Seminar 12 Expectations (McGann answers)

Diagnosis

1. **Explain how** you can change skeletal resistance by the diagnosis of incisor bracket torque.
   *The Retraction limit is different for SLi, Li, R, and La. The Advancing limit is also different for each bracket choice. These limits Determine the amount of tipping allowed, and how much bodily movement there will be to get to the intended final tooth position (if any). The amount of bodily movement determines the amount of encroachment of the cortex.*
   *Therefore changing the bracket will change the skeletal resistance (if any).*
   *Note: there is nothing special about the ‘names’ of the bracket torques...these were made up by McGann as they were being invented, taking into consideration the computer capabilities for identifying bracket types. Each simply is a bracket with the slot cut at a different angle.*

2. **Explain how it is possible** to have bone remodeling with any bracket torque, not just SLa (advancing) or SLi (retracting).
   *The codes are only names of bracket slots cut at different angles. Only names to how much tipping is allowed before bodily movement is demanded. Tipping results in limited bone remodeling, only in severe tipping cases. Intrusion with Skeletal anchorage or other methods can also result in bone remodeling as the advancing limit stops the tipping. Bodily movement always demands bone remodeling OR tooth movement is stopped.*
   *Note: some of these brackets were designed to “stop” tooth movement, for example La and SLa in the lower arch. But this did not always happen, leading to the discovery of bone remodeling at different forces.*

3. **Discuss how orthodontic extrusion** of [hopeless] teeth can result in ridge augmentation in preparation for implants. What forces should be used for this extrusion?
   *AS teeth are “slowly” (not defined, but something slower than extraction) extruded, the bone and soft tissue comes with the tooth, leveling the bone and widening the ridge. Light forces are needed, and if tipping needs to be controlled, then rectangular archwires should be used. (18x25N)*

4. How does the crown to root ratio change with orthodontic extrusion and how does that effect the long term prognosis of the tooth, if it is retained (not extracted for an implant)?
   *The crown to root ratio ‘improves’, theoretically improving the long term prognosis.*
5. **How far can you expand** the upper teeth and bone in an adult patient with a TPA and archwires? At what age and how much Maxillary constriction should be present before sending to a surgeon for SARPE, surgical assisted rapid palatal expansion?

   In this seminar, case 1037, age 28 at start, was presented. The combination of TPA and expanded archwires resulted in 5mm of upper arch expansion. In my opinion, any patient with a significant amount of posterior crossbite over the age of 20 should be considered for surgical assisted rapid palatal expansion (SARPE). What is a ‘significant’ amount? How about the need for 5mm or more of upper arch expansion as a rule of thumb. But if the case is an open bite case (dental and skeletal) or a TMD case with posterior crossbite related to the symptoms, then maybe 3mm should be done by the surgeon. Surgical expansion in adults should be considered more stabile, and in cases where the bite will open with relapse of the dental expansion, surgery should be more strongly considered.

6. **What problems** do you need to watch out for if the patient becomes pregnant during active tx?

   Gingival inflammation, and bone loss are the main issues. Since you cannot document bone loss or root resorption without taking x-rays, document refusals to take progress x-rays with a statement that the patient is responsible.

   Do not deband until you can get final x-rays and she can tolerate the retainer. That means AFTER term, since I have had patients get ‘sick’ on the retainer and were unable to wear it during
their pregnancy. You have that happen to you one time and you will not want it again. And, you will get some respect for how important the retainer is for the first 6 months.

7. **Explain the process** of correcting a transposition and what the problems can be. What are the general steps of treatment? Explain what the usual treatment approaches are if you leave the transposition.

   **The problems of correcting a transposition are,**
   
   a) **Extended tx time,**
   b) **Possible perio defect between the teeth is not evident,**
   c) **attached gingiva problems with risk of recession,**
   d) **torque of single teeth.**

   It is generally better to leave the transposition, placing the teeth where they will easiest be moved, and then place a crown. If this is not possible, then consider extraction of one of the transposed teeth for a non-standard treatment plan.

   The general process of correcting the transposition is to first move one of the teeth into the palate (force to a palatal bar) and then try to cross this tooth with the other on the archwire.

   ![Image of teeth and orthodontic appliance](image)

**Perio:**

8. **If the patient has** periodontal pockets documented at the start of an ortho case, what is the protocol for management during ortho treatment?
2-4mo “perio” scaling as needed to control inflammation, and frequent periapical and bitewing x-rays (2-4 months instead of the usual 3 months) to monitor bone levels.

** before starting the case, you should determine at the phase I reevaluation if the benefits of orthodontic treatment outweigh the risks of bone loss and root resorption from orthodontics. Refer to a periodontist if you do not feel competent to make this determination.

**Do not start ortho until gingival inflammation is under control, then 2-4mo “perio” scaling as needed to control inflammation during treatment

9. **What happens** if you INTRUDE a tooth into a boney perio defect...will the defect go away? What happens to the defect if you EXTRUDE the tooth?
   Intrusion of a tooth into a perio boney defect will NOT regain attachment. If you extrude a tooth from the defect, the bone will move with the tooth and level the boney defect.

10. **What happens** to the gingival tissue when you extrude a tooth “slowly”. Is this any different than what might happen if you extrude the tooth ‘rapidly’?
    The gingival tissue follows the tooth, leveling the tissue, reducing any pockets. Rapid extrusion is not well defined, but theoretically, a tooth extruded ‘rapidly’, which to me would mean with heavy force, the bone and tissue may not follow.

11. **As teeth move apart** (away from each other), what happens with the gingival tissue (and papilla) that was between the two teeth?
    The gingival tissue “levels” as does the bone, reducing pocketing and perio defects. The pocket is actually “everted”, the inside tissue of the pocket is now exposed.

12. **What happens** when a tooth is INTO a vertical perio defect?
    There is not an increase in the height of the attachment level, and there is an increased risk of a periodontal defect.

13. **What happens** when a tooth is moved distal into an area of ‘lesser’ bone height? (eg. bicuspid distalization).
    The bone level of the tooth generally maintains at the original height, but there will be some loss of bone due to the pressure from the gingival tissue and resistance of the cortical bone.

14. **When should perio surgery** be done, before or after ortho?
    Mucogingival surgery (eg. Gingival grafts) should be done BEFORE ortho to minimize the risk of attachment loss. Comprehensive ostectomy and osteoplasty (not sure they do this anymore) and bone grafting (anyone doing that now?) should be delayed until after ortho. Bone and gingival tissue leveling can reduce the need for surgery, improving the prognosis of the teeth.

15. **Should you do anything** different when treating a diabetic patient?
Be certain that the patient is getting regular prophylaxis during orthodontic treatment, starting at 3x per year to see how that controls inflammation. Take regular bitewing and periapical screening x-rays to check bone levels. Keep the treatment short, with light forces where possible.

The problem is NOT the known diabetic patients that are controlled with insulin or diet, it is the ones that do NOT KNOW they are diabetic that are the problems. I had this experience before, and recommended he get checked and sure enough he was diabetic.

16. **If you notice** generalized bone loss during active orthodontic treatment, but the gingival tissue is free of inflammation, what should you do?

   Generalized bone loss is an indication of a systemic problem. The patient should be referred to his/her physician for a physical exam to check for diabetes, pregnancy, or other systemic diseases.

17. **If you see radiolucency** around all the roots of the teeth with brackets on a progress x-ray, what should you do?

   Radiolucency can be a normal part of orthodontic tooth movement as the immature bone (osteoid) is radiolucent on an x-ray. It takes about 3 months to change to mature bone. Notice on some x-rays you will see a more radio-opaque band on the “trailing” or tension side of a tooth that is moving...this is the new bone.

   To see a radiolucency around all the roots would be unusual. The teeth may be excessively mobile (2+ mobility). In such a case, reduce the force, check for prematurities, possibly give the patient a night guard to prevent bruxing. Monitor the bone conditions and tooth mobilities with x-rays as you feel they should be taken...maybe every 2 months? Maybe every month? If the condition does not improve, then consider removing the archwires (place elastomerics on the brackets to reduce irritation). If the condition does not improve, you may be obligated to remove the brackets much earlier than you expected at the start of treatment.

18. **If you notice generalized** tooth mobility during active orthodontic treatment, what should you do?

   Check for bruxism, and adjust any obvious prematurities (or reposition bracket). Consider giving the patient a soft night guard over the brackets to control the bruxism. Stabilize the teeth with a stiffer archwire (18x25N or 19x25ss) as these will act as a ‘splint”. Take x-rays as needed to evaluate bone levels.

   Monitor the mobility with documentation at each visit, taking x-rays to evaluate the bone as you think as needed.

   If severe mobility (2+ with 1-1+ being normal with orthodontic movement) continues, then consider reducing the treatment objectives, debanding earlier. The mobility should return to normal within 6 months of debanding. Be sure to give a retainer (clear overlay can be considered a splint) to help stabilize the teeth.

19. **If you notice gingival recession** during active orthodontic treatment, what should you do?
Take photo documentation and compare with the start photos. Assess for lack of attached gingiva and/OR tight muscles. Take a progress ceph and do overlays to determine if there has been advancement (or retraction) into the area of recession. Look at the other teeth and assess if the patient has “fragile” tissue.

Look for traumatic occlusion on the tooth with recession, relieving this by bracket repositioning, equilibration, or removing the bracket all together.

If there is a lack of attached gingival or fragile tissue, then do a gingival graft (or refer to a periodontist for evaluation and grafting) immediately, not waiting for further loss of attachment. Possibly change the diagnosis if the stress is too much on the gingival tissue and bone with resisting muscles (usually to extraction).

20. **If you notice a periodontal abscess** (pus) during active orthodontic treatment, what should you do?

   If there is a band, remove the band and change to a bonded bracket. Scale the area thoroughly, document with photo and x-ray, irrigate with water. I see no need to give antibiotics, but some would consider this. Reschedule the patient for 1 week to check again, and then shorten the time interval (monthly) between appointments to monitor the condition.

   Inform the patient of the infection and possibility that they will need surgery, usually done after the brackets are removed, but I have done surgery during active orthodontic treatment to get control of an abscess (on a cuspid with a big pocket!!). So it does happen.

21. **What is the protocol** when you find root resorption on progress x-rays during orthodontic treatment?

   Compare the start and progress x-rays and be certain that the x-ray was taken at the correct angle, not shortening the root due to changes in inclination (maybe take another x-ray yourself). Next assess if there is any long term danger from the loss of root or if the blunting is not (yet) significant. Inform the patient (and write it down that you did) of the root shortening and what your decision is for the future, if there are any changes or not. Good words to use are “your teeth may not tolerate as much orthodontics as we have originally planned, so we may have to shorten the treatment and modify the goals of our treatment”. Increase the monitoring of these teeth with x-rays every 2-4 months instead of 6 months.

   Next consider removing the brackets from the affected teeth, shortening the time of treatment on those teeth as you correct the cuspid class II, later to rebond the brackets for a quick finishing.

   If significant enough (2/3 root loss), then you will be obligated to remove the brackets. Let it be known that in a study of 20 such cases, not one tooth was lost after more than 20 years. So the prognosis of these teeth is not necessarily less.

   Note; the real problem is not finding the root resorption during treatment, it is when the root resorption is NOT found and continues without any thinking and monitoring. For this reason, I suggest that you take x-rays for this purpose on any cases from your orthodontist, as the standard is NOT to look for these known problems of root resorption and bone loss.
22. **What is** the first step that needs to be taken to start the orthodontic treatment on a patient with periodontal breakdown? 2nd step?

   The first step is a thorough periodontal scaling and assessment of the response of the tissue to this. Also check for traumatic occlusion and other local factors that could be contributing to the breakdown of the attachment.

   Document thoroughly the,
   
   a) Starting attachment condition, including recession, bone levels (Full mouth x-ray or 3D scan), pocket charting
   b) Chart tooth mobilities
   c) The history and current Health of the patient, looking for systemic causes.

   The second step is the periodontal reevaluation, where the tissue response to the phase I periodontal treatment (just listed) is assessed and the patient is given clearance for orthodontic treatment.

23. **If you do** the perio reevaluation (instead of a periodontist), determining if the case is ready for ortho, what are you expected to do?

   You are assuming the position and responsibility of the periodontist in making this decision if the patient is a good candidate for orthodontic treatment. If anything goes wrong, then fingers will be pointed at you. If a periodontist is part of the team, there is a “sharing of responsibility”.

   If you are the one providing the reevaluation, then you need to,
   
   a) List the prognosis of the individual teeth (good, guarded, hopeless)
   b) Make a statement about the tissue response to phase I treatment and if the gingival inflammation is under control (or not). You cannot start ortho until the active periodontal disease is arrested.
   c) Make a new charting of attachment loss including recession, pocketing, mobilities.
   d) Assess the risks of orthodontics, including the possibility of root resorption, bone loss, and tooth loss.
   e) Make a preliminary post orthodontic plan, possibly extruding hopeless teeth with the orthodontics in preparation for implant replacement.

24. **How can the treatment objectives** for a case be different in a patient with bone loss than with other patients?

   The goals are usually modified for a shorter treatment time. For instance, class I and correction of anterior overjet may NOT be in the best interests of the long term dental health if this is going to take 3 years of treatment. But keep in mind that a patient is not happy with their teeth and appearance of their teeth, they will generally not take good care of them.

   Treatment objectives can read like this: Level the gingival tissue and bone, improve root proximity for improved hygiene access, extrude individual teeth for ridge augmentation and pocket reduction.
25. **When is a perio case NOT suitable for orthodontic treatment.**

When the gingival inflammation is NOT controlled by phase I scaling and occlusal adjustment, and/or a systemic problem has been identified (ie. Diabetes) and is not yet controlled. If the risks outweigh the benefits, then it is better not to start orthodontic treatment.

26. **Do you do anything different mechanically on perio patients?**

Do NOT use bands, ONLY bonded brackets. The forces are kept light, but 18x25N and 19x25ss wires to control inclination are OK to use. Definitely start with 012N and leave this in place for longer before changing to 18x25N (full alignment on light round wire).

27. **How much bone loss can you have and still safely move the teeth?**

I have worked on patients with 80-90% bone loss and did not lose the teeth. The only teeth I lost (only 1 or 2 in my career) were due to a temporary crown with overhanging margins and traumatic occlusion (made too ‘high’). Use common sense and pay attention to detail and you will be surprised. Some cases get MORE bone from the orthodontic treatment. This has been reported and the feeling is that there may be ‘latent osteoid’ that is radioleucent, in a periodontal pocket.

28. **What should you do if a patient has generalized gingival hypertrophy during active orthodontic treatment?**

Scale and irrigate, being certain there is no excess bonding adhesive around the brackets. Inform the patient that the hygiene care needs to be improved or you will have to stop treatment. “brush your teeth, not the brackets”, get an at-home irrigating device or toothbrush. Tell them to keep brushing ‘lightly’, even if there is pain or bleeding. Many stop brushing at the first sight of bleeding. More brushing is less bleeding and less pain.

Take a photo.

**TMD:**

29. **What is the purpose of a Splint, when given to a TMD patient?**

To determine if the reported symptoms are related to their teeth and bite (or not). Many symptoms such as headache have other causes than the teeth or malocclusion, and the expectations of which symptoms might be improved by ‘fixing their teeth’ need to be set.

30. **What is the problem if the patient does not wear the splint?**

They are not bad enough. Otherwise, they would wear the splint. Do NOT give splints to people with minor problems like ‘clicks’. I would suggest defining a TMD patient as one whose life is being adversely affected by the symptoms. They cannot work, they cannot eat, etc. are the patients you want to work for. Clicks do not adversely affect someone’s life.
Simply tell the patient to return if the symptoms become worse and they are ready to wear the splint. The splint is for diagnosis, NOT TREATMENT. Many are confused by this.

31. **If the reported TMD symptoms** change with wear of a splint, for better or for worse, what does this mean?
   The reported symptoms are related to the teeth and bite in some way, yet to be determined.
   Note: it does NOT mean that the teeth need to be built up to the vertical of the splint with restorative!!

32. **If the splint resolves NONE** of the reported symptoms, what does this mean?
   That the reported symptoms are not related to the teeth and bite.
   Do NOT start any treatment of the malocclusion with ortho or restorative with the patient expecting this will improve the symptoms. You are setting expectations.
   The other possibility is that the damage (to the TM joint) is extensive and irreversible, so the symptoms may be related to the teeth and bite, but they are irreversible and the patient may need TM joint surgery to resolve the problems.

33. **If the splint resolves SOME BUT NOT ALL** of the reported symptoms, what does this mean?
   That part of the symptoms may be related to the bite and teeth, but there may be other causes. In addition, the damage may be too much and some of the symptoms may be partly irreversible.
   You then must assess if the proposed treatment (orthodontics, restorative, orthognathic surgery, TM joint surgery) is worth the [partial] improvement or not. Many times it is the patient that must make that decision since they are the only one that really knows how life is with the symptoms and how life is with partial improvement.

34. **If a splint** (or TENS pulsing of the muscles) gives relief from the reported symptoms, does this mean that the occlusion needs to be built up to that vertical dimension with crowns or orthodontic extrusion?
   Absolutely NOT, in my opinion. It only means that the reported symptoms are reversible if the bite is improved, and there is less force applied to the system (biting on plastic with less muscle force since the bite is opened).

35. **When should you** give an “ortho” patient reporting TMD symptoms a splint and when is it not needed to start the ortho?
When the patient is NOT expecting the TMD symptoms to go away from the orthodontics, you are welcome to start the ortho case without first going through the splint phase. If the patient IS EXPECTING ortho to do this, then you need the splint to set expectations (never better than what the splint gives you).

36. **What are the 5 orthodontic problems that can be seen in 95% of all TMD patients?**
When these are corrected, do the symptoms go away?
1. Posterior crossbite
2. Asymmetry right vs. left
3. Loss of teeth with drifting [and loss of vertical dimension from tipping]
4. Deep bites with upright incisors (locking the mandible back, without freedom of movement).
5. Lots of restorative work. Was possibly placed for missing teeth, plus the added trauma and stretch from making preparations, taking impressions, opening the mouth wide, and losing vertical dimension from the temporaries and new crowns can do it.

When these items are corrected (ortho does the first 4), the joint related symptoms will routinely disappear to an acceptable level. If they remain, then TM joint surgery is then considered, but now the bite is stabilized so there is a good chance of healing after the surgery.

37. **When should TM joint surgery** (arthroscopy or condylar shave or ??) be done? Before or after ortho? Why?

    Many times TM joint surgery is done without first doing orthodontic treatment to stabilize or improve the bite. This is like doing knee surgery when the shoe is worn to the side. The knee surgery will not heal right. Try to first correct the problem (bad shoe) and then do the surgery.

    But in the emotions of a TMD patient, that is having a difficult time getting through life, the tendency to want surgery NOW to get rid of the chronic pain and symptoms is a tremendous force to overcome. Surgery is the quick solution.

38. **If the patient** still has some of the same TMD problems when you finish ortho as when you started, what is the NEXT STEP?

    Send the patient to a surgeon who is interested in TMD treatment for evaluation. The patient will likely also need an MRI (magnetic resonance imaging). Surgery can range from arthroscopy (simply lubricate and irrigate the joint) to condylar shaves, to disc repairs or replacements.
39. **What should you do** if a patient complains of TM joint pain during active orthodontic treatment, but was asymptomatic at the start of treatment?

   Look again at the initial records and see if there was a pre-existing problem, even if it was slight and insignificant at the start. The ortho, in changing the bite every day, could have aggravated the problem.

   Do NOT brush them off, saying it will go away. Instead tell them that you did not realize that they had this problem (or that it was this severe), and therefore you did NOT recommend the extra diagnosis (and cost of that diagnosis) before starting orthodontics. So now that they brought it up, then you are now obligated to STOP the orthodontics and do the additional (splint) diagnosis (now longer until they are finished, and more money). Make the splint over the top of the brackets.

   Document the reported symptoms and monitor any changes with the splint, ask for a CBCT scan (bone problems can be seen on this) or Magnetic Resonancy so you can see the disc move, ruling out an anterior displaced disc.

### Corticotomy:

40. **If the upper incisors do not retract**, then describe how you can get them going.

   a. Determine if the wire is not sliding through the tubes due to a damaged second molar tube or archwire bend

   b. Evaluate the forces applied, and adjust to a different force (usually LESS force is better)

   c. Take new records to reevaluate (lateral cephalometric to make overlays and check RBT), panoramic, photos, etc.

   d. Do an **Upper lingual corticotomy** if you determine the problem is due to skeletal resistance.

41. **If there is known** ‘moderate’ skeletal resistance, explain how you can speed the treatment.

   Even though we can retract incisors with bone remodeling into moderate skeletal resistance (determined by RBT), it may take 1 year to close the extraction space or more. An **Upper lingual corticotomy**, which was done for this problem before bone remodeling was discovered, can be done for the purpose of speeding treatment.

42. **Describe what** an upper lingual corticotomy (per McGann) is.

   A **Section of bone is made behind the incisors (or 3-3)** that you want to retract. The cuts are made (bur, saw, or piso) the thickness of the cortical bone, one sided (not labial), from the crest of ridge to more superior to the apices. **ON** the crest of the ridge, there is immature bone since the cuspid was first retracted from this location.

   The concept is to **MOVE THE BONE** with the teeth.
43. **When a corticotomy** is done, describe the difference in force applied to the teeth and bone. 
   *Heavier force is used to move the bone with the teeth. Instead of 150 grams per side, use 200 grams if 2-2 corticotomy and 250 grams if 3x3.*

44. **When is a lower** lingual corticotomy needed?

   *When skeletal resistance is documented as severe or ‘extreme’ using the range of bracket torque templates, reference to the incisal edges of the final tooth position and inclination.*

45. **What are the risks** if a lower lingual corticotomy is not diagnosed and not done?
   a. *Inability to retract the anterior teeth,*
   b. *risk of root perforation of the lingual cortical plate,*
   c. *incomplete correction.*

46. **Describe what a lower lingual** corticotomy is and when/why it is added to a treatment plan.
   *Section of bone lingual to the teeth to be moved, the thickness of the cortex, to the height of the ridge (one sided). Move the lingual bone with the teeth.*

47. **How is a corticotomy different than an osteotomy.**
An osteotomy is similar to a corticotomy in design, except that the cortical bone is cut on BOTH sides AND the cancellous bone is also cut between the plates. The segment is mobilized. Blood supply is from one side of the gingival tissue that is not reflected.

**IP appliance:**

48. **There is distal root tip** in a Roth cuspid bracket. How does this promote lower incisor advancement? How is Ne better for this.

_Crowns tip forward (before roots) during alignment, advancing the incisors. Ne does not have the extra distal root tip (for closing extraction spaces), and therefore also does not advance incisors during alignment._

49. **What is a ‘tie’ bracket**, and what purposes can this bracket be used for?

_The Tie bracket is a single tie-wing bracket designed to be used in ‘tight areas’ where there is small interbracket distances. In indirect bonding, the tie bracket is used to signify that the final intended bracket was UNABLE to be placed in the correct position, so “start with the Tie bracket’, change to the double tie-wing bracket later._

50. **Explain how anterior cortical anchorage** can be established by any of the bracket torques (not just Li or SLi).

_The retraction limit that engages the incisor depends on the starting and final inclination on the dental vto. IN some cases, with a retroclined lower incisor, Roth is enough to establish the incisor inclination, demand bodily movement, and thus engage the lingual cortical bone._

**Mechanics:**
51. **When a 20 degree gable** bend is added (to a KH or T loop archwire), the retraction limit can look like the advancing limit when checking RBT on a progress x-ray. Please explain.

   19x25 has a 20 degree round wire range between the retraction and advancing limits. RBT templates on the progress cephal will show the actual incisor at the advancing limit, but in reality it is at the retraction limit (of Li+ gable in the example below). You can NOT “see” a gable bend with RBT and the incisor inclination.

![](image)

52. **How can You can “SEE”** a gable bend distal to a loop at chairside?

   *If there is a T loop, then look at the Top (horizontal part of the loop) and see if it is angled back. AND, look at the vertical legs of a T or KH loop to see if they are angled back.*

![](image)

53. **Why do some orthodontists** suggest cinching back the alignment archwires? Does this work?

   *The cinchback on alignment wires is to prevent incisor advancement, but if you do not allow the arch to ‘enlarge’, then the teeth cannot align. With nitie alignment wires, the cinchback is ineffective anyway. Just try making the cinchback in your hands and push the end of the wire through the molar tube. You will see what I mean.*

54. **How can the anterior bite OPEN as a result of mesial inclined (upper or) lower molars?**

   *The forces on a Continuous archwire are felt throughout the wire. If the molars are tipped mesial, then the incisors feel an intrusion force as the molars upright. This is more obvious in a “partial strap-up” as a utility arch would be.*
55. **If the BITE OPENS** following intrusion of the **UPPER incisors**, explain how the bite can close if the upper is suspended and vertical elastics are worn.

   The upper teeth cannot extrude since they are suspended. Therefore the elastic is working only on ‘one end’. This will result in lower dental extrusion or rotation of the mandible to close the bite. If you release the suspension, then upper dental extrusion is added to the bite closing. Most of the time, it is Not a good idea to release the suspension after all the work to intrude the teeth.

56. **If the BITE OPENS** following intrusion of the **LOWER incisors**, explain how the bite can close if the lower is suspended and vertical elastics are used.

   With the suspension, the lower teeth will be unable to extrude and the elastics are working on one side only. If left suspended, the bite will close with upper dental extrusion or rotation of the mandible. In the lower arch, it was usually **NOT** suspended for cosmetic reasons, but to correct deep bite, so it may be a good idea to release the suspension and let the previously intruded incisors, extrude again to close the bite. Extrusion of the upper may not be what you want on the final esthetics.

57. **If a Roth type** molar buccal tube is used on the molars, why is lingual chain (cleats) needed to close lower 5 or 6 spaces? What happens if the chain was not used, elasticity wears out (patient does not return to change), or forgotten? How was this solved with CIIE or UP.

   The (rotation) “moment” of Force acting on the buccal of the molar by the closed coil (hook is away from the center of the crown) was countered by the ‘counter’ moment of the lingual chain to keep the molar moving forward without rotating mesial lingual. The total force felt by the molar is that of the closed coil PLUS the chain. Force of the chain at initial placement is HEAVY, about 500 grams, decaying to near zero in 1 month.

   If the chain was not used, the molar crown rotates mesial lingual, ‘binding’ on the lingual cortical plate, stopping the mesial molar movement.

   In McGann’s CIIE and UP molar buccal tubes, custom designed and an injection mold made for manufacturing, there is ‘MORE’ mesial-buccal rotation (distal offset) in the design of the buccal tube. This small change made the use of lingual chain unnecessary, and in the process made the forces more exact since now only the closed coil was needed. Closing lower 5 and 6 spaces became ‘routine’ after this change PLUS having archwires that would guide the tooth between the cortical plates.

   With “only” Roth type Rx available, most orthodontists think that closing lower molar spaces, especially into constricted ridges, is NOT possible. True, not possible or very difficult in their world. I know, I was there.
58. **When are cleats** needed on IP bands? For what purpose?

   *Cleats are used to add forces to the lingual. Examples of these are,*
   
a. *Rotating bicuspids and molars*
b. *Posterior cross elastics to upright lower crowns or constrict the upper*

   *Cleats are also handy when seating and removing bands, giving you a place to apply force with a band seater or remover. This is especially true on the upper, but on lower molars, we usually do NOT apply force to the lingual as this twists the band gingivally.*

   *If you do NOT see the use for lingual cleats in a case, I would encourage you to leave them off, reducing the tongue and tissue irritation to the patient.*

59. **What is the difference** in treatment effect with RHG applied to adults versus growing patients?

   *With adult patients, the same force will result ONLY in dental movement (upper molar and incisors moving forward), where in a young, growing patient the maxilla plus upper teeth will move forward.*

60. **What are the problems** with placing bone plates between the 3-4s or 4-5s for minimum molar anchorage? How is this less a problem with lower anterior bone plates to support the force?

   *The main problem is Failure of the plate as the force is pulling it ‘to the side’. Surgery is also*
more ‘delicate’ in this area and the bone is not as dense. Between the lower bicuspids, there is the mental nerve, which limits our ability to screw into thicker bone found more inferior.

When the bone plate is placed on the lower anterior, the bone of the chin is thick, there are no limiting nerves, and this location has easy access. Avoiding the incisor roots is much easier than screwing between the roots of the 3-4 or 4-5 where there is less room for error.

Finishing:

61. In finishing, if you have too much anterior overjet, describe how you can resolve this.
   a) Change bracket torque to Roth or La to allow detorquing, finishing in rectangular wire
   b) Finish in round wire with vertical elastics
   c) Square the upper, taper the lower.

Patient Management

62. After reviewing many ‘life change reports’ in the cases reviewed in this course, what can you say that is a consistent theme of the patient benefits of orthodontic treatment?
   a. Increase in self esteem and confidence,
   b. personality changes,
   c. viewed as being more friendly as they smile more.
63. **In the life change reports** seen in the cases in this course, what common problems do you consistently see listed BEFORE ortho (besides their teeth are crowded or protruded).
   a. Feeling of insecurity,
   b. low self esteem by the way they look,
   c. different than others,
   d. sometimes even outcasts or introverts.

64. **Why is it good** to offer a referral to a specialist and document any refusals?
   Some patients are ‘specialist oriented’, who go to an ENT for a runny nose. You should respect this and be sure they get the level of care they want.
   When there is a refusal by a patient of going to a specialist, they are [legally] accepting a lesser quality of care, you being held to a lower standard. IN my opinion, you should have no fear of meeting the standard of the specialty, but this is still a good practice. Making sure it is documented that you never held yourself out as a specialist.