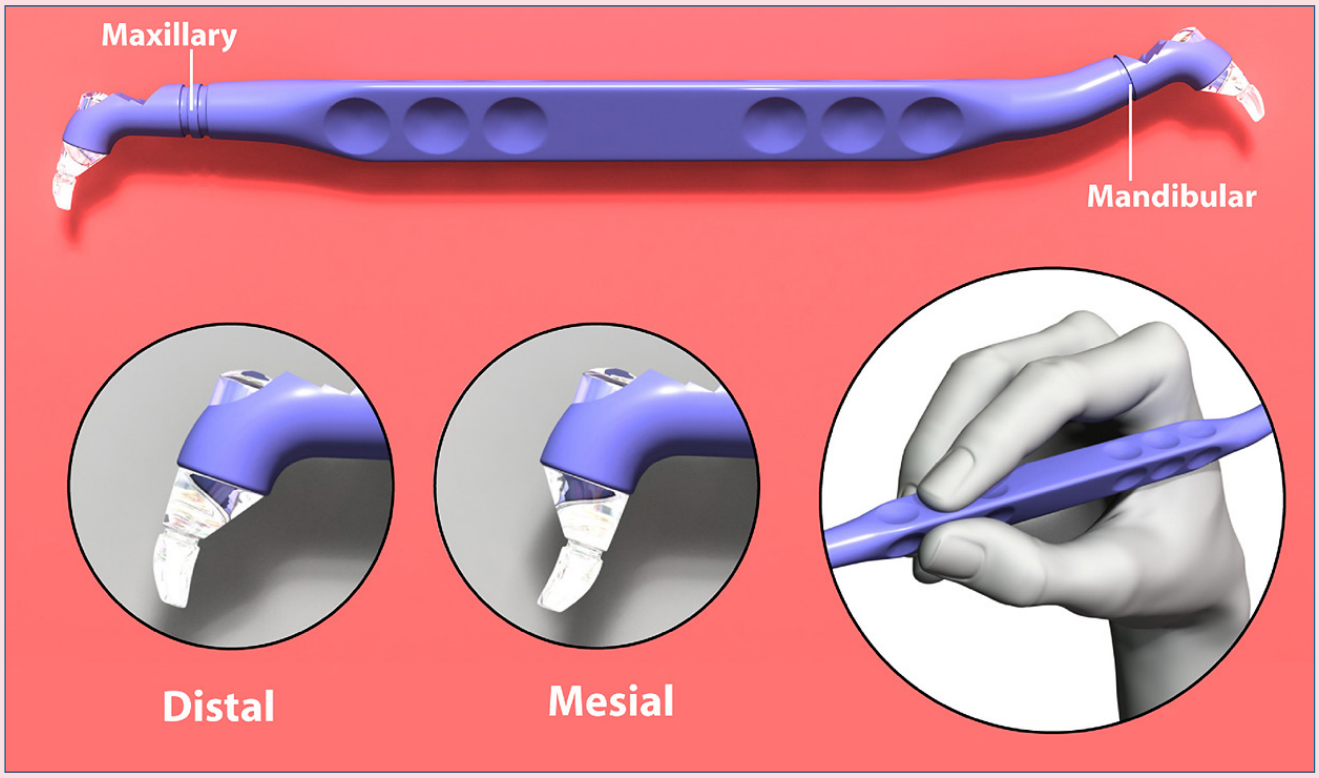
The Trimax is a composite contact instrument designed for placing the tip into deep restorations or tight anatomical contact areas. This allows operators to polymerize deep restorations while maintaining correct proximal anatomy.

The instrument features a light guide step and a marginal ridge guide that illuminates during the curing process, making it versatile for use in various positions. Some of its key benefits include improved polymerization and reduced shrinkage, elimination of open contact areas, and the ability to create ideal anatomical forms for premolar, molar, and large molar restorations. Additionally, the tip serves as a guide for achieving proper marginal ridge height, enhancing overall anatomy.



FEATURES

- Eliminates open contacts
- Improves polymerization
- Perfectly fits proximal box preparation

BENEFITS

- Eliminates open contacts
- Improves polymerization
- Perfectly fits proximal box preparation

CONCLUSION:

Conscientious dentists recognize the significance of achieving the proper shape and contour in the spaces between teeth. Improper contacts can lead to the buildup of plaque and food particles, which can harm gum health, promote decay, contribute to advanced periodontal disease, and ultimately result in tooth loss. Reliable and predictable interproximal contacts can be achieved through a systematic approach that incorporates a variety of instruments.[9]

The Trimax composite instrument is essential to effectively tackle these challenges by enhancing the contact area while helping to shape the proper marginal ridge. This results in a stronger and anatomically accurate restoration that lasts, reducing the likelihood of patients returning to the office due to dissatisfaction.

References:

1. Clinical measurement of the height of the interproximal contact area in maxillary anterior teeth Mohd G. Sghaireen, Bader K. Al-Zarea, Hisham M. Al-Shorman, and Mahmoud K. AL-Omiri https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3921062/#:~:text=The%20interproximal%20contact%20area%20(ICA,called%20spillway%20spaces%20or%20embrasures.
2. Proximal contacts in posterior teeth and factors influencing interproximal caries K. S. Gohil, M.D., S. T. Talim, M.D.S. and Iqbal Singh, M.D.S https://www.sciencedirect.com/science/article/abs/pii/0022391373901868
3. Why contacts are so important to success in dentistry by Dr. Lisa Knowles https://www.dentistryiq.com/dentistry/restorative-cosmetic-and-whitening/article/16367783/why-contacts-are-so-important-to-success-in-dentistry
4. Proposed classification for interproximal contacts of primary molars using CBCT: a pilot study M. Kirthiga, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6171554/#:~:text=A%20well%2Dcontoured%2C%20properly%20positioned,between%20permanent%20molars%202%E2%80%93%205.
5. Clinical considerations in restorative dentistry - A narrative review Shivakumar, Ashwini Tumkur; Kalgeri, Sowmya Halasabalu; Dhir, Sangeeta https://journals.lww.com/jicd/fulltext/2015/07020/clinical_considerations_in_restorative_dentistry__.9.aspx
6. Solving Bad Proximal Contact Problems in Posterior Composite Restorations-Simon McDonald BDS MSc DDPH https://rhondium.com/solving-bad-proximal-contact-problems-in-posterior-composite-restorations/#:~:text=It%20can%20be%20quite%20frustrating,making%20the%20dentist%20run%20late.
7. Strains in the marginal ridge during occlusal loading - Palamara JE, Palamara D, Messer HH. https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1834-7819.2002.tb00332.x
8. Expediting Class II Posterior Composite Placement – Richard Truskowsky, DDS, FAGD, FADM, FICD https://addent.com/wp-content/uploads/2017/04/article_14.pdf
9. PRIME CONTACTS — Predictable Reliable Interproximal Method to Obtain Proper Contacts – Daniel H. Ward DDS https://addent.com/wp-content/uploads/2017/04/trimax-article-DanWardInsideDent.pdf