

If I introduce dry brushing and disclosing tablets
will my orthodontic patients have cleaner
braces?

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ACTION RESEARCH QUESTION

It's hard to imagine that orthodontic treatment dates back to ancient times as far as 50,000 years ago. Historians have documented mummies found with a number of crude metal bands around their teeth, thought to have been used to move misaligned teeth. If that isn't mind blowing enough how about the evolving orthodontic treatment that has taken place over the last twenty to thirty years, ideally orthodontic treatment was designed to help fix a wide range of malocclusions ranging from overbites to overjets, anterior posterior discrepancies, tooth crowding and space correcting to help align newly erupting teeth. "Dentists often attempt to rest the positions of the teeth in the patient's mouth. The dentist do this by attaching braces to the patient's teeth and by gradually adjusting the forces applied by the braces to the teeth. These forces act against the teeth in the patient's mouth to move the teeth gradually toward the positions desired by the dentist". (10)

During my elementary school years my mother worked at a general dental practice as a front desk receptionist. During some of the summers my sister and I would spend some of her shorter days there when we weren't in camp. I can vividly recall over hearing her have conversations with patients about their horrifying experiences wearing head gear for ten to twelve hours throughout the day and at times having to sleep with it. These days, my generation included, would have cried immediately at just the mere thought of having to wear orthodontic head gear outside the house. Thankfully orthodontic treatment has evolved so much it's become a fad. I frequently now get questions from my younger patients, asking when they would be able to start braces, some more anxious than others mainly because some of their

peers have started phase one of two at an earlier age. Because of clear ceramic traditional braces and the convenience of removable invisalign trays, patients are more willing now than ever before to start active orthodontic treatment, but what happens when the novelty wears off? When the at home care becomes a thing of the past, patients are faced with the harsh reality of having to remove chunks of food debris and plaque from their teeth on their own. What once was a fad or even considered cool, quickly becomes an annoying task. Having to brush after every meal ideally, being restricted from eating certain foods, candies and gum not to mention having more than the average dental cleaning visits twice per year can cause some slight resentment, to say the least. Perhaps if patients with braces knew how to properly clean their braces they wouldn't have such a hard time keeping them clean. "Action research developed out of critical theory, and went beyond it. Critical theory asked 'How can this situation be understood in order to change it?" (2, pg.47) So I pose the question: If I introduce the dry brushing technique and disclosing tablets will my patients have cleaner braces?

BACKGROUND

There is a large population of my patients who are in active orthodontic treatment; many of them are in the beginning phase of orthodontic treatment which is referred to as Phase I. During this particular phase, patients typically wear fixed maxillary expanders, space maintainers, retainers, or partial braces. Fixed maxillary expanders are utilized to help expand the maxillary palate in preparation for full orthodontic treatment. A study reported that the maxillary arch perimeter could be increased by 3 to 4 millimeters by using rapid palatal expansion, or RPE, providing

space for incisor alignment to resolve crowding.(5) Expanders are popularly found in patients ages six to ten. This is so because patients' maxillary bone (the mid-palatal suture) is not fused and easier to manipulate during that tender age bracket. Another important fact is that expanders also help to avoid tooth extraction, which was very common twenty to thirty years ago, in an effort to make space for permanent teeth. The patient's parent is responsible for turning the expander daily with a small key and although it seems a little intimidating in the beginning, both the patient and the parent adjust rather quickly. Patients in Phase I orthodontic treatment may present with an oral retainer as well. I've seen retainers designed to help arrest finger habits, such as thumb and finger sucking, retainers to correct tongue thrust or to simply retain space for the eruption of permanent teeth. Space maintainers are also used during this phase, "space maintainers are typically used in pediatric dentistry to preserve the space left by primary teeth requiring extraction prior to exfoliation time, and maintenance of these spaces prevents later complications such as crowding, ectopic eruption, impaction of successor teeth and malocclusion".(8) Lastly, there are partial braces and in most cases if not all they are utilized to correct more isolated areas in the mouth and treatment time is significantly shorter compared to full maxillary and mandibular braces. One of the primary differences between the two orthodontic phases is simple, Phase I treats at a younger age when the patient's primary teeth are still present, normally in a mixed dentition stage. The goal during this phase is to achieve proper jaw relation prior to the eruption of permanent teeth. However, during Phase II orthodontic treatment patients are more likely to have their full permanent dentition and the jaw has been adjusted, making their orthodontic experience a bite more critical during this stage.

Unfortunately, patients and parents believe patient participation is complete after Phase I, primarily because the fixed expander has either been removed or the expanding process is complete. Or perhaps the habit breaker and or retainer have been removed. Sadly enough that isn't the case, patient participation is just as important during Phase I if not more important during Phase II. "Much care needs to be taken when instructing patients about their role in orthodontic treatment".(9) Good oral hygiene for patients in active orthodontic treatment is imperative to help maintain adequate oral health. "Before any active orthodontic treatment is considered it is essential that the oral hygiene is of a high standard".(9) I found that patients who are either in active orthodontic treatment or preparing for orthodontic treatment dread the idea of having braces simply because of esthetic reasons, yet the real issue is the idea of avoiding the most common dental issues associated with braces, such as moderate to severe plaque deposits, calculus build up, gingivitis and ultimately bone loss. "Orthodontic bands and brackets are reported to influence plaque growth and maturation orthodontic appliances are reported to promote plaque accumulation and cause gingivitis".(8) "Arch wires, headgears and brackets themselves may cause significant damage either during an active phase of treatment or during debonding".(9) Patients with braces are more prone and at a much higher risk for these diseases. "Thirty-seven percent of orthodontists reported that they had removed braces because of patient's poor oral hygiene."(6) This will best be achieved by "raising awareness, it is often most effective to focus on objective risks of the exposure instead of the patients unfavorable behavior".(7)

METHODOLOGY

I started my action research by first getting permission from my office manager and doctors, and to no surprise they were elated and completely on board. Once my consent forms were approved I began screening each of my colleague's scheduled columns for orthodontic patients, and because they were aware of my study they gladly handed over their patients. I began my study with introducing the Butler G-U-M Red-cote Dental Disclosing tablets. I most certainly thought this technique would be a hit and my pediatric patients would love this cool and unique way to identify and remove plaque and debris; and perhaps they just needed a little fun relatable motivation. In addition to the typical manual or electrical toothbrush and floss message, I added "dental plaque is not visible to the naked eye; its removal is difficult and complex. In order to neutralize this characteristic and help in oral hygiene, the use of disclosing agents has been recommended since the early twentieth century".(4) I could vividly recall disclosing agents being fun, motivational techniques when I was in dental hygiene school simply because of the dye or coloring agents which turned your teeth purple, red, blue and even green, with certain brands. "Disclosing agents are preparations in liquid tablet or lozenge, which contain dye or other coloring agents, which is used for the identification of bacterial plaque".(4) Needless to say I was overly excited to introduce them to some of my orthodontic patients. I first began by asking each patient to demonstrate their "Best Brushing". I then asked each patient, one by one, would they be interested in learning a fun technique to help brush and keep their braces cleaner. "Offering a menu of strategies is a way of talking about change without being too prescriptive" (7, page 105). The majority of them obliged without hesitation, a few probably still unaware of how

significant their roles were (as expected). I instructed my patients to stand over the sink and chew on a tablet for thirty seconds while swishing it around generously in their mouth and spit. The patients were then asked to look into the patient mirror and thoroughly remove the dark red color with their toothbrush. I encouraged them to remove all the stain which ultimately means the removal of plaque. "Give it your best brush" I shouted, coaching them while they removed the stains in the mirror.

Most of my patients did pretty well for the first time and seemed pretty excited about their results. Therefore I was confident for positive results in the weeks to come. I provided each of my patients with a two weeks supply of disclosing agents and a soft bristle toothbrush. I even wrote down local drug stores and website the patient's parent could go and purchase more in the event the patient wished to continue once the study was complete. I repeated these very same steps for the next five orthodontic patients totaling six patients in my disclosing agent group. Now it was time for me to introduce my dry brushing technique I definitely thought this was going to take a little more convincing from my end and a lot of motivation from my patients. I followed the very same introductory technique I used on my disclosing patients. I had them demonstrate their "Best Brush" and asked if they were interested in learning something new and helpful to help keep their braces clean. If the patient and parent agreed that contacting via telephone was the best form of contact to follow up with the patient's progress or lack thereof. For my first few patients I did not have the book "The Toothpaste Secret" written by Trisha O'Hehir, so I simply demonstrated and described how "you can't see the bacteria, but you can smell them when you wake up in the morning. Morning mouth!" "Toothpaste makes so many bubbles you can't see in the mirror, so you just

drool and daydream. Thirty seconds seems like three minutes. Toothpaste flavor numbs your tongue so your teeth feel clean when they really aren't.”(3) I recommended patients use a soft bristle toothbrush, first brushing the back molars top and bottom then placing the toothbrush bristles underneath and above the wires of the maxillary arch and mandibular arch. I encouraged the patients to pull their lower lip down for better access to the area in which they're trying clean. I also recommended patients rinse after dry brushing to help remove any loose debris. My first five patients seemed really impressed with their in-office results and some even promised to keep up with the technique. I reassured each of them I'll be following up in two weeks with a phone call.

RESULTS

Disclosing Tablet Group

| | Patient 1 | Patient 2 | Patient 3 | Patient 4 | Patient 5 | Patient 6 |
|---|-----------|------------------|------------------------|-----------|-----------|-------------------------|
| Follow up Method | Phone | Phone | Phone | Phone | Phone | Phone |
| F/U Q 1: Did you notice a difference between the Dis. Agent & TP? | NO | YES | NO | NO | NO | YES |
| F/U Q 2: What did you like most abt the Dis. Agent? | Nothing | I didn't like it | Hated it after one day | Nothing | Nothing | Won't use it ever again |

| | | | | | | |
|---|-----------|-------------------------------------|-----------------------|---------------|--------|---|
| F/U Q 3: What did you least like abt the Dis. Agent? | Too messy | The stain takes too long to go away | My tongue was stained | Too much work | Messy | I rather use tp so you won't see it if it's still in my mouth |
| Duration technique was used | 2 Days | 3 Days | 1 Day | 3 Days | 4 Days | 2 Days |
| Will you use Dis. Agents again? | No | No | No | No | No | No |

Dry Brushing Group

| | Patient 1 | Patient 2 | Patient 3 | Patient 4 | Patient 5 | |
|--|--|--------------------------------------|--|--------------------------------|----------------------------|--|
| Follow up Method | Phone | Phone | Phone | Phone | Phone | |
| F/U Q 1: Did you notice a difference between Dry brushing & TP? | YES | YES | YES | YES | YES | |
| F/U Q 2: What did you like most abt Dry brushing? | You can see exactly what your cleaning | My teeth feel very smooth afterwards | Saves time since I don't need toothpaste | I don't need toothpaste | Teeth smooth and I can see | |
| F/U Q 3: What did you least like abt Dry Brushing? | Nothing | I liked it | Nothing | Like it better than toothpaste | Nothing | |
| Duration technique was used | 14 Days | 11 Days | 13 Days | 13 Days | 12 Days | |

| | | | | | |
|----------------------------------|-----|-----|-----|-----|-----|
| Will you use Dry brushing again? | YES | YES | YES | YES | YES |
|----------------------------------|-----|-----|-----|-----|-----|

I must admit, I was surprisingly alarmed with my data. I was seemingly overly confident in the disclosing tablets and their level of success; turns out they were actually a nightmare for many of my patients. However, since I found dry brushing to be a success I decided to introduce it to an additional five patients. My patients were still motivated and that made me feel good. “An individual is motivated to practice behavior that leads to achievement of goals that are valued”.(11, pg. 365) I repeated the same exact instructions only this time I was fortunate enough to have Trisha O’Hehir “The Toothpaste Secret” book as a visual, which patients seemed to enjoy.`

Dry Brushing Group Two

| | Patient 1 | Patient 2 | Patient 3 | Patient 4 | Patient 5 |
|--|--------------|-----------------------------|-------------------------|-----------|-------------------------------|
| Follow up Method | Phone | Phone | Phone | Phone | Phone |
| F/U Q 1: Did you notice a difference between Dry brushing& TP? | YES | YES | YES | YES | Kind of |
| F/U Q 2: What did you like most abt Dry brushing? | Smooth teeth | I can see what I’m brushing | I don’t need toothpaste | I can see | Nothing |
| F/U Q 3: What did you least like abt Dry Brushing? | Nothing | Nothing | I liked it | Nothing | I just really need toothpaste |
| Duration | | | | | |

| | | | | | |
|----------------------------------|---------|---------|---------|---------|-------|
| technique was used | 12 Days | 11 Days | 13 Days | 14 Days | 1 Day |
| Will you use Dry brushing again? | Yes | Yes | Yes | Yes | No |

Business Aspect

It's become very obvious the dental hygienist can be a significant key component in facilitating and encouraging patients to reduce many of the primary factors that lead to oral diseases. Dependent upon the continued success with dry brushing, patients who continue with the technique may surprisingly find themselves visiting the dental hygienist less frequently for prophylaxis, since it's both common and recommended that patients receive prophylaxis every three to four months, opposed to the regular six month recall. Ultimately this will minimize parents' out of pocket expenses for patient care, especially since our office is fee for service. I also believe my patients will become more enthusiastic about their dental appointments for they will have a sense of pride and accomplishment for their improvement in oral health. Possibly increasing patient recalls because then the patient becomes a reminder to the parent. Another benefit for both the patient and provider would be shorter appointment times. A lot of our orthodontic patients appoints can last anywhere between 45 minutes to an hour. This is both hard on the patient and provider. Better oral hygiene would definitely shorten the time the patient spends in the chair which would ultimately be less physically demanding on the dental hygienist. Lastly, the orthodontist may want to consider hiring a "dry brushing coach". That person would be responsible for working closely with their orthodontic patients who struggle with poor hygiene. Having a personal coach would also benefit the patient as well; cleaner oral hygiene will help avoid prolonged

orthodontic treatment and help avoid the dentist having to remove braces which becomes the last option because patients aren't able to take control of their poor oral hygiene. Not to mention the sales Trisha O'Hehir'd book "The Toothpaste Secret" and how much revenue she could potentially make partnering with orthodontic offices in her community and ultimately worldwide.

CONCLUSION

I am completely thrilled with my dry brushing technique results and plan to continue to teach and demonstrate dry brushing to all my patients, not just my orthodontic patients. Although I'm sure every patient will not comply, I'm confident a lot of my patients will like it and notice a significant increase in their oral health. In my professional and personal opinion great hygiene habits should be instilled at a very young age, and typically those patients will grow into confident, complying adults who will most likely exhibit little to no dental fear or anxiety. As a dental hygienist, I've learned just how important it is to step outside my comfort zone and every day routine of cleaning teeth and become the coach that my patients so desperately need, unknowingly. "Inamdar and Roldan (2013) tell us that the ability to face, frame and build solutions to ambiguous, highly uncertain situations is [essential] in rapidly evolving and globalizing business settings."(1, pg.15)

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