


NOTES from the Invisalign Summit

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Since the Invisalign system is a proprietary system sold only by AlignTech, Inc., we will start this report with a disclaimer: We have no financial or consultant connection with AlignTech, nor do we own any of the company's stock. The reason for our interest is simply to learn more about a system of moving teeth. This meeting was twice the size of last year's and the ideas presented have become more sophisticated. Cases shown are more complex, and the finished results are better.

Will this company survive? The new CEO, Tom Prescott, has already initiated major restructuring, and seems to have the strong support of all employees with whom we spoke. He predicts profitability in 2003. It was supposed to happen in 2002, and we suspect that is one reason he has been hired. According to Mr. Prescott, their current goal is to better serve orthodontist clients.

He noted that 20% of new cases are sent to general dentists — significantly fewer than the number of general dentists trained. What Invisalign study club orthodontists and AlignTech are reporting is that most general dentists who attend the training seminar do not start patients. However, they are better informed about the appliance, and typically, become referral sources. Below are short summaries of several of the presentations:

DR. RANDOL WOMAK ON INTERPROXIMAL REDUCTION (IPR)

Dr. Womak noted that the scan discrepancy from impression to computer is +/- 0.10 mm. That is pretty accurate. However, if the IPR doesn't closely follow the Clincheck, the teeth may not move well with the aligners. He prefers to do the IPR after the aligners are delivered, adhering precisely to the IPR form. He uses the thickness gauges available from AlignTech to measure the amount of IPR performed.

He discussed diagnostic criteria for removing interproximal enamel in both the anterior and the posterior sections of the dental arches. The goal is to produce parallel surfaces at the contact point, with the enamel properly smoothed and finished. He records each reduction and the amount on the IPR form provided with the aligners. Two serious errors to avoid are tapering the interproximal surfaces toward the incisal, and producing an enamel ledge near the cervical of the crown.

DR. KEN FISCHER ON IMPROVING THE CLINCHECK

Dr. Fischer offered the following suggestions for improved results when working with Clincheck:

- **SUPERIMPOSITIONS:** AlignTech offers a new service that can help you to assess progress. When you submit a new PVS impression at any time during or at the end of treatment, technicians will provide a superimposed image that you can apply to any stage of the Clincheck. This lets you accurately assess whether the teeth moved according to the aligners and which movements will need some over correction or other special efforts.
- **ATTACHMENTS:** Use attachments when you intrude anterior teeth, move roots into an extraction space, rotate cylindrical teeth or move teeth with short clinical crowns. Different types of attachments (short or long rectangular, oval or horizontal) are available. Properly placed, attachments will parallel roots in an extraction case, or diverge roots in an implant case. Attachments can be placed or removed at any stage of the Clincheck.
- You can email the Clincheck to your patient using 'SnagIt' software, available from www.Techsmith.com.

DR. JUAN CARLOS QUINTERO ON
**TREATING COMPLEX AND PREPROSTHETIC
 CASES WITH ALIGNERS**

Dr. Quintero's presentation offered an excellent overview for using Invisalign in multidisciplinary treatments. Although missing teeth and the presence of restorations often complicate such treatment, Invisalign is effective in the following situations:

- Planning and positioning precise positioning of the teeth is facilitated.
- Treatment planning with Clincheck improves communication between the orthodontist and prosthetic dentist; proposed goals are clarified and better assessment of planned tooth movements is possible before aligners are made.
- Virtual teeth (pontics) can be incorporated into the aligners to increase patient acceptance and provide the precise space for the prosthetic tooth.

Dr. Quintero showed a case where extraction spaces were reopened to allow for implant placement. Another case involved orthognathic treatment, where time in fixed appliances was decreased to four months from the typical 24+ months. This is a notable benefit for tissue health, as well as patient acceptance.

Dr. Quintero stressed that aligners do not treat patients, orthodontists do, and Invisalign is simply one tool that they can use. For skeptics about Invisalign's benefits, his presentation gave them much to think about.

DR. ROSS MILLER ON
GENERAL TREATMENT TIPS

This helpful list can provide quick reminders as we practice our specialty.

- A favorable protocol is loose contacts in the beginning of treatment, tight contacts at the end. Design the Clincheck steps to ensure adequate space during the alignment phase. You can request AlignTech to tighten contacts at the end of the series.
- Plan extrusive movements for the end of the series — extrusion may need auxiliaries, and it is nice to have first resolved all the other problems.
- Upper laterals are the most troublesome to fully correct. If they are not tracking, extend intervals and consider attachments.

- Allow settling at the end of treatment by switching to a Hawley or by cutting away the posterior segment of the aligners.
- Use AlignTech's new superimpositon service to compare before and after Clinchecks and improve your Clincheck skills.
- Ask AlignTech to overcorrect space closure as well as the basic over-corrections.
- Manage your success by managing both your expectations and those of the patient. Understand the limitations — educate your patient.
- The doctor – not AlignTech — sets the standard of care.

DR. TIM WHEELER, CHAIR, U. OF FLORIDA, ON
**INVISALIGN RESEARCH
 AT THE UNIVERSITY**

Research at the University of Florida inspired the following comments and observations:

- Because tipping in extraction cases is common, especially of upper first molar and second bicuspid, it is advisable to first move the roots into space, then move the crowns. Do not try to move both at once.
- Contacts must be loose to provide movement.
- Short clinical crowns may not track as well. Consider attachments.
- Invisalign is studying different types of movements using strain gauges in aligners. They expect to find that some types of movements involve greater forces and require longer time to work.
- In periodontally affected cases, they have found that the health of periodontal tissue improves in most cases during aligner treatment.

DR. ROBERT BOYD, CHAIR,
 U. OF PACIFIC ORTHODONTICS DEPT., ON
**INVISALIGN FOR PERIODONTALLY
 INVOLVED PATIENTS**

Dr. Boyd noted that Invisalign offers some advantages for periodontal patients: There is less round-trip movement of teeth; the orthodontic treatment can be paused for periodontal treatments; and the tissue is not challenged by sub-gingival bands or brackets, which trap plaque next to the gingival margin. He offered a few treatment tips:

- Colgate Sensitive is an effective adjunct for hot/cold sensitivity
- When bone levels are low, IPR helps by moving the teeth closer together
- Labial recession can be aggravated by orthodontics. Design the Clincheck movements to avoid labial movements in high risk areas.

DR. RAY McCLENDON ON
FINISHING

Dr. McClendon said a common mistake is giving up on the Aligner series as soon as a tooth isn't tracking well. He recommended sticking with the aligners and using secondary mechanics to bring the errant tooth back into the aligner — usually toward the end of the series. He offered the following specific finishing tips:

- **UNDER ROTATION:** Apply additional specific force by using the new crimping plier to place a dimple in the aligner material, adding composite buttons or ramps to the teeth, or ordering an aligner with the next heavier thickness.
- **TRACKING:** When teeth don't follow the aligner, the problem teeth, in order, are upper laterals, upper cuspids and upper centrals. To correct, first remove any attachment. If this is ineffective, cut a window in the aligner and bond a hook or button at the gingival margin of the tooth and on the lingual of the aligner. Use a sling elastic to extrude the tooth into the aligner.
- **ROOT PARALLELISM:** For retracting affected teeth, bond buttons at the gingival margin and use an AlastiK chain to pull roots together (cut a window in aligners). For retracting cuspids, bond long arm on the cuspid, use AC chain to a button on the molar (cut windows in aligners).
- **ANTERIOR OPEN BITE:** In the Clincheck, order horizontal attachments on the facial. The versatile Clincheck allows one to add or subtract attachments during any stage of the treatment.
- **INTRUSION:** To intrude a single tooth, add a thin layer of composite to the inside of the aligner at the incisal edge of the tooth.
- **OVER CORRECTION:** The procedure is recommended during the refinement series. If you plan all over-corrections at the start, you never know which ones will be needed. Suggested practice is to run through the correction series, then routinely finish with a refinement series.

- **TORQUE:** Use the crimping plier to add pressure at the labio-gingival, or add a composite button to the gingival of the tooth.

DR. ANDY TROSIEN ON
INVISALIGN FOR TEENS

Invisalign may provide special benefits for a teens speciality as suggested by the following remarks:

- Use an Essix retainer to hold the dentition steady while you wait for the aligners to arrive from AlignTech. Teens' dentition is rapidly erupting and can change more than you expect during the interval between when PVS impressions were made and aligners delivered, resulting in ill-fitting aligners.
- Start treatment after full eruption of the permanent dentition, including 12-year molars. The gingival margins of most teeth in the buccal segments should be retracted beyond the height of contour to allow good retention of the aligners and a good grip on the individual teeth. You can also request a Clincheck to lower the gingival margin on specified teeth by 1mm. It will increase retention. You can relieve any tissue impingement in the first few aligners.
- Before you start, make sure the patient and the parents understand patient responsibilities and treatment limitations. Poor cooperation may result in full braces to finish the case. Teens may not record the number of hours they use the appliances. Be sure to warn parents about the extra cost of a reboot.
- Compliance with teens drops off, on average, at nine months. For longer treatment plans, discuss burnout with the family. Consider some auxiliary treatment before starting the aligner series, so you can limit aligner treatment time to 12 months.
- Establish a defined end-point of the treatment. With Invisalign treatment, the end of treatment could be vague. Unlike the fixed appliance — patients who could care less if the midline is off 0.5 mm and just want to get them off — Invisalign patients often get very picky about details at the end of treatment. And, Invisalign takes away the thrill of removing fixed appliances. Make an effort to clarify the finish. Some tactics include using a positioner, going to an upper Hawley and lower cemented retainer, taking final records and sending a completion-of-treatment letter that warns of the need for retention.
- Invisalign treatment for teens with very poor hygiene is preferable; There is no risk of decalcification and no increased risk of periodontal damage.

- Both the parents and patient must be motivated to proceed with Invisalign treatment. Poor agreement at the start often ends up in family squabbles that ultimately end up on your desk.
- From the start, explain the difference between limited and comprehensive treatment. Some parents believe that, while Invisalign might work, braces are better. Thus, they may criticize the orthodontist if minor details are not perfectly corrected.
- Address the chief complaint early in the treatment. When reviewing the Clincheck, take the CC into account. Close that midline diastema in the first few stages.

DR. ERIC KUO ON REFINEMENT SERIES, PRINCIPLES AND PRACTICE

- Establish expectations with the patient from the start. Describe the refinement series of aligners and explain that additional aligners are routine. If new PVS is needed, treat the situation as similar to rebonding loose brackets.
- Keys to success of the original series include sufficient space for each tooth to move, adequate wear time, good aligner adaptation and well-thought-out anchorage.
- Sequence movements. Many clinicians look at the before and after images but neglect the sequencing. Proper sequencing and potentially challenging movements are as follows:
 - Extrusion – save it for the end. Then you can use secondary forces to finish, and proceed to retention, without worrying that the tooth will relapse during the finishing.
 - Rotation: Create space before you rotate. Dr. Kuo suggests a push coil movement to first move the adjacent teeth away from the rotated tooth, providing extra room (even if the adjacent teeth need to move facially). Once the tooth is in place, close the excess space, and reduce the proclination of adjacent teeth.
 - Translation: First move the roots toward the extraction site. Don't move crowns and roots at the same time.

- In the anterior, if an incisor loses tracking and slips gingivally, the patient will object to the appearance of the plastic edge that shows. Trim this excess edge from the aligner using the EZ-Trim brush and bur. Once the esthetic problem is solved, you can continue the series while you solve the tracking problem with secondary mechanics.
- Dr. Kuo suggested that the posterior open bite one sees occasionally may not be due to the aligner material over the posterior teeth, but a result of incisor interference. Check the bite with marking tape both with and without the aligners in the mouth. You may find that you have incisor interference that requires a plan to alleviate it. The possible causes are insufficient incisor intrusion (poor cooperation?), insufficient torque (crimping plier on the gingival margin), tooth size discrepancy (insufficient IPR?) or loss of lower anchorage in a bicuspid extraction case. Some of these problems are a result of inadequate planning in Clincheck. Once you diagnose the problem, you may need to take new PVS impressions.
- Use the crimping pliers sold by AlignTech to introduce pressure points in the existing Aligner series and also to increase retention by placing dimples in the interproximal undercuts.

LEE ANN PENICHE, PENICHE AND ASSOCIATES, ON BUSINESS MANAGEMENT

Ms. Peniche provided the following reminders of good management practices to help us keep our businesses healthy:

- Staff members should be trained in handling questions about Invisalign so they feel comfortable recommending the technique to parents and acquaintances.
- Reviewing a credit report can help you tailor a reliable payment plan. She recommends third party financing, and provides a referral to the web site, www.patientfinance.com
- The fee can be more accurately set by accounting for the following separate parts of Invisalign treatment: aligner fee, monthly payment times months of contract, records, treatment planning, IPR and retention.

