McGann’s answers: Seminar 9 Expectations

Diagnosis

1. What issues are especially important to document on all retreatment and transfer patients and why?
   a) TM joint disfunction and symptoms (clicking, pain, limited opening?)
   b) Periodontal condition (bone loss, gingival recession, tooth mobility?)
   c) Condition of the roots (resorption?)

   These issues are especially important since they are the favorite problems that you can be blamed for causing, potentially leading to a legal problem.

2. Describe how to distinguish skeletal asymmetry, dental asymmetry, and functional shift in a patient presenting with noticeable asymmetry of the face and smile.

   Dental asymmetry:
   a) If the upper midline is centered, then the upper arch may be symmetrical and the problem is in the lower.
   b) If there are any missing teeth, and sometimes even as unobvious as 2 molars on one side and 3 on the other (missing first molar?), then there may be dental asymmetry
   c) Model measuring, comparing right vs. left

   Functional shift: is ‘suspected” if,
   a) The jaw is noticeably shifted to one side at the chin button (facial photo)
   b) Frontal ceph: menton is not centered on the sagittal plane
   c) There is a ‘shift’ of the occlusal surfaces of lower 6s and 7s on one side (the lower 7 is usually buccal to the lower 6 and this is on the side that the mandible is shifted towards).

   Skeletal asymmetry
   a) The jaw does not center after the teeth are discluded for a few months
   b) Frontal ceph: comparing measurements right vs. left, vertical.
   c) Lateral ceph: double mandible
   d) CBCT scan, measuring structures are not the same size. Some 3D softwares have the ability to “mirror” right vs. left sides, viewing for example that the mandible is longer on one side than the other.

3. What is the most common treatment approach error made by dentists when they see class II on one side (class I on the other)?
   They extract [upper only] on the class II side, the mind not thinking that the lower arch could be the problem and the upper is the symmetrical arch.

a) Menton to sagittal plane: visually look to see if this is centered or off to one side, if off to one side, it is possible there is a functional shift of the mandible (bad bite).
b) Plane cants: visually look to see if the planes are perpendicular to the sagittal plane. If not, look at the numbers and see if there is a cant of more than 2-3 degrees.
c) Vertical: visually look to see if the zygoma to antegonial notch is the same length right vs. left and if not, then look at these measurements to see if you are right. More than 3-4mm off is significant.
d) Right vs left: compare numbers right vs left to see if the size is the same (could be head positioning error).

5. Why are deep bite cases more difficult to treat than those with a normal vertical dimension?
   The muscles of mastication are generally tighter, anterior overjet is lacking, and the incisors are at the wrong angle for a good occlusion (retroclined).

6. Describe the various ways to correct deep bite and rank each by the most to least effective.
   a) Intrude the upper incisors: easy if you have skeletal anchorage, difficult otherwise.
   b) Intrude the lower incisors: easy if you have skeletal anchorage, difficult otherwise.
   c) Extrude posterior teeth: not easy and ineffective.
   d) Advance incisors: easy, when there is crowding. More difficult when no crowding.

7. What is the problem of NOT doing a corticotomy when your skeletal resistance is diagnosed as severe or extreme?
   The incisors will either NOT move to the intended final location OR the roots may resorb.

8. If you are ever blamed for root resorption and starting anterior PA x-rays are not in the records, describe the next best method to determine if the roots were short at the start of treatment or in fact there was root resorption.
   Measure the incisors on the lateral cep. The problem of this method is that there are two incisor roots and you may only be measuring one, but most will not be this smart to question your findings.

   Subapical osteotomy [and extraction of bicuspid teeth at surgery]. Cutting the bone labial+Lingual under the 3-3 teeth (4mm below the apices at least), making a vertical space in the bicuspid extraction just done or segmenting this out from the level of the horizontal cut to the crest of the ridge, and then moving the anterior segment(s) back.
   Problems include: a) perio defect where the bicuspid was removed
   b) changes in the nose as the upper anterior segment is moved back.
10. When do you need a bicuspid extraction pre-surgical ortho setup and when can you do non-extraction presurgical setup for mandibular advancement surgery?

When there is too much lower incisor advancement, reducing the anterior overjet available for mandibular advancement, then you must extract teeth in the presurgical setup. In general, the incisors need to be “decompensated” (made to be normal inclination to the jaws), so if there is excess proclination due to alignment of crowded teeth, then you must extract to get the inclination correct.

11. What are your possible risks if orthognathic surgery is not considered in your diagnosis? What documentation do you need to show that you did consider surgery?

If you do not consider orthognathic surgery, where this is indicated as determined by others practicing around you, then you can be considered ‘negligent’ (and have to pay for the needed surgery).

Documentation that you did consider the orthognathic approach when making the diagnosis would include,

a) Surgery is listed in the treatment options you considered
b) Surgery was discussed and refusals documented at the consultation
c) Surgical VTO was made.
d) Document that you offered a referral for a surgical consult.

Model Measuring and VTO

12. What “Dots” on model measuring need skeletal anchorage in the AP direction

a) Maximum anchorage (100% of the extraction space to be used by the anterior teeth)
b) Minimum anchorage (100% of the extraction space to be used by the posterior teeth)...anterior cortical anchorage can be used, but cannot be counted on to be 100% effective.
c) Distalization of an upper arch in excess of 2-3mm
d) Distalization of a lower arch (even 1-2mm)

13. What “dots’ are possible for treatment with dental anchorage (forces from teeth to teeth, 50:50, etc) and when do you need skeletal anchorage?

Dental anchorage is possible “up to” 80% moderate-maximum molar anchorage and then you need skeletal anchorage.

14. How much molar advancement using anterior cortical anchorage can you count on (dots) and when should you use skeletal anchorage [in addition to the cortical anchorage]

For minimum anchorage, anything more than 4-5mm of molar movement forward (non extraction moving the entire arch forward as in closing anterior spaces) could benefit from skeletal anchorage. In extraction cases, anything more than 6mm of the extraction space closed (80% moderate-minimum anchorage) by the molar could be assisted by skeletal anchorage.
15. How does skeletal open bite influence your anchorage planning by the dots? Skeletal closed bite?
With skeletal open bite, the molars tend to drift forward during mechanics, so skeletal anchorage is needed more for molar stabilization. In skeletal closed bite cases, the teeth move slower, and no molar drifting, but skeletal anchorage may be helpful in speeding up the case and helping to overcome skeletal resistance of the cortical bone.

16. Describe how to make a surgical vto for a bicuspid extraction pre-surgical orthodontic setup followed by mandibular advancement.
   First make a dental vto: Make a copy of the start model measuring and after locking the archwire, move the dots of the bicuspids to be extracted. In the upper arch, you will use (only) enough molar anchorage to decompensate the incisors, to remove the upper incisor pronclination, so the anchorage planning will be moderate 50:50 or moderate-minimum molar anchorage.
   In the lower arch, you will plan moderate-maximum molar anchorage (or at least more molar anchorage than in the upper) to decompensate the incisors and to create as much anterior overjet as possible. Note: Choose incisor torque brackets that give you a retraction limit on the intended pre-surgical incisor position.
   Then, for the surgery “ceph” vto, make a copy of the start ceph, move the incisors to the predicted pre-surgical position on the dental vto, and then move the lower incisor forward to be in occlusion with the upper incisor, PLUS move the mandible, symphysis to fit the new lower incisor position, adjust the lower profile soft tissue.

17. Describe how to make a surgical vto for maxillary advancement [to correct class III dental]
   Make a copy of the start ceph, adjust the incisors according to the pre-surgical dental vto, then move the upper incisor forward to occlude with the lower (should be negative anterior overjet), then move the maxilla forward to the new incisor position. Adjust the soft tissue 1:1 forward movement of the upper lip.

18. Describe how to make a surgical vto for posterior maxillary intrusion to correct open bite.
   Make a copy of the start ceph, adjust the incisors according to the pre-surgical dental vto, then move the upper incisor ‘up’ (if desired, not required), then move up the upper molar. Next move up the maxilla to fit the ‘new’ upper incisor position, and then holding down the shift key, drag the ‘end point’ of the maxilla (lingual of the upper incisor) to rotate the posterior maxilla up. Now move the lower molar and incisor ‘up’ to occlude with the upper molar/incisor.
   Next move the mandible and symphysis ‘up’ to meet the new position of the lower incisor, then hold down the shift key and rotate the end point of the mandible (by the condyle) and rotate the condylar head back to position (autorotation). Last, move the lower profile soft tissue “up” to close the lips and then hold down shift key as you rotate the soft tissue of the chin forward to match the extra chin from autorotation of the mandible.

19. Describe the circumstances when should you diagnose (and refer) a case for surgical assisted rapid expansion? What do YOU need to do before and after surgery?
Adult patient, over the age of 20 with significant posterior crossbite (or mild crossbite with anterior open bite). Before surgery, you need to Bond an RPE appliance, then send to the surgeon for the surgical assist. They return the patient with instructions, which typically may read: wait 7 days after surgery for osteogenesis, then activate the screw ¼ turn morning and night (2x/day) until the planned expansion is reached (surgeons usually ask for +25% over-expansion), then tie the screw and wait for at least 1 month before removing the expander. Retain with TPA.

20. Describe how to make a skeletal anchorage vto for upper incisor intrusion

Review the severity of the deep bite without incisor intrusion to get some idea of the magnitude of intrusion needed. Determine the resting upper lip to upper incisor (photo and classification II tab) PLUS gingival display (if any) to determine how much upper incisor intrusion is possible.

Make a copy of the start ceph, intrude the upper incisor to the resting lip location or the amount determined by evaluating the records. Add some lingual root torque to the intrusion (and be sure NOT to retract the incisor, move it ‘up’ only). Calculate and save

Keeping this ceph open, click VTO and reference the model measuring of the planned treatment. Confirm the vertical is good.

Next, open the ceph with incisor intrusion, turn off vectors and points, make a screenshot of the line drawing showing the intrusion. Paste in the treatment plan. Next turn on grid, zoom-in, and make screenshot of the incisor intrusion, counting the mm of intrusion. Plan your activation and reactivation schedule.

21. Describe how to make a skeletal anchorage vto for lower incisor intrusion

Review the severity of the deep bite and curve of Spee without incisor intrusion to get some idea of the magnitude of intrusion needed. Determine the resting upper lip to upper incisor (photo and classification II tab) PLUS gingival display (if any) to determine how much upper incisor intrusion is possible. It will NOT BE ENOUGH, and this is the reason why you need to intrude the lower. Get a photo of the resting LOWER lip to the lower incisal edge for documentation completeness.

Make a copy of the start ceph, intrude the LOWER incisor to the resting lip location or the amount determined by evaluating the records. Add some lingual root torque and tip the crown slightly forward (advancing limit of the bracket is final inclination. Calculate and save

Keeping this ceph open, click VTO and reference the model measuring of the planned treatment. Confirm the vertical is good.

Next, open the ceph with incisor intrusion, turn off vectors and points, make a screenshot of the line drawing showing the intrusion. Paste in the treatment plan. Next turn on grid, zoom-in, and make screenshot of the incisor intrusion, counting the mm of intrusion. Plan your activation and reactivation schedule.

22. Describe how you document the amount of intrusion you added to make the good ‘picture’ (dental vto) and what screenshots should be added to your treatment plan
Open the ceph with incisor intrusion, turn off vectors and points, (change color of the lines if they are not obvious on the ceph background...edit-select all, object-line color, select color) make a screenshot of the line drawing showing the intrusion. Paste in the treatment plan. Next turn on grid, zoom-in, and make screenshot of the incisor intrusion, counting the mm of intrusion.

Plan your activation and reactivation schedule.

23. Describe how to make a skeletal anchorage vto for molar intrusion to correct anterior open bite

Make a copy of the start ceph. Move the molar ‘up’ the approximate amount needed to close the anterior open bite. Make a screenshot of this with zoom and grid on and paste into MS word or the treatment plan if you know what it will be. Then move up the lower molar and incisor to occlude with the upper.

Next, move the symphysis and mandible to meet the new incisor position. Select the mandible and hold down the shift key as you rotate the condylar head back to the original position. Autorotation should give you more chin and less vertical.

Finally, move the lower profile up to close the lips (if you think that will happen) and then rotate the lower profile by holding down the shift key as you drag the end point (most inferior) to reflect the added bone of the chin in the horizontal position.

24. Describe what ‘autorotation’ of the mandible is and how you predict and show this on a dental or skeletal vto.

When the mandible rotates “UP and forward”, hinging around the condylar head, this is called auto-rotation of the mandible.

On a surgical or skeletal anchorage vto, after intruding the maxilla and/or upper teeth, move the lower teeth to occlude with the new upper incisor and molar positions. Then move the symphysis and mandible up to the fit with the new incisor position.

Autorotation is now made by holding down the shift key as you rotate the condylar head back to the starting position.

IP Appliance

25. Describe how to determine if a broken molar buccal tube came off the band because of a failure of the welding vs. too much force applied to the buccal tube.

Look at the band material. If there are ‘holes’ where the welds used to be, then this is failure of the band material. We do NOT want to make the band material too thick or stiff, since this would make all bands more difficult to burnish and fit between the teeth. So failure is considered OK.

If there are no holes in the band material, but only a mark where the weld was made, then this is a weld failure. PDS uses computerized machines that will not let the welder continue if a bad weld is detected, so this should be very rare.
26. Why is it NOT a good idea to make the band material thicker to hold on the molar buccal tubes 100% 
   *We do NOT want to make the band material too thick or stiff, since this would make all bands more difficult to burnish and fit between the teeth.*

27. What potential problem can you have if the bonding adhesive is stronger between adhesive and tooth THAN adhesive and bonding pad. (ie. You do not necessarily want the strongest adhesive!)
   *When you try to remove the bracket, the enamel fractures, sometimes the entire facial surface can come off. This happened when ceramic brackets were first introduced by Unitek...and a new and improved adhesive called transbond was used to bond them to the teeth. BIG problems as you had to grind the ceramic off the teeth with a diamond and the orthodontists did not have that capability...what do you do now? Send the case to the referring GP asking for them to grind off the brackets!! There is an acceptable amount of bond failure in orthodontics!*

28. What is the potential problem of activating a nitie closed coil more than its original length?
   *It exceeds the working length and the material fails, leaving you with NO force. Do this on one side of a bilateral mechanics application and asymmetry can develop. With the PDS nitie closed coils, the maximum we activate is 1mm less than the length of the coil (if 12mm, then 11mm is maximum, and happens to be step 4)*

29. When moving lower molars a long distance forward (minimum anchorage), what molar buccal tube variation is best suited for this tooth movement and why? What problems can you have if a Roth buccal tube is used?
   *The UP variation is the best, keeping the crown upright with the tipD weld and ’extra’ buccal crown torque (than Roth) plus the mesial-buccal rotation. Roth type Rx has problems with the crown tipping lingual and mesial-lingual rotation into the lingual cortical plate, stopping the forward movement of the molar.*

30. Explain the difference in the ability to torque the upper incisor with the deep bite 51% vs. deep bite 81% prescription.
   *Theoretically, the bracket is more gingival with 51% deep Rx than 81% deep Rx, so you should be able to torque (add lingual root torque) to an upper incisor BETTER with 51% since it is closer to the center of rotation. In practice, the incisor inclination is more controlled by the location of the retraction limit and what vertical forces are being applied, if any.*

31. Why should you select an archwire to “constrict” when closing a lot of spaces between anterior teeth? Why may this change your cuspid torque diagnosis?
   *A constricted archwire will help you close the anterior extraction spaces (expansion makes more space). Constriction of the archwire at the cuspid should be compensated by using an Li bracket torque.*
32. When is the 37/47Li bracket used and how do you get this in the IP appliance tab?
   When lower 7 crowns are tipped lingual, then use the Li variation. This variation has more buccal crown torque (lingual root torque), and is only available on a band with a lingual cleat. The lingual cleat is to provide for an attachment of a posterior cross elastic, also a method used to upright the crown.

33. Why is the “UP” variation more favorable in deep bite cases (vs. ClE or Roth)?
   The tipback and buccal crown torque, both ‘uprighting’ the crown, will act like an extruded posterior tooth, opening the anterior open bite.

Skeletal anchorage

34. What does the word skeletal anchorage refer to?
   Applying forces from the skeleton (cortical bone) rather than to/from teeth. This provides “absolute” anchorage, not previously available in orthodontics.

35. What wording should you use in the clinic when referring to skeletal anchorage (eg. Implants, mini implants, pins)
   Patients may not have a favorable impression of the word ‘implant’ if they know someone that had problems with their dental implant, so I do not recommend using this term. Ortho anchor or pins seems to work well, along with the word ‘temporary’.

36. What types of skeletal anchors can be used in the upper arch for 100% maximum anchorage dots
   The anchor must be posterior to the molar being anchored, which sometimes is a challenge if the molar is a 7 or 8. That said,
   a) 012 ‘rope’ Ligation to a bracket base or auxiliary tube (must be tight ligation!)
   b) Zygoma bone plate supports the force to the anterior segment, the suspension wire attaches to the bracket base
   c) Ligation from the zygoma buttress to a 17x25 segmental wire helix with ss closed coil from the helix to the auxiliary molar tube
   d) Ortho anchor pin in the dento-alveolus (limited by attached gingiva), ligated to a bracket base or auxiliary tube.
   e) Palatal ortho anchor ligated to the molar generally does not work. Too vertical to the tooth to be stabilized and palatal pins often fail due to tongue and food jiggling.
37. What types of skeletal anchors can be used in the lower arch for 100% maximum anchorage dots
   a) Ortho anchor ligated to the molar auxillary tube or bracket base
   b) 2-hole bone plate with 1-6mm screw, ligated to the molar auxillary tube or bracket base
   c) T or Y plate to apply force directly to the anterior segment, the coil attachment wire ligated to the auxillary tube or bracket base.

38. Describe the procedure to place lower anterior bone plate and coils for intrusion of the lower anterior teeth (flap design, pilot hole, etc)
   Vertical incision is made between 2-3 (avoid the coil from crossing over crestal tissue of a tooth), to a level that allows activation AND reactivation of the closed coil. A 2-hole plate with one 6mm screw is placed at a level below the roots of the teeth, and preferably on the chin button to keep the coil away from the gingival tissue. The attachment wire of the 6mm or 9mm closed coil to the bone plate is now the suspension wire, brought up and tied to the archwire. The coil is activated to the archwire using another 012 ligature.
   Closure can be one intermittent suture.
39. How much force should be applied to the lower anterior by nitie closed coils for intrusion. 
   150 grams per side (or less as the teeth move and the coil shortens)

40. Describe the procedure to suspend lower anterior intrusion when the pin has been placed 
   directly to the nitie closed coil at the initial surgery 
   Surgical exposure of the bone plate, removal of the coil, and placement of a suspension (012) 
   ligature tie. (ie. Another surgery)

41. Describe the setup of ligature wires, coils, and bone plates to avoid having a second surgery 
   when you wish to suspend an intrusion. 
   A loop is made through the free bone plate hole, and twisted AFTER supporting the coil (also 
   possible to attach the coil directly to the bone plate, the ends of the attachment ligature are NOT 
   cut, but extended down to the archwire) to be the future suspension. The coil is activated by a 
   second ligature.
42. Describe how to find loose bone plates or screws during treatment. What are the tell tale signs?
   a) Take a periapical x-ray and see if the coil looks activated. If not, suspect the screw is no longer supporting the force
   b) If on an intrusion, you get an occlusal plane cant, suspect a loose screw on one side.

43. Which is most important during incisor intrusion, the retraction limit, the advancing limit, or the Roth ideal inclination and why?
The incisor will procline until reaching the ADVANCING LIMIT proclination of the archwire/bracket combination.

44. Why is it important to bond or band ALL the teeth in an arch being intruded with skeletal anchorage?
   Because ALL teeth on the archwire will intrude. If you do not attach the 2nd molar to the archwire, anterior bite opening will come quickly.

45. What is the most common causes of skeletal anchorage [screw] failure?
   a) Not sufficient thickness or density of the cortical bone
   b) Excessive force applied
   c) Tongue, muscle, cheeks, toothbrush, food contacting to create jiggling of the attachment
   d) Applying the force away from bone, as with an ortho anchor (vs bone plate flush to the bone)

46. Why can you expect more ortho anchor (pin) failure when you place the pins at the crest of the ridge (between the teeth)?
The cortical bone is thinner in that area

47. Why use a bone plate instead of an ortho anchor?
   a) To direct the line of force
   b) So multiple screws can be placed
   c) So screws can be placed in a location with thicker and more dense cortical bone

48. What is wrong with placing skeletal anchorage pins through the soft tissue without raising a flap?
   You cannot determine how much cortical bone is in the location before the pin is placed
   You cannot use bone plates to redirect the force.

49. What do you do about gingival inflammation at the location of the screw/bone plate/coils?
   a) Do not cut the coil attachment ligature under the tissue
   b) Avoid, if possible, placing the coil under the tissue
   c) Water irrigation, if the patient will comply
50. Should skeletal anchorage bone plates be removed at the end of ortho treatment? Why or why not?
   Unless there is severe tissue irritation, you should wait to remove the skeletal anchorage until debanding, especially with intrusions. In the finishing stage, it is common to use vertical elastics, which if the [suspension] support for the previous intrusion has been removed, the intrusion can be lost.
   If the bone plates are placed for molar anchorage and the extraction space has been closed, then these may be removed earlier than deband, presuming you will not need them again.

51. What is the diagnostic criteria when determining if upper intrusion or lower intrusion (or both) is appropriate [in a deep bite case]? What records do you need to support your decision?
   Upper resting lip to the upper incisor cannot be less than 1mm. If starting 1mm, then lower intrusion will be needed. If some upper intrusion is desired for smile esthetics, but there is not enough to correct the deep bite, then both upper and lower is needed.
   You need the following records for the best documentation,
   a) Photo: upper resting lip to incisal edge and high smile
   b) Photo: lower resting lip to lower incisal edge
   c) Lateral ceph: with lips at rest
   d) Classification II tab: measurement of gingival display and resting lip.

52. When is upper incisor [skeletal anchorage] intrusion needed in class II mechanics?
   When the dental vto predicts anterior deep bite (that will prevent the full correction of the class II) and/or when the dots in the upper arch are 100% maximum anchorage.

53. When is lower incisor [skeletal anchorage] intrusion needed in class II mechanics?
   When the dental vto predicts deep bite that will interfere with mechanics, and there is not enough room to intrude the upper incisor (resting lip is normal to the upper incisor)

54. What does the term ‘passive skeletal anchorage’ refer to and when might it be used?
   When there is NOT a coil (or other force generating device) applied to the anchor. For example, Zygoma ligation for growth management, or piriform ‘suspension’ to maintain the vertical position as the incisor is retracted.
   Note: this is a different meaning than the common terms “direct” skeletal anchorage used when a coil is attached to the anchor, or “indirect” when the anchor is tied to a tooth and the force is applied directly to the tooth.

55. What problems can arise if the forces on one side are different than the other side when intruding incisors (upper or lower)? How can you make the correction?
   You can get a ‘cant’ of the occlusal plane. Correct this by deactivating one side and continuing the intrusion on the (trailing) side. Then when they catch up again, activate both coils the same amount. Note: be sure to check for a failed screw.
56. If the nitie intrusion coils are attached directly to the skeletal anchorage screws, then what can happen if the pins are placed at different distances from the archwire? How can you make the correction?

If the screws are placed at a different distance from the archwire, then the applied force is for sure different right vs. left, and you can get a ‘cant’ of the occlusal table. Making the correction would be to deactivate one side (the one with more intrusion). To avoid doing this surgically at the end of the anchor, remove the archwire, releasing the coils from the archwire passing through the end of the coil, and activate using a ligature to the archwire and a gram gauge to check the forces.

57. What does it look like on an x-ray when a skeletal anchorage screw fails?

The coil no longer looks like a ‘spring’...the loops are together, not open. You may not see a loose screw.

58. Why is it NOT a good idea to cut the pigtail attaching the coil to the bone plate (under the tissue)? What should you do instead with the ends of the attachment wire?

Gingival irritation results, and it is more difficult to twist the ligature when placing the plate. Instead, the ends of the attachment wire can be twisted and attached to the archwire, eventually becoming the suspension wire.

59. Why should you use 012 ligature, not the 010 ligature used to attach archwires to brackets, when coils to skeletal anchorage or suspending intrusions?

If the ligature breaks, you need to do another surgery to reattach the coils. This has happened before during my development, an occlusal plane cant resulting from the failed ligature...recovered after some adjustments. After that experience, 012 ligature!!

60. What is the difference between placing the upper anterior skeletal anchorage distal to the cuspids vs. the piriform rim and when do you do each?

The difference is the line of force. From the piriform rim, the bone plate most commonly placed between the roots of 2-3, the force is near vertical. If the pin/plate is located more to the distal, then the line of force is more ‘up and back’.

In a non extraction, class I deep bite or gingival display case, apply the force from the piriform rim. In an extraction case, you would want to place the anchorage more to the distal of the cuspid, BUT you may be limited by thin cortical bone. Either way, you will use the skeletal anchorage for the intrusion and closed coils from the molars to retract the anterior segment (after suspension of the intrusion, since coils do not hold the intrusion as the incisors are retracted).

61. What are the problems of intruding on 18x25N (instead of 19x25ss)?

18x25N is more flexible, so you will get some arch distortion from the intrusion forces being place in ‘points’ along the archwire. If only 2-3mm, this is ok, but if more, then maybe better to wait to start the intrusion until 19x25ss is in place.
62. What is the most common problem seen during anterior intrusion? Why and how can this be controlled?

Proclination of the incisors. This can be controlled by diagnosing an incisor bracket with an ADVANCING LIMIT that is not proclined (ie. La upper, La or Sla lower). Placing the bone plate further back will also change the line of force so that there is less incisor proclination.

63. How can skeletal anchorage be used to correct midlines?

Apply a bone plate on one side and apply a closed coil from the bone plate to the opposite side of the arch. Try to get as near as parallel to the occlusal table to prevent canting.

Mechanics

64. Explain how to diagnose the need to add a gable bend distal to the KH loop to engage the retraction limit of a proclined lower incisor. How to you determine amount of gable bend to add to the archwire?

If you are trying to maintain the (forward) position of the LOWER incisor, but it is too proclined for even the SLi retraction limit, then you will see this when selecting brackets to keep the incisor forward. Rotate the template in powerpoint ‘all templates’ by right clicking, position and size, and changing the rotation until the retraction limit now engages the proclined incisor…this is how much gable bend to add distal to the KH loop.

65. Explain why it is generally NOT a good idea to add a gable bend to upper archwires when Li bracket torque is on the upper incisors.
The gable adds lingual root torque, which also increases skeletal resistance of the palatal cortex. This can either stop incisor retraction and/or resorb incisor roots. Li 19x25 is usually has plenty of skeletal resistance, no reason to add more and no reason to add to the proclination.

66. Under what circumstances can chain be used from a 6-5 to help rotate a mesial rotated bicuspid with a round nitie alignment wire in the bracket slots? Why not always?
   When it is ok in the overall diagnosis scheme if the molar moves mesial in the process (dots on model measuring). Chain will move the molar forward, and if the anchorage planning says this is NOT Ok, then don’t use the chain.

67. When closing lateral incisor [extraction]space, upper or lower, what else can you use besides chain 3-3?
   [nitie] open coil from 4-3 to push the cuspids to the center, closing the lateral incisor extraction space.

68. Explain how you can tell in the chair if the intended incisor torque (RBT on dental vto) is maintaining or is different due to wire flexibility in the loop. Describe the example of retracting upper incisors and they are detorquing more than the retraction limit diagnosis.
   Look at the vertical legs of the loop to see if they are parallel. If offset, then the loop is not maintaining the torque (of the retraction limit).

69. Why is distalization more effective than protraction when using palatal skeletal anchorage to palatal bars?
   Because the cortical bone widens as you go more posterior, tapers as you move anterior. The palatal bar connecting the molars maintains the width, resisting forward movement.

70. When should intrusion coils be reactivated? How much should they be reactivated? How do you reactivate the coil when the inferior of the coil is already extended to the archwire?
   Approximately 8 weeks if using 6mm or 9mm closed coils since 150 grams ONLY has 2/3mm activation respectively. With a 12mm closed coil, 5mm activation is 150 grams, so reactivation could be delayed until 12-16 weeks. You can choose to apply heavier force, 200-250 grams and this still seems to work well from our initial experiences, extending the range of activation. Stainless steel coils will generate a larger force per mm activation...they also worked for intrusion, but have a short range of activation for a given force.
   Reactivation should be 2mm every 8 weeks. If the coil is already fully extended to the archwire, then you must extend the coil more superior towards the bone plate by twisting the suspension wire.

71. What should you do if you are faced with a space between [upper] 2-3 that will not close? What are the possible problems?
**First check** to see if the roots of 2-3 are touching and this is the reason that your expectations are not being met on the rate of space closure. This is done by taking a periapical x-ray. Change bracket position if this is the problem.

If you are using sliding mechanics, then check to see if

a) The end of the molar tube is not crimped (7s) by a distal end cutter

b) The archwire can slide in the tubes (push the wire back and forth with a light wire plier)

Another problem can be **skeletal resistance**. The molars will not move forward, and the cortical bone will not allow the incisors to retract. Take a progress ceph and check range of bracket torque, looking at the palatal cortical bone relationship.

Most likely what you will do is to change to a T loop and close the space without friction, without sliding, but if the problem is skeletal resistance, you may change to step 3 or 4 to move the molars forward (plus class III elastics?)

72. Can cortical ‘bone remodeling’ take place in orthodontic cases? Under what circumstances?

   Yes, even though cortical bone is considered the limits of orthodontic tooth movement, remodeling is possible when using low force AND the tooth is not tipping (over the crest of the bone). This can be predicted now with the use of range of bracket torque templates (skeletal resistance), dental Vto predictions, and precise skeletal resistance diagnosis.

73. What does bone remodeling look on the upper facial surface when the incisors have retracted (a long way)? How can this be corrected or does it need to be corrected?

   The labial cortical bone is irregular and “thick”, the teeth having pulled away from the labial plate. You can do an alveoloplasty (will include decortication in some areas) to smooth the alveolus, but it will likely remodel over a period of 2 years (?)

74. What is the retainer for Rapid Maxillary [palatal] Expansion (RPE)? When can this retainer be removed during active treatment? When and how and for how long should rapid maxillary expansion be retained?

   TPA is the only retainer that should be considered since the expansion needs ‘fixed’ retention. Remove the retainer only for finishing, allowing the teeth to settle. There should be a straight palatal bar soldered to bands with a clear retainer on top. Retention of the expansion should be 4 years.

75. If you are unsuccessful in making a palatal bar (TPA) at the chair, what should you do?

   Take an impression and make the palatal bar on the model with only minor adjustments remaining for chairside.

76. How can inter-maxillary elastics assist you in the correction of functional shifts of the mandible?
They move the mandible from the shifted position, quickly changing the class II and midline problems.

77. Why is the reactivation schedule for nitie closed coils so important when using anterior cortical anchorage in your treatment planning?
   If the coil force changes to a ‘low’ force, then the cortical bone no longer resists retraction of the incisors. 12mm nitie closed coil is +8mm at stage 3 and +4mm at stage 2....you only have 3-4mm of tooth movement to work with. Patient does not return and your dental vto and treatment may change.

78. What do you have to do to engage bracket slots with a rectangular wire when the incisors are proclined (or retroclined) outside of the advancing (or retraction) limit of the bracket-archwire?
   Twist the archwire superiorly (if proclined) to FULLY engage the bracket slot with the rectangular wire.

Patient Management

79. What issues are in the patients mind when they start a retreatment of previous orthodontic care?
   It would be natural to doubt your abilities to reach a successful result. After all, they surely trusted the previous practitioner when they started treatment. The length of time to reach their intended ‘look’ is taking a major part of their life. The cost is now much more than what they originally planned, and agreed to “at the start of all this”

80. What are some words to use that keep the peace when a previous treatment was unsuccessful?
   “More orthodontics” is needed to reach a higher treatment goal. This implies that the first treatment may have been successful, and even as contracted, just “not good enough”.

81. What problems may be associated with a patient giving you a [short] deadline of when their ortho treatment must be completed?
   You do not have time for finishing, especially if they do not do their part (keep on their brackets, wear forces as directed). If you go over the deadline, then you cannot do anything right after that. They become unreasonable (or maybe they were unreasonable at the start!)

82. Why is a patient who starts with visually straight teeth more difficult to treat than one with very crowded front teeth?
   They do not see the improvement [of teeth straightening], which in turn encourages them mentally. Why am I doing this if I already have straight teeth?

83. Why are patients in the medical or dental fields more difficult to treat?
They are more demanding to be seen more often, thinking this will make their teeth move faster, when in fact this over-activation makes them move slower. They may also demand treatment be stopped when they are satisfied.

84. Why are family members more difficult to treat?
   They may not trust you in the same way as a real, paying patient. They also usually get too frequent of adjustments, and you have to listen to every complaint.

85. Why would a patient refuse to ‘add back’ a missing tooth, but agree to extract 3 more when presented these orthodontic treatment options to solve dental asymmetry.
   Avoiding the ‘false’ teeth or “man-made” replacement that he/she may have heard do not work. The missing tooth may have been extracted by someone famous or close to the family, so adding it back would cause them to ‘lose face’.

86. What do you need to give to the patient that moves from your area of practice when you are NOT finished with your orthodontic treatment?
   Give them,
   a) A copy of the lateral and frontal ceph (no tracing needed unless sending to a POS doc)
   b) A copy of the study models
   c) A copy of the start photos
   d) A written transfer letter stating what the diagnosis was and why, the progress to date and what your next steps were to be if the patient stayed in your practice, What the intended retention was for the case, if the patient has been compliant or not (with details), and what the financial arrangement included, if the payments are current, and the remaining $. 

   Note: there is no need to send a copy of your treatment record unless transferring to POS doc

   Note: ALWAYS try to get the ‘ending’ records to document what you did, what condition you left the patient (TMD, perio, root resorption) and what the starting point is for the next doctor…you can send a copy of these with the patient.

87. How do you determine if the patient owes you money (or you owe them money)?
   Review the contract and treatment rendered. Add up the records and diagnosis fee, initial banding fee, and the “adjustment financing” fees to determine how much of the original fee remains. Keep in mind that the subsequent treater will need to deband the case and deliver retainers, which is an extra cost.

88. Can you refuse to give the patient transfer records if they do not pay you in full for what is owed? What MUST you do legally?
   You can require that they pay for the copies, but you must transfer these records, even if they do not pay in full. You are entitled to retain the original records documenting what YOU did.
Practice Management

89. How much more doctor time and how much more fee should be charged for a section 1 case vs. section 3 case? Section 1 vs. 2? Section 2 vs. 3?
   Section 1 case should be your basic ‘orthodontic’ fee.
   Section 2 case should be slightly more fee for an orthodontic approach, even higher if dentofacial orthodontics approach.
   Section 3 case will likely have an orthodontic approach (less fee) and a dentofacial approach (more fee)

90. Describe how to explain to the surgeon (you are referring this procedure) to give you the skeletal anchorage location you want for piriform rim intrusion. For lower anterior intrusion. For lower molar ortho anchors. For palatal ortho anchors.
   Send them
   a) The surgeons referral manual
   b) A study model with an “X” marking the spot where you want the coil to be attached to the bone plate
   c) The actual coil you want installed on the bone plate and any instructions for activation if you want the surgeon to do the initial activation.

91. What should you provide to the surgeon when you are asking him/her to place skeletal anchorage on one of your cases.
   See answer #90

92. What should the approximate fee be for skeletal anchorage in the anterior (upper or lower) for intrusion. What are the procedures that need to be done and the approximate doctor time and materials cost to justify this fee.

   AS of this writing (2012), the fee for anterior intrusion can range from US$750-2000.
   Consultations discussing the procedure and complications, Raising the flap, installing the bone plate and coil, and do NOT forget occasionally replacing a failed plate AND removing the plate all count in the total doctor time that can be from 1 hour to 2 hours total doctor time. Materials can be expensive, ACE materials are about $20 per screw and $40 per bone plate.