

Oral and Maxillofacial Surgery Review

A Review of Anatomy and Treatment Considerations for the
Non-OMS Surgeon

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FACIAL COSMETIC SURGERY

Facial Analysis

Upper, middle, and lower facial thirds

Facial fifths

Gross asymmetry (inferior border of mandible, dystopia)

Tooth display in repose

Gingival display in animation

Lip asymmetry in repose and animation

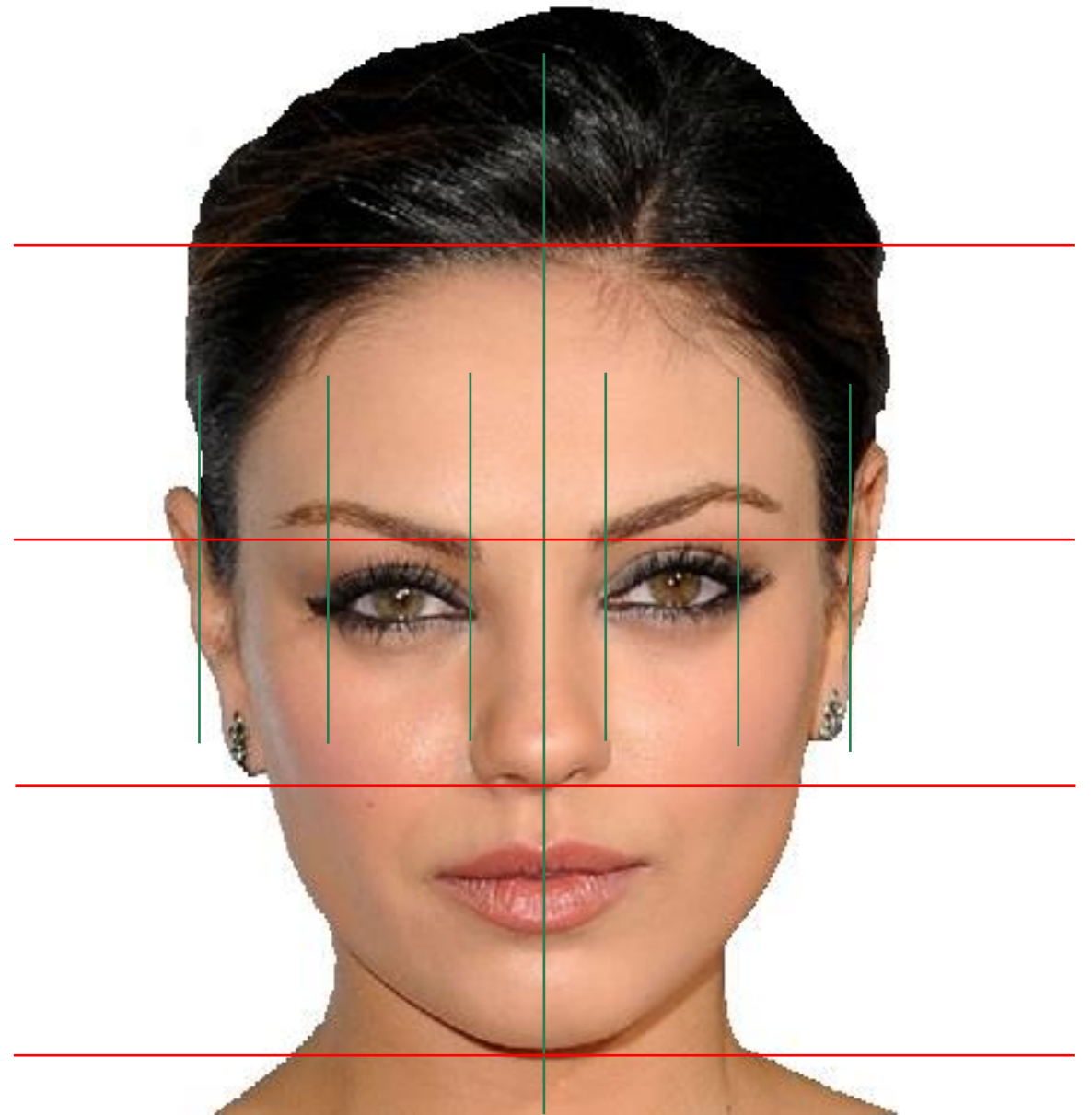
Cants and yaws

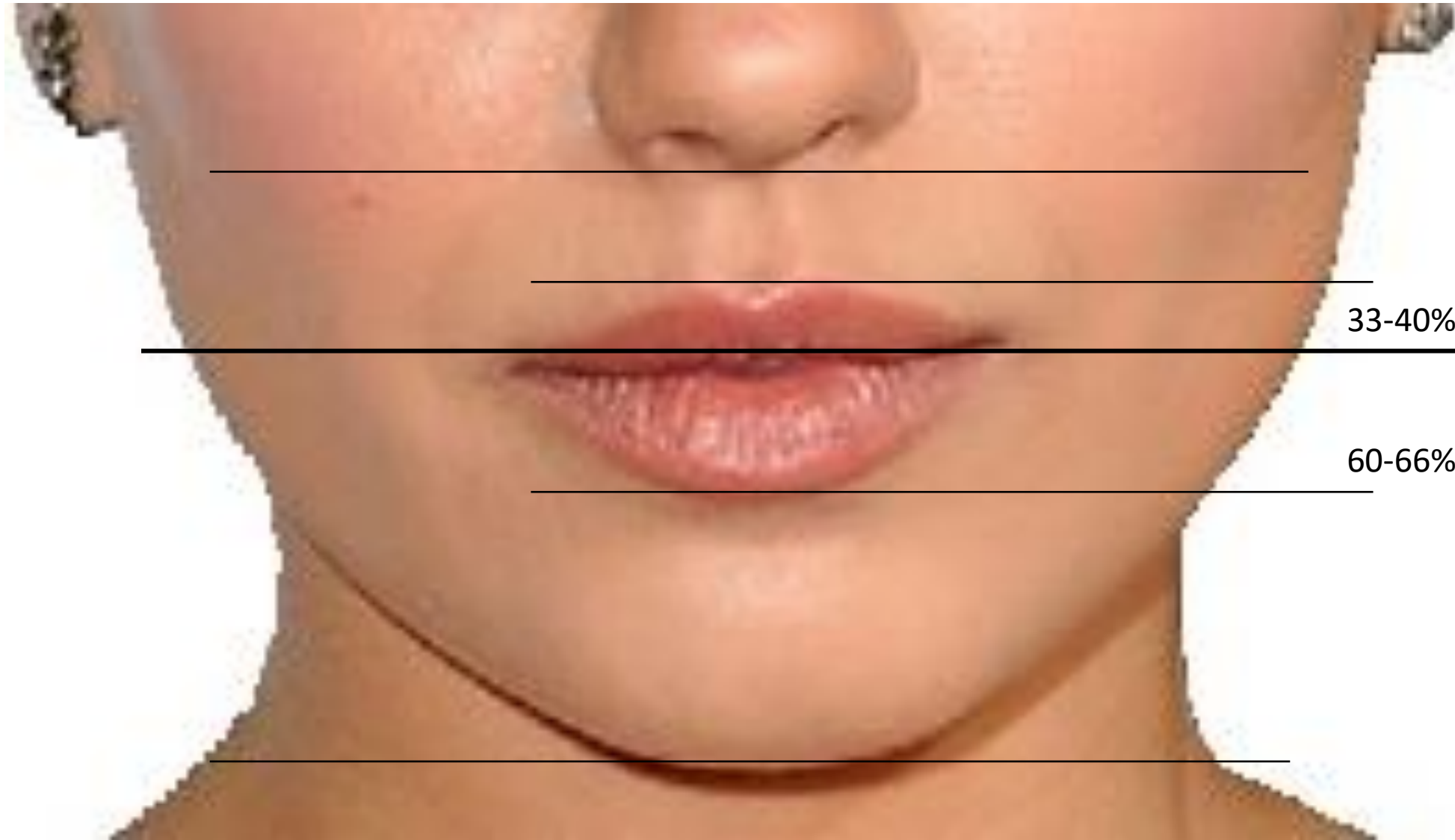
Hemimandibular elongation / Malar hypertrophy

Excessive /deficient genial projection

Long /short lower facial height

Under /over projected nasal tip or illusion from genial projection





1/3

33-40%

60-66%

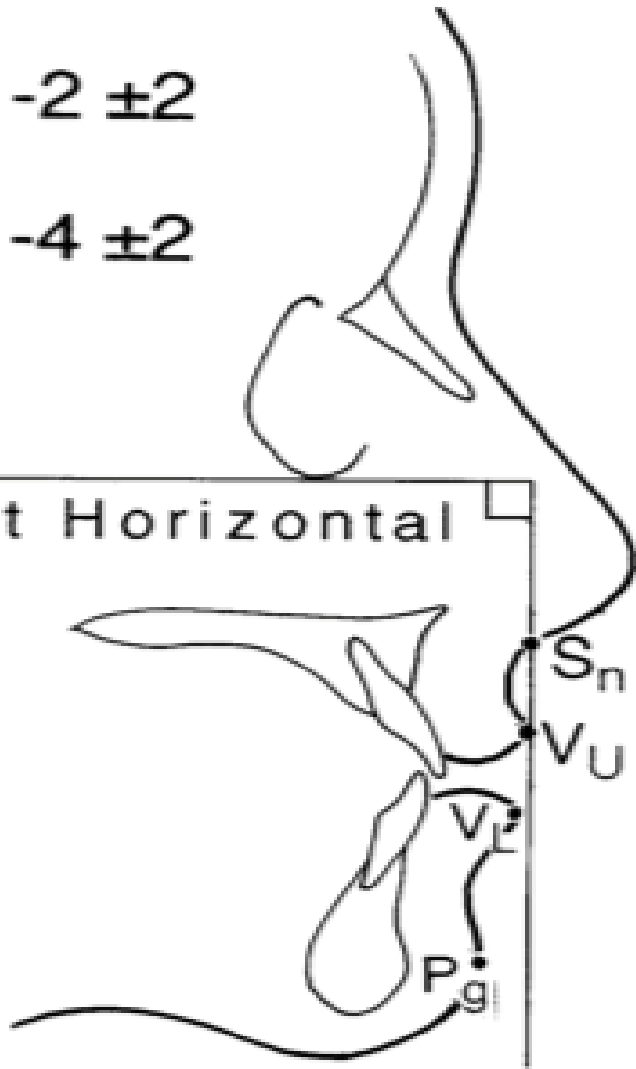
2/3

$$S_n - V_U \quad 0 \pm 2$$

$$S_n - V_L \quad -2 \pm 2$$

$$S_n - P_g \quad -4 \pm 2$$

Frankfort Horizontal



If You are in Question if it is an
Orthognathic Case or not,
Look in the Mouth at the
Occlusion & Look at the Smile

Orthognathic Surgery

Bony framework sets the foundation for facial aesthetics

Soft tissue envelope enhances substructure

Provides volume, expression, and protection

70-75% of patients presenting for orthognathic surgery are concerned with facial appearance



Goal of Orthognathic Surgery

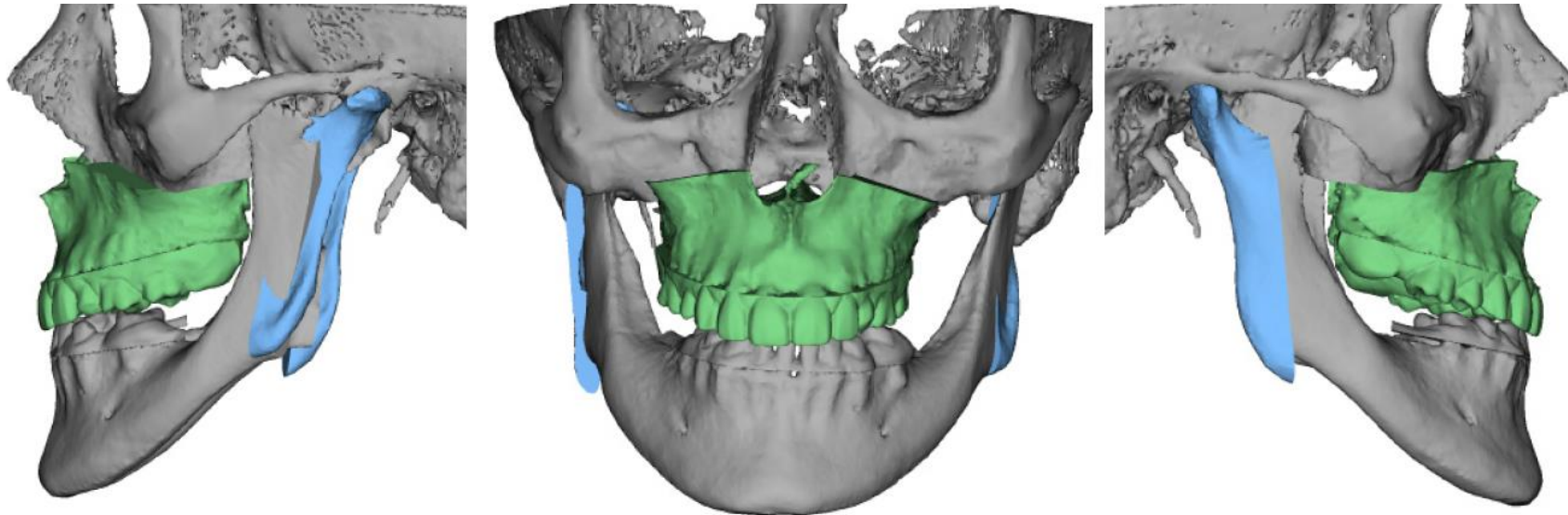
Surgical correction of facial skeletal deformities

Primarily done for the correction of skeletal malocclusion

Correction of both form and function

- Malocclusion, sleep apnea, temporomandibular dysfunction, and poor aesthetics

Most dramatic functional and facial cosmetic surgical procedure



Frontal View

Frontal:

Upper 1/3:

Male pattern baldness, frontal bossing, rhytids

Middle 1/3:

Eyebrows (symmetrical, position)

Eyes lids (scleral show, ptosis, dermatochalasis)

Dystopia/anti-mongolid slant, canthal positioning

Otic Projection (normal, excessive)

Radix curve

Dorsum (wide, narrow, normal)

Dorsum (straight, deviated, C-shaped deformity crooked, twisted)

Tip definition (well defined, bulbous, midline, triangular)

Alar base width (coincident with intercanthal distance, wide)

Gull wing (adequate, narrow, steep)

Lower 1/3:

Cupids bow

Fullness of lips

Upper 1/3 to Lower 2/3

Symmetric mandible

Jowling

Platysmal banding



Repose

Tooth to Lip:

3-4mm in females

2-3mm in males



Animation

Gingival display

Adequate

Excessive

None

Tooth to lip

Amount

Buccal corridor

Maxillary constriction



$\frac{3}{4}$ View

Malar/submalar projection

Paranasal support

Jaw line



Profile

Upper 1/3:

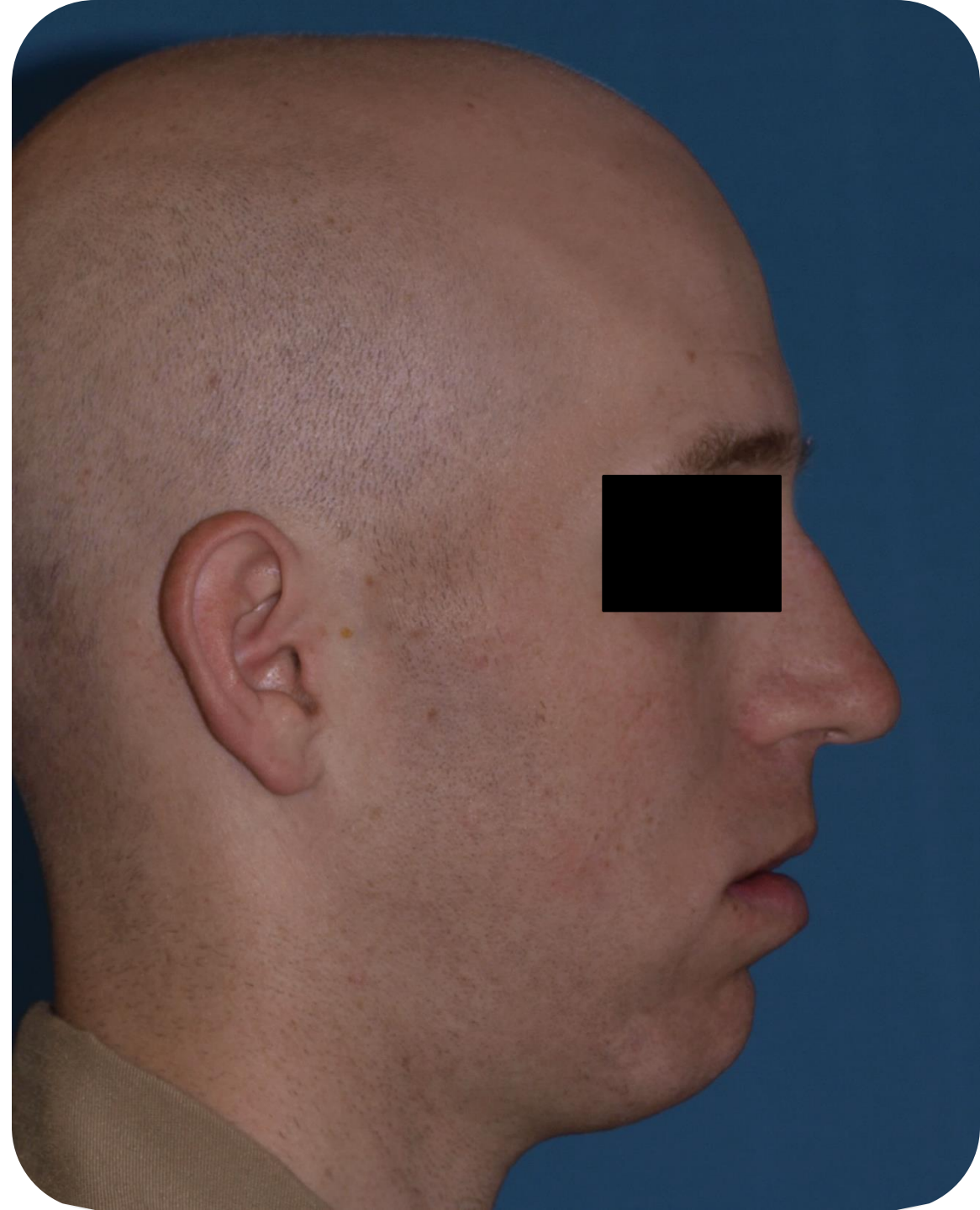
Unremarkable, frontal bossing,
prominent supraorbital rim, androgenic
alopecia

Middle 1/3:

Radix takeoff (high, low, good)
Radix projection
Dorsal hump (flat, hump, pseudohump)
Supra-tip break:
Tip projection and rotation (under
rotated, over rotated, adequate)
Alar, columella
Nasolabial angle
Paranasal support

Lower 1/3:

Upper lip support
Lower lip support
Labiomental groove
Genial projection
Cervicomental definition
Thyromental distance



Submental View Vertex

Dorsum (midline, deviated, asymmetrical)

Tip deviation

Tip shape

Bulbous, Triangular, trapezoidal, amorphic

Nares to tip ratio

Nares symmetry

Footplates

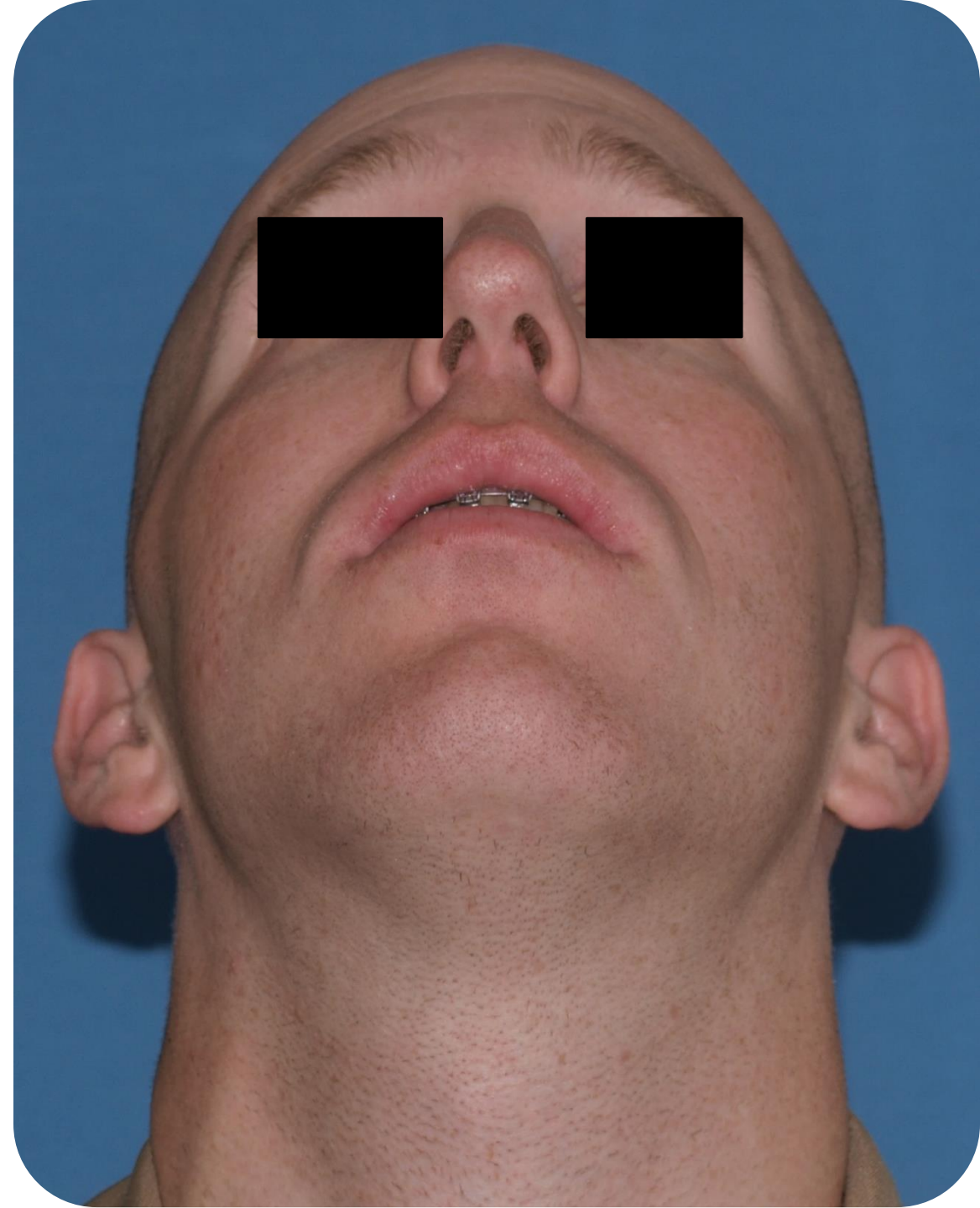
Alar base width

Malar projection

Infraorbital hollowing

Chin with midline

Mandibular asymmetry



Dental

Molar/canine classification

Crowding

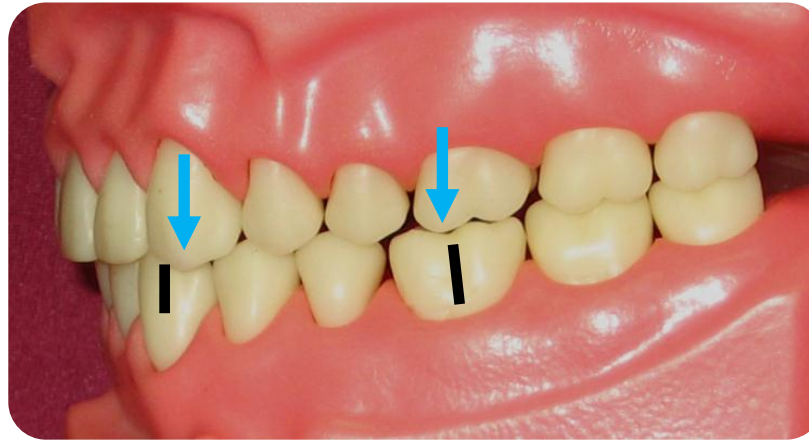
Midline

Open bite

Cross bite

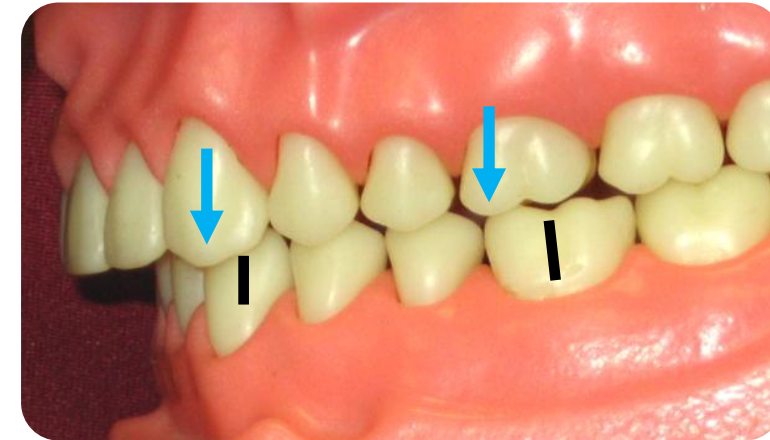
Overbite/overjet

Molar/Canine
Dental Class 1 Occlusion

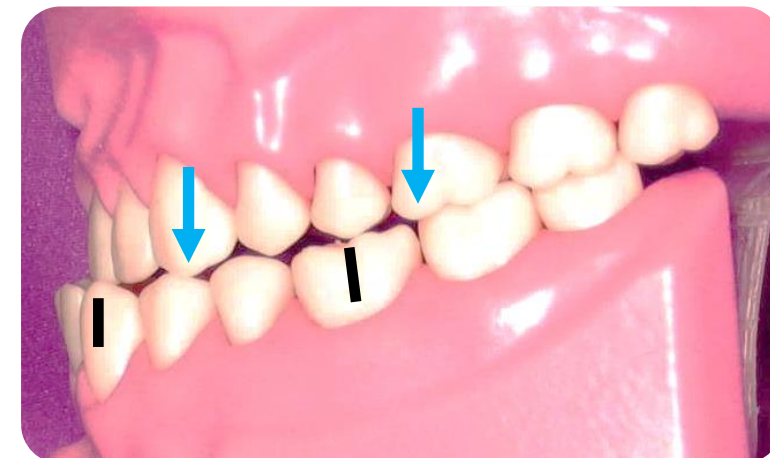


1. Find the mesial buccal cusp of the maxillary first molar and cusp tip of the canine
2. Find the buccal groove of the mandibular first molar and the cusp tip of the mandibular canine

Molar/Canine
Dental Class 2 Malocclusion



Molar/Canine
Dental Class 3 Malocclusion



Dental

Molar/canine classification

Crowding

Midline

Open bite

Cross bite

Overbite/overjet

Open Bite (Apertognathia)



Deep Bite



Under Bite



Cross Bite



Over Bite



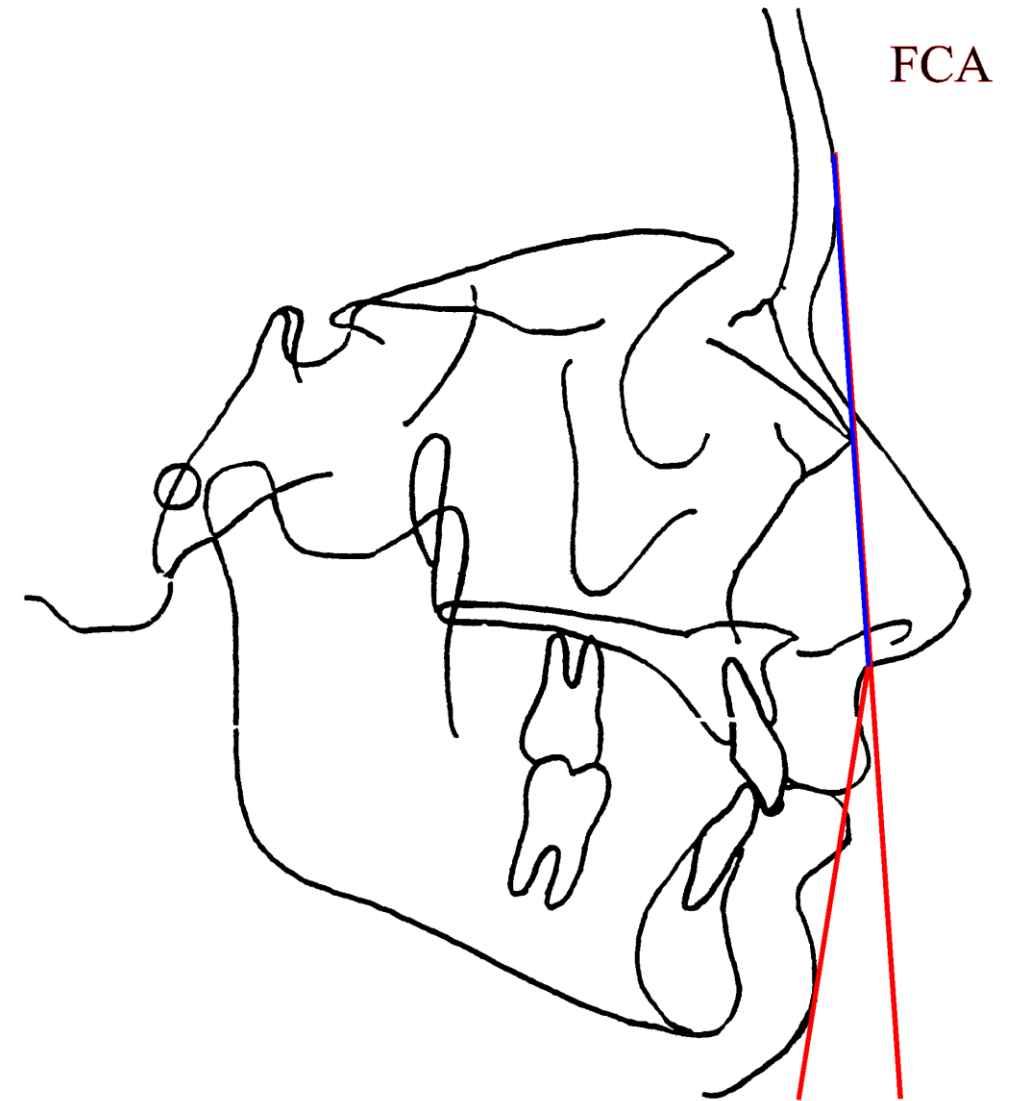
Under Bite



Skeletal and Associated Soft Tissue Diagnoses

• Facial Contour (FCA)

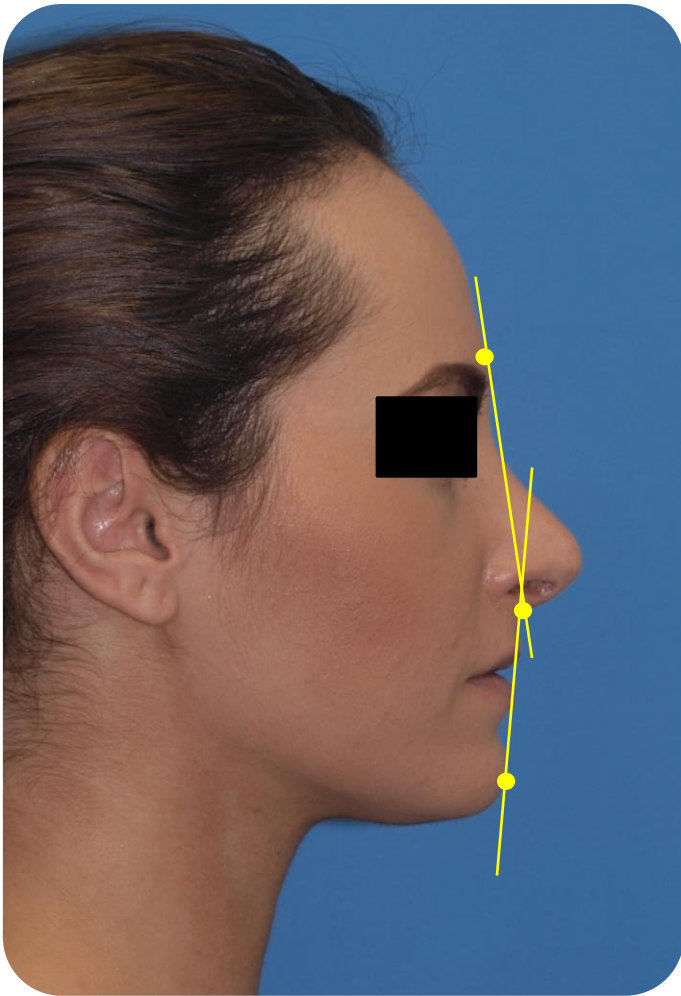
- Formed between a line from Glabella to Subnasale (extended) and a second line from Subnasale to soft tissue Pogonion
- More negative = convex profile
 - Indicating mandibular retrognathia or maxillary prognathism
- More positive = concave profile
 - Indicating mandibular prognathism or maxillary retrusion
- May be influenced by:
 - Frontal bossing
 - Shallow forehead slope
 - Unusual soft tissue thickness and bony chin projections



Skeletal and Associated Soft Tissue Diagnoses

Skeletal Diagnosis

Skeletal Class I



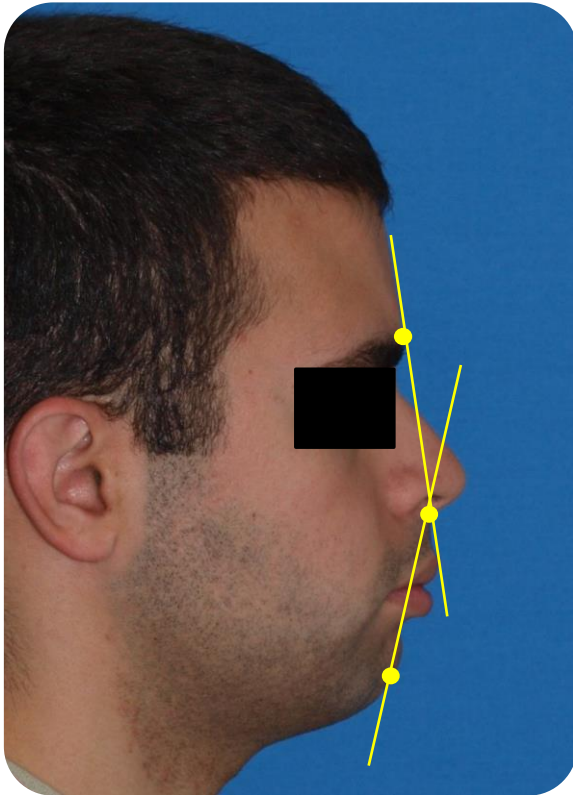
Associated Hard/Soft Tissue Diagnoses

Bony structures good. May be any other associated soft tissue defects

Skeletal and Associated Soft Tissue Diagnoses

Skeletal Diagnosis

Skeletal Class II secondary to mandibular anterior-posterior deficiency (retrognathia)



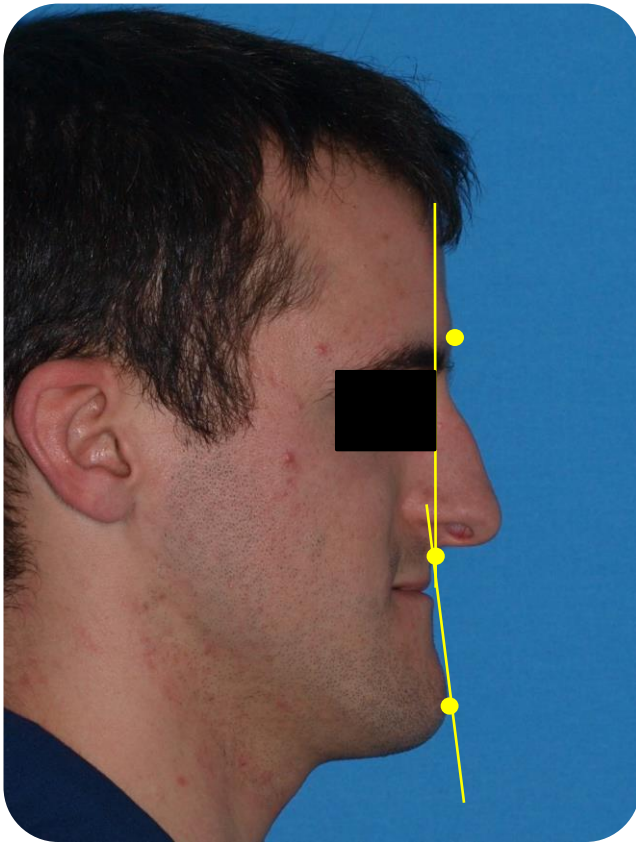
Associated Hard/Soft Tissue Diagnoses

- Deficient genial projection
- Short lower facial 1/3
- Submental adiposity
- Poor cervicomental definition
- Short thyromental distance
- Deep labiomental sulcus

Skeletal and Associated Soft Tissue Diagnoses

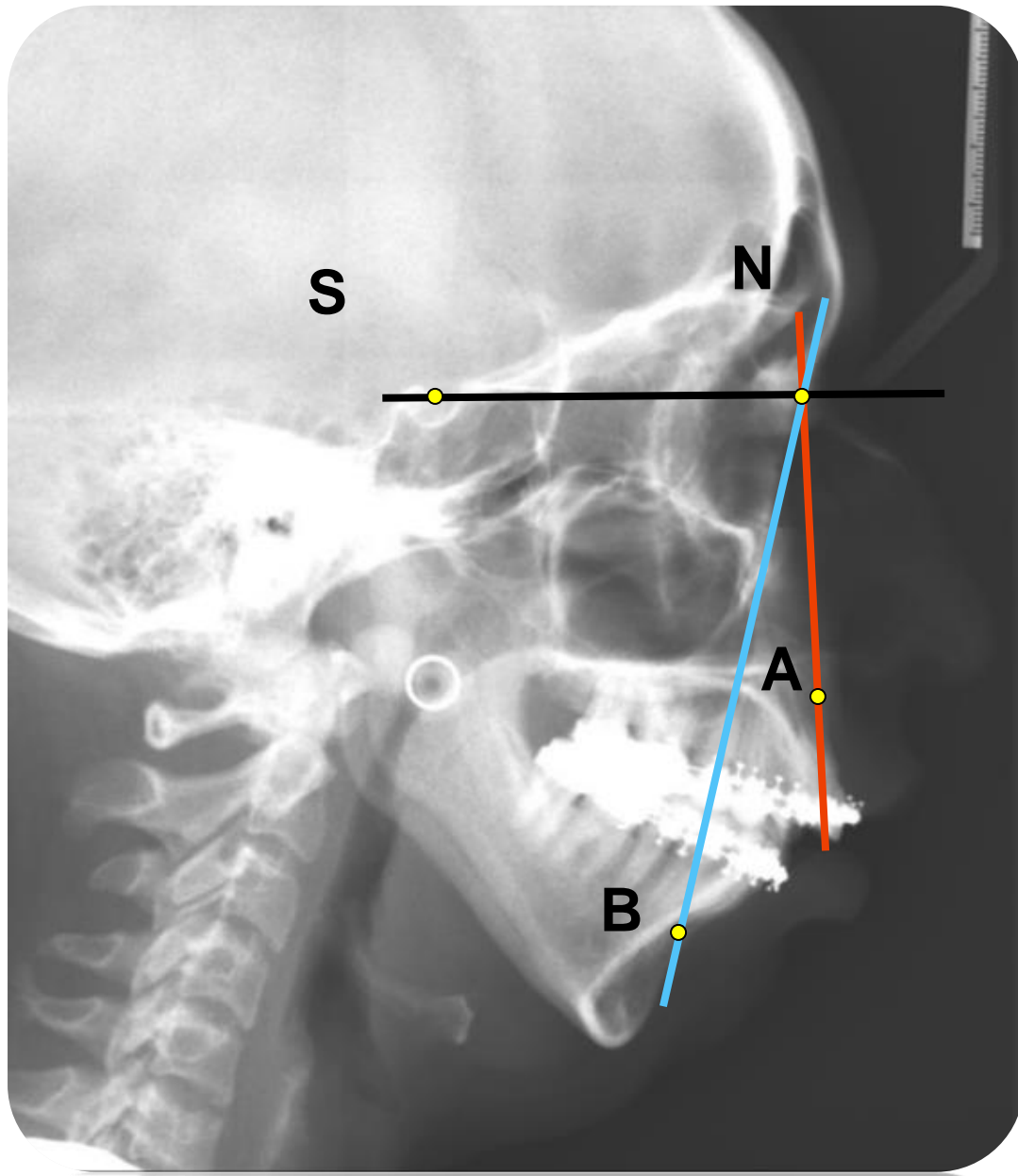
Skeletal Diagnosis

Skeletal Class III secondary to maxillary anterior-posterior deficiency (maxillary hypoplasia vs. mandibular hyperplasia)



Associated Hard/Soft Tissue Diagnoses

- Deficient malar/submalar projection
- Poor paranasal support
- Under-rotated nasal tip
- Pseudo-dorsal hump
- Deep nasolabial folds
- Tear trough deformity
- Orbital hollowing
- Poor upper lip support (volume and architecture)



- SNA and SNB indicate the AP position of the maxilla and the mandible relative to the cranial base
- High values indicate prognathism for that particular jaw
- Lower values indicate retrognathism

- SNA: $82^{\circ}(\pm 2)$
- SNB: $80^{\circ}(\pm 2)$
- ANB: $2^{\circ}(\pm 2)$ subtract SNB from SNA

If You are in Question if it is an Orthognathic Case or not,
Look in the Mouth at the Occlusion & Look at the Smile

Skeletal and Associated Soft Tissue Diagnoses

Skeletal Diagnosis

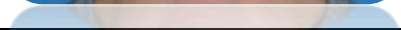
Vertical maxillary excess



Skeletal Class III secondary to
Mandibular anterior-posterior Excess



Hemi-mandibular
elongation/hypertrophy



Associated Hard/Soft Tissue Diagnoses

- Excessive gingival display
- Excessive tooth to lip
- Poor lip architecture and definition
- Long lower facial 1/3 (apertognathia)
- Excessive genial projection
- Concave Facial Profile
- Significant facial asymmetry
- Mandibular boarder asymmetry
- Maxillary cant



Soft Tissue Changes with Orthognathic Surgery:

Cervicomental Region

Effects of Orthognathic Procedures on Neck-Chin Angle

Improved Aesthetics

Mandibular advancement

Genial advancement

Superior repositioning of the maxilla
• Mandibular counter-clockwise autorotation

Combination of 1, 2, 3

Worsened Aesthetics

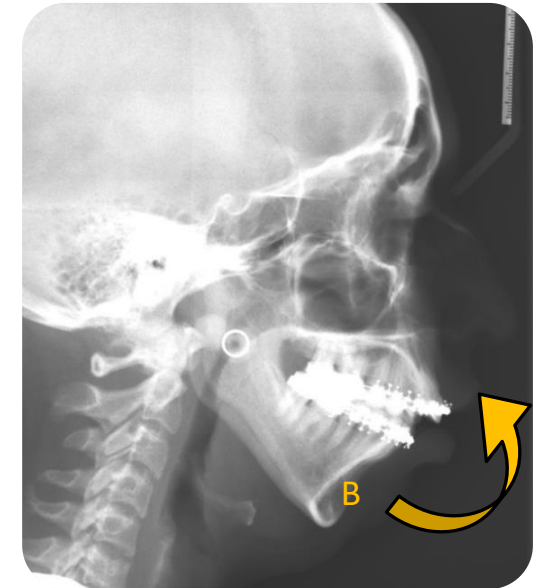
Mandibular setback

Reduction genioplasty

Maxillary downgrafting
• Mandibular clockwise autorotation

Combination of 1,2,3

Adapted from Epker, Stella JOMS, 47:795-803, 1989



Soft Tissue Changes with Orthognathic Surgery

Middle Facial 1/3

Maxillary impaction and advancement

- Widens alar base
- Increases tip projection
- Rotates nasal tip (counterclockwise)
- Accentuates supratip break
- Shortens upper lip

Maxillary downgrafting

- Decrease tip projection
- Under-rotates nasal tip (clockwise)
- Pseudo-hump formation (Polybeak appearance)



No Substitute for Orthognathic Surgery!

Camouflaging procedures have a time and place!

Don't get caught trying to fix soft tissue when bone is the issue!

Don't place an implant where bone should go!

Benefits of Chin Augmentation

- Increases thyromental distance
- Improved cervicomental definition
- Improved lower facial 1/3 height and proportions



Implant vs. Genioplasty

IMPLANT

Pros

- Quicker
- Less of a learning curve
- Good for AP augmentation
- Decreased risk of paresthesia
- Easily reversible

Cons

- Lack of vertical height?
- Bony resorption
- Increased infection rate?
- Migration

OSTEOTOMY

Pros

- Control/increase vertical facial height
- Ability to flatten or smooth out labiomental sulcus
- Advances suprahyoid musculature (snoring)
- Correct midline discrepancies

Cons

- More involved surgery
- Greater risk for permanent paresthesia

Genial (Chin) Augmentation

Attempts to mask underlying skeletal deformity with soft tissue augmentation.

- Not always ideal treatment (masking skeletal deficits)
- Patients who don't want orthodontics and orthognathic surgery
- Want a “less involved” surgery
- Shorter recovery period
- Less expensive



Poor genioplasty candidate



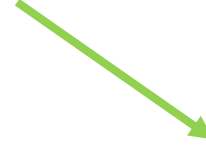
A



B

22 y/o male before (A) and 3 months after (B) sliding advancement genioplasty

Osteotomy vs. Chin Implant



- Skeletal Class 2 relationship
- Class 2 dental relationship
- Deep bite
- Poor lip position/everted lower lip
- Deep labiomental sulcus
- Skeletal asymmetry
- Short lower facial 1/3 height

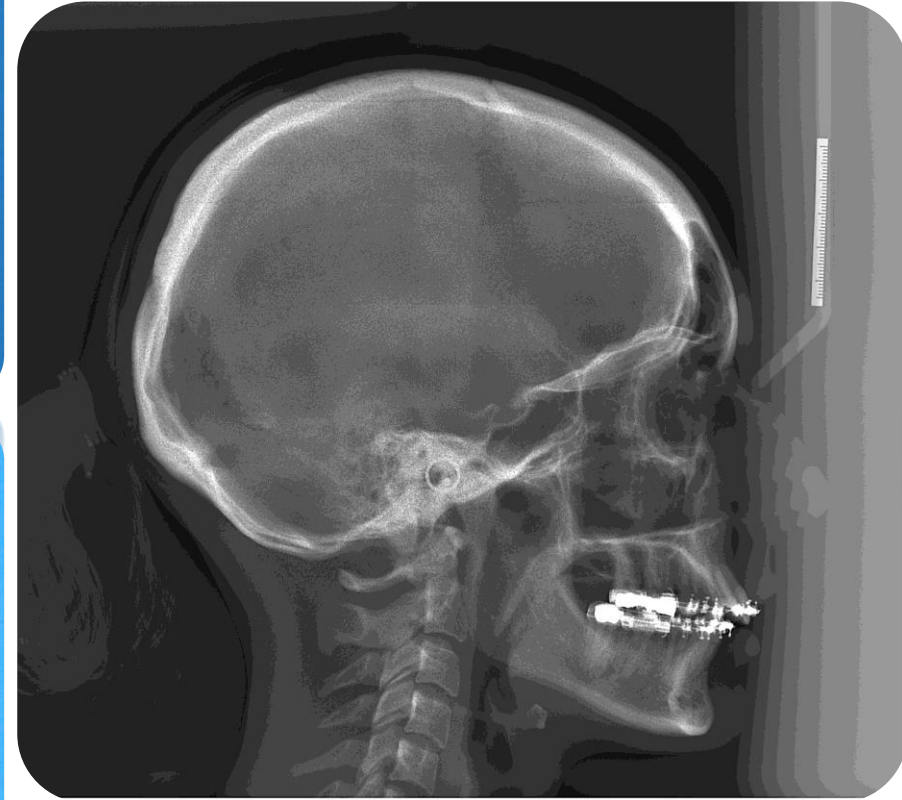
- Skeletal Class 1 relationship
- Microgenia
- Class I dental relationship
- Normal lip position
- Smooth or flattened labiomental sulcus
- Proportional lower facial 1/3 height

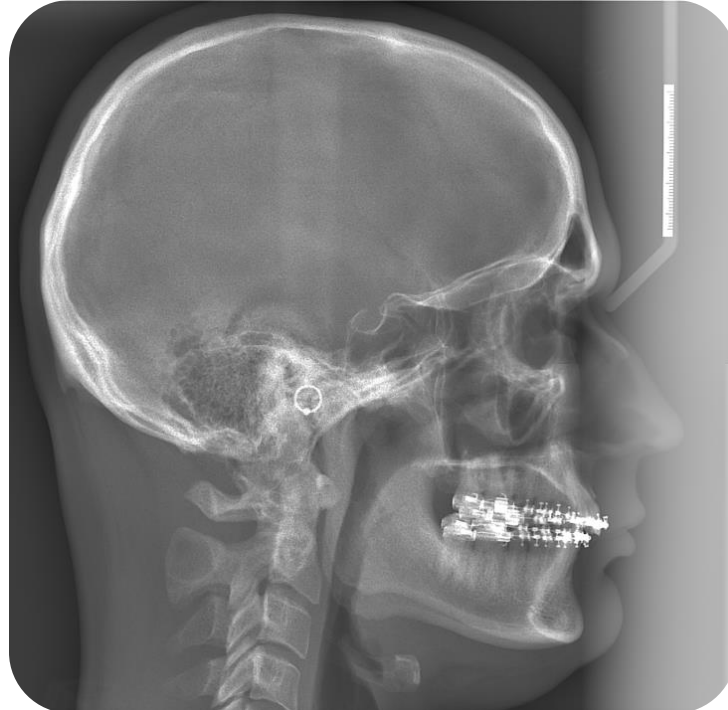


Good Genial Implant Candidates



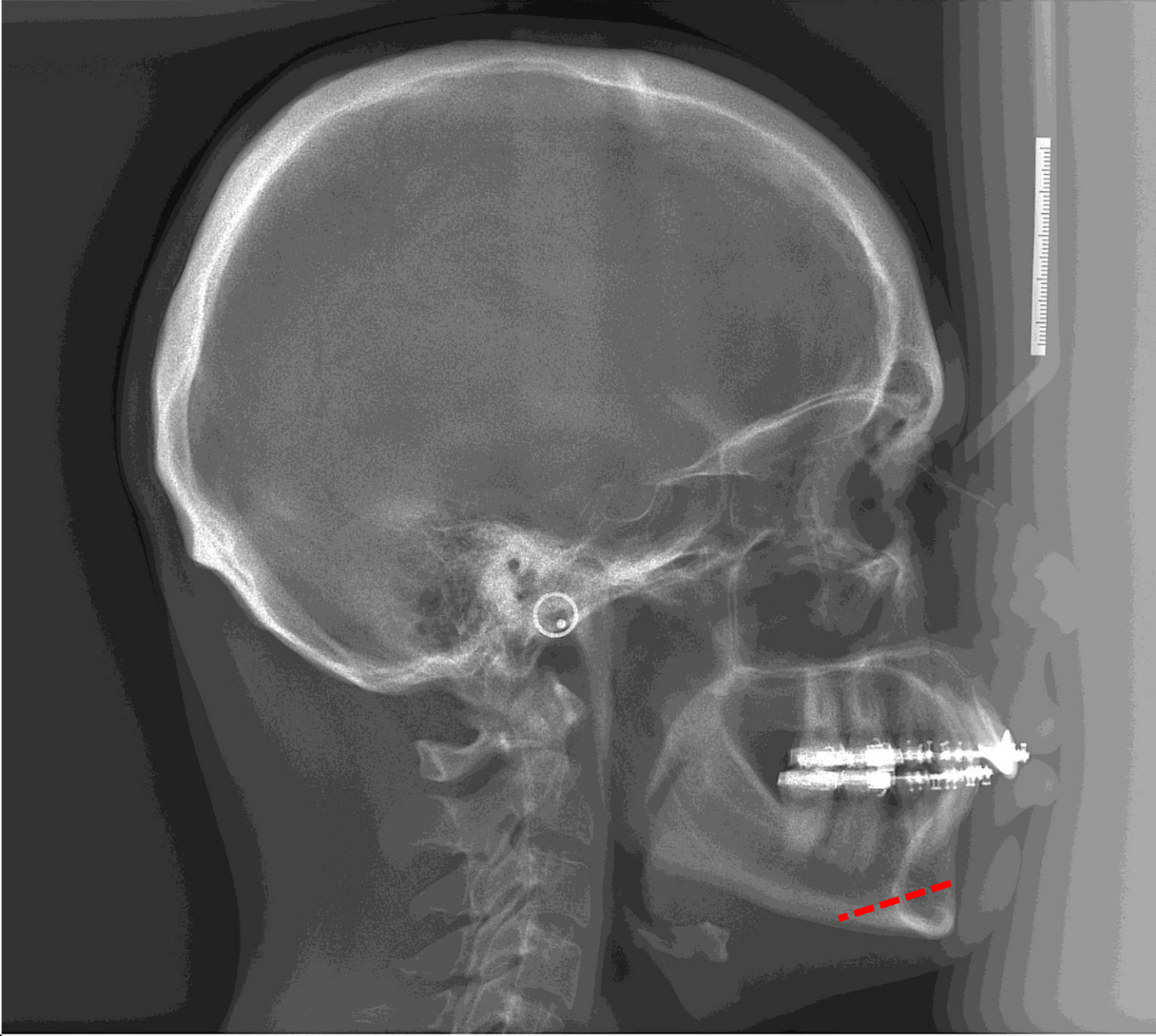
Poor Genial Implant Candidates

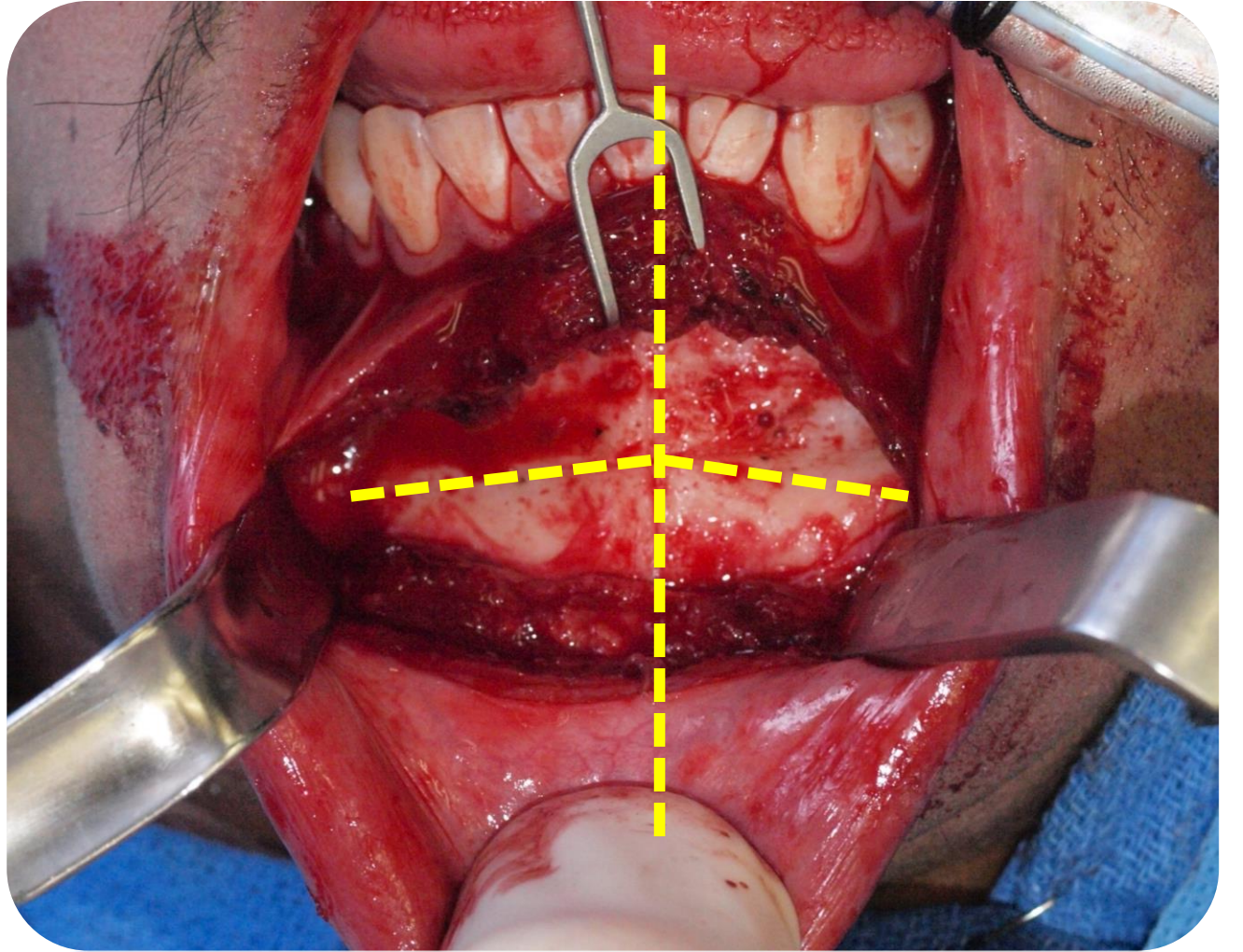


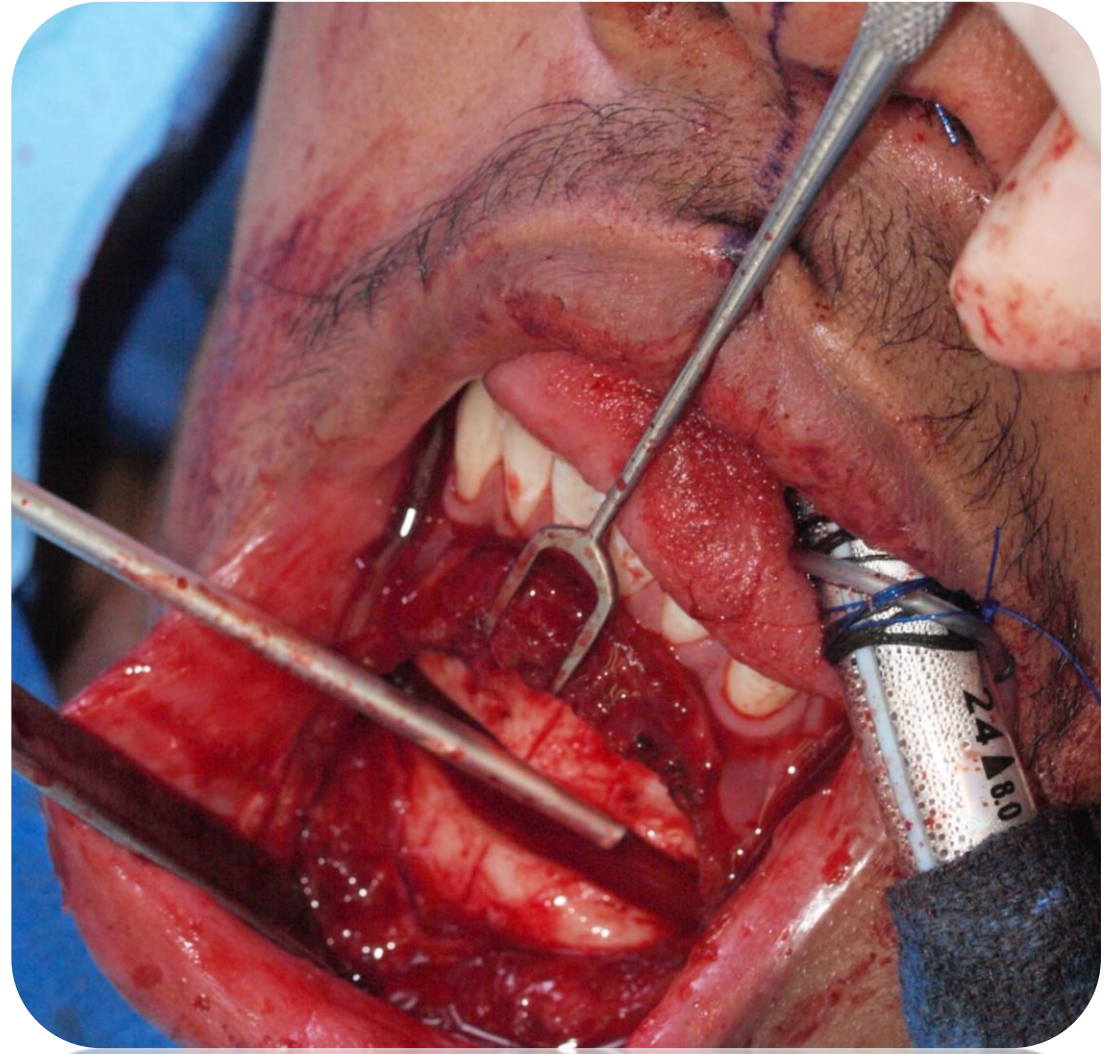
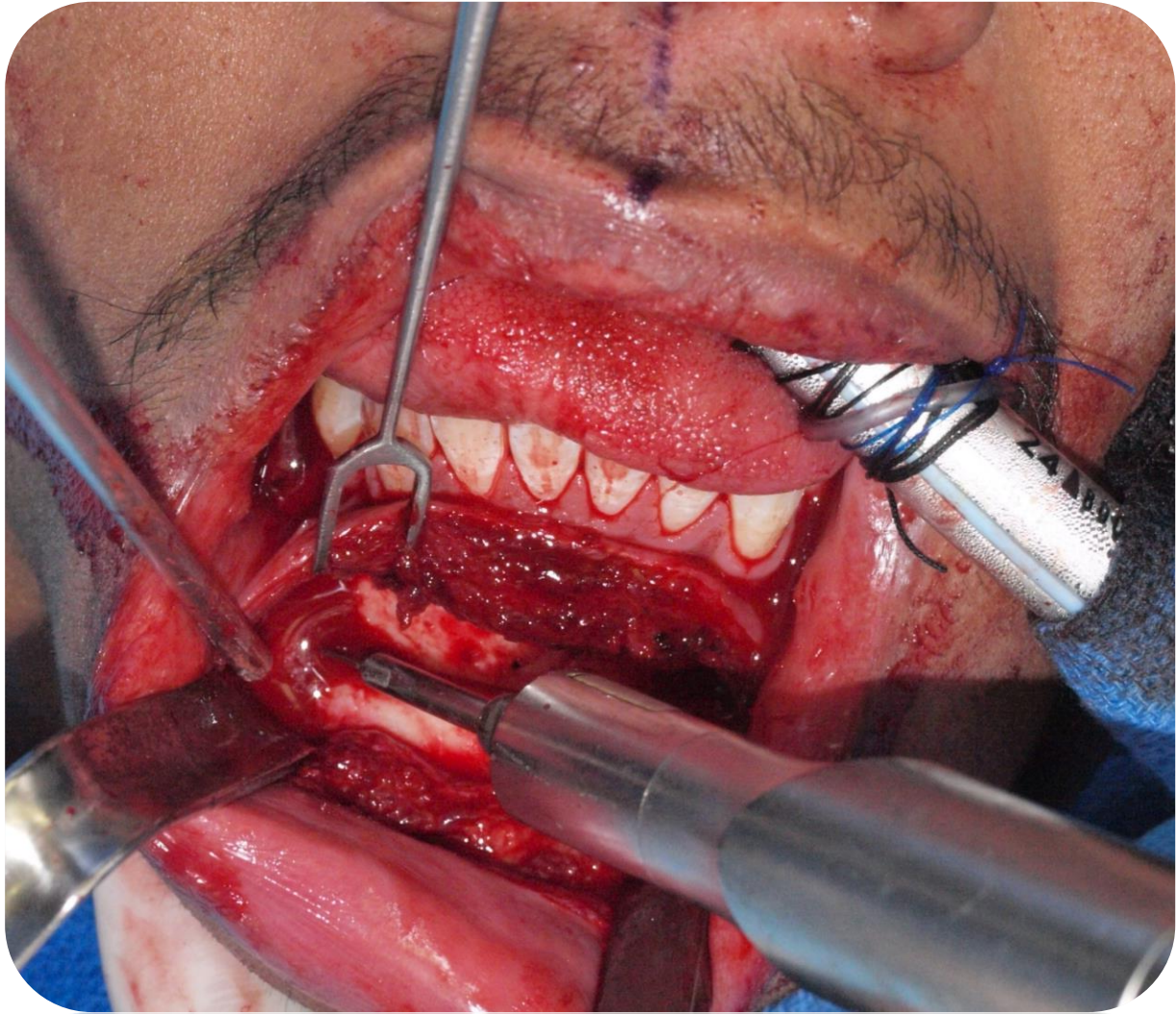


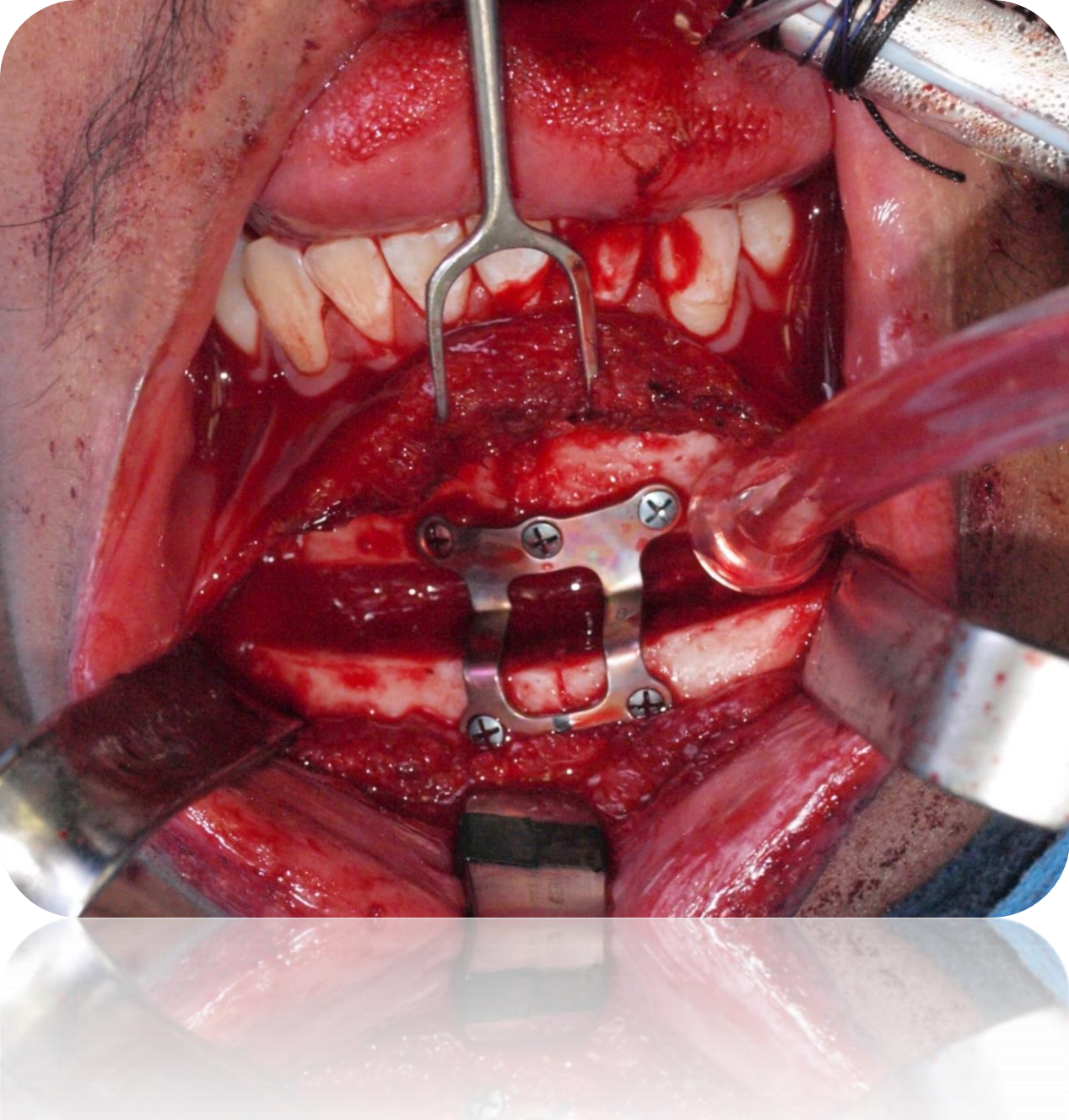
SOFT TISSUE MEASUREMENTS

			Pre-Op	Post-Op
U1-Lip	(Upper Incisor to Lip)	2mm(±1)	2.0	2.0
FCA	(Facial Contour Angle) G'-Sn'-Pg'	-11°(±4)	-10.0	-7.0
TVL-Pog'	(True Vertical Line Subnasale - Soft Tissue Chin)	M: -3.5°(±1.8) F: -2.6°(±1.9)	-5.0	-1.0
UFH (G')	(Glabella to Subnasale)	UFH:LFH=1:1	66.0	66.0
LFH	(Subnasale to Soft Tissue Menton)	UFH:LFH=1:1	68.0	72.5
ULL	(Subnasale to Stomion)	UFH:LFH:LL=2:1:2	23.0	23.0
LLL	(Stomion to Soft Tissue Menton)	UFH:LFH:LL=2:1:2	45.0	49.5
UFH/TFH	(Upper Face Height to Total Face Height)	45%(±3)	49.0	47.7
LFH/TFH	(Lower Face Height to Total Face Height)	55%(±3)	50.7	52.3







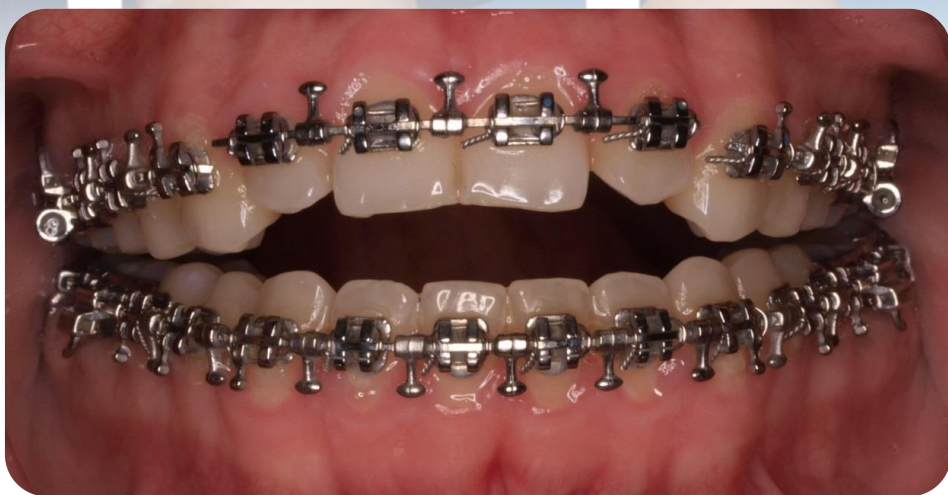


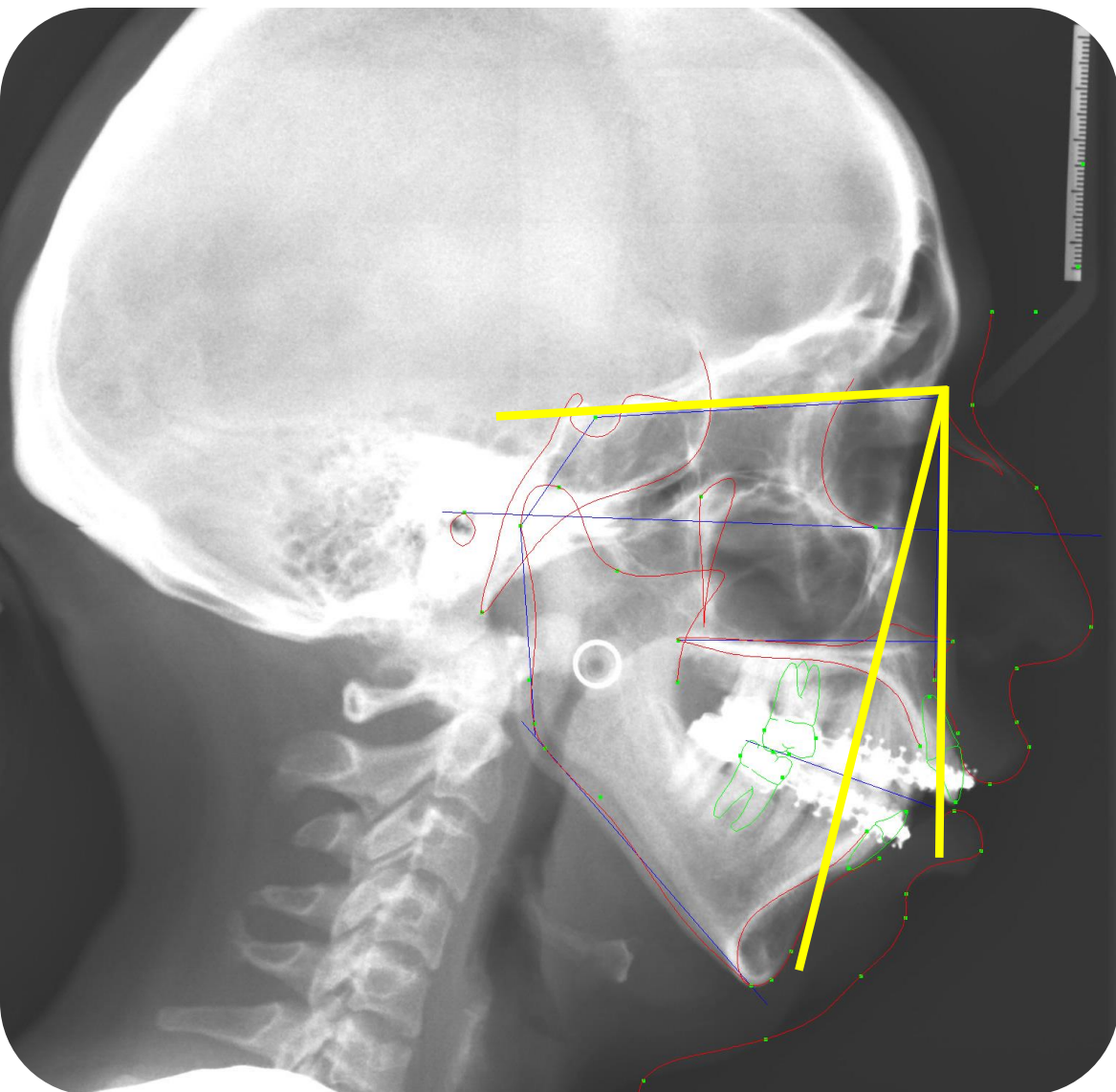


Complications of Osteoplastic Genioplasty

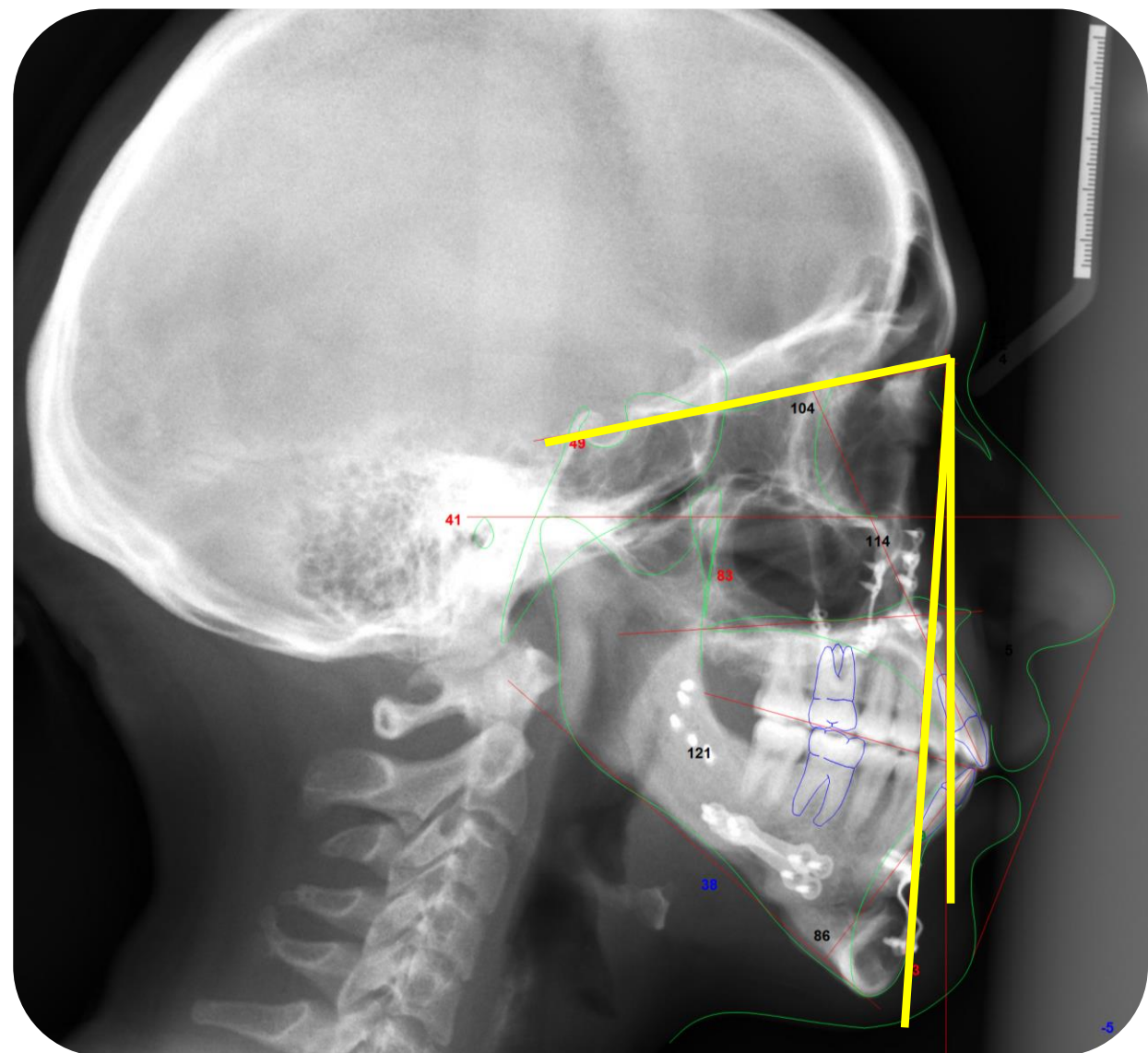
- Notching / prejowl sulcus accentuation 72 %
- Relapse - considered a stable procedure
- Wound dehiscence/ gingivoperiodontal issues 3%
- Patient dissatisfaction <7%
- Hypoesthesia 15%
- Avascular necrosis of the chin
- Removal of hardware 5%

Case 1





- SNA: 88
- SNB: 74
- ANB: 14



- SNA: 82°(±2)
- SNB:80°(±2)
- ANB: 2°(±2) subtract SNB from SNA

- SNA: 81.3
- SNB: 77.3
- ANB: 4

Case 1



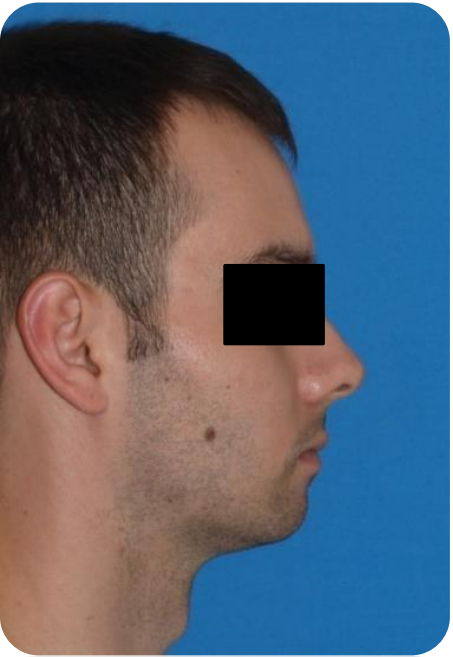
- Leveling of the occlusal plane and counterclockwise rotation of the mandible
- Counterclockwise rotation advanced chin.
- A simultaneous genioplasty provided lower facial 1/3 height and additional advancement of the chin.

Case 2

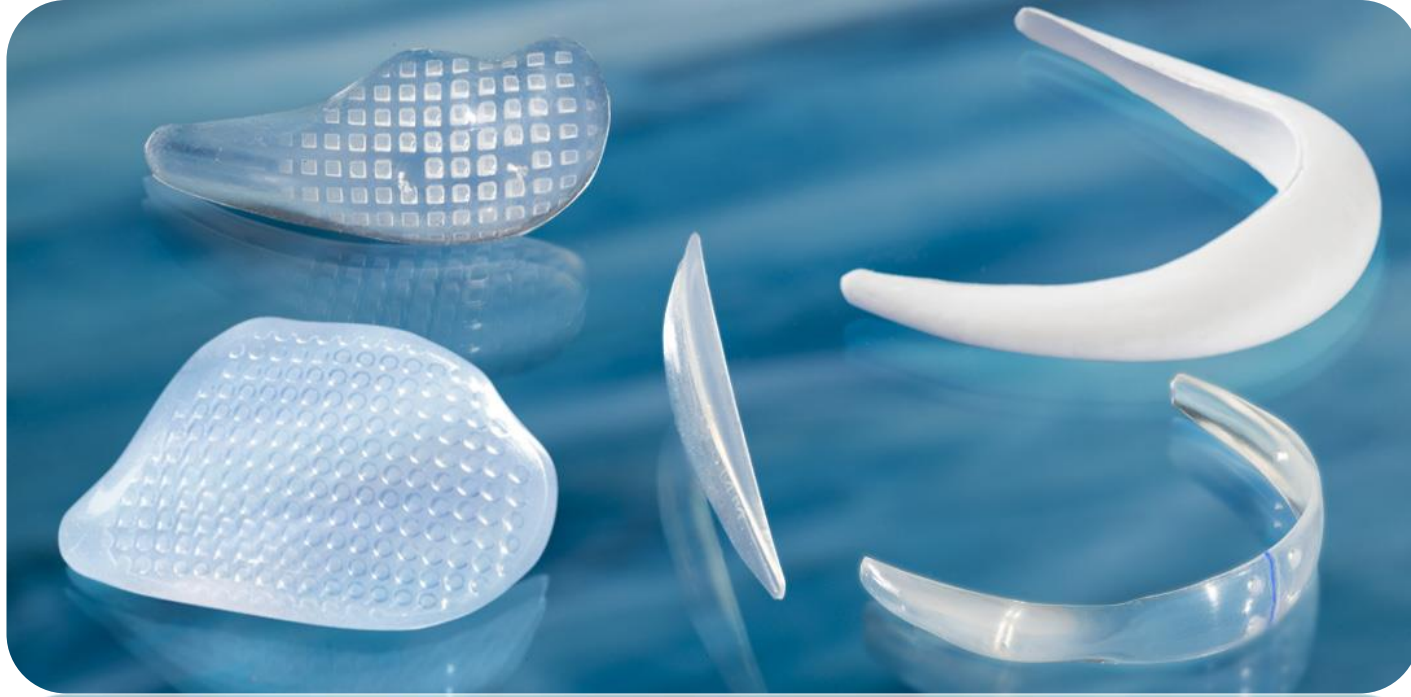
- Smooth labiomental sulcus

Pitfall

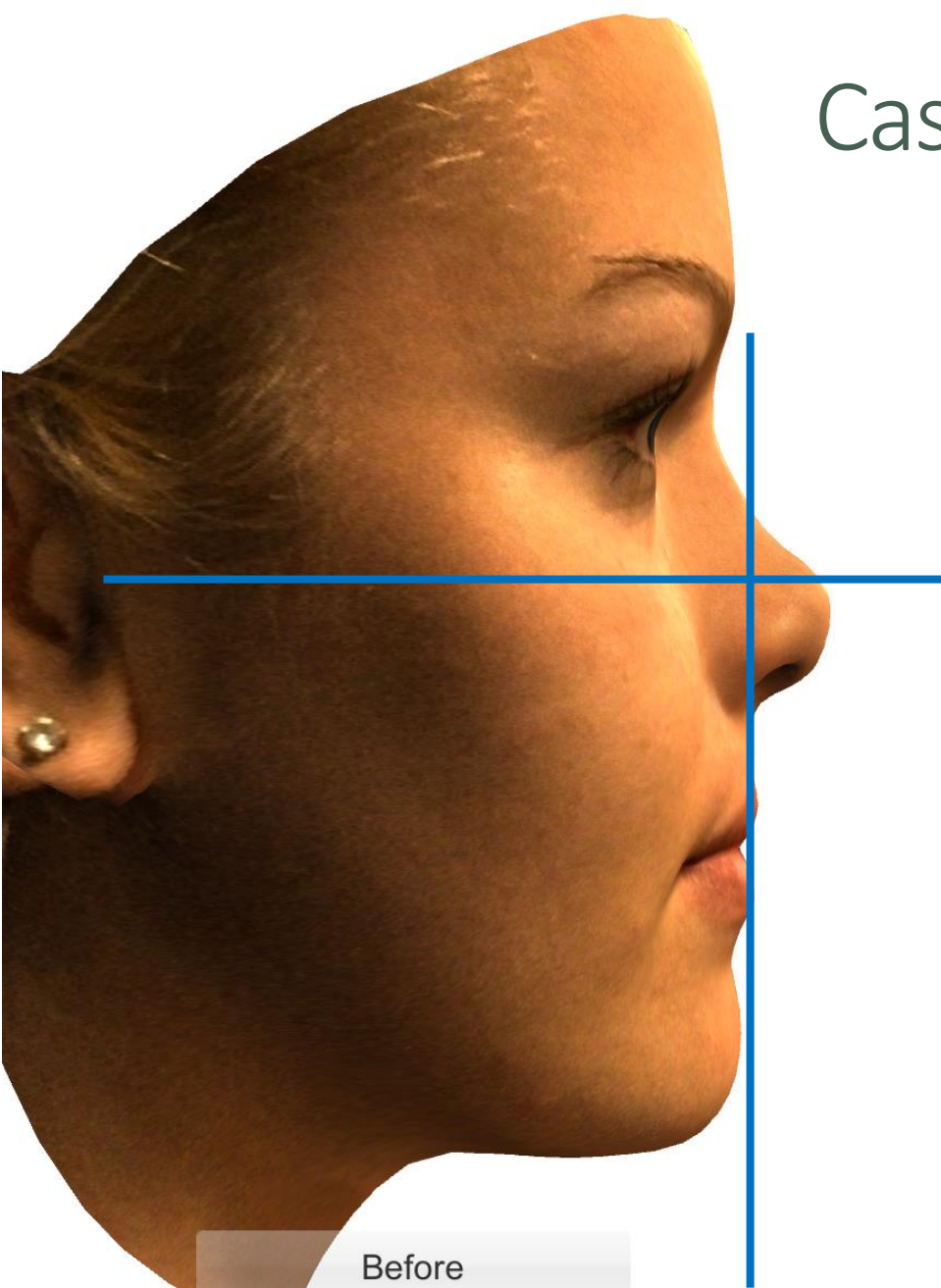
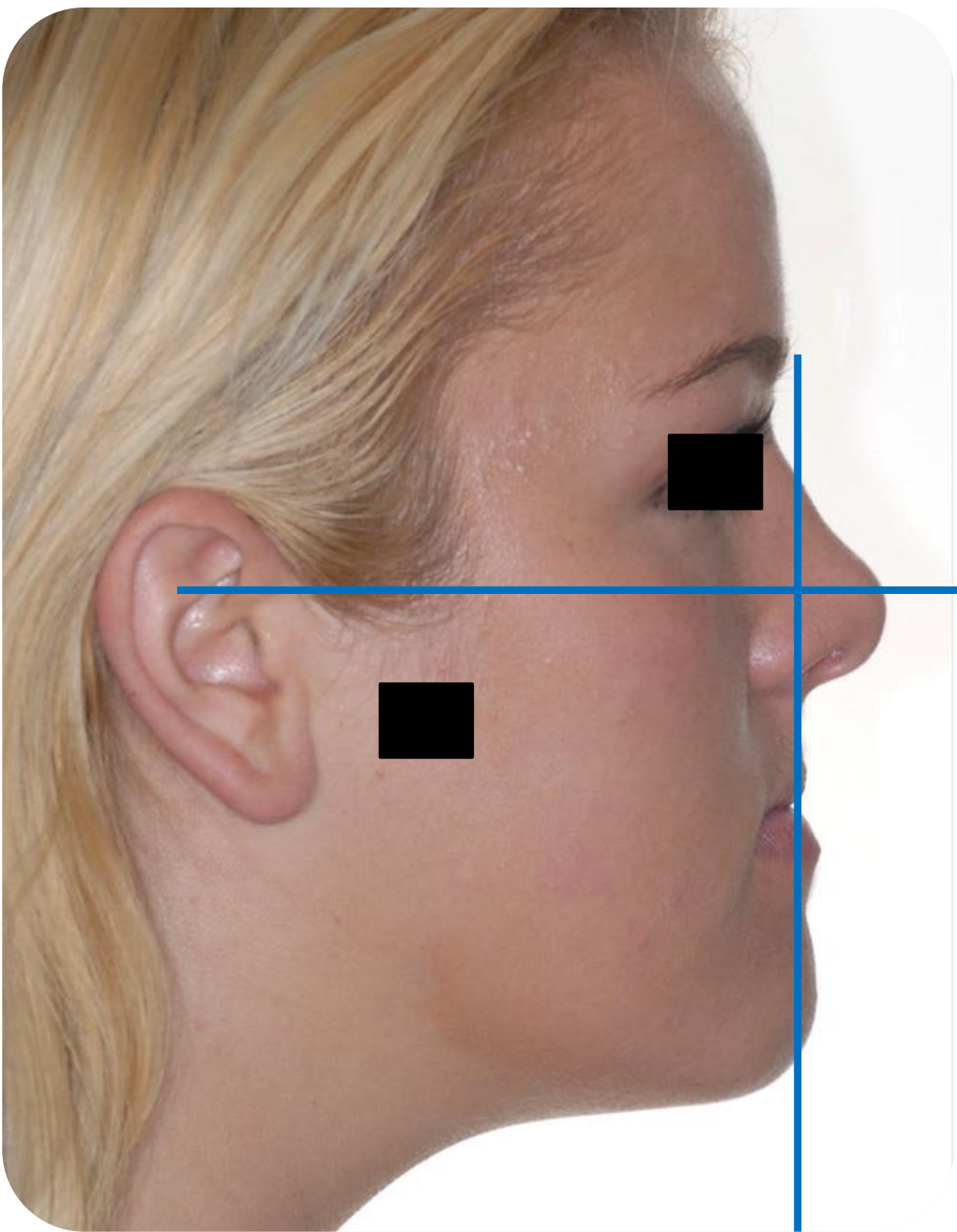
- Isolated genioplasties/implants poor choice for patients with deep labiomental sulci and lip incompetence
- Consider orthognathic surgery in this group



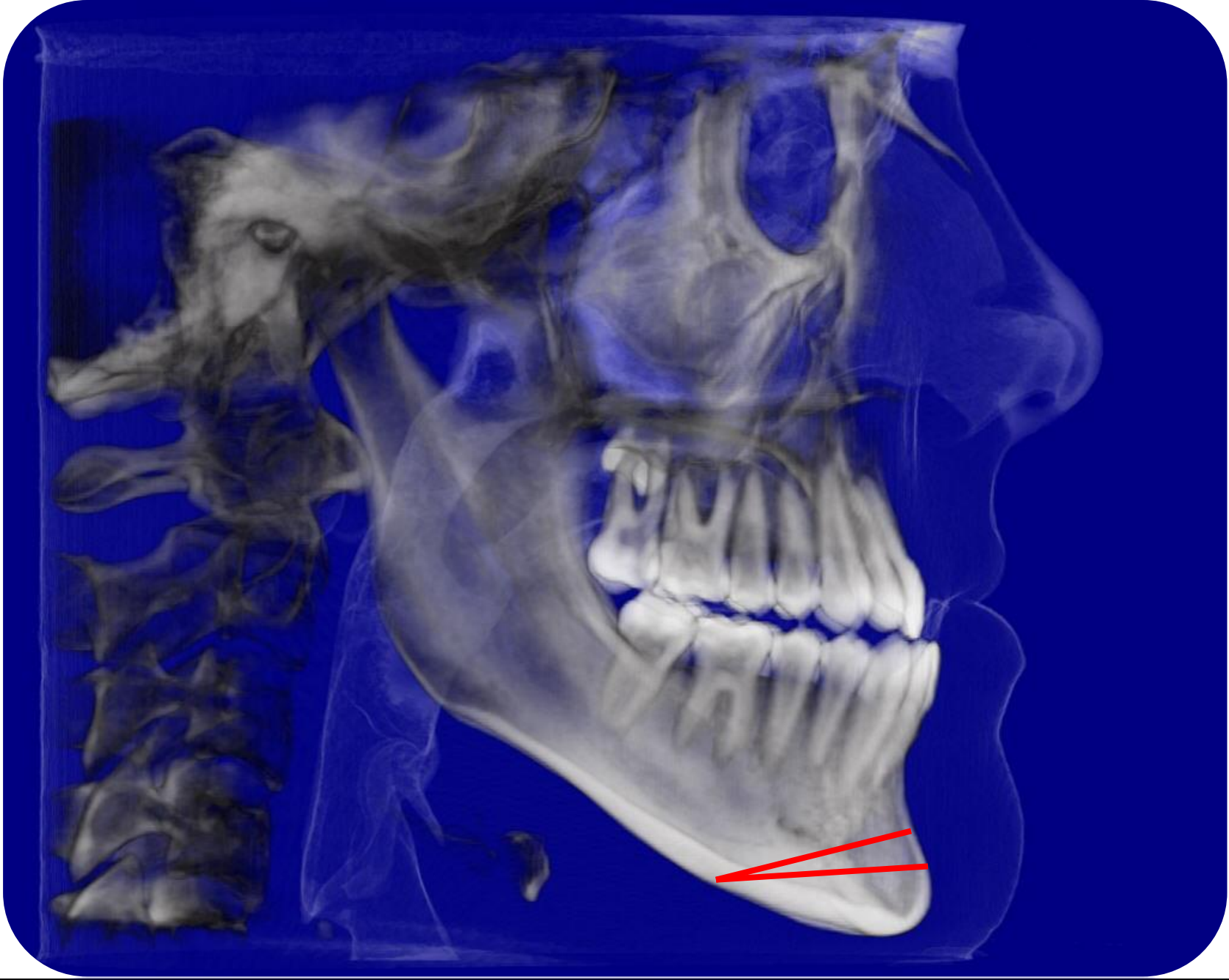
Implant Augmentation



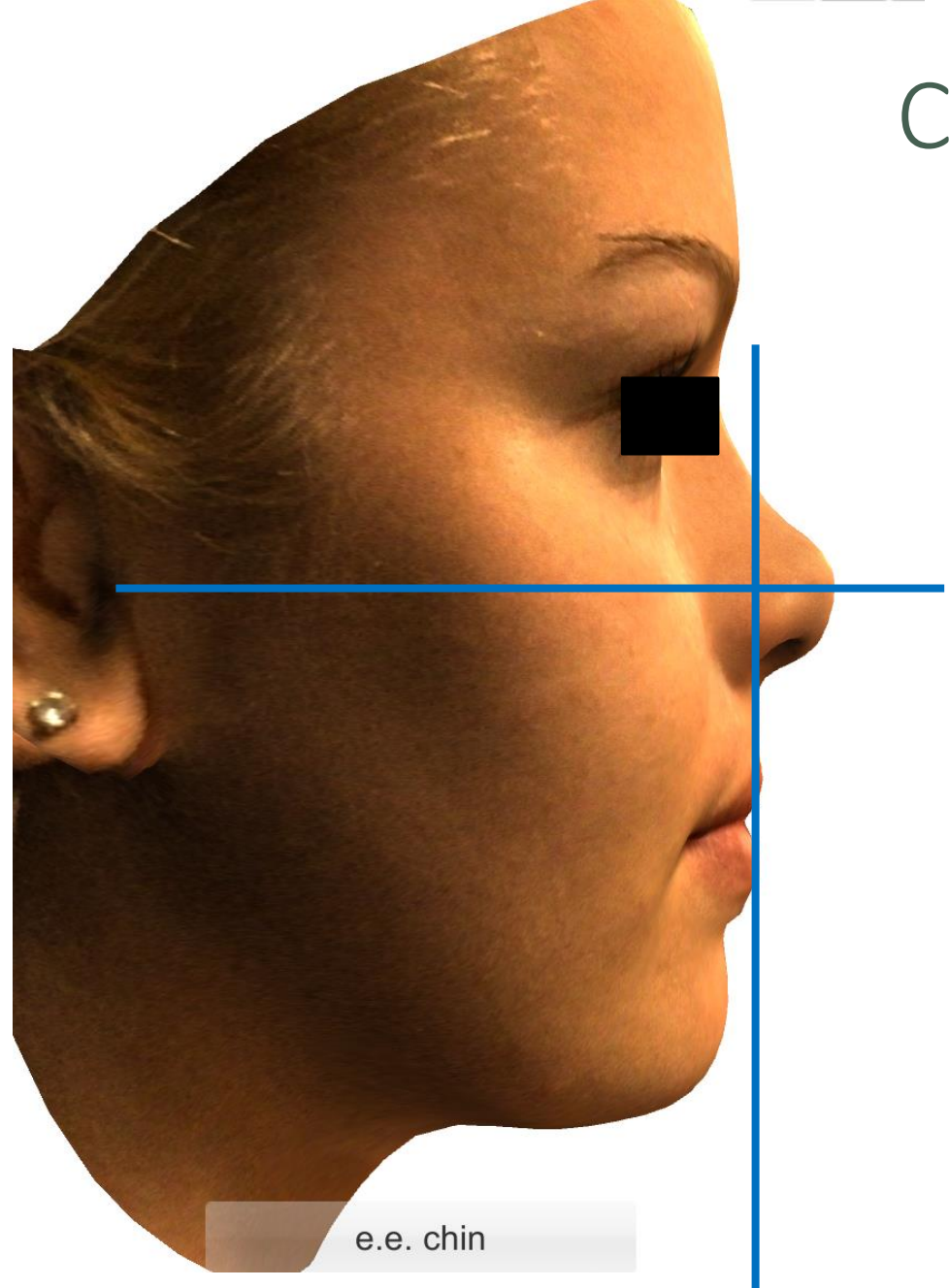
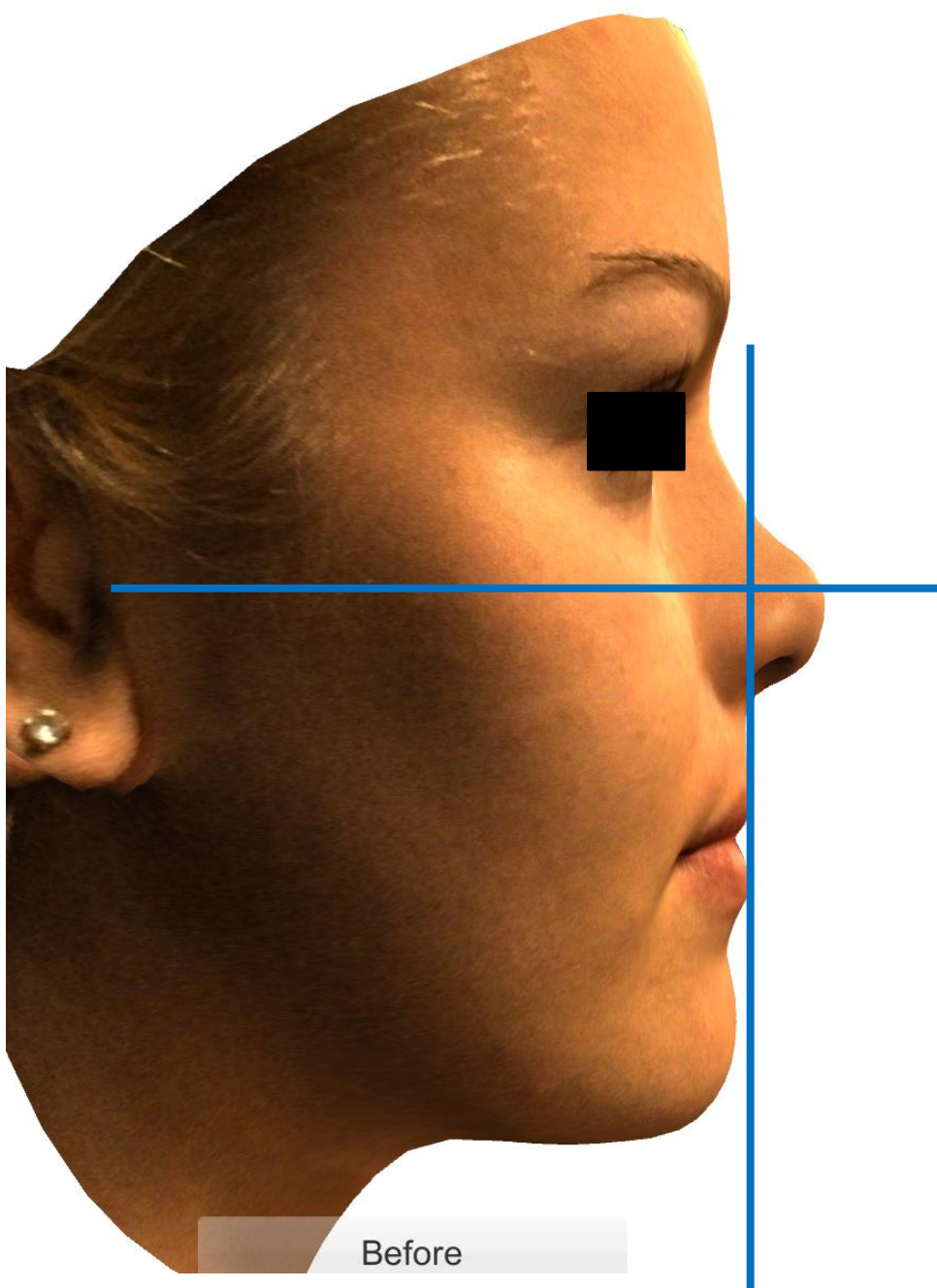
Case 3



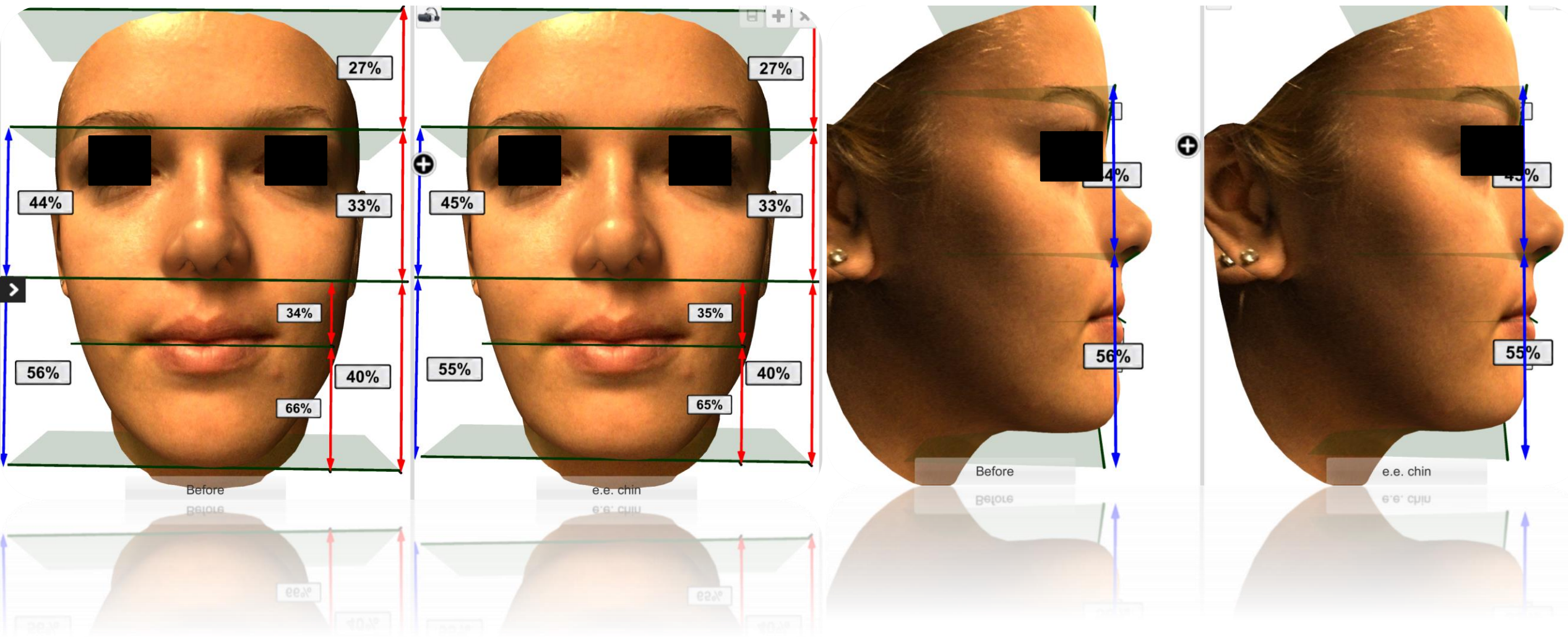
Case 3



Case 3

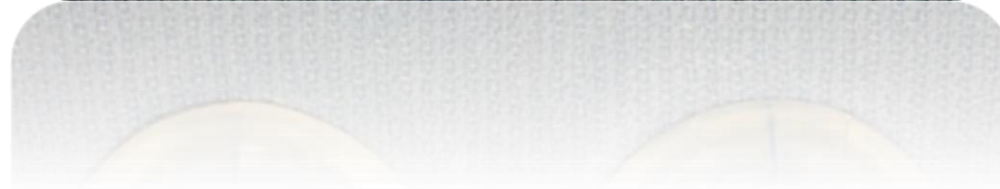


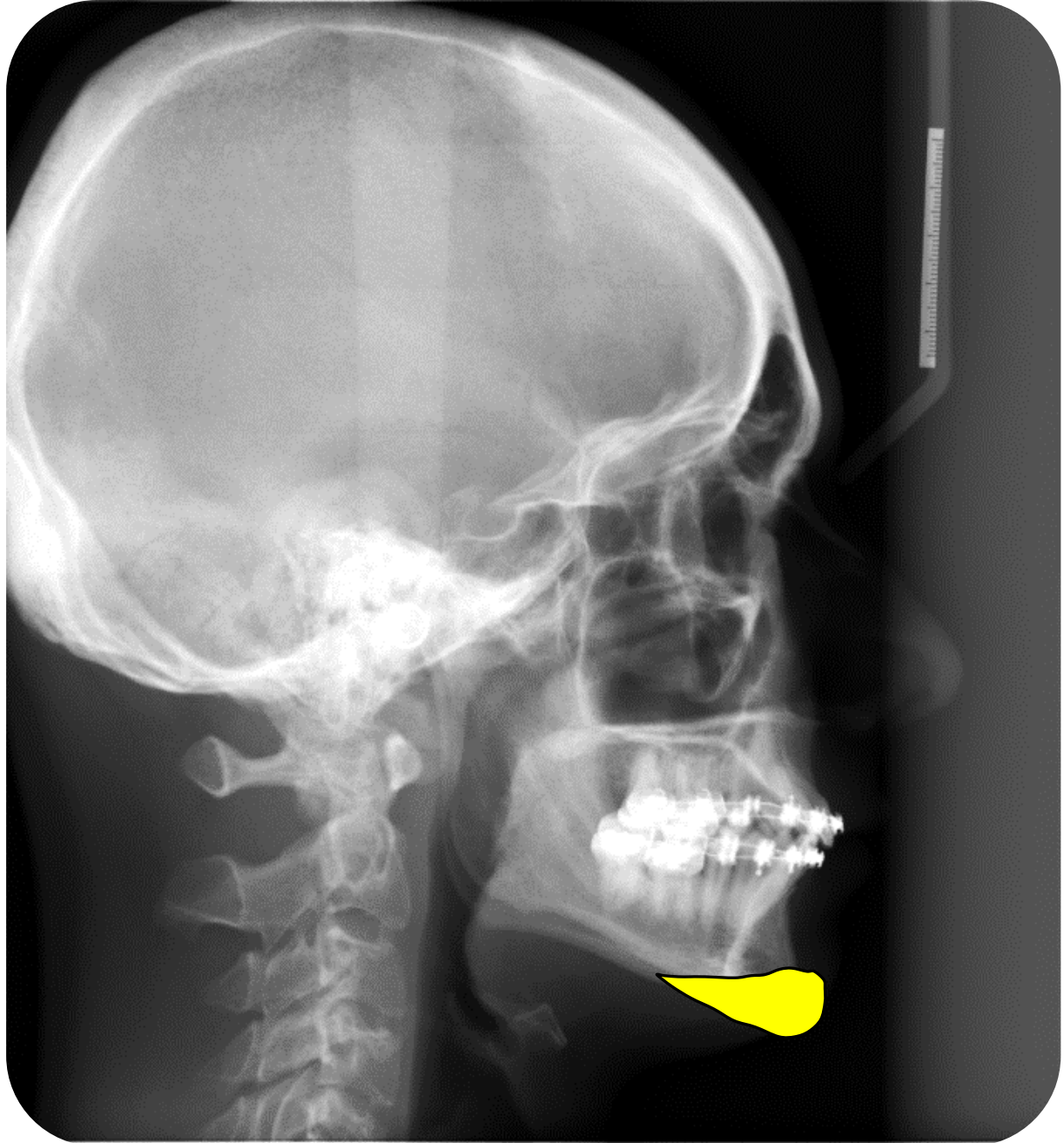
Case 3

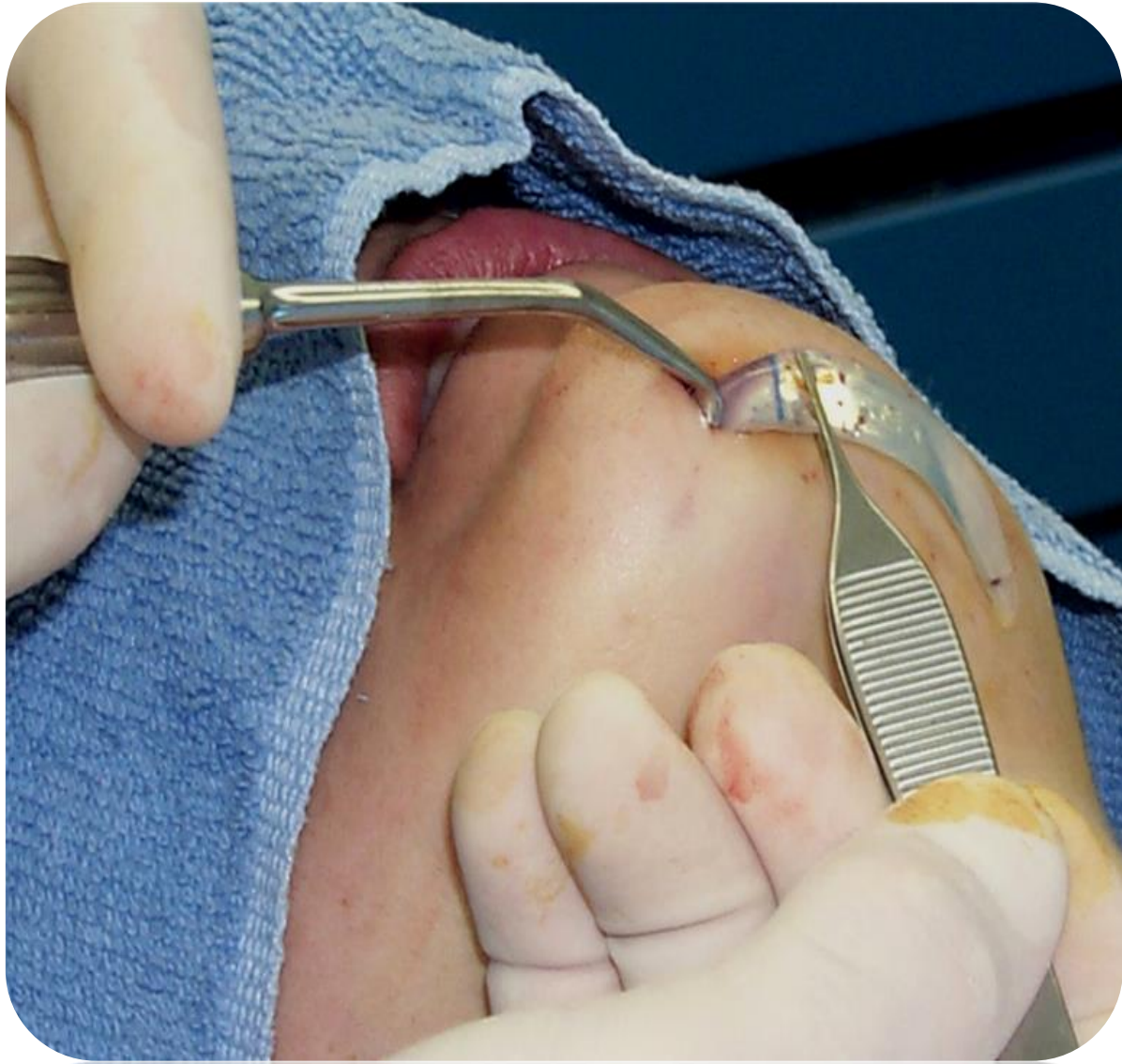


Implant Augmentation

- Useful to Improve
 - Thyromental distance
 - Lower facial 1/3 AP length
 - Cervical aesthetics
- Simple surgery
- Silicone, Gortex, Med-Por
- Anatomical, button, wing
- Secured with suture vs. screw
- Place at inferior border of the mandible







Case 4



Implant Complications

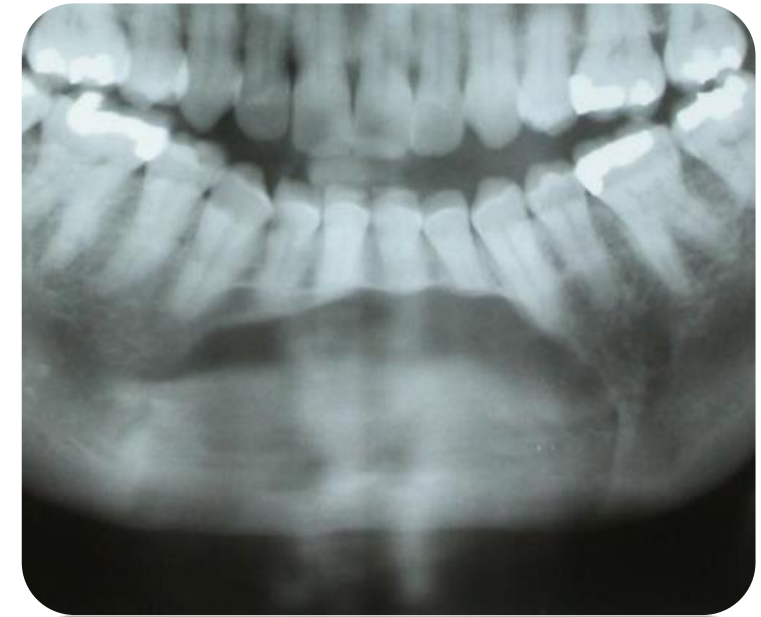
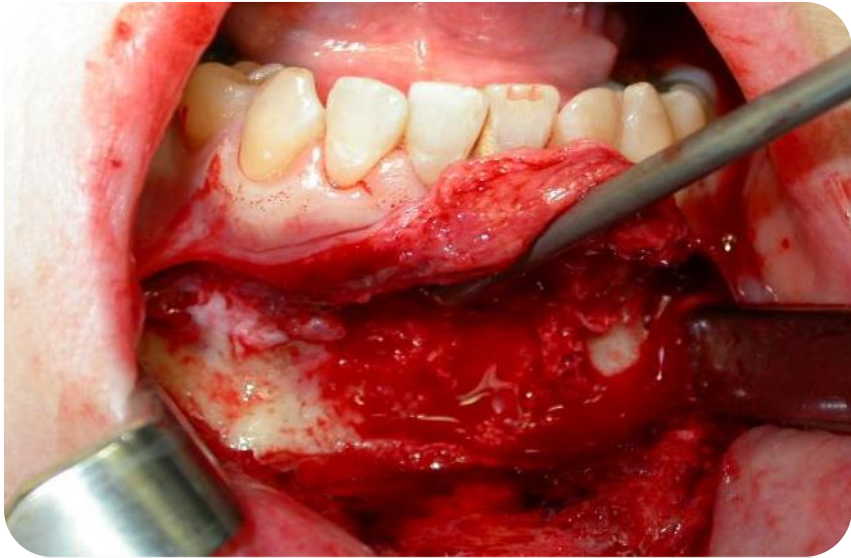
- Bone resorption
- Migration
- Infection
- Tooth damage
- Paresthesia
- Dehiscence
- Asymmetry
- Lip eversion
- Chin button
- Unaesthetic result

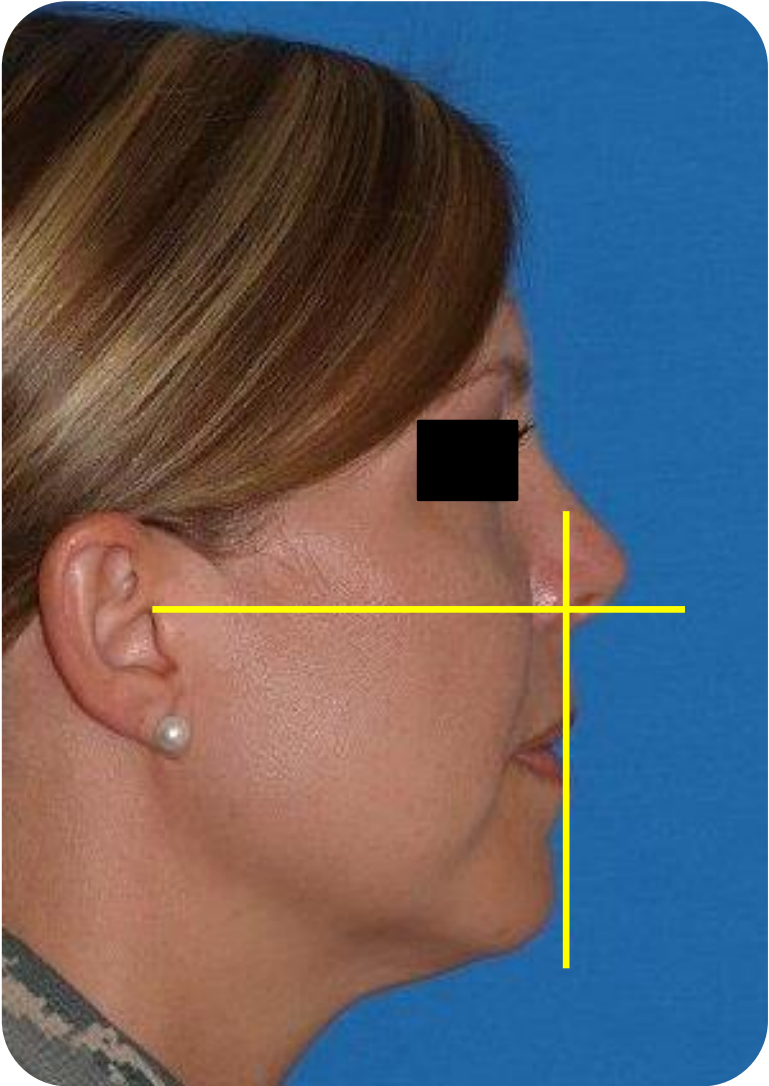


Implant Complications

Bone Resorption

- Used Anatomic Design
- Use Preformed Shape
- Avoid 'Button' Shape
- Place at Inferior Border & Avoid 'High' Position
- Proper Fixation
- Adequate Soft Tissue Coverage





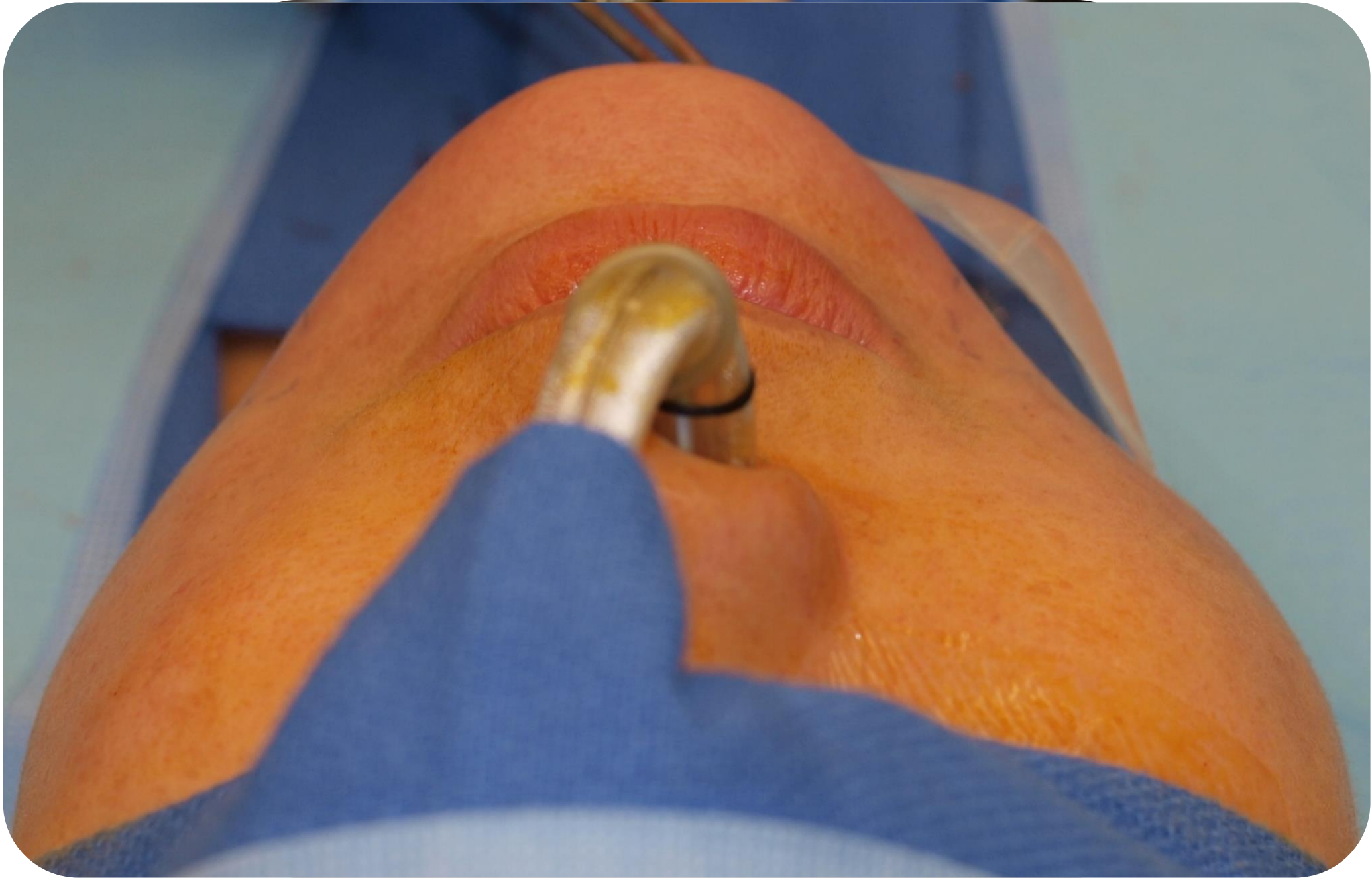
Case 5



Case 5



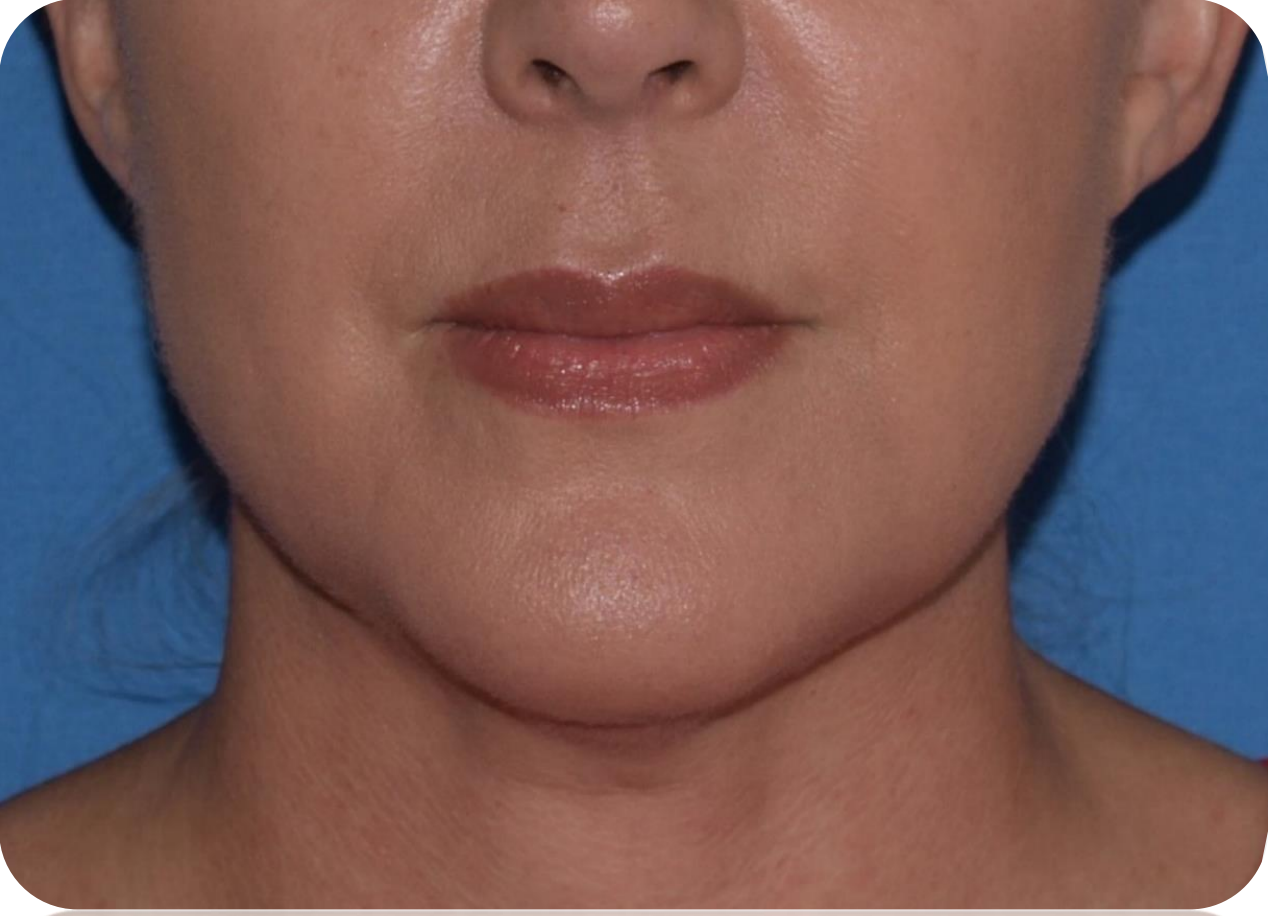
Case 5



Case 5



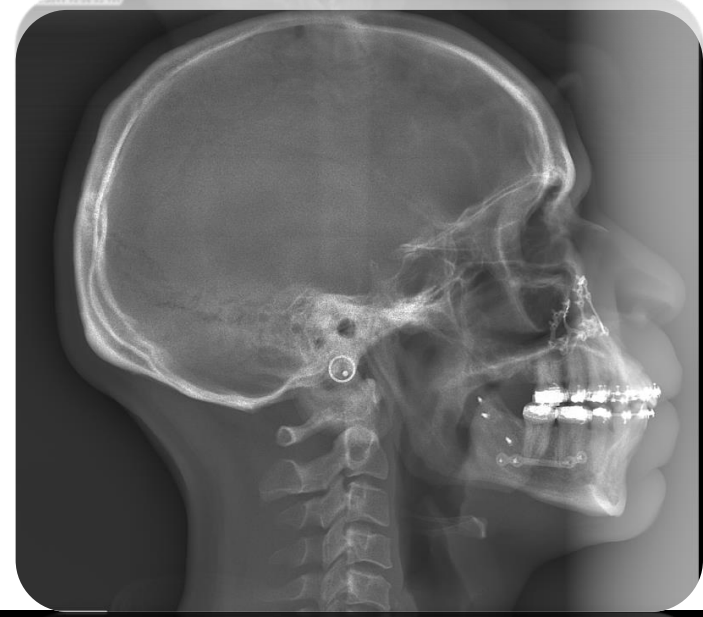
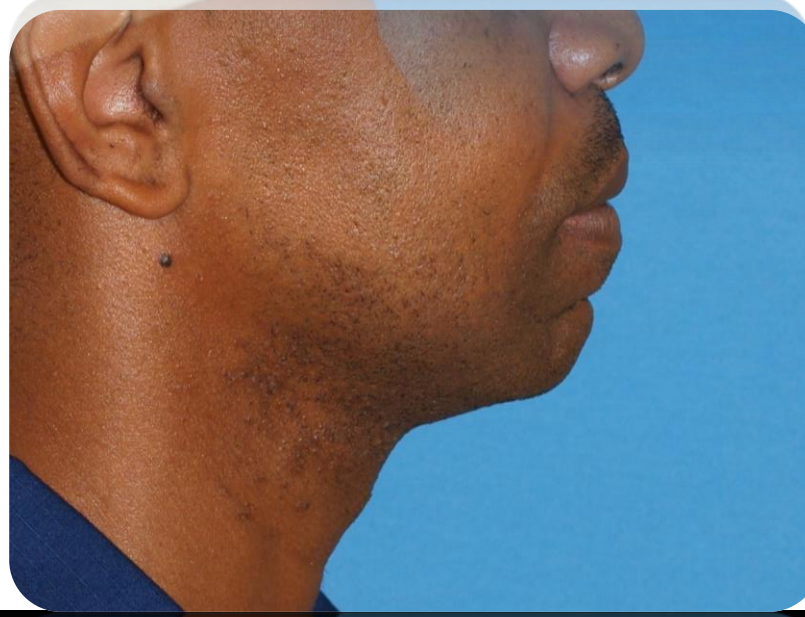
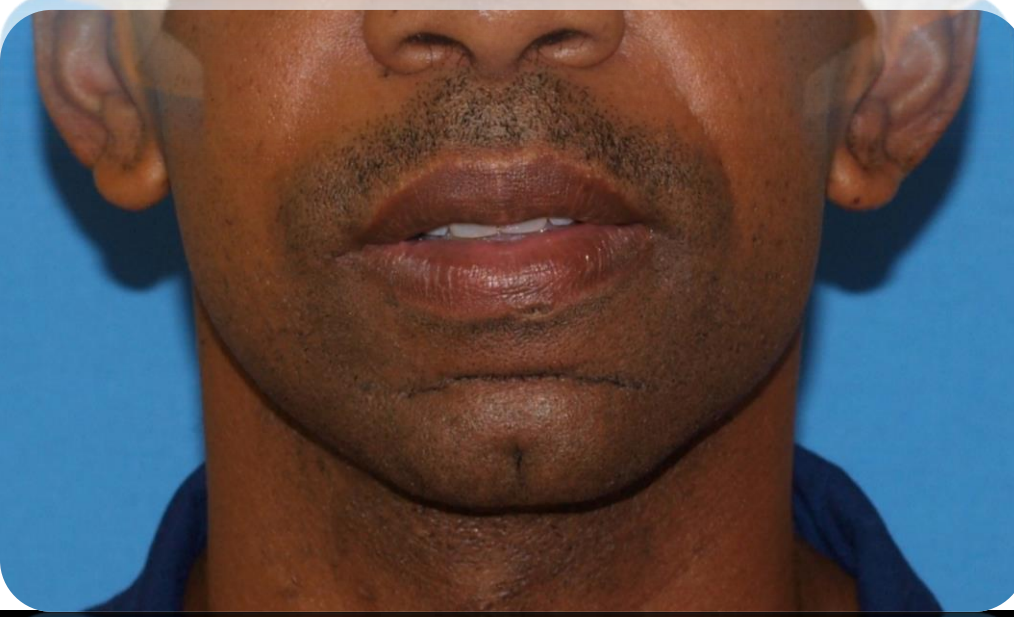
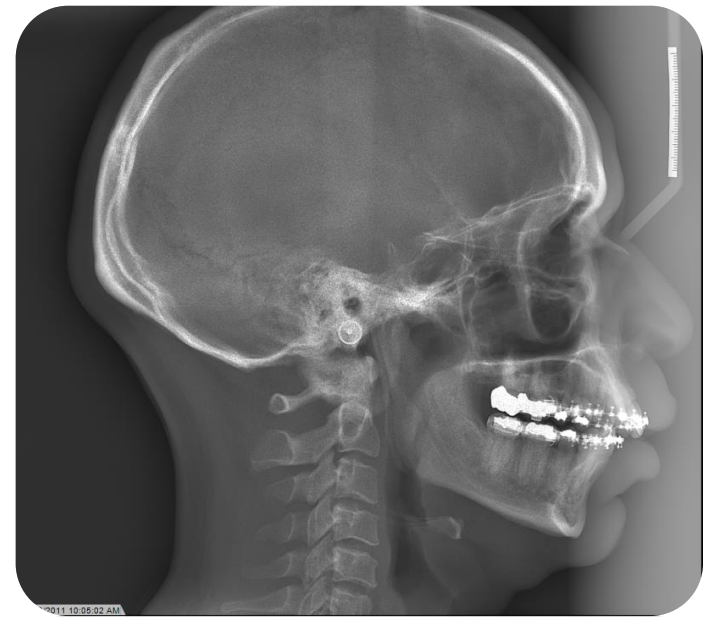
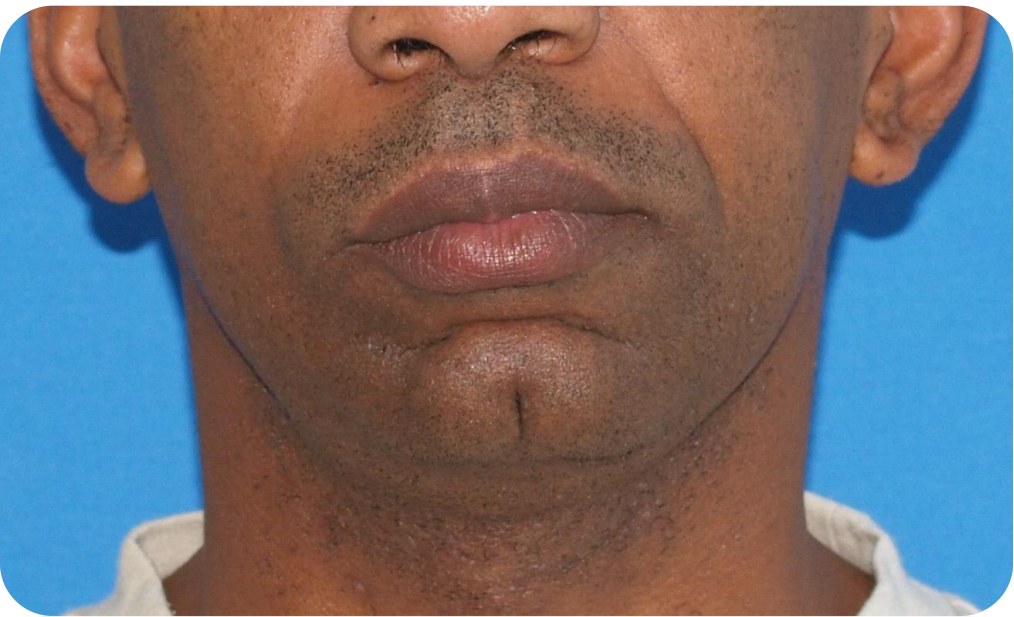
Case 5



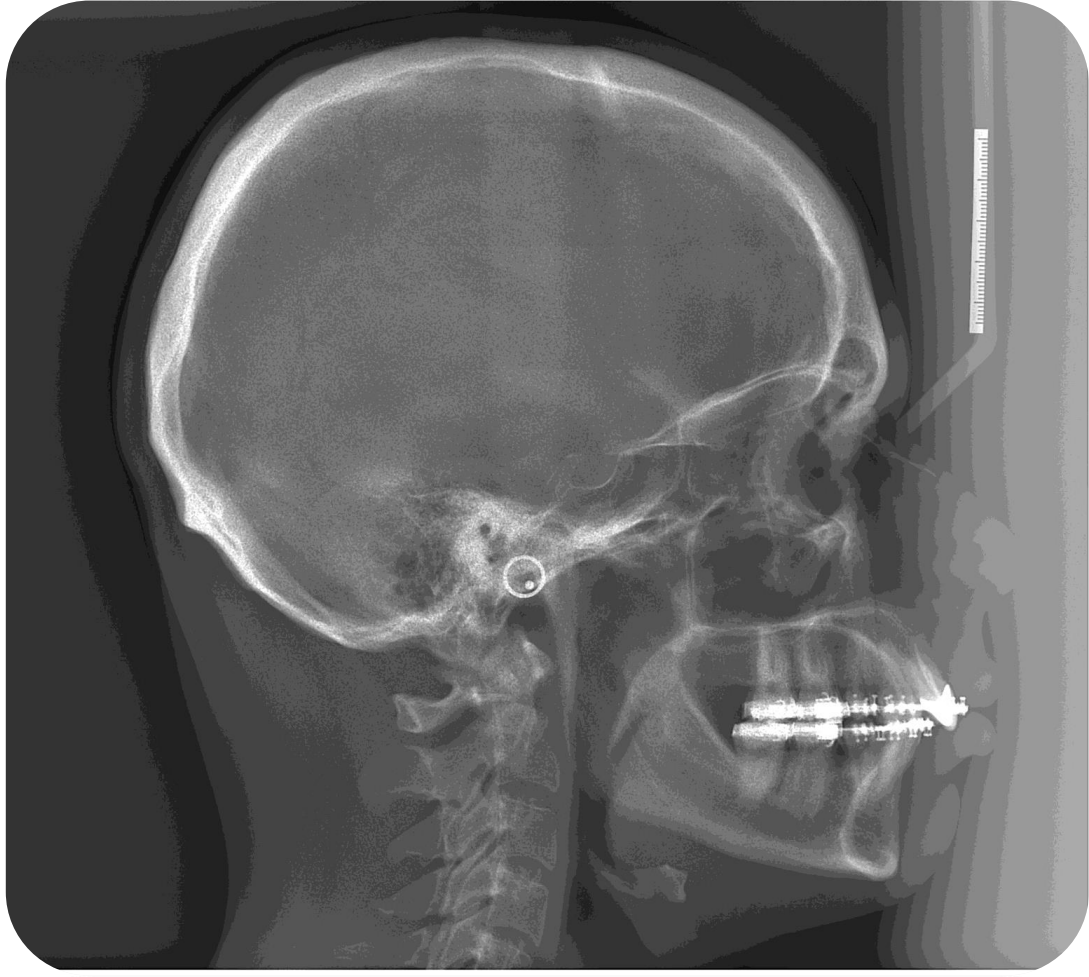
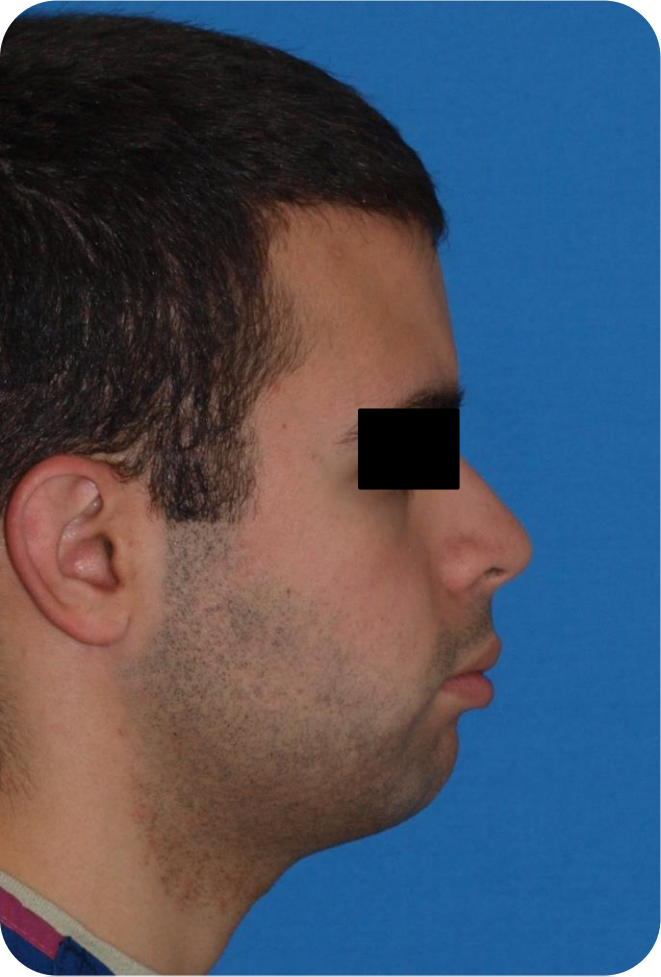
Case 6



Should Have Done A Chin



Should Have Done A Chin



Questions?

