Dr. Marco Caminiti discusses:

ORTHODONTIC GOALS FOR IDEAL ORTHOGNATHIC SURGICAL OUTCOMES

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Transcript: (edited)

Outline:

1. Prepare the patient
2. Obtain accurate data
3. Determine the skeletal discrepancy and commitment to a treatment plan
4. Determine the transverse discrepancy
5. Create plan around a surgically-based treatment plan
6. Decompensation and adjuvant tooth movements
7. Removal of wisdom teeth
8. Ensuring optimal temporomandibular joint health
9. Ideal orthodontic mechanical support
10. Assisting in post-operative monitoring

Notes on:

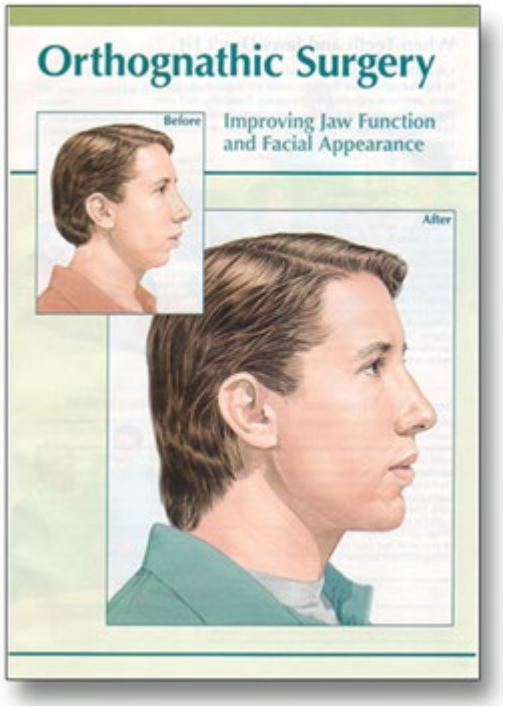
Incisor Angulation

Occlusal Plane Alteration – Occlusal Esthetic Quartet

Tooth Spacing (Iowa and Segmented)

Timing

1. PREPARING THE PATIENT FOR SURGERY



The orthodontist and the oral surgeon must be sharing the same information with the patient: this includes what the overall length of treatment time will be and enable them to commit to surgery from an orthodontic, surgical and medical standpoint. Although the general aim of orthognathic surgery follows specific patterns, each patient needs to assess and managed as an individual case. Communication and supplemental aids to educating patients either via meetings, pamphlets, websites, and consultations is necessary. It is essential that patients understand what the procedural details are: the timings and sequencing with regards to orthodontics, extractions, surgery and post-surgical orthodontic finishing. The orthodontist is primarily responsible to educate the patient as to why they need the surgery. The patient needs to know why they need to visit a surgeon particularly if their chief complaint was to straighten their front teeth only.

The orthognathic prayer:
-establish a skeletal class I occlusion with a healthy dentition on a stable alveolar base, -occluding in an ideal functional pattern,
-providing optimal temporomandibular joint health and function,
-while ensuring the hard and soft tissue maxillomandibular complex is positioned in the most esthetically pleasing position possible
-without compromise to airway or speech.

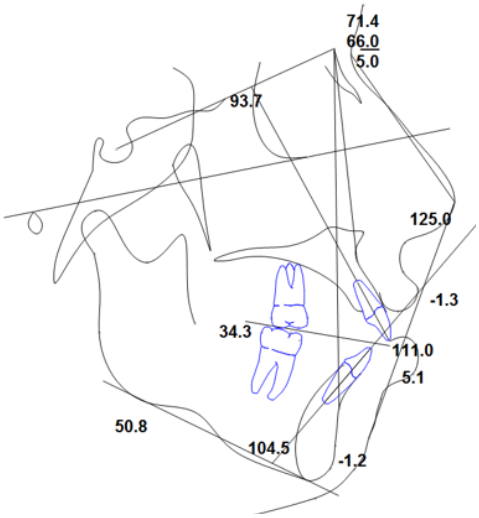
Preparation starts with a detailed referral with an accurate diagnosis from the orthodontist. The patient needs to be informed what to expect at the surgical consultation. Generally, at this visit the OMFS will discuss not only what possible surgery may be required, but also the risks and benefits of the surgery. This is a high-risk surgery that is commonly performed with excellent results on a daily basis around the world; however serious complications have and will occur, and this decision should not be taken lightly. Surgeons will discuss normal postoperative events of orthognathic surgery including swelling, bruising, bleeding, pain, loss of function, the necessity close follow up and absence from school or work. The surgeon should also talk about the all inherent risks including: anesthetic/medical complications ranging from nausea and vomiting all the way up to mortality; and, surgical complications ranging from wound complications, nerve damage and the possibility of re-operation. The ultimate decision to proceed lies solely with the patient.

2. OBTAINING COMPLETE AND ACCURATE DATA

It is essential to obtain proper radiographic records (Pan and Ceph), photographs and diagnostic models. A CBCT or CT may not be required yet at this stage. Models (scanned or stone) may not be as important if single jaw surgery is necessary. However, models are critical in determining transverse discrepancies, Bolton discrepancies and in trying to see what final occlusal results may be possible. The data that is collected during the orthodontic visit needs to be shared with the surgeon for that initial consultation to help in providing an accurate diagnosis. In most surgical settings, the initial consultation is quite involved with all the above data elements. It is not uncommon for patients at the initial surgical consultation to have visual treatment objectives (VTO) performed on the various digital software programs that are now readily available. This not only helps in communicating with the patient about what facial changes may occur; but, also helps in demonstrating that there may be an uncertainty with regards to the number of osteotomies and possible movements that cannot be determined until decompensation has occurred. VTOs do help to show patients what things may look like since many may have over-demanding esthetic demands and others may feel they are just having their teeth moved around so that they may be shocked at the changes after surgery. We need to prepare them for the dentofacial changes that may occur.

Our planning is now all performed through Dolphin™ and the options of cephalometric points are endless. For surgical purposes we will use only the Toronto Analysis but mostly the combined Steiner-Wits-Tweed Analysis which combines both angular, ratioed, and linear references. There is no single step of this surgical preparation process that is critical – there is no hierarchy of decision making. There are many elements that *combined* result in an ideal outcome.

SNA (°)	71.4	82.0	3.5	-3.0 ***
SNB (°)	66.0	80.9	3.4	-4.4 ****
ANB (°)	5.4	1.6	1.5	2.5 **
Occ Plane to SN (°)	34.3	14.4	2.5	8.0 ******
Pog - NB (mm)	-1.2	2.4	1.7	-2.1 **
MP - SN (°)	50.8	33.0	6.0	3.0 ***
FMA (MP-FH) (°)	37.3	23.9	4.5	3.0 ***
Interincisal Angle (U1-L1) (°)	111.0	130.0	6.0	-3.2 ***
U1 - SN (°)	93.7	102.8	5.5	-1.7 *
U1 - NA (mm)	6.1	4.3	2.7	0.7
U1 - NA (°)	22.3	22.8	5.7	-0.1
L1 - NB (mm)	8.6	4.0	1.8	2.6 **
L1 - NB (°)	41.3	25.3	6.0	2.7 **
FMIA (L1-FH) (°)	38.2	64.8	8.5	-3.1 ***
IMPA (L1-MP) (°)	104.5	95.0	7.0	1.4 *
Lower Lip to E-Plane (mm)	5.1	-2.0	2.0	3.6 ***
Upper Lip to E-Plane (mm)	-1.3	-6.0	2.0	2.3 **
Soft Tissue Convexity (°)	125.0	132.4	4.0	-1.9 *
Wits Appraisal (mm)	-1.8	-1.0	1.0	-0.8



3. DETERMINE THE SKELETAL DISCREPANCY AND COMMITMENT TO A TREATMENT PLAN

We must be able to determine what the skeletal discrepancy (i.e. Diagnosis) is from the onset. We need a surgical-orthodontic diagnosis. Secondly is the production of a problem list with the categorization of the deficiencies, abnormalities or discrepancies that exist. This allows us to determine the course and predictability of the surgery. From an orthodontic standpoint, the determination of the skeletal discrepancy needs to be shared with the surgeon. The orthodontist must commit to a diagnosis. We see two types of failures in neglecting this diagnostic discipline:

The first is the misinformed patient. A complacent orthodontic commitment without full disclosure of what outcomes may occur and where the limitations may lie results in challenges that a proper informed consent process was undertaken. (i.e. the patients do not know what they are getting themselves into). The second failure are those patients that are misdiagnosed that may NOT require surgery yet are consulted by the surgical team simply because of an error in assessment.

The best referral letters would include a statement from the orthodontist such as:

> *"I believe that patient XX has a CLASS II MALOCCLUSION of skeletal and dental etiology DUE TO a retrognathic mandible, orthognathic maxilla, CHARACTERIZED BY a 7mm overjet and mild bimaxillary crowding.. The occlusion cannot be corrected with orthodontics alone and in order to achieve a stable, functional, and esthetic result a sagittal split osteotomy advancement to correct this skeletal malformation may be required."*

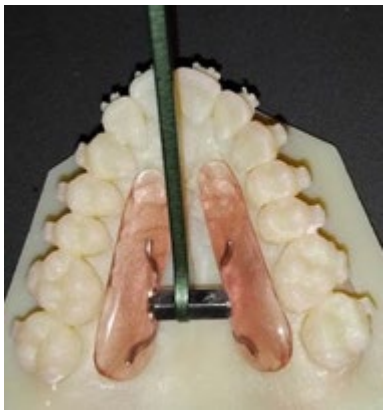
This simple statement not only engages the orthodontist and the patient within all treatment decisions, it also gives the surgical team a direction to proceed with. The worst referral letters would include the singular statement: *"patient needs jaw surgery"* without any commitment to diagnosis.

4. DETERMINE THE TRANSVERE DISCREPANCY

It is necessary from the outset to figure out how much widening the maxilla needs. This point is often overlooked. This is best done with models. Ideal diagnostic wax-ups should be obtained and for complex crowded cases with transverse discrepancies this is quite beneficial. The determination as to whether or not a segmental osteotomy or a surgically-assisted rapid palatal expansion varies among surgical teams. It is also dependent on the orthodontic preparation. The easiest way to determine this is by a rough estimate of placing the molars in the predicted class I occlusion. For example, measuring the Central Fossa of the maxillary first molars and comparing it to the DB cusp of the mandibular first molar gives a rough number (assuming the case is a NON-extraction case). Of course, the measurement should be tempered with assessing the curve of Wilson and the tipping of the maxillary molars.

In general anything with over 5-6mm transverse maxillary discrepancy would require a surgically assisted rapid palatal expansion (SARPE) prior to any other surgery.

Other reasons for a SARPE include:



1. significantly crowded dentition with non-extraction treatment,
2. A flattened palate with a transverse discrepancy,
3. No room for any alveolar expansion and orthodontic limitations to obtain a good setup,
4. Questions about long-term stability and if any of the orthodontic movements presurgery may be unstable (open bite for example) and
5. If a Lefort advancement of greater than 5mm is planned with segmentalization to expand the maxilla (these cases are prone to significant relapse). If a SARPE is required then this is performed first. With the advent of bone-borne or TAD retained appliances (TAPE), orthodontic therapy need not be delayed.

The SARPE SCORE:

An algorithm that evaluates 4 elements: the absolute transverse measurement; the curve of Wilson; tooth-arch requirements (crowding) and the inclination of the buccal segments. By using the table, the surgical-orthodontic team can be aided in the decision whether a case can be treated by segmentation of the maxilla during OGS, or that a SARPE is needed prior to orthodontic level and alignment.

Score	**1**	**2**	**3**
Transverse measurement*	0-4mm	4-8mm	>8mm
Lingual Inclination of the Buccal Segment	Lingually inclined	Straight/Vertical	Buccally inclined
Tooth Arch discrepancy	Need to Extract teeth	Moderate: IPR	Mild: Non-Extraction
Curve of Wilson	Flat	Shallow/Mild	Deep
Total			

*measure the central fossa of the upper maxillary 1st molar compared to the distal buccal cusp of the lower mandibular 1st molar (or measure the relationship in the predicted (final) class I molar occlusion)

The SARPE Score table is a guide to help determine the management of transverse discrepancies. The score is added for each row and the total score is applied to the decision range as follows:
<5 = manage orthodontically.
5-8 = manage with a segmental Lefort
>8 = manage with a SARPE

5. PLAN WITH YOUR SURGEON A SURGICALLY-BASED TREATMENT PLAN AND ESTABLISH A FINAL OCCLUSION

There are certain surgical movements that simply cannot be done. Orthognathic surgery is orthodontically driven; however, knowledge of surgical limitations is critical. For example, the amount of instability in OGS increases with the degree of difficulty of the surgery and amount of movement. Lefort impactions are very stable, sagittal split advancements are also stable, but as we move down to a Lefort advancement, Lefort setback, sagittal split setbacks and Lefort downgrafts, there is greater and greater instability. Remember Proffitts hierarchy of stability in OGS. If the ideal cephalometric analysis produces movements of the bony changes outside a stable envelope, it is prudent to minimize some of these changes and look at alternatives that will still give us the aesthetic outcomes necessary.

If the surgical treatment plan is based on an ideal cephalometric outcome but leads to, for example, down grafting the maxilla and a set back of the mandible in exaggerated amounts then alternative treatments or modifications may be necessary. The primary objective in positioning the occlusion should be based on the position of the central incisors in a horizontal, vertical, and angular position. This results in the most esthetic position. Then, limiting certain vectors in order not to place so many instabilities within your treatment plan should be the goal. These movements need to be favourable and contained (stable). This surgically-based treatment plan emphasizes a simple plan with stable surgical movements and it also creates surgical efficiencies. This results in shorter surgical times, therefore shorter hospital stays, easier recovery, less blood loss, less complications and eventually better stability. Furthermore, care needs to be taken in creating too large of vertical movements that jeopardize the condyles (see section 8).

Another example is increasing facial height. It is uncommon to have to induce surgical changes that produce a noticeable difference in down grafting a maxilla a small amount. This however is not the case for syndromic short vertical face height where down grafting is a significant and beneficial movement. Down grafting (inferior repositioning of the maxilla) is very unstable movement and if it is large (>5mm) then interposition bone grafts taken from the iliac crest are required to make it stable and result in esthetic improvement.

Final Occlusion: The orthodontist can be involved in this step but mostly to understand where challenges may exist in fitting the best occlusion. The Orthodontist must be able to accept that the occlusal set up may not be as good as they hoped. Only the orthodontist knows if they can finish the case post surgically given a certain occlusal setup. Also, if segmentalization is required, the orthodontist should understand why it is necessary and as well be able to prepare the patient that spaces may remain after Ortho is complete because of the unmasking of a Bolton.

Occlusal Esthetic Quartet: Incisor Angulation, Occlusal Plane Angle, Effectiveness of Pogonion and Fullness at Subnasale

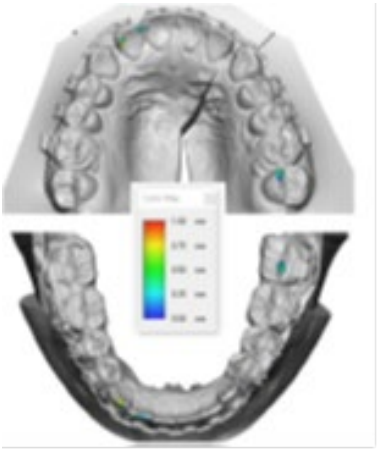
The occlusal plane determination will influence many points (Figure 5). For example, if the occlusal plane is increased during the digital planning session then expect:

1. Upright Proclined incisors
2. Increasing the fullness at Sn
3. Reducing the prominence of pogonion
4. Promoting an esthetic U-shaped smile

Although these elements can be used in beneficial esthetic changes, it must be noted that they can quickly and easily ruin a well-executed plan. Simply increasing the occlusal plane to soften pogonion and ignoring that a patient has upright incisors, will induce a very unaesthetic retroclined incisor look. Furthermore, over steepening the plane will cause unesthetic alterations to Subnasale and cause the patient to have the appearance in the subnasal/labial area akin to the "Whoville " look. .

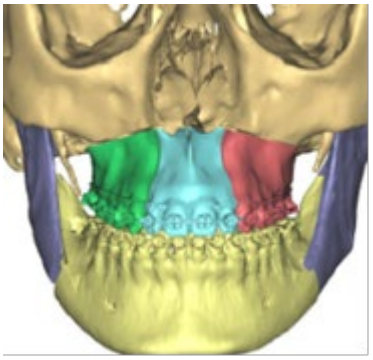
Finally, consideration must be given for the age of the patient. Sarver has evaluated extensively the position of the teeth and gingiva and mandibular teeth. Over decades of evaluation it is obvious that with aging there is less tooth display of the maxillary incisors and more teeth display of the mandibular incisors. To this effect then it should be noted that providing patients with more tooth show is more youthful.

6. DECOMPENSATION AND ADJUVANT TOOTH POSITIONING (IOWA SPACES AND SEGMENTAL SPACES)



This is probably the single most important presurgical orthodontic goal. It is simple in concept and all orthodontists are keenly aware of it. However, it seems to be a challenge in some cases and for some clinicians. Some deformities are difficult to decompensate (eg very deep bites). This can lead to the great frustration. These also may be cases that are amenable to a surgery first approach. It is surprising for cases after presenting for surgical consultation with a Class II deformity and 7-8mm overjet to then show up one year later "ready" for a mandibular advancement surgery but with a 3mm overjet and class II elastics in place! Obviously the compensations have not been removed and in fact a non-surgical method of orthodontics has been applied. This may be due to a lack of communication between orthodontist and allied staff. A clear understanding by the entire orthodontic team with a review of the goals including decompensation is needed. Labelling surgical charts differently (eg a red folder) will alert ortho and staff to pay particular attention in avoiding compensatory changes. Enough cannot be said about decompensation: uprighting the existing dentition over basal bone without expanding the alveolus; level and alignment without compensatory movements; elimination of the curve of Spee as best as possible (except in deep bite Class II mandibular retrognathic cases where this curve of Spee can be more easily corrected post-surgery); flattening the curve of Wilson; and, uprighting or proclining incisors into the ideal arch position.

Study Models: Make the discrepancy as worst as possible - the dental discrepancy needs to reflect the skeletal discrepancy. This allows us to maximize our surgical changes which will also benefit the patient aesthetically. In discussing decompensations, we need to discuss the important use of study models. If you feel the patient is ready for OGS from an orthodontic standpoint, you MUST take study models or scan the teeth and send to a digital planner to establish whether or not a proper final occlusion is possible.



Segmentalizing: Models also help in determining if any segmentalization is required and where. Sometimes we discover a Bolton problem at this stage and now spaces are needed in the lateral incisor area. The patient can then be warned about this. Where the position of osteotomy in the maxillary arch will eventually be can be determined early: it is usually between the central incisors for a 2 piece maxilla or between the laterals and canines or the canines and first premolars for a 3 piece maxilla. In

either case it is recommended NOT to separate the teeth or the roots to allow for surgical cuts. This is for 3 reasons. The first is that the location of the segmentation (osteotomy) may be altered during the surgical splint fabrication stage. Secondly the tipping of the teeth makes proper occlusal set up a challenge. Thirdly, contemporary OGS do not cut or osteotomize between the roots but rather a "split" is created that propagates down one or the other PDL in the segmented space.

Iowa Spaces: A misconception is that an Iowa space (between the laterals and canines) is for segmental spaces or to compensate for Bolton discrepancies. Although this sometimes these may be coincidental findings, the Iowa spaces are created to establish a proper and solid class I occlusion in the surgical final occlusion. Orthognathic set ups are created in a perfect CLASS I CANINE position. If however there are interferences from the incisors because of restrictions of overjet (incisor angle, shape, size or position) when trying to establish that perfect canine class I, then Iowa Spaces are created by dumping the incisors anteriorly, socking in the canines in class I for surgery, and then after surgery these spaces can be retracted to the normal position. Although these are beneficial in many cases from an orthodontic standpoint, they may be problematic when trying to establish ideal incisor positioning during VSP or at least need to be accounted for.

When is the ideal age for OGS?

The combination of wrist films, superimposition of lateral cephalometry or spheno-occipital synchondrosis seen in CBCT are several guides to determination of growth cessation. The surgical orthodontic team should get a good idea of the suitability for timing. In general the ideal age for surgery appears in the realm of: [9–12]

- Severe class III mandibular excess: you can initiate phase 1 orthodontics with expansion and Alignment. Delay surgery until demonstration of completion of mandibular growth. This could be as late as 22-24 years old
- In severe asymmetry and unilateral hypertrophy, the surgery may need to be delayed until bone scans demonstrate cessation of growth activity of the hypertrophic condyle.
- In cases with vertical maxillary excess (Class I + Class II): the surgery can be considered before growth is complete when psychosocial factors dictate; however, these patients may require mandibular surgery in the future.
- In cases with maxillary transverse deficiency: orthodontic expansion may be effective up to age 14 (girls) and 16 (boys). Thereafter, expansion of the maxilla may require either a surgical expansion (SARPE) or segmental osteotomy.
- Some mandibular deficiencies may be treated early as these patients will have the same Class II relationships throughout growth. The mandibular advancement in this group is stable. However, younger patients do show greater changes than adult treated cases especially in larger movements.

Notwithstanding, the psychosocial needs and requirements of the patient may supersede these growth determinants and close monitoring of mental maturity and preparedness is required. The influence of social media on our patients is a further element to be aware of when counseling is performed. A fine balance between too early surgery resulting in a poorly prepared patient subjecting them to relapse and possible stunting subsequent growth needs to be tempered by performing surgery too late when orthodontic management, patient compliance, the effects of social stigma and burnout lead to an unsatisfied patient.

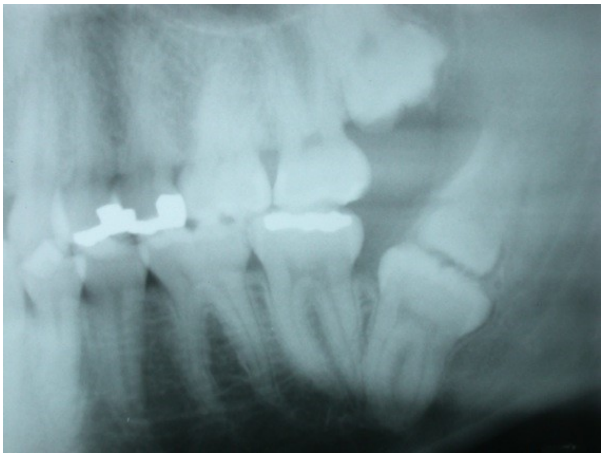
"Readiness" for surgery depends on 3 items:

1. Maturity/Growth (including patient mental maturity),

2. Orthodontic Preparedness for post-operative finishing,

3. Requirements for successful surgical preparation and execution.

7. REMOVAL OF WISDOM TEETH



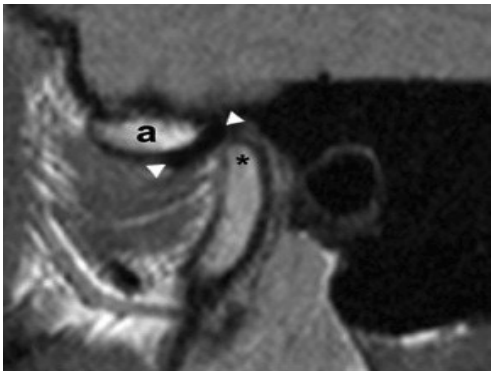
Wisdom teeth should be removed as soon as the patient embarks on the planned surgical orthodontic treatment. There is no strong evidence supporting removing wisdom teeth during OGS. It may increase the risk of bad splits and importantly it may make it more difficult to apply rigid fixation from a practical, mechanical, and technical standpoint. Removal of wisdom teeth at the time of orthognathic surgery will lengthen the time of surgery and can set up unforeseen events (i.e. surprises). Furthermore, the removal of these teeth beforehand and in the office setting increases the surgeon/patient bond. It also familiarizes the patient to the surgical treatment plan. Also, when done early, the bone heals very well and during orthognathic surgery there are fewer worries with regards to the possibility of bad splits or poor rigid fixation application or stability. So, as the orthodontist, it is important to address the wisdom teeth and look at removing them in a timely fashion.

Obviously, the management of any other malpositioned tooth (canines, second molars) should be addressed preoperatively. An ideal minimum would be about 5-6 months to allow for full bone healing.

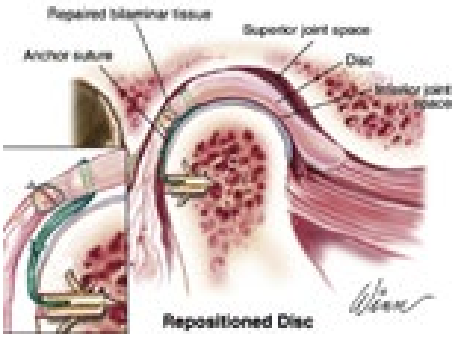
A note about TADS. These are now increasing used to help with direct or indirect anchorage and can be applied at anytime during the peri-orthognathic phase. These can remain in place and do not hinder the surgical outcome. Not too infrequently the surgeon may place supplemental TADs or Fixation screws or MMF (Maxillomandibular) fixation screws to improve or aid in stabilization of the dentoalveolar segment or as a utility anchor for numerous reasons.

8. ENSURING OPTIMAL TEMPOROMANDIBULAR JOINT HEALTH

It is essential that symptoms are controlled palliatively. Orthodontic treatment, jaw surgery and TMJ health may be anatomically and functionally related but from a treatment standpoint, each must be seen to be independent. If there's suspicion of active inflammation while presurgical orthodontic treatment is occurring, then address the TMJ complaints. If the complaints are not managed then orthognathic surgery may need to be delayed. Delaying or postponing surgical orthodontic treatment is prudent as oftentimes there is some burn out or accommodation or resolution of the symptoms over a 4-6 month period.



The problem is that some patients have of ongoing TMD but they may BENEFIT from OGS to provide a stable occlusion and stable and functional joint. Many patients undergoing any orthodontics or who have dentofacial deformities will have some sort of TMJ symptoms at some point during or after treatment. A common rule of thumb is that the correction of the dental facial discrepancy does actually improve overall TMJ health in about 70% of patients. The issue with that is we do not know which patient category fits into the 70% since the spectrum is so broad. Some patients with severe internal derangements with pain (Wilkes >3) may actually benefit from OGS and concomitant TMJ disc plication.



The degree of maxillary impaction producing mandibular auto-rotation in cases with vertical maxillary excess and high mandibular plane angles may induce a rotation of the mandible counter clockwise. Excessive rotation may place the patient at a higher risk of post-operative condylar issues (ICR?) because of the poor condyle fossa relationship that is established. Pre-operative nuclear medicine scans may be required in cases of active disease and is also useful in the assessment and monitoring of possible idiopathic condylar resorption. Cases predisposed to idiopathic condylar resorption need to be identified and prophylaxis to settle the joints or prevent problems should be instituted. A specific idiopathic condylar resorption prophylaxis has been established (*sic*).

There is no specific recommendation when having to deal with patients with concomitant TMD or TMJ disorders and each needs to be evaluated uniquely.

9. IDEAL ORTHODONTIC MECHANICAL SUPPORT

Obtaining proper mechanical aids cannot be emphasized enough. It is probably the single greatest source of surgical frustration. Patients requiring mandibular sagittal split osteotomies need molar bands on the first molars. The use of the bands is critical during surgery when screws are placed across the osteotomy. When these screws are tightened, rotational forces at the osteotomy may occur. This translates into a change in position of the bone and then a vertical change in the occlusion (posterior open bite). This can be prevented with good inter-maxillary fixation which can only be obtained with good mechanical orthodontic aids. When we tighten the interarch wires after we have set the occlusion using our splint, we cannot have orthodontic aids moving around.

Archwire: the archwire that is placed must be the largest that the bracket prescription can handle. This wire then needs to be firmly tied to each bracket with ligature wires and not elastics. The use of Speed or other self-ligating brackets is not a contraindication but ligatures need to be tied around them to avoid them inadvertently opening during the peri and post-operative stages. A final note about **bracket systems** is that glass or porcelain brackets can be used however the issue form a surgical standpoint is that the corners can break off during MMF or during surgical manipulation and these tiny pieces of glass can make their way into the wound.

Hooks.

-Closed crimped hooks slipped on a detached RECTANGULAR wire provide the best support. They come in various heights with smoothed ball-ended or oval-ended tips. Orthodontists may not like putting these on because the archwire needs to come off and then the hooks are slipped on and then the archwire needs to go back in…. However, this remains the ideal.

- They next best option is to place open crimped hooks on the existing wire. These are much easier to place and come in many shapes and sizes. Trillium hooks are very popular but the short 1-2mm ones should be avoided; recently the company has introduced a 3mm tall version that works very well. Also, the size of the open crimped hook MUST match the archwire size otherwise it will rotate when any elastic or wire traction is placed on it.

-Soldered hooks were once the norm but are now mostly abandoned because of the hooks falling off due to a lab issue or poor soldering. The problem is that these extensions are very difficult to retrieve intra-operatively and are only recognized embarrassingly in the post op radiographs! (these items DO NOT pose a problem in the long term)

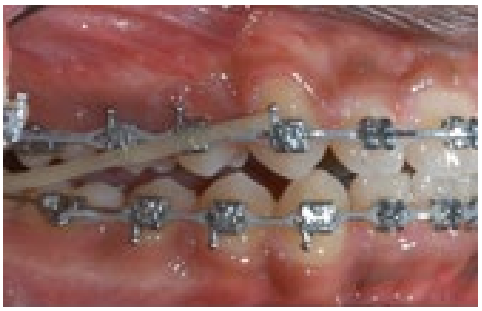
-Vertical Slot attachments: Power pins (whale tails) added to the vertical slot on a bracket system. These are sufficient but not ideal

-Kobiashi hooks: again these are moderately useful but not ideal and problematic if rigid stability is needed such as in segmental maxillary surgery.

10. ASSISTING IN POST-OPERATIVE MONITORING

The patient is followed carefully after the surgery. Usual visits are at post op: week 2 (with radiographs); week 6 (with elastic changes and splint removal prn); week 12 to finalize elastic wear; week 26 (to monitor); and week 52 (for final records). However, the first 6 weeks' focus should be left to the oral surgeon in order to help monitor the patient's wounds and the osteotomies as well as the occlusion. OMFS must take ownership of the occlusion immediately after surgery and any interventions required need to be dealt with immediately. The surgeon needs to look at the loss of fixation, movement of the osteotomies, creation of instabilities, poor splits, poor splints, and anything that may cause the occlusion to shift. If this occurs early within the first week or two, a good surgeon knows to go back to the operating room and repair these things. To camouflage these errors with elastics is negligent and problematic.

The orthodontist needs to understand that the occlusion in the first 8 weeks post surgery is subject to many changes (muscular, occlusal, fixation, bony, TMJ). Sometimes a keen orthodontist may jump into the case too early post-surgery and sees an imperfect occlusion and reacts. Their reaction may create anxiety to the team or patient. Let the OMFS deal with it. There is a settling and accommodation phase where shifting WILL occur.



Elastics: the first set of elastics are usually heavy (6ou 170gm) ¼ inch (we use Fred (3M unitek) and the patient is almost in a quasi-MMF situation but can open a little for the first two weeks. The elastics vector is in the direction of the deformity that was corrected. Mandibular advancements are kept in Class II elastics. These are tight for 2 weeks for 24hrs a day then for 2 weeks at 21hrs a day and then for 2 weeks at 18 hours a day. The goal by week 8 is to have simple overnight elastics.

The Orthodontic visits and treatment can restart at 6-8 weeks post op. The orthodontic brackets, regardless of the occlusal result, should not be removed for at least 3 months. Early debonding is a problem because there are still small osteotomy changes that can occur. In some segmental cases, the splint can stay in place up to 6-8 weeks depending on how much expansion was performed. Splint removal requires good coordination. Patients need to be seen by the orthodontist immediately after splint removal to have the arch wire changed and/or to place a TPA if there has been expansion. Relapse following splint removal can be rapid and significant depending on the surgical changes.

All this changes with the use of Clear Aligners and is covered in another section.

CONCLUSION:

There are many variables that can make an ideal occlusion difficult. A perfect occlusion is a combination of orthodontic setup, the surgical movement of bone across osteotomies, muscular tension, joint changes, bone healing, and external forces on the osteotomies. A perfect esthetic result involves a good occlusal setup, proper planning, a well executed surgery and respect for hard/soft tissues. There are so many variables that influence our outcomes. Some as we know are clearly within our grasp and it is these that both surgeon and orthodontist can and should control. There are other factors that are beyond our control that can negatively affect our results but at least an expert team will recognize early and apply appropriate interventions if needed.

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