



GRAND ROUNDS (September 6, 2019)

Ahernandez/Notario/Dealino/Tirol



DEPARTMENT OF OTORHINOLARYNGOLOGY
PHILIPPINE GENERAL HOSPITAL

VISION

The Department of Otorhinolaryngology shall be an internationally recognized center of excellence in the field of Otorhinolaryngology and Head and Neck Surgery

MISSION

The health needs of the Filipino shall be its prime consideration.

It shall provide excellence and leadership in the different aspects in Otolaryngology – Head and Neck Surgery by teaching, providing exemplary clinical practice and dynamically pursuing relevant researches beneficial to the community in an environment guided by moral, ethical and spiritual values.

General Information



- RA
- 19/M
- Single
- Freelance Makeup Artist
- Naic, Cavite

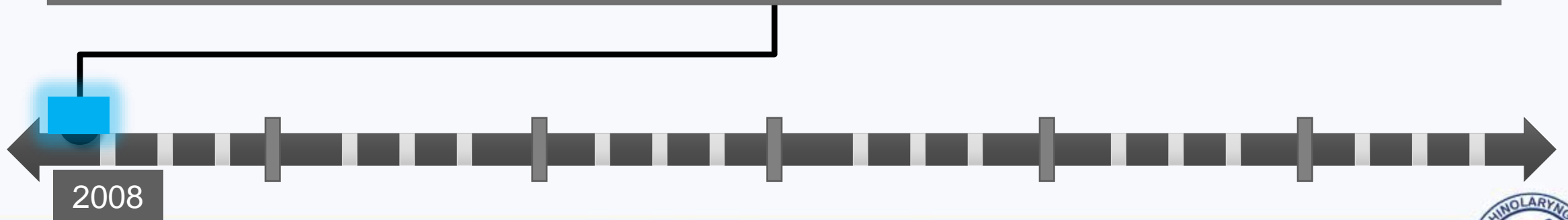
Chief Complaint

Nasal obstruction, right

History of Present Illness

11 years prior to admission,

- TOI: 12NN
- POI: Street outside their home in Laguna
- MOI: Vehicular crash (pedestrian vs van)
- Patient was crossing the road when the L side of his body was hit by a high-speeding van. He was thrown into a canal.
- (+) B epistaxis, (-) nasal obstruction, (+) LOC, (+) multiple abrasions on his face and body. He was brought to the LH where Chest and Abdominal Xrays showed normal results. He was then discharged stable.
- Patient could not recall if he was hit in the head or face, if he had a misshapen nose or swelling/bruising around his nose during this time.



History of Present Illness

9 years prior to admission,

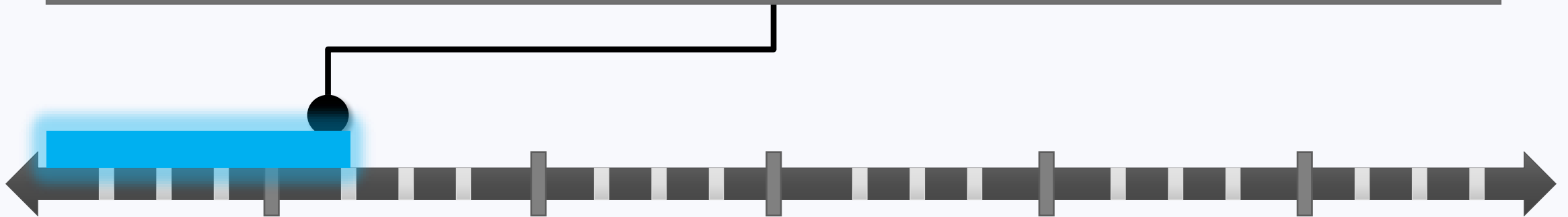
- TOI: unrecalled
- POI: Street outside their home in Laguna
- MOI: Vehicular crash (pedestrian vs van)
- Patient was again crossing the road when the L side of his body was hit by a high speeding van. He was thrown about a meter in front of the van.
- (-) epistaxis, (-) LOC, (+) multiple abrasions on his face and body. He was brought to the LH where chest and abdominal xrays allegedly showed normal results. The patient was eventually cleared for discharge.
- Patient could not recall if he was hit in the head or face, if he had a misshapen nose or bruising around his nose during this time.



History of Present Illness

Interim,

- Patient's neighbors noted that the bridge of his nose was deviated to the R
- (+) B nasal congestion, (+) B rhinorrhea, (-) facial fullness, (-) hyposmia, (+) sneezing occurring in the morning and spontaneously resolving, which would occur 2x/week. No noted difficulties with school or abnormal sleeping patterns.
- No consult done.



History of Present Illness

8 years prior to admission,

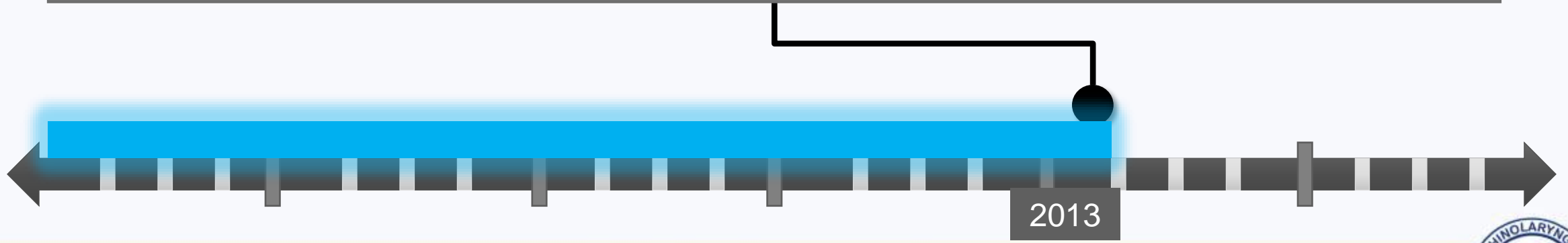
- TOI: 12AM
- POI: Street outside their home in Laguna
- MOI: Vehicular crash (pedestrian vs van)
- Patient was avoiding fire crackers when he accidentally hit the L side of his face and body onto a cruising van. (-) epistaxis, (-) LOC. His L foot was allegedly run over. This prompted consult at the LH where xray of his L foot was done showing normal results.
- No cranial or facial imaging was requested. Patient was sent home stable.
- Patient could not recall if he had a misshapen nose or bruising around his nose during this time.



History of Present Illness

6 years prior to admission,

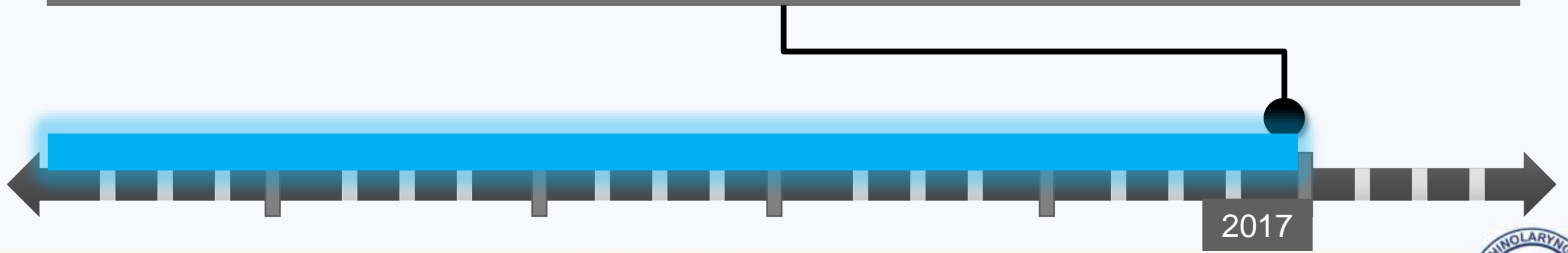
- TOI: Afternoon
- POI: Street outside their home in Laguna
- MOI: Vehicular crash (pedestrian vs van)
- Patient was again crossing the road when the R side of his body was hit by a crusing van.
- (-) epistaxis, (-) LOC, (+) multiple abrasions on his face and body. He was brought to the LH and was discharged after chest and abdominal xrays showed normal results.
- No cranial or facial imaging was requested.
- Patient could not recall if he was hit in the head or face, if he had a misshapen nose or bruising around his nose during this time.



History of Present Illness

2 years prior to admission

- Patient noted more frequent bouts of nasal congestion, R>L. (+) B rhinorrhea, (+) occasional facial fullness, (+) hyposmia, (+) sneezing occurring in the morning which would occur daily. Noted daytime sleepiness, but no trouble with work. Symptoms would worsen when exposed to dust and strong odors.
- During this time, he noted (+) R sided nasal obstruction and that the bridge of his nose was deviated to the R.



History of Present Illness

2 mos prior to admission

- Persistence of symptoms prompted consult at a private MD for R nasal obstruction. On physical exam, noted rightward deviation of the nasal dorsum and septum. He was advised surgery but transferred to PGH due to financial constraints hence this admission.



NOSE Scale

	Not a problem	Very mild problem	Moderate problem	Fairly bad problem	Severe problem
1. Nasal Congestion	0	1	2	3	4
2. Nasal Obstruction	0	1	2	3	4
3. Problems in breathing through the nose	0	1	2	3	4
4. Sleeping problems	0	1	2	3	4
5. Difficulties in breathing through the nose during exercise or physical	0	1	2	3	4
TOTAL = 10 x 5 = 50 / 100					

Review of Systems

(-) fever

(-) headache

(-) dizziness

(-) blurring of vision

(-) chest pain

(-) cough

(-) abdominal pain

(-) diarrhea/constipation

(-) dysuria

(-) polyuria

(-) nocturia

(-) numbness

(-) edema

Past Medical History

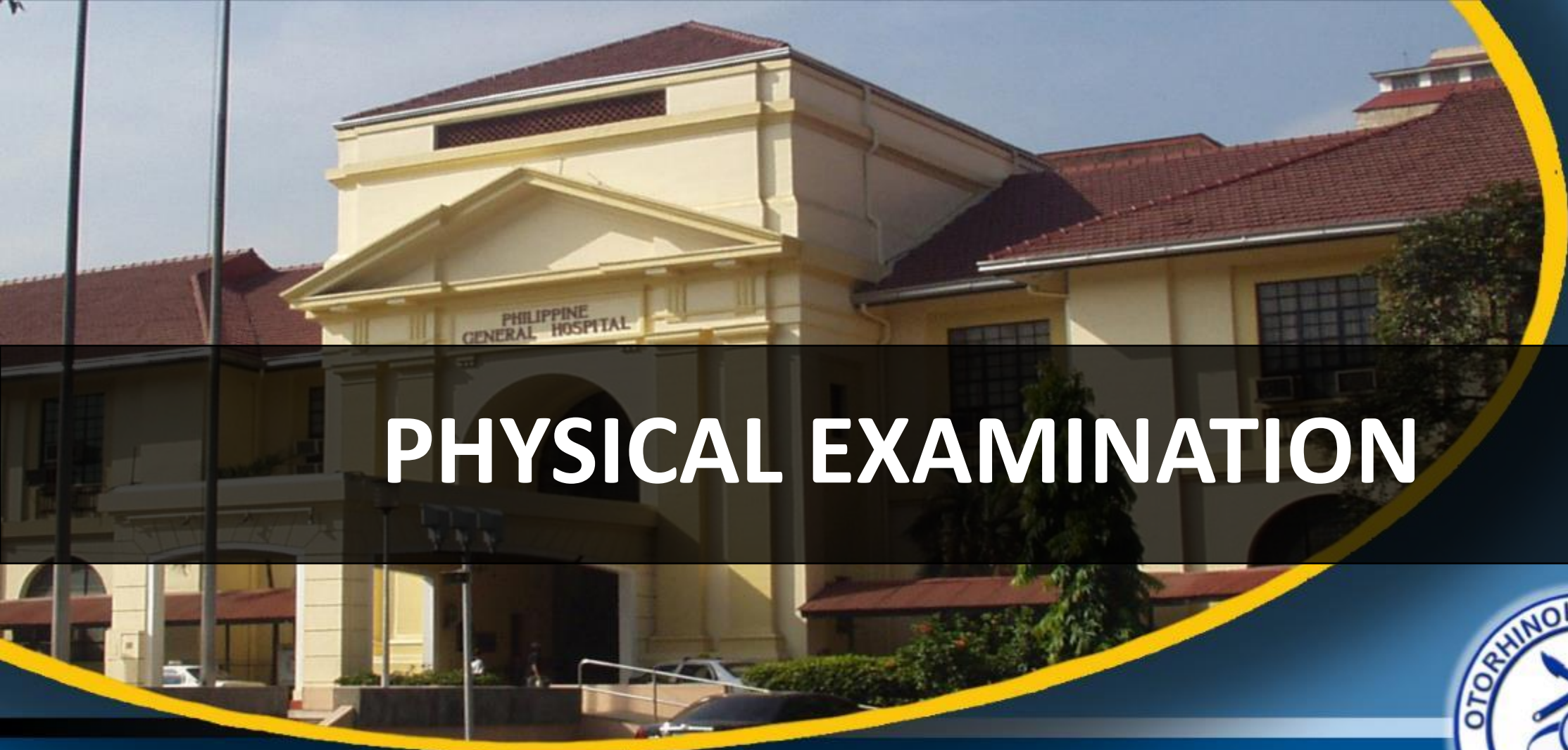
- (-) hypertension
- (-) diabetes
- (-) bronchial asthma
- (-) tuberculosis
- (-) heart disease
- (-) cancer
- (-) liver disease
- (-) kidney disease
- (-) previous surgeries
- (+) allergy to seafood

Family Medical History

- (+) diabetes (maternal and paternal grandmothers)
- (-) hypertension
- (-) heart disease
- (-) cerebrovascular disease
- (-) bronchial asthma
- (-) tuberculosis
- (-) thyroid disease
- (-) cancer

Personal and Social History

- Works as a freelance makeup artist
- Previous 0.5 pack year smoker (Last smoked 2018)
 - 5 sticks/day for 2 years
- Regular alcoholic beverage drinker
 - 3x/month
 - 1 beer bottle or 1 shot of gin
- Denies illicit drug use
- 2 previous non-promiscuous male sexual partners



PHYSICAL EXAMINATION

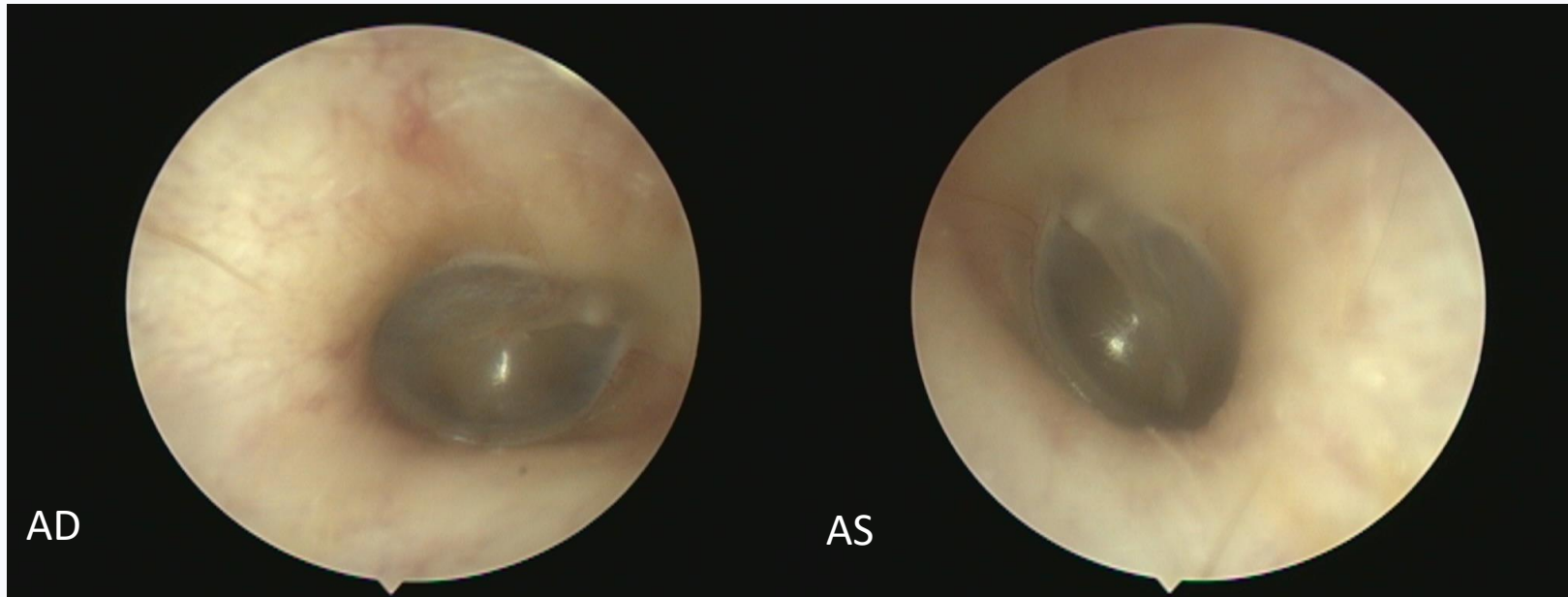


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SYSTEMIC PE

- **VITAL SIGNS:**
BP 110/80, HR 76, RR 18, T 36.8
Ht 166cm, Wt 49.8 kg, BMI 18.1
- **GENERAL:** awake, coherent, ambulatory, not in cardiorespiratory distress
- **CARDIAC:** adynamic precordium, normal rate with regular rhythm, no murmurs
- **PULMONARY:** equal chest expansion, clear breath sounds
- **ABDOMEN:** soft abdomen, normoactive bowel sounds, no tenderness
- **EXTREMITIES:** full and equal pulses, pink nail beds, good capillary refill time, no edema
- **SKIN:** no lesions

OTOLOGIC EXAM



(-) gross deformities, patent external auditory canal
Intact mobile tympanic membrane AU, (-) discharge

ORAL CAVITY EXAM



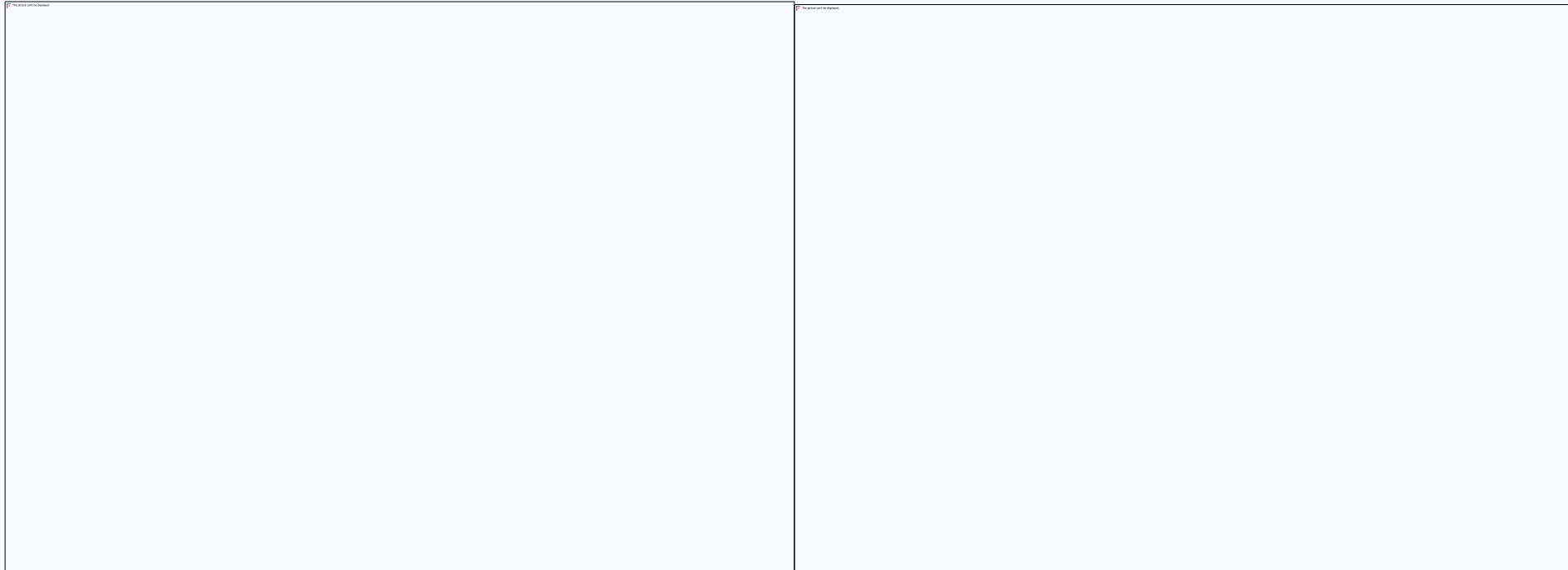
Pink oral mucosa
Tongue and uvula midline
(+) dental caries, (-) masses, lesions

HEAD AND NECK



(-) ANM, (-) CLAD
Trachea midline

INDIRECT LARYNGOSCOPY



Fully mobile vocal cords
No masses noted

RHINOSCOPIC EXAM

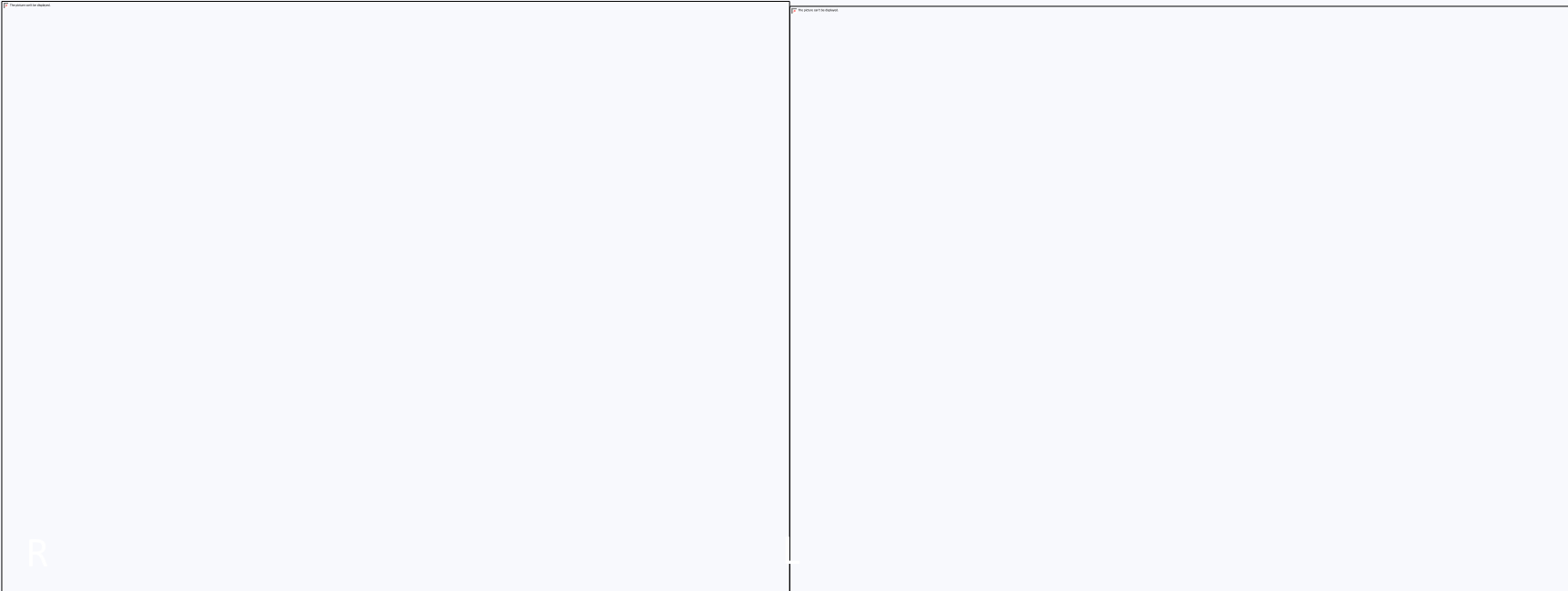


Anterior:

Rightward deviation of the nasal septum

Septal prominence on L nasal cavity

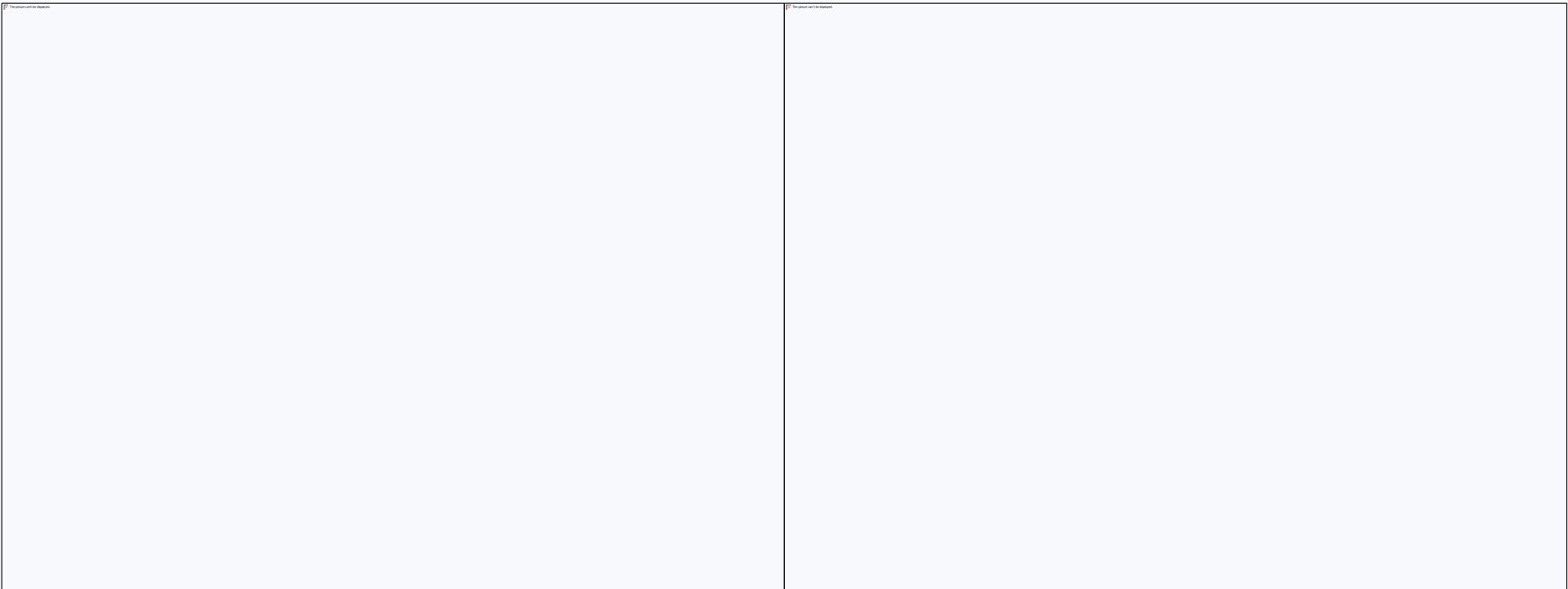
RHINOSCOPIC EXAM



Rightward deviation of the nasal septum
Septal prominence on L nasal cavity



RHINOSCOPIC EXAM



Gr II polyps, bilateral





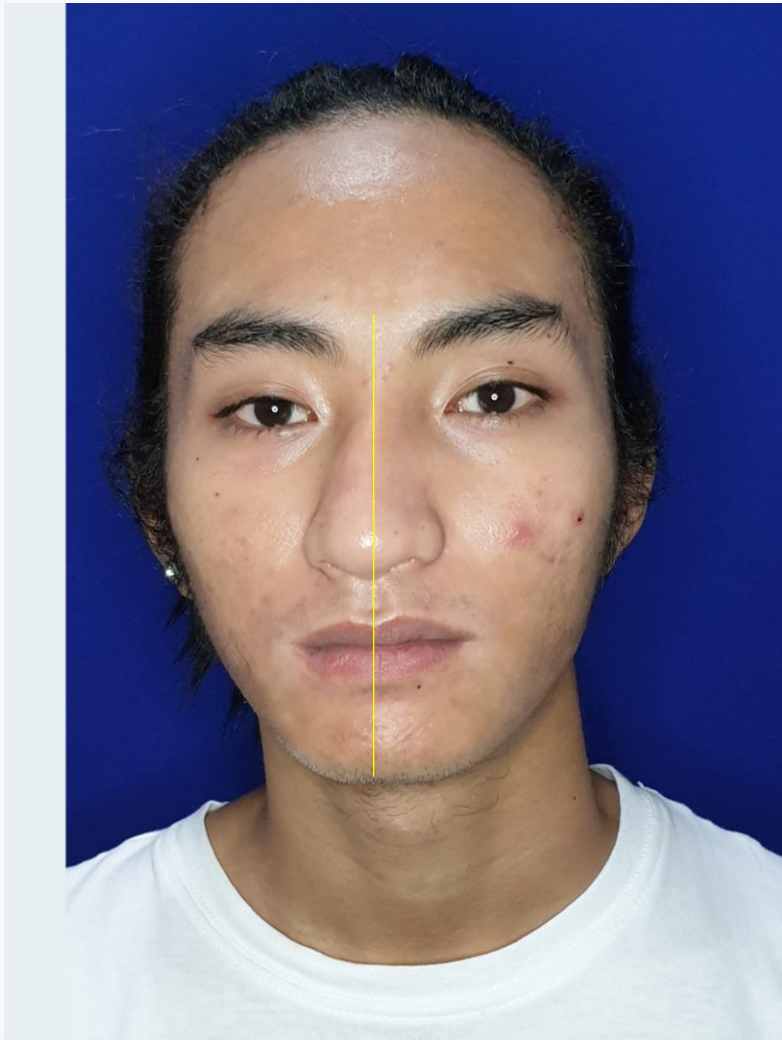
INSPECTION:

- Deviated nasal dorsum to the right
- Dorsal hump
- Bulbous, poorly-projected tip
- Under-projected tip
- Retracted columella
- Hanging ala
- Thick Skin and soft tissue envelope
- Wide alar base with flare

PALPATION:

- (-) Crepitus
- Good tip recoil
- Anterior septal angle and septum firm
- (-) Step down deformity (orbital rim)
- (+) Cottle Maneuver

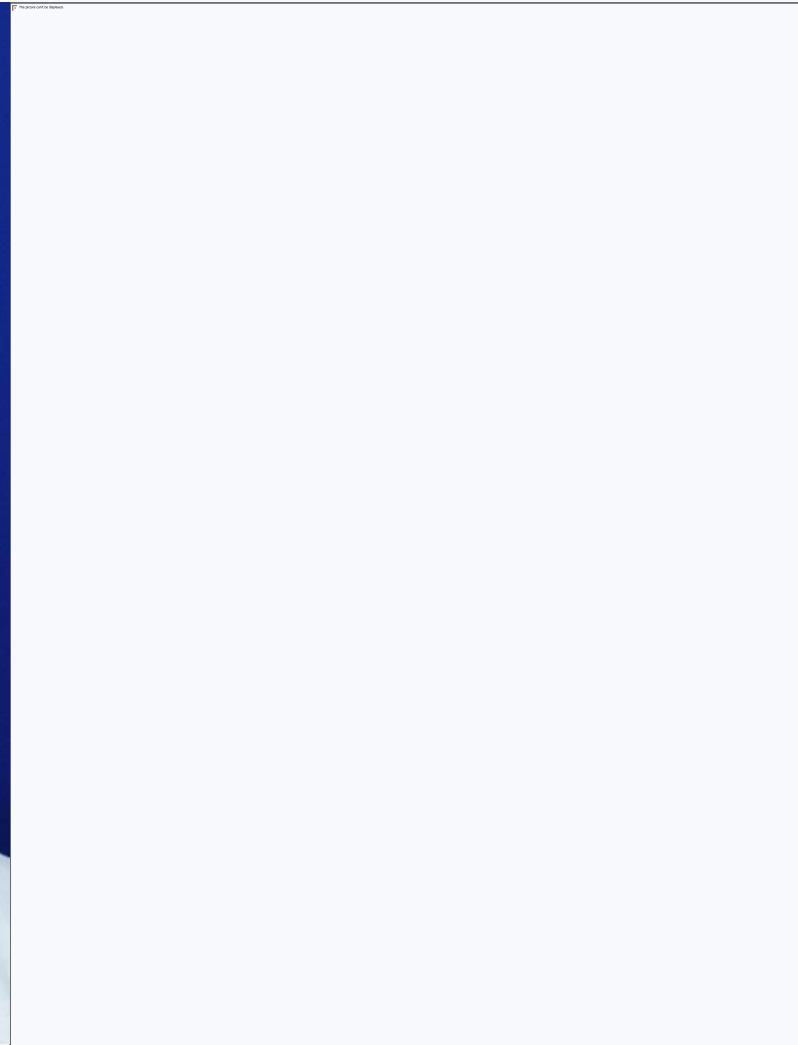
PHOTOGRAPHIC EVALUATION



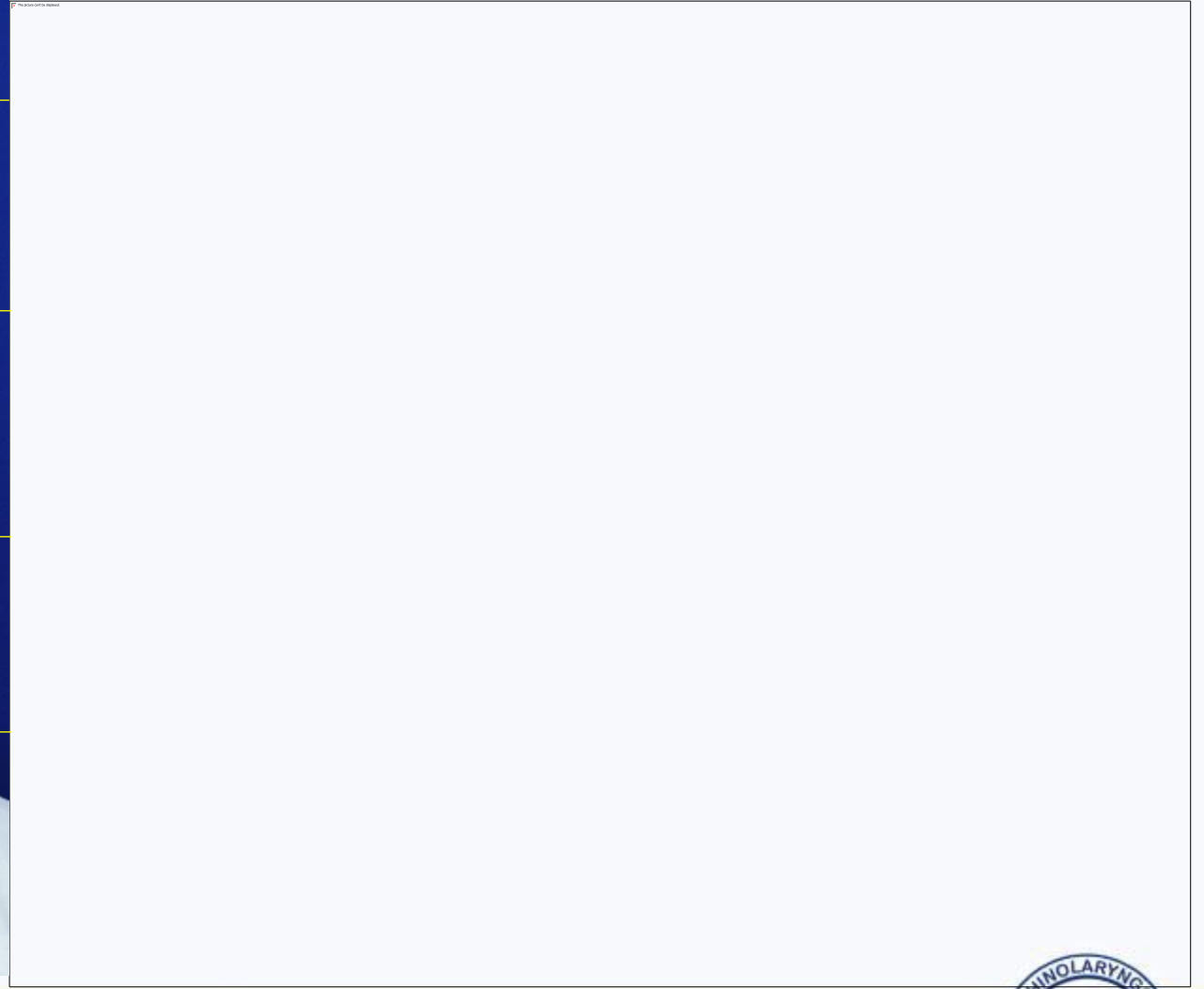
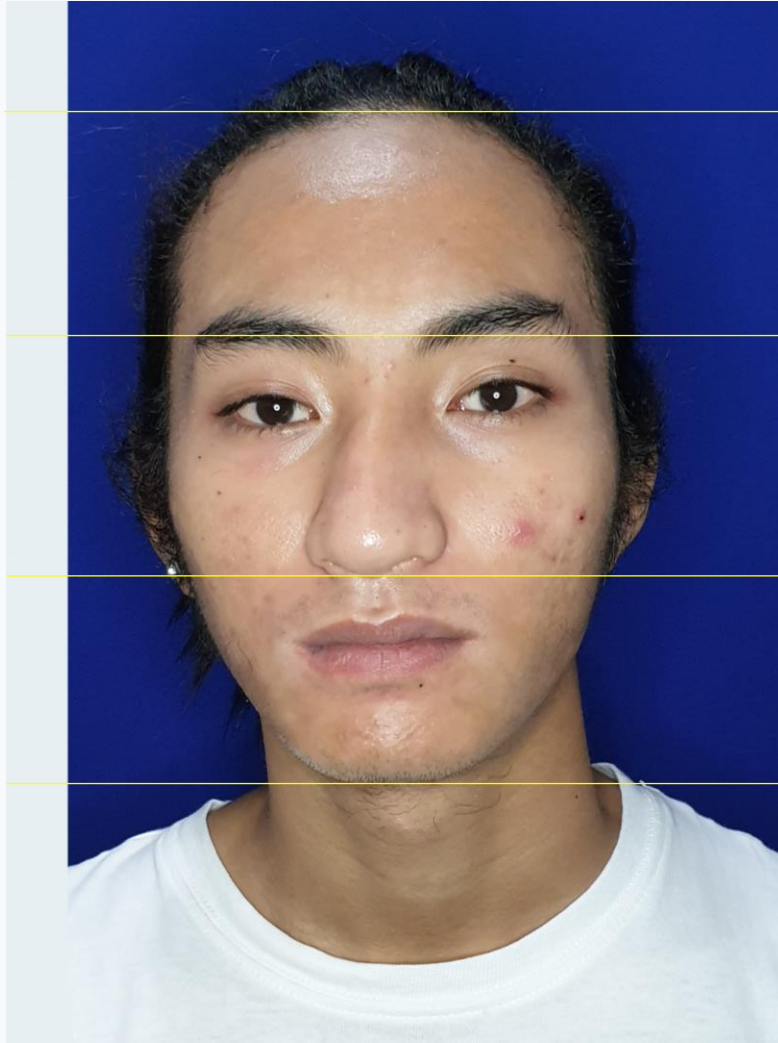
FRONT VIEW

- Ala
 - Flare: (+)
 - Base: wide
- Dorsum: deviated to R
- Tip: bulbous
- Columella: retracted
- Thick Skin Soft Tissue Envelope

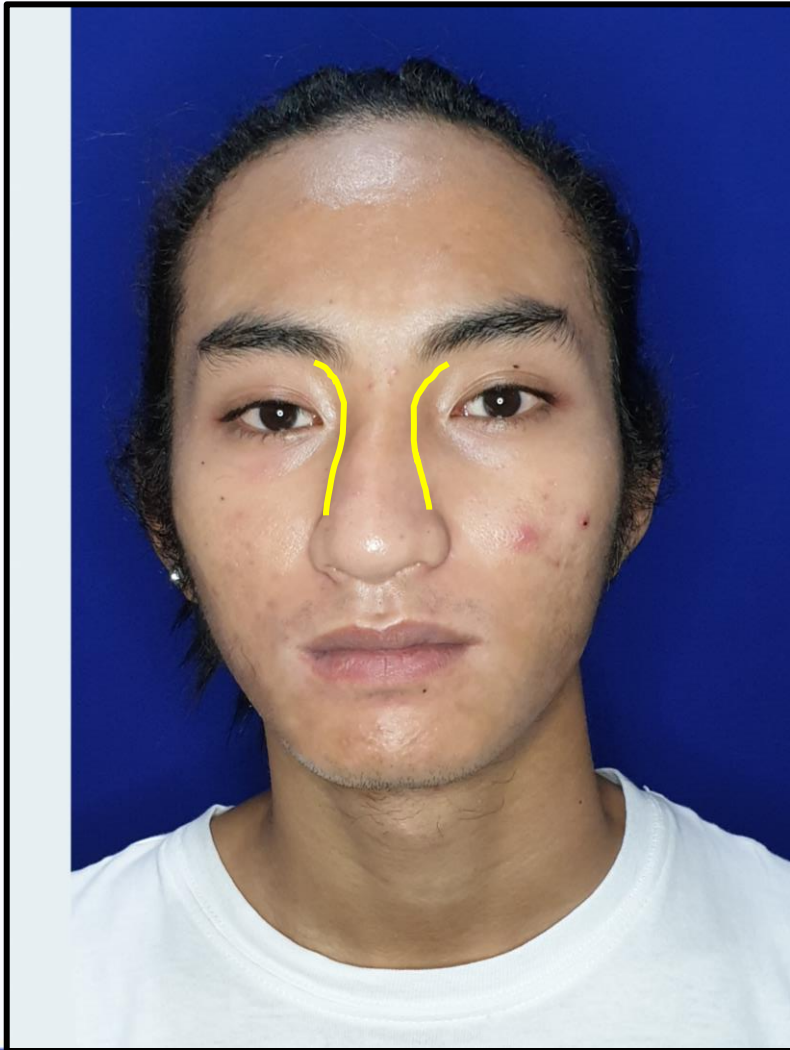
PHOTOGRAPHIC EVALUATION



PHOTOGRAPHIC EVALUATION



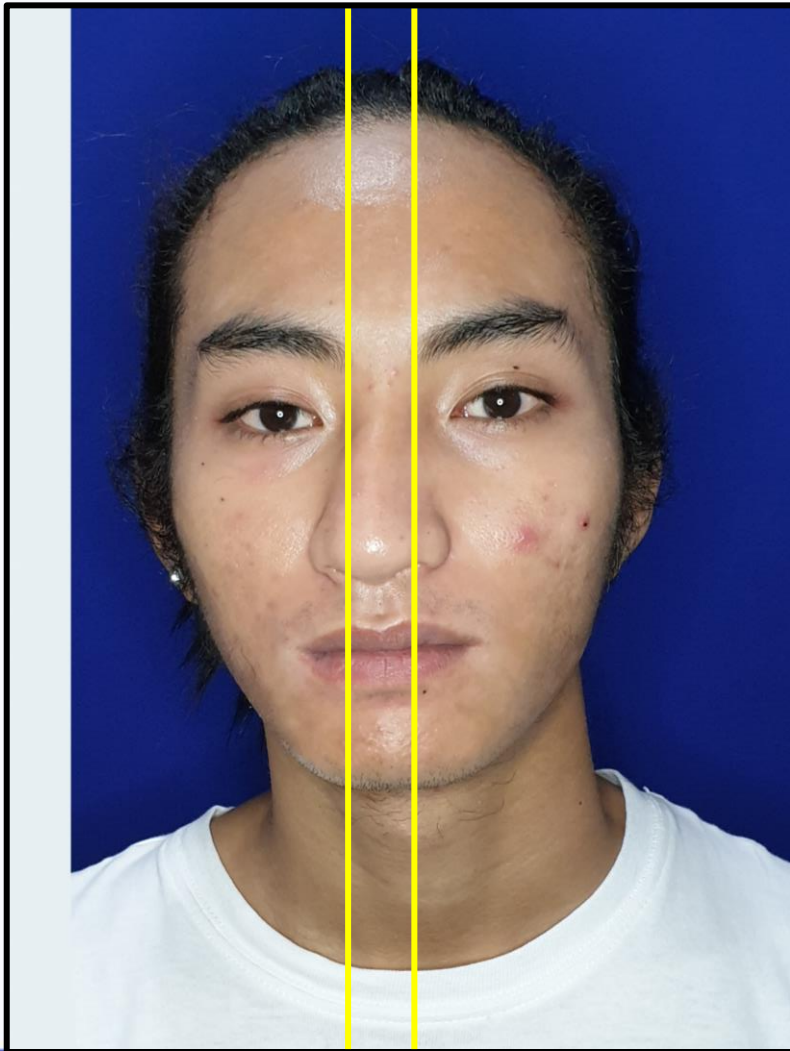
PHOTOGRAPHIC EVALUATION



FRONT VIEW

- ***Dorsal aesthetic line:*** The nasal bridge forms two roughly parallel lines from the brow to the tip defining points.
- A slight concavity is acceptable, but smooth and uninterrupted paths are expected, leading directly to a nasal tip, which appears elegant, natural, and inconspicuous.
- Tip defining points should be discrete, symmetric, and appropriately spaced apart.
- Bulbosity to the supratip can disrupt the brow –tip lines and can be detected from the frontal view.

PHOTOGRAPHIC EVALUATION



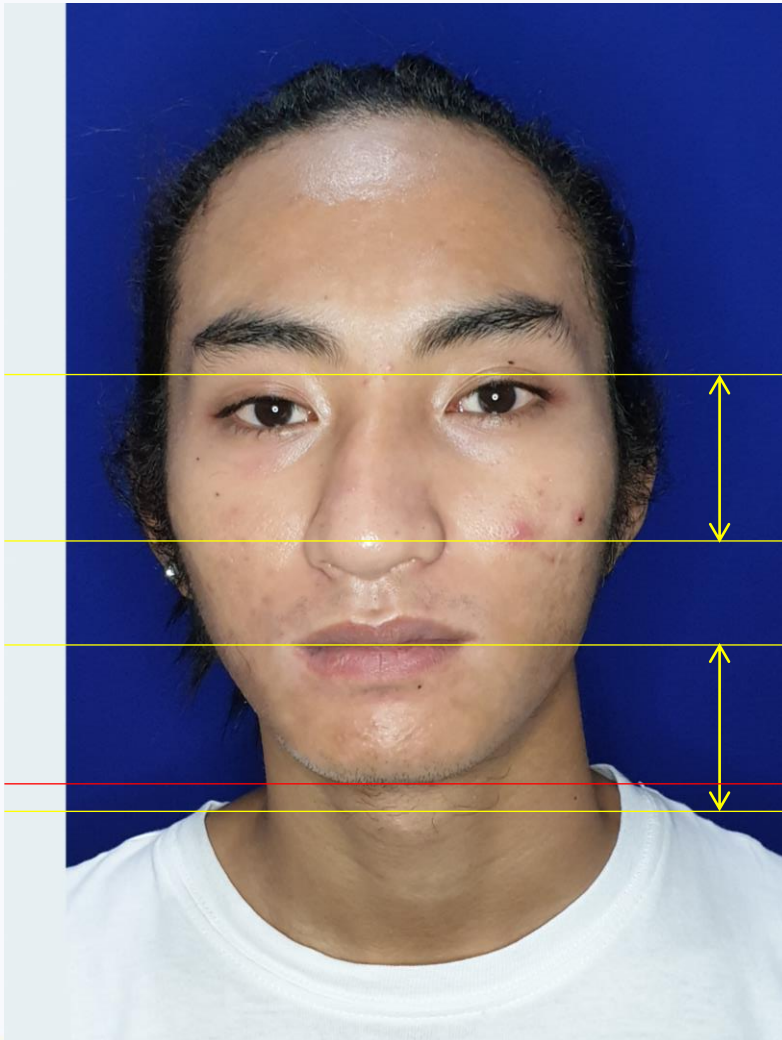
FRONT VIEW

Nasal bony vault: usually acceptable when the width is two-thirds of the alar base width or two-thirds of the intercanthal distance

PHOTOGRAPHIC EVALUATION

FRONT VIEW (DORSUM)

- The distance from the soft tissue nasion to pronasale (usually measures between 45 to 50 mm) is equal to the distance from the stomion to the menton.



PHOTOGRAPHIC EVALUATION

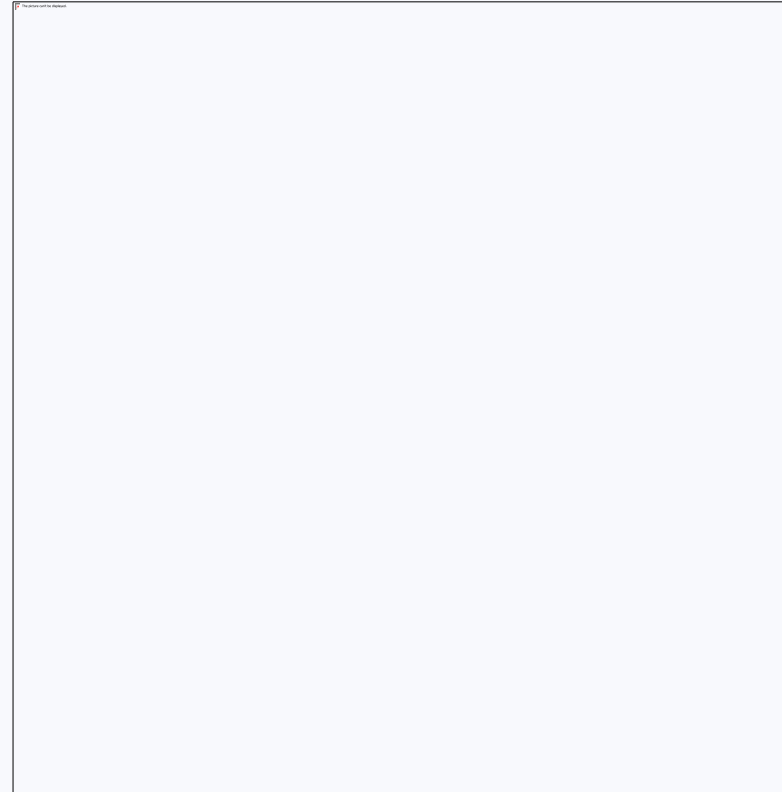
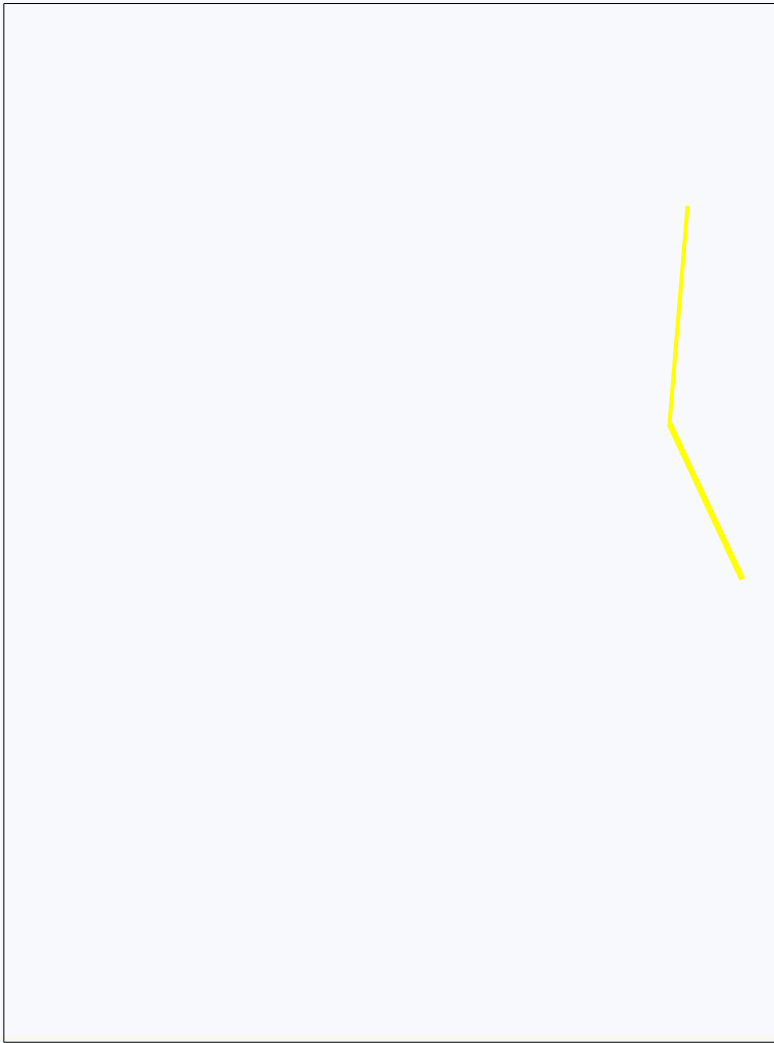
LATERAL VIEW

- **Frankfurt Line:** drawn from the superior aspect of EAC to the inferior border of the infraorbital rim while the patient's gaze is parallel to the floor

PHOTOGRAPHIC EVALUATION

LATERAL VIEW

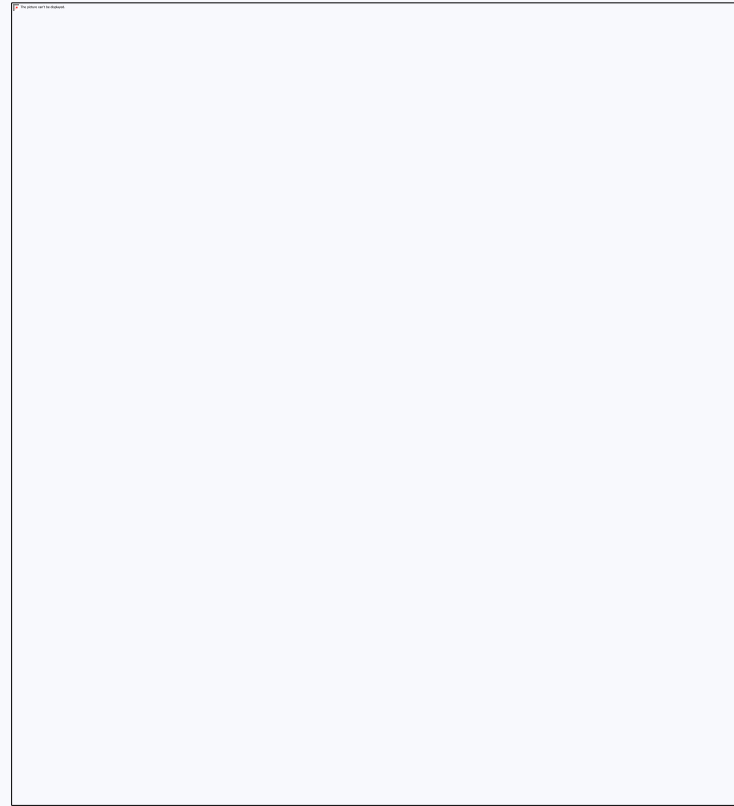
- Nasofrontal Angle: 115 – 135 degrees



PHOTOGRAPHIC EVALUATION

LATERAL VIEW

- Nasofacial Angle: 30 – 40 degrees



PHOTOGRAPHIC EVALUATION

LATERAL VIEW

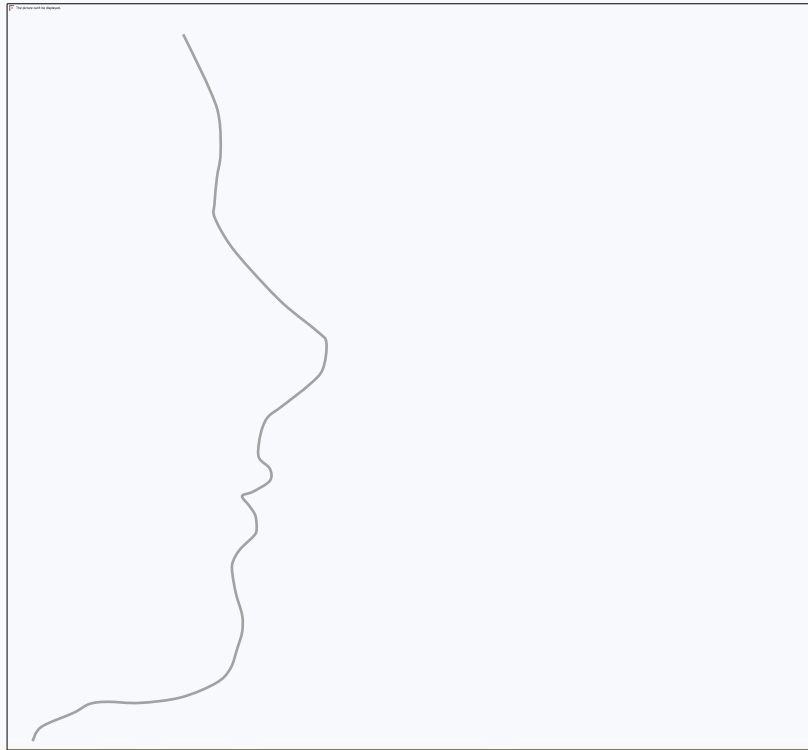
- Ala: hanging
- Columella: retracted
- Dorsum: (+) hump
- Tip: bulbous
- Normal tip projection
- Thick SSTE



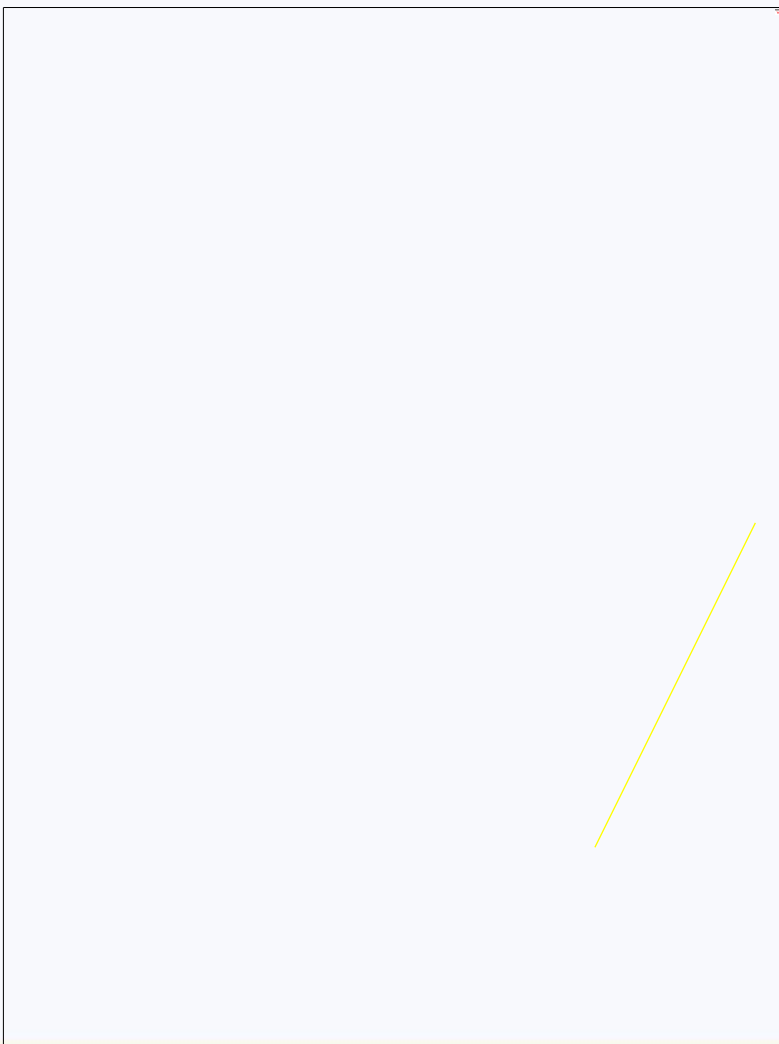
PHOTOGRAPHIC EVALUATION

LATERAL VIEW

- ***Ricketts E line***: Imaginary line connecting the tip of the nose to the pogonion



PHOTOGRAPHIC EVALUATION

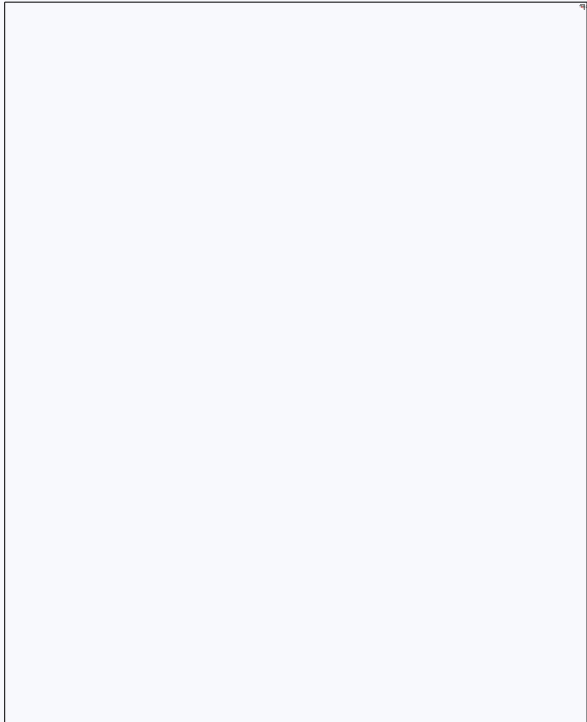
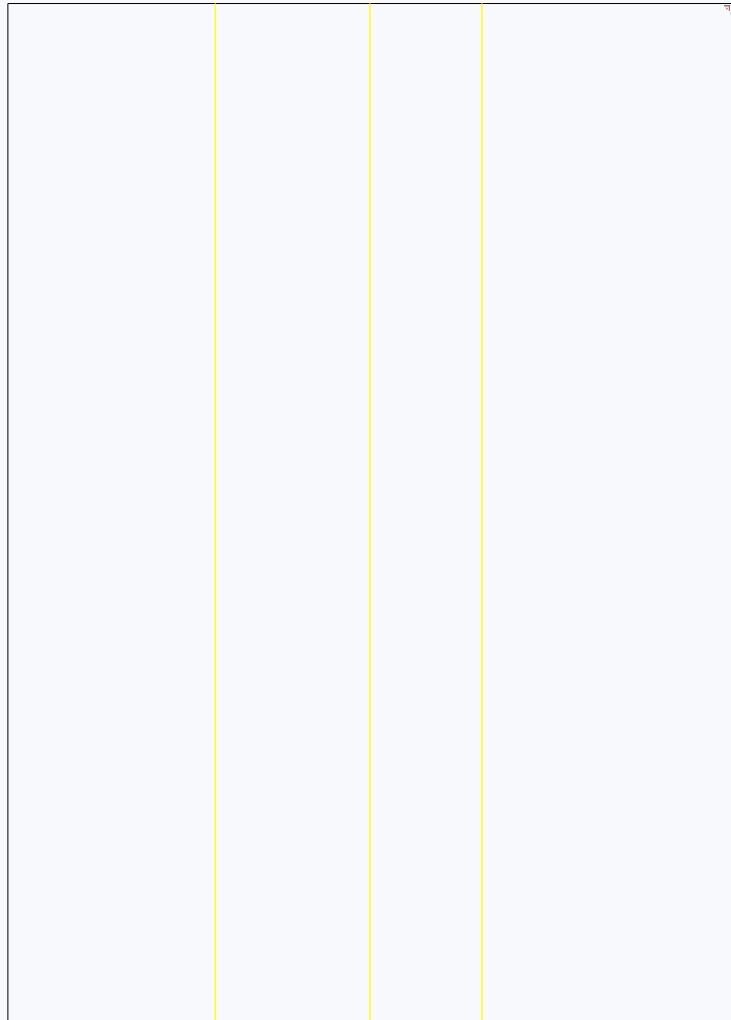


- Ideally:
 - upper lip – 2-3 mm behind the line
 - lower lip – 1-2 mm behind the line
- Asians:
 - upper lip – 0.41mm
 - lower lip – 1.27 mm
 - Problem: lies in tip under-projection
 - Maxillary hypoplasia

PHOTOGRAPHIC EVALUATION

LATERAL VIEW

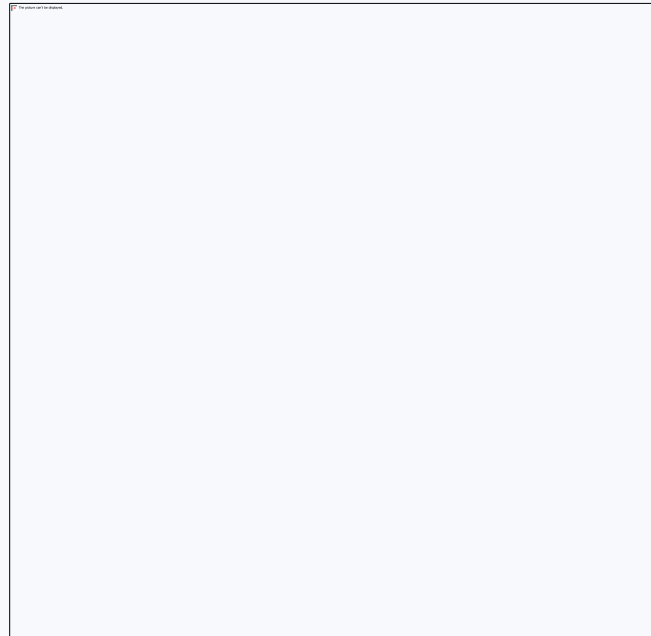
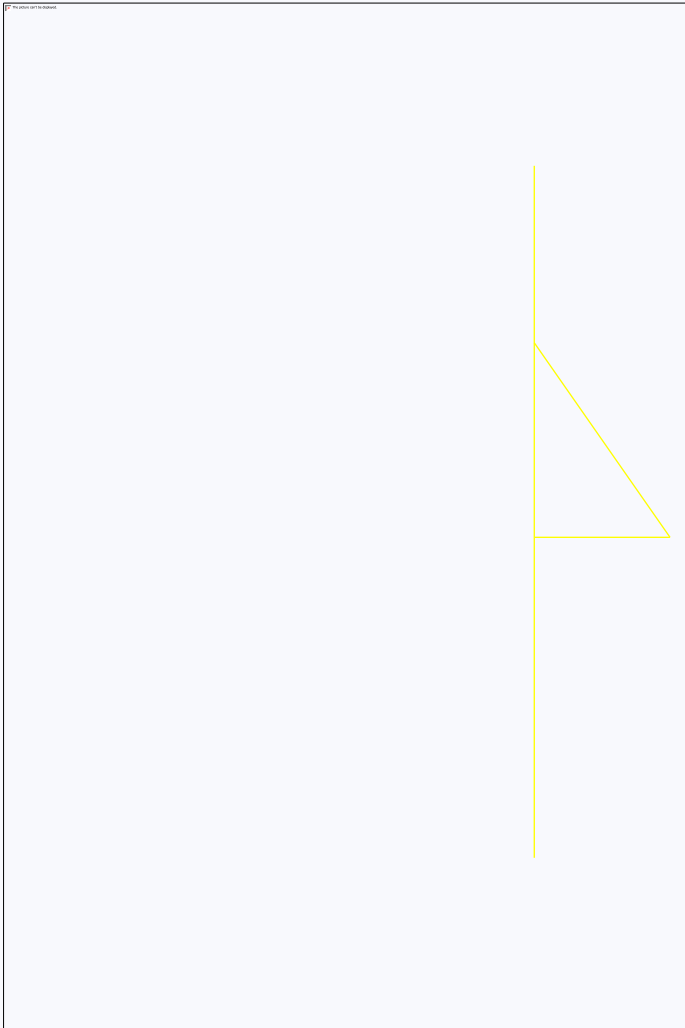
- Ala-to-tip lobular complex ratio
 - Ideal ratio is 1:1



PHOTOGRAPHIC EVALUATION

LATERAL VIEW

- Nasal tip projection
 - Goode's index – Ala to tip : Nasal length = 0.55 - 0.60



PHOTOGRAPHIC EVALUATION

OBLIQUE VIEW

- Dorsum: (+) hump
- Tip: bulbous
- Columella: retracted

PHOTOGRAPHIC EVALUATION

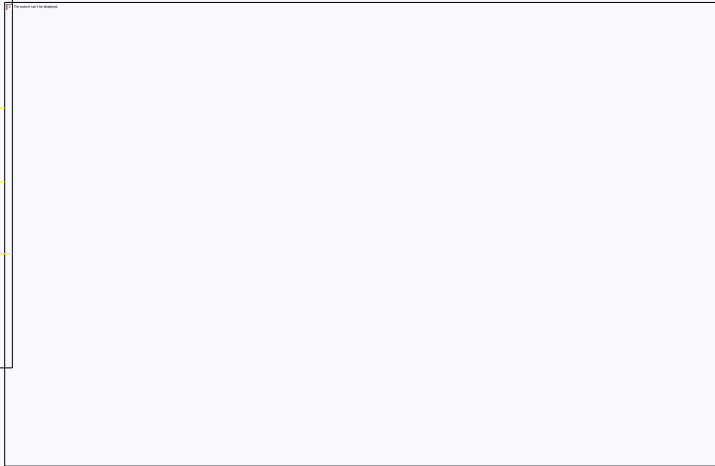
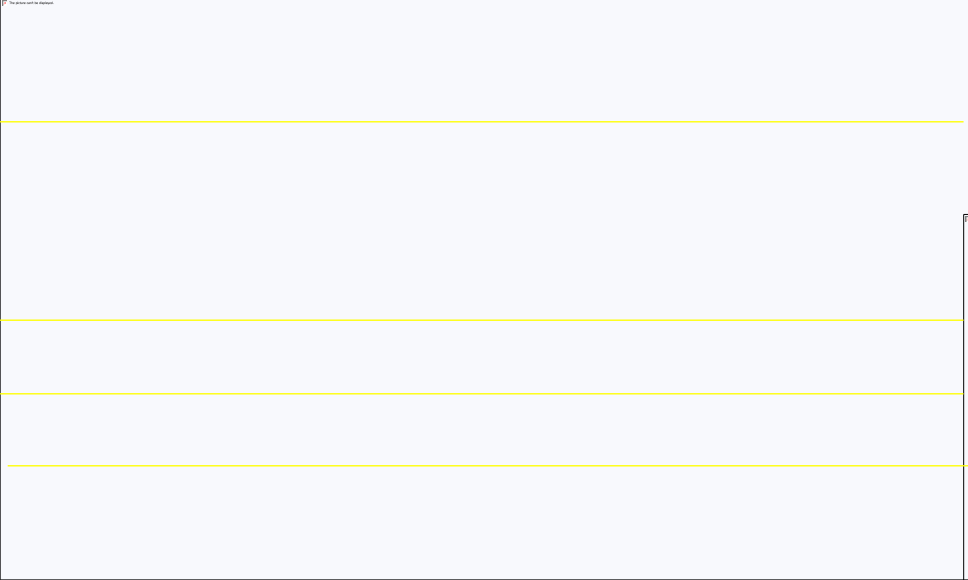
BASAL VIEW

- Ala
 - Base - wide
 - Flare - (+)

PHOTOGRAPHIC EVALUATION

BASAL VIEW

- Good tip projection
- Poor columellar show (middle 1/3)



Case Summary



- 19/M
- Involved in 4 vehicular crashes with incomplete workup
- (+) deviated nasal bridge R
- 2 year history worsening R sided nasal obstruction

Assessment



- Neglected Nasal Bone and Septal Fracture from prior vehicular crash
- Chronic Rhinosinusitis with Nasal Polyps Gr II B



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DIAGNOSTICS



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IMAGING OF THE NASAL BONE



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Radiographic Films

- An accurate history and PE are more useful than xray for distinguishing nasal bone fractures
 - Crepitus, epistaxis, ecchymosis, deformity, tenderness, edema, instability, and crepitations
 - Not always present, may be transient
- Plain films have high rates of false-positive and –negative findings and are inadequate for an accurate diagnosis of nasal bone fractures
 - Nasal bone forms from multiple ossification centers and involves multiple suture lines -> can be misidentified as fractures on x-ray
 - Septal bone fracture can be missed on a simple x-ray film -> potentially leading to a secondary deformity

Guisado, J. "Clinical Evaluation of the Nose: A Cheap and Effective Tool for The Nasal Fracture Diagnosis." *ePlasty* (2012)

Song, Sun Wha, et al. "Clinical Utility of Three-Dimensional Facial Computed Tomography in the Treatment of Nasal Bone Fractures: A New Modality Involving An Air-Bone View

With A Volume Rendering Technique." *Indian J Otolaryngol Head Neck Surg* 65.S2 (2011): 210-215. Web. 25 Aug. 2016.

Computed Tomography

- Computed Tomography (CT) scans have greater sensitivity and specificity for nasal fracture
 - Cost and lack of impact on management do not justify their use in diagnosing isolated nasal fractures
 - Utility would be in managing the patient with extensive maxillofacial trauma

Guisado, J. "Clinical Evaluation of the Nose: A Cheap and Effective Tool for The Nasal Fracture Diagnosis." *ePlasty* (2012)

Song, Sun Wha, et al. "Clinical Utility of Three-Dimensional Facial Computed Tomography in the Treatment of Nasal Bone Fractures: A New Modality Involving An Air-Bone View With A Volume Rendering Technique." *Indian J Otolaryngol Head Neck Surg* 65.S2 (2011): 210-215. Web. 25 Aug. 2016.

Role of Imaging in Nasal Bone Fractures

- CT is useful in the accurate diagnosis of nasal bone fractures
- 3D CT -> enables precise reconstruction of the extent of the nasal bone fracture and displaced fragments with a low dose of radiation
 - 3D CT helped to recognize not only the position and direction of fractures, but also the number of bone pieces and the amount of dislodgement in acute trauma cases



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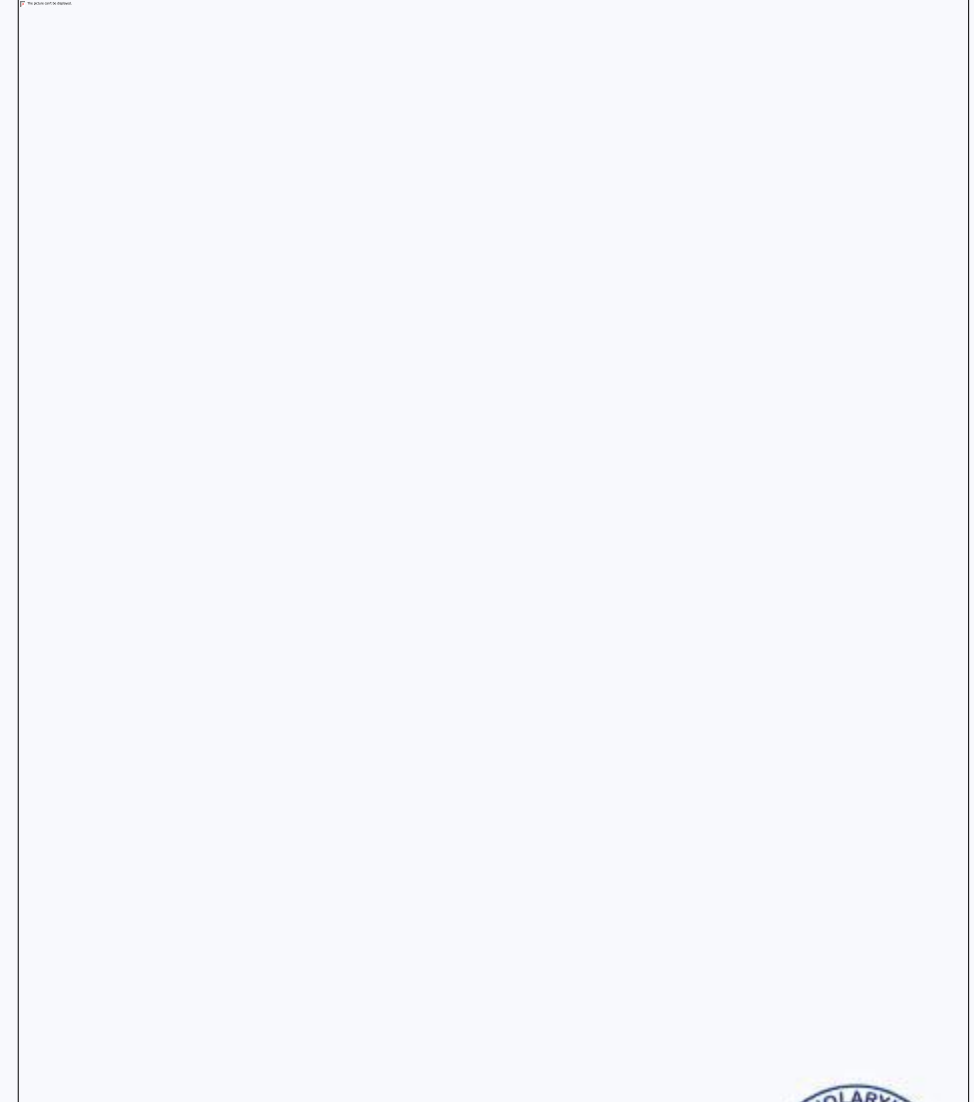
DISCUSSION



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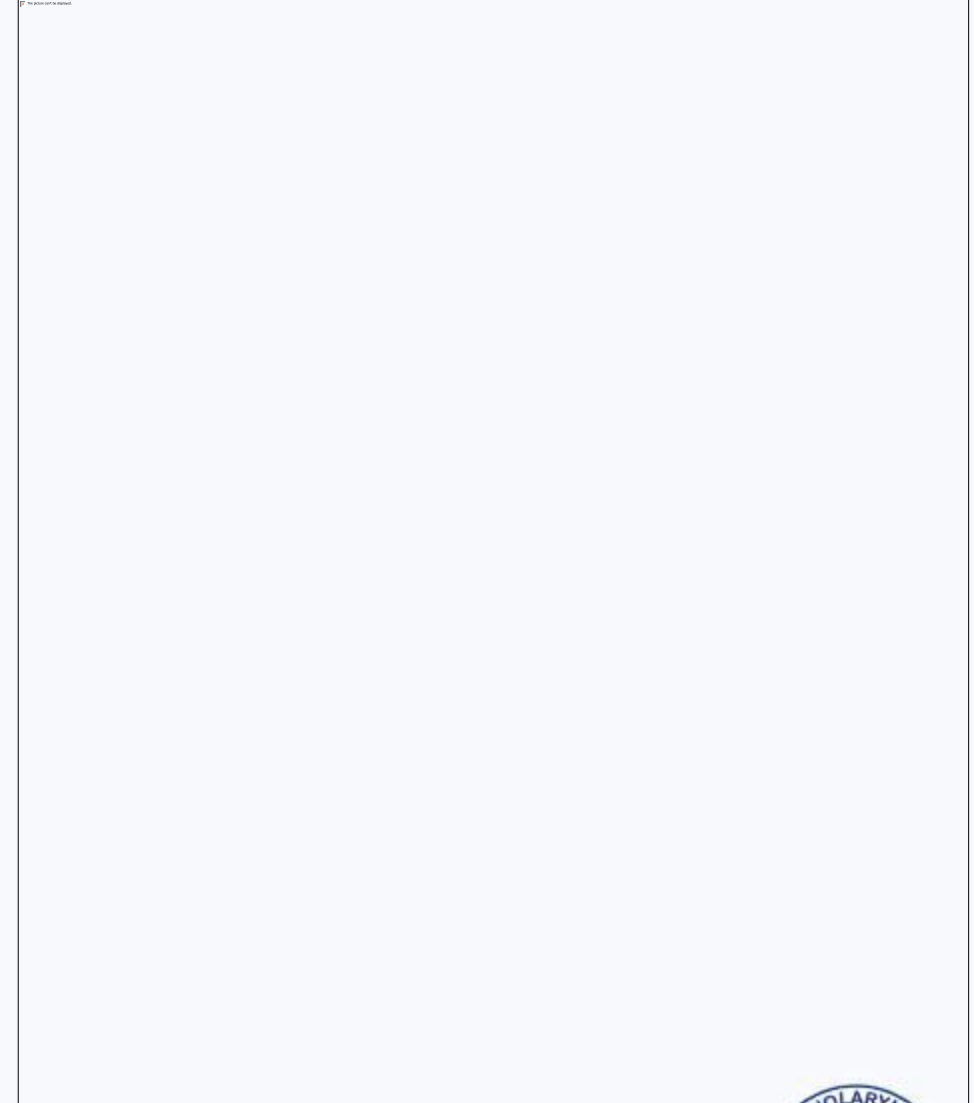
Anatomy

- Vasculature
 - External and Internal Carotid Arteries form a subdermal plexus that is most dense at the nasal tip
 - Lining of the nose
 - **Anterior and Posterior Ethmoid Arteries** superiorly
 - **Labial and Angular Arteries** inferiorly
 - **Lateral Nasal Artery** over the alar groove
 - **Superior Labial Artery** superiorly through the columella
 - Medial and lateral walls
 - Anterior Ethmoidal
 - Posterior Ethmoidal
 - Sphenopalatine
 - Greater Palatine
 - Septal branch of the superior labial artery



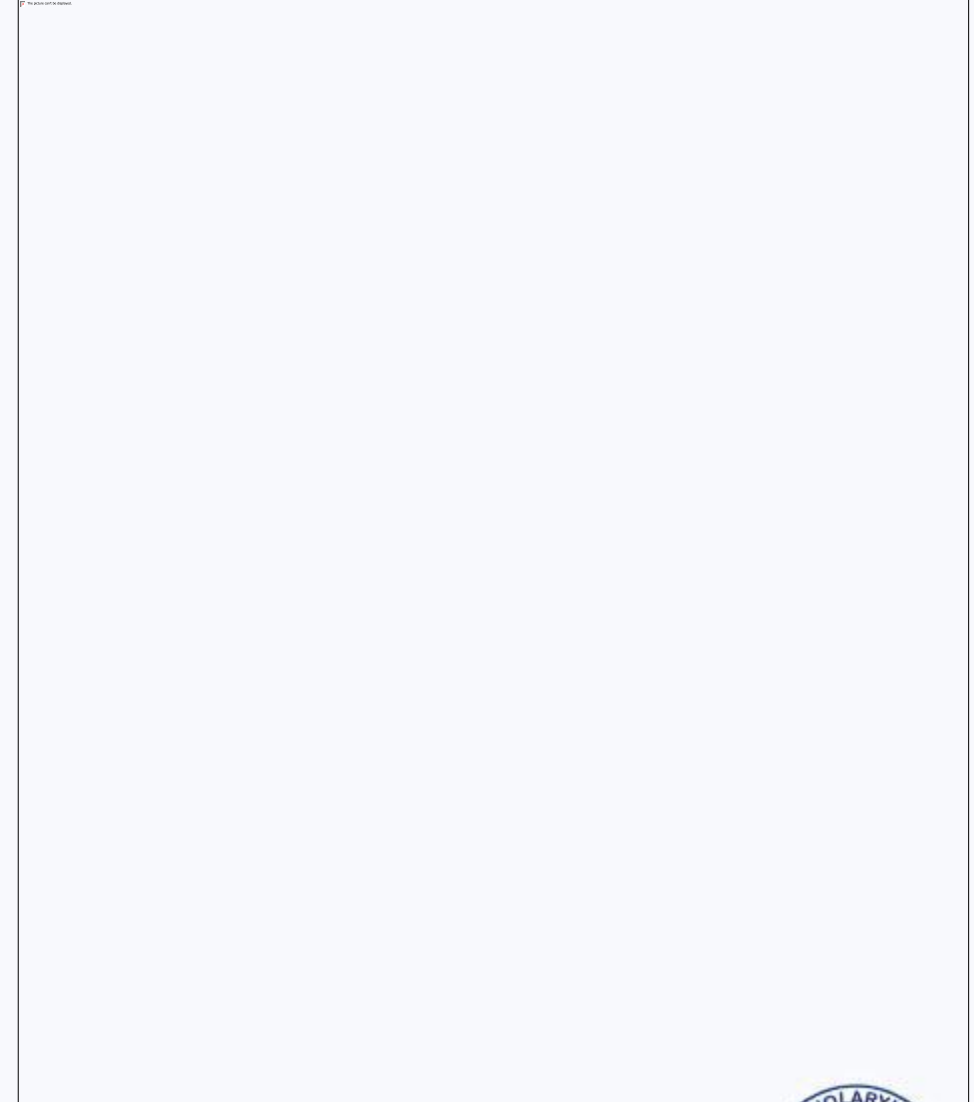
Anatomy

- Vasculature
 - Venous Drainage
 - Facial Vein
 - Angular Vein



Anatomy

- Nerve Supply
 - Supratrochlear branches of the Ophthalmic Nerve - Skin of the nose
 - Anterior Ethmoidal Nerve - Tip of the nose
 - Infraorbital Nerve - Lateral nasal wall, columella, vestibule



Nasal Bone Fracture

- Most frequent facial fracture
- Third most common fracture in the body
- Usual s/sx: Deformity, swelling, epistaxis, nasal obstruction, and periorbital ecchymosis, bony crepitus, nasal segment mobility
- Fracture occurs as a combination of several factors:
 - force
 - impact direction
 - nature of the striking object
 - patient age

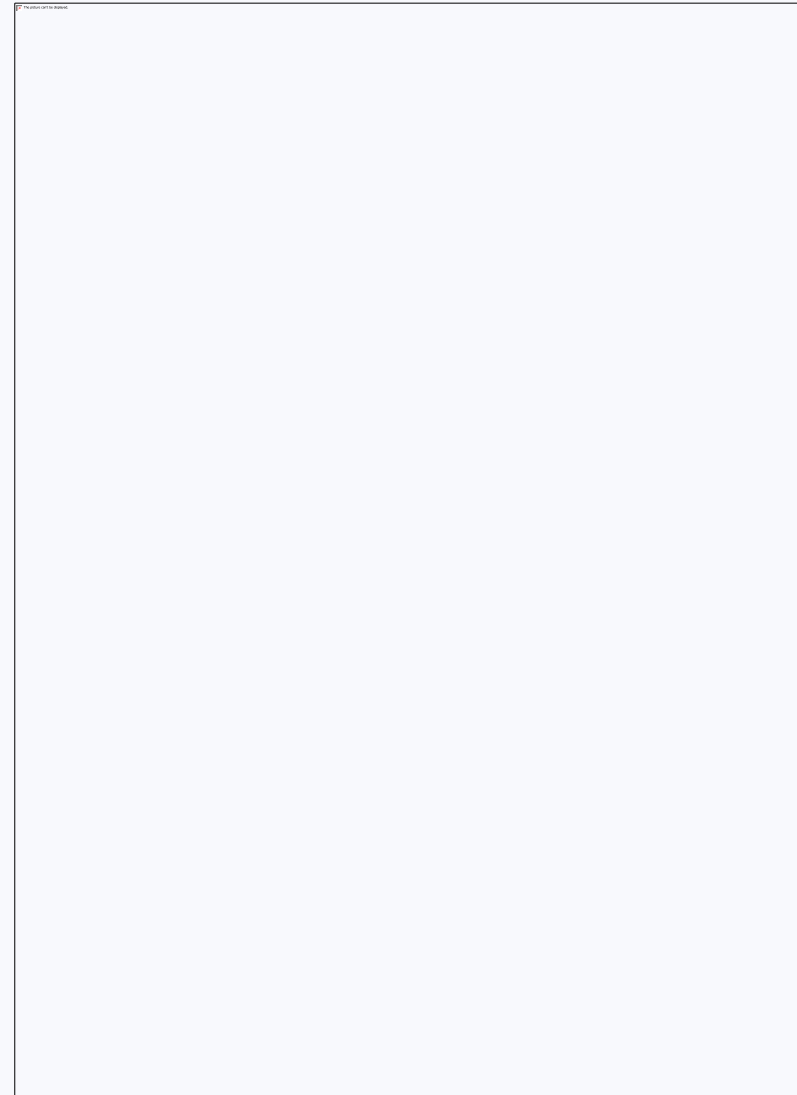


Grand Rounds
Sept 6, 2019

Hernandez/Notario/Dealino/Tirol

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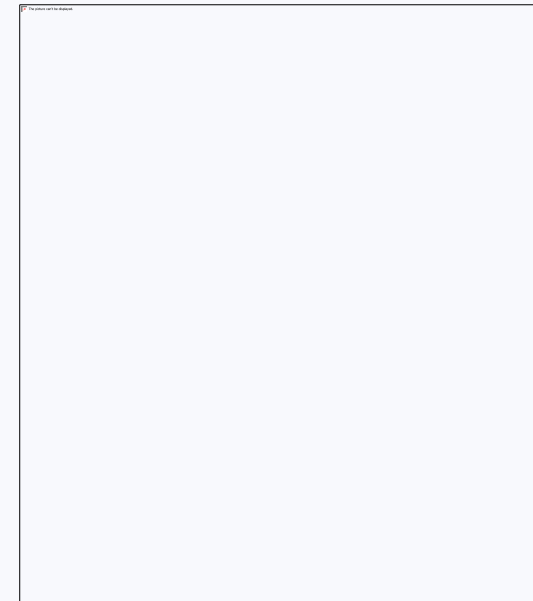
Details	Patient
Initials	RA
Age/Sex	19/M
Occupation	Make-up Artist
Hometown	Naic, Cavite
Chief complaint	Right-sided nasal obstruction



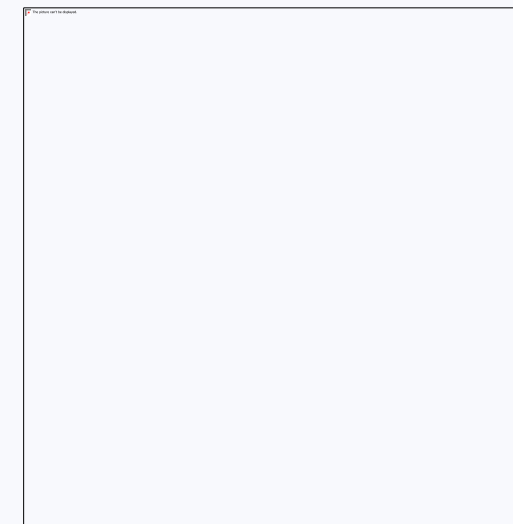
Details	Patient
<p>Summary of history</p>	<p>Multiple episodes of vehicular crash (Pedestrian vs. Van), The patient cannot clearly recall some details of the incidents.</p> <ul style="list-style-type: none"> • 2008: Hit from the Left, causing him to thrown a few feet from the vehicle, (+) bleeding, epistaxis, (+) LOC, (+) multiple abrasions • 2010: Hit from the Left, (-) epistaxis, (-) LOC, (+) multiple abrasions, (+) neighbors noted rightward deviation of nose, (+) nasal stuffiness • 2011: Hit from the Left, (-) epistaxis, (-) LOC, (-) abrasions, (+) left foot was run over • 2013: Hit from the Right, (-) epistaxis, (-) LOC, (-) multiple abrasions

Details	Patient
Past Medical History	No history of nasal obstruction prior to 2 nd vehicular crash, (+) Seafood allergy, no other co-morbidities
Family Medical History	Diabetes Mellitus (grandmother)
Personal Social History	0.5 pack year smoker, , 3 rd Year Highschool Undergraduate, Freelance Make-up Artist

Details	Patient
PE Findings	Rightward deviation of the bony and cartilaginous nasal dorsum, Septal deviation to the right (profoundly noted at the anterior 1/3 of the nasal septum) Grade II Nasal Polyps Bilateral



RIGHT



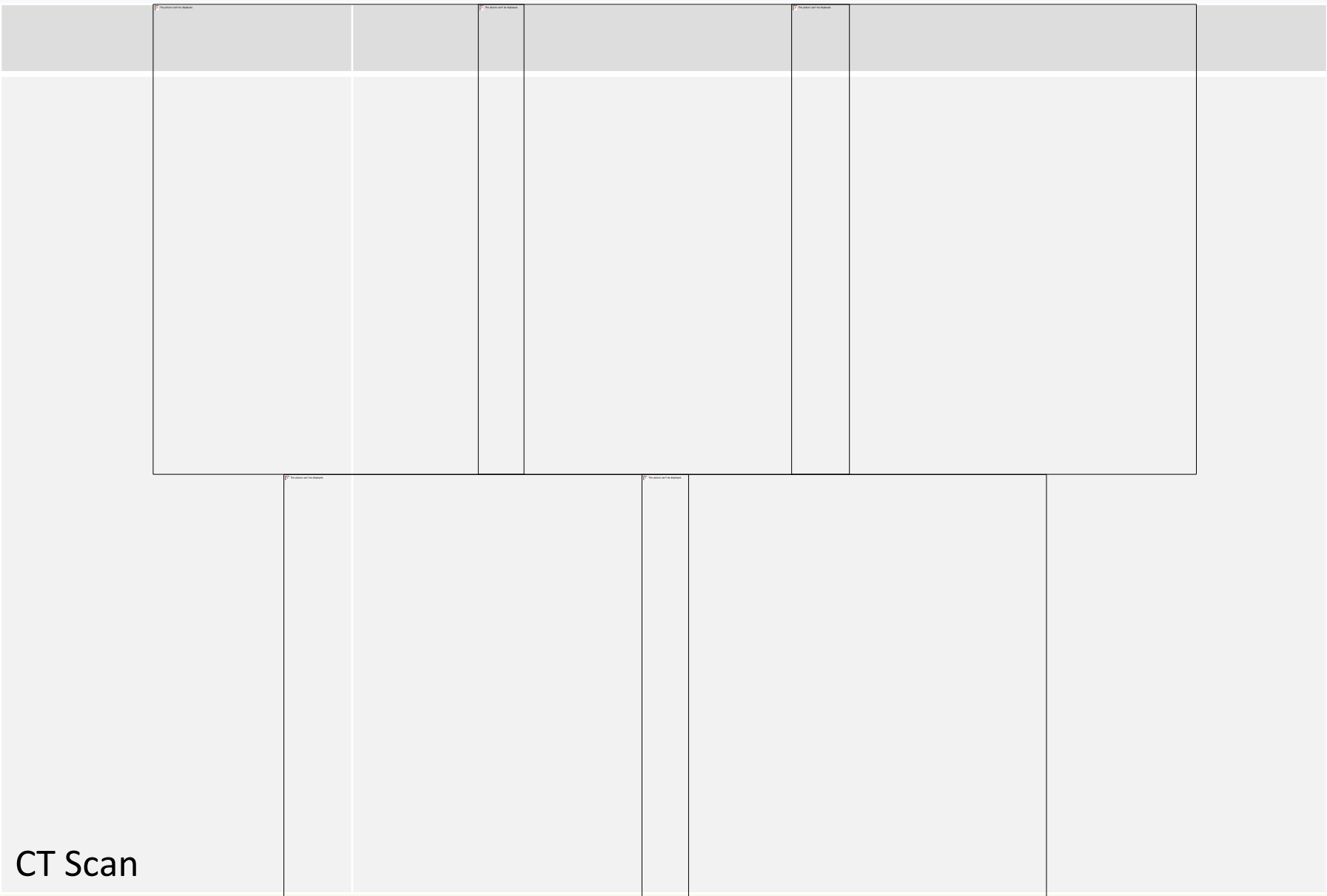
LEFT

INSPECTION:

- Deviated nasal dorsum to the right
- Dorsal hump
- Under-projected tip
- Retracted columella
- Bulbous tip
- Thick Skin and Soft Tissue Envelope
- Wide alar base with flare
- Hanging ala

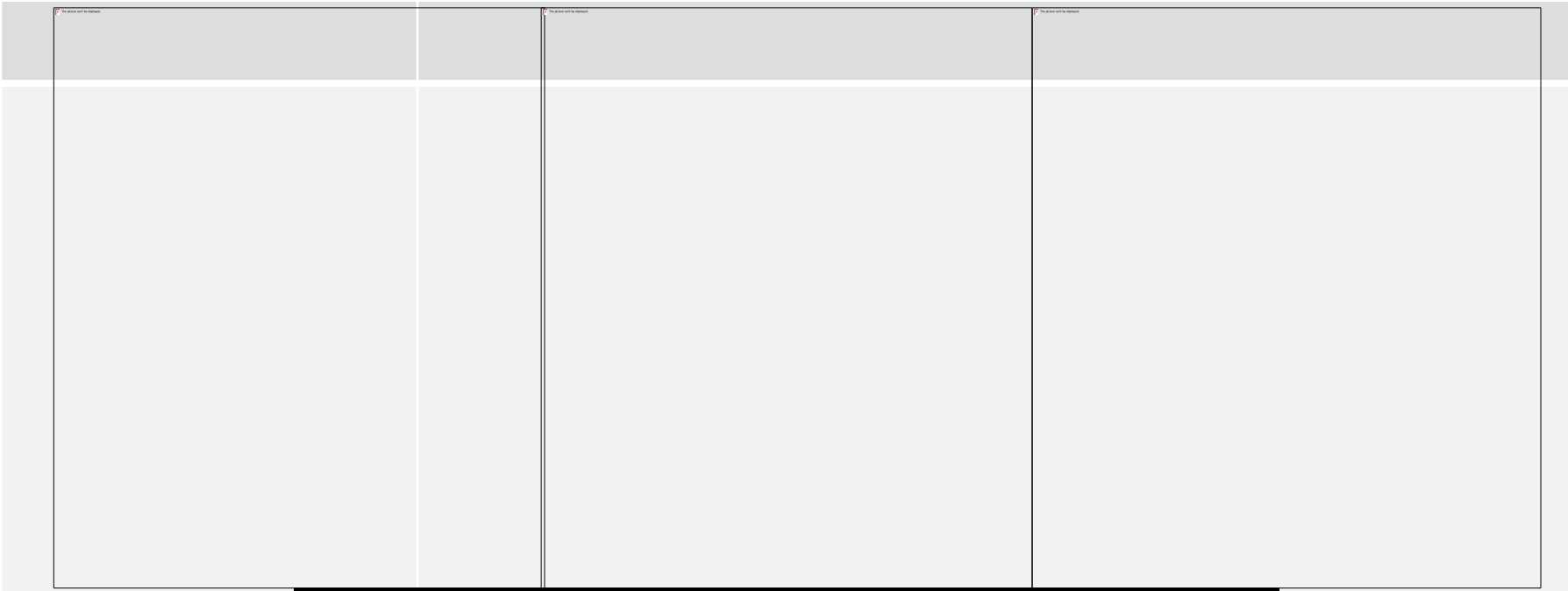
PALPATION:

- Good tip recoil
- Palpable nasal bone and septal cartilage, deviated to the right



CT Scan





CT Scan



Assessment

- Neglected Nasal Bone and Septal Fracture from prior vehicular crash
- Chronic Rhinosinusitis with Nasal Polyposis Gr. II B, with allergic component

Management

- Nasal Deformity
 - Rightward deviation
 - Obstruction
- Patient Factors
 - Clear with expressing desire to be relieved of nasal obstruction
 - Aesthetic sequelae is a bonus
 - Management of CRS with NP and AR
- Analysis

4 Key Maneuvers

to correct a crooked nose

- Septum straightening
- Complete osteotomies, including intermediate osteotomies
- Long and wide spreader grafts for cartilaginous dorsal deviation
- Strategic camouflage

Flint, Paul W. (Ed.) (2015). Cummings Otolaryngology: Head & Neck Surgery. Philadelphia, PA : Elsevier/Saunders.

Management

- Open approach is preferred for management of the deviated nose
 - Better exposure of the nasal dorsum
 - Improved graft maneuverability

Jang, YJ, Wang JH, & Lee BJ. (2008). Classification of the Deviated Nose and Its Treatment. Arch Otolaryngol Head Neck Surg, 134(3), 311-315.

What needs to be done?

ISSUES TO BE ADDRESSED	SURGICAL PLAN
Nasal obstruction	Septoplasty, Spreader Graft
Deviated nasal dorsum with dorsal hump	Osteotomy, Septoplasty
Under-projected bulbous tip	Septal Extension Graft, Camouflage Graft
Wide alar base with flare Hanging ala	Alarplasty

What to use?

- Autologous tissues (i.e. bone, cartilage)
 - Primary choices for nasal reconstruction
- Advantages:
 - Biocompatibility is unsurpassed
 - Risk for infection and protrusion is far less as compared to an alloplast
- Disadvantages:
 - Donor site morbidity
 - Limited supply
 - Potential warping
 - Uneven contour
 - Risk of misplacement, displacement, resorption

Chen, Chien-Tzung et al. "Reconstruction Of Traumatic Nasal Deformity In Orientals". *Journal of Plastic, Reconstructive & Aesthetic Surgery* 63.2 (2010): 257-264. Web.

Autologous Graft Options

- Septal Cartilage
 - Flat contour, harvested easily via rhinoplasty incision without the need to involve other body sites for graft harvesting
 - Necessary to stack the graft to create adequate volume

Autologous Graft Options

- Conchal Cartilage
 - Readily available, easy harvest
 - Curvature → less than ideal for dorsal augmentation
 - Flatten curvature by sutures or scoring may cause visible lump or bump irregularities later under thin dorsal skin

Autologous Graft Options

- Rib cartilage graft
 - Need to harvest at another body site, (+) scar
 - Tends to fragment when crushed
 - Must be splinted to prevent warping

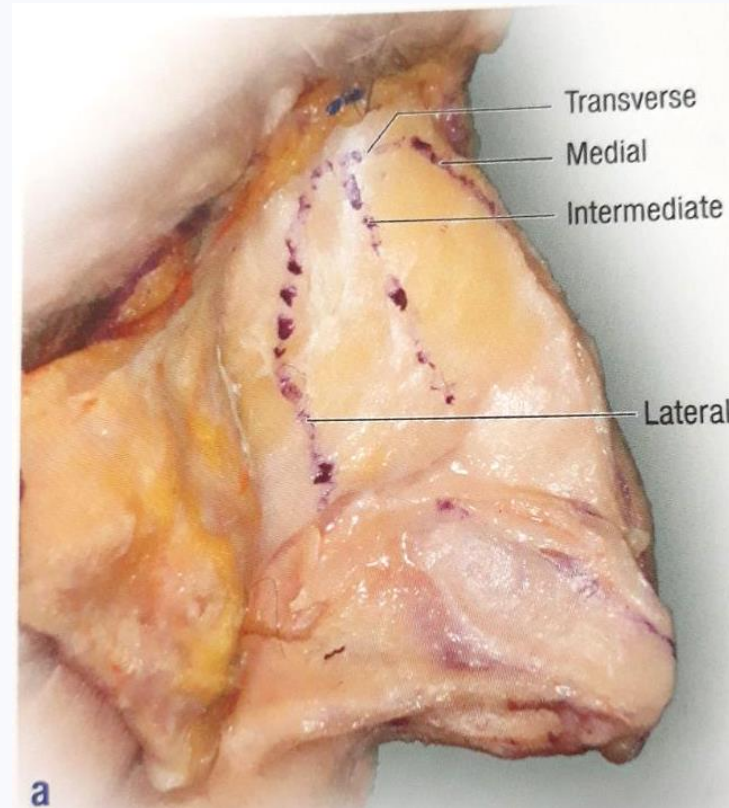
Osteotomy

- Indications:
 - Open roof deformity
 - Narrowing the bony nasal pyramid
 - Correcting a deviation of the upper 1/3 of the nose

Park, S., Sethi, D., Oo, K., & Loh, I. (2015) Rhinoplasty Dissection Manual: A text on dissection, anatomy and technique. Endo Press: Germany. p. 28

Osteotomy

- Types:
 - Medial
 - Lateral
 - Intermediate
 - Transverse



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Osteotomy

- Central midline bony fragment, the frontal beak, must be mobilized to allow repositioning of the bony pyramid
- May require a transverse osteotomy

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Osteotomy

- Complications:
 - CSF leak
 - Intracranial injury
 - Rocker bottom deformity
 - Saddle nose
 - Injury to the lacrimal system and medial canthal tendon

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Septoplasty

- Resection of large central septal segment can be done safely if required to address central septal deflections, or if grafting materials are needed for rhinoplasty
- Important to preserve 1cm dorsal and 1m caudal septal segment (L-strut) to decrease potential for loss of dorsal or tip support

Flint, Paul W. (Ed.) (2015). Cummings Otolaryngology: Head & Neck Surgery. Philadelphia, PA : Elsevier/Saunders.

Septoplasty

- Should include bilateral release of the upper lateral cartilages from their attachments to the dorsal septum

Flint, Paul W. (Ed.) (2015). Cummings Otolaryngology: Head & Neck Surgery. Philadelphia, PA : Elsevier/Saunders.



Septal Extension Graft

- Workhorse graft for lengthening the short nose, common to Asians
- Graft is suture-secured to the caudal septum and can rest on the floor and anterior nasal spine
- Lower lateral cartilages are then sutured directly to this new graft and can be “walked up” the caudal border in order to increase projection



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Septal Extension Graft

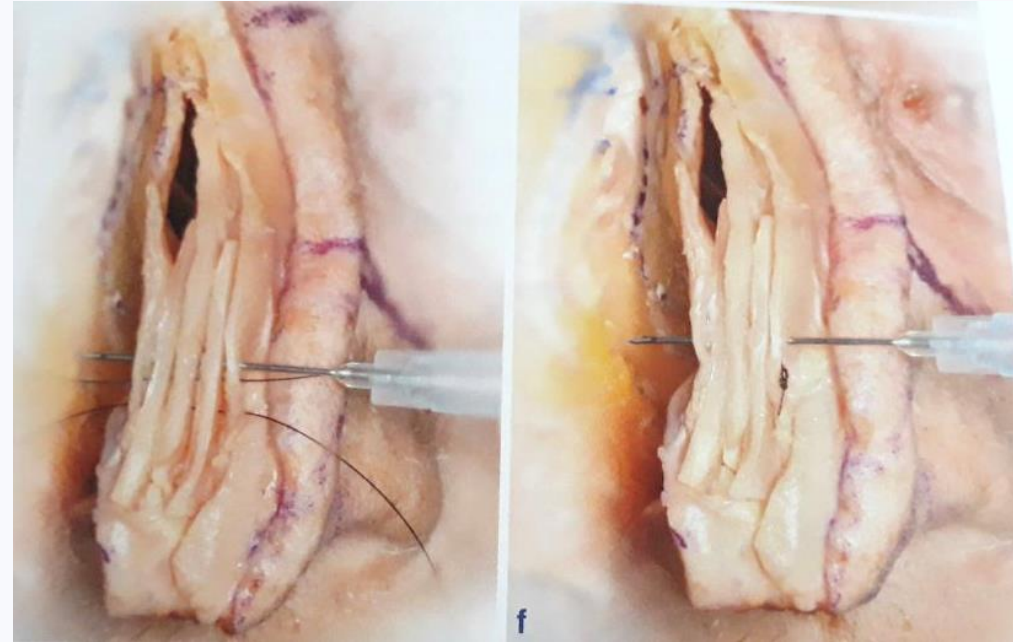
- Firm cartilage is needed (septum or rib)
- Septal mucosa is dissected off both sides of the caudal septum to allow suture fixation
- Secured with a permanent suture in multiple locations, may be suture-fixated to the periosteum of the anterior nasal spine
- Graft can be end-to-end or overlapping



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Spreader Graft

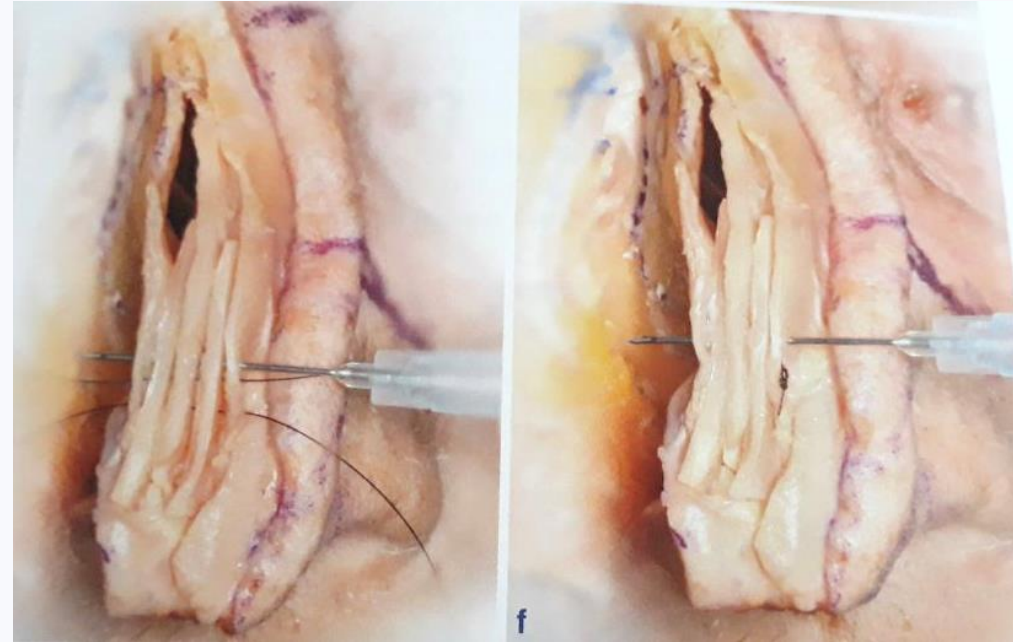
- Rectangular grafts placed between the upper lateral cartilages and the dorsal septum
- Functions to lateralize the upper lateral cartilages and stent the dorsal septum, if twisted.



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Spreader Graft

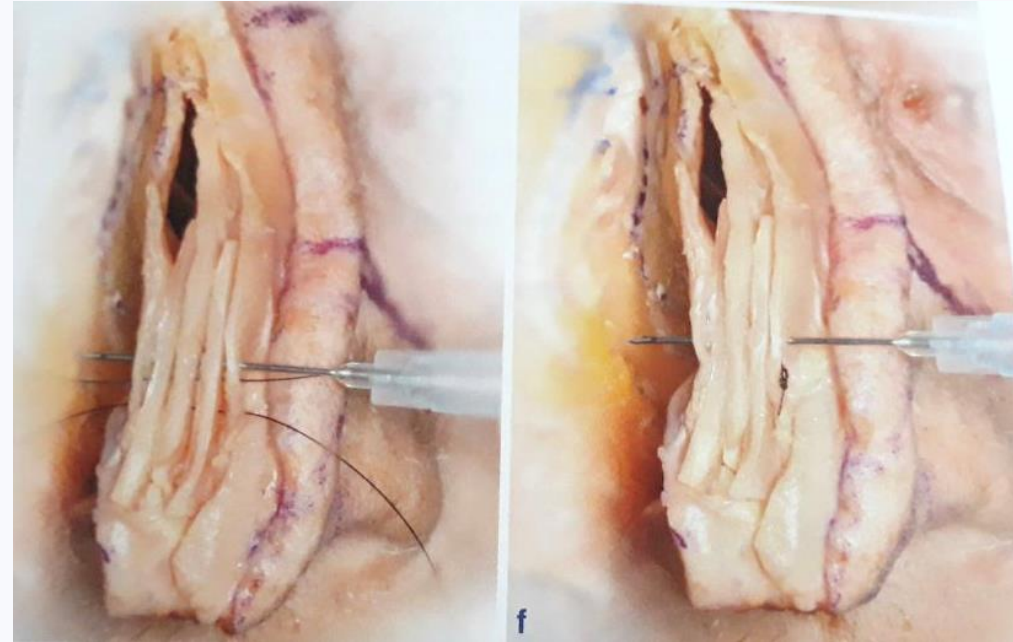
- Can lead to increased cross-sectional space at the internal nasal valve
- Can also stent a twisted or deformed nasal septum



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Spreader Graft

- May be extended beyond the caudal border and anterior septal angle to accomplish tip projection and derotation (useful for a short nose)



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Camouflage Graft

- May be placed directly over the upper lateral cartilages
- Very efficient in directly correcting concavities
- May need to be sutured in place if done through external approach
- Care must be taken to bevel edges of the graft to avoid visible step offs

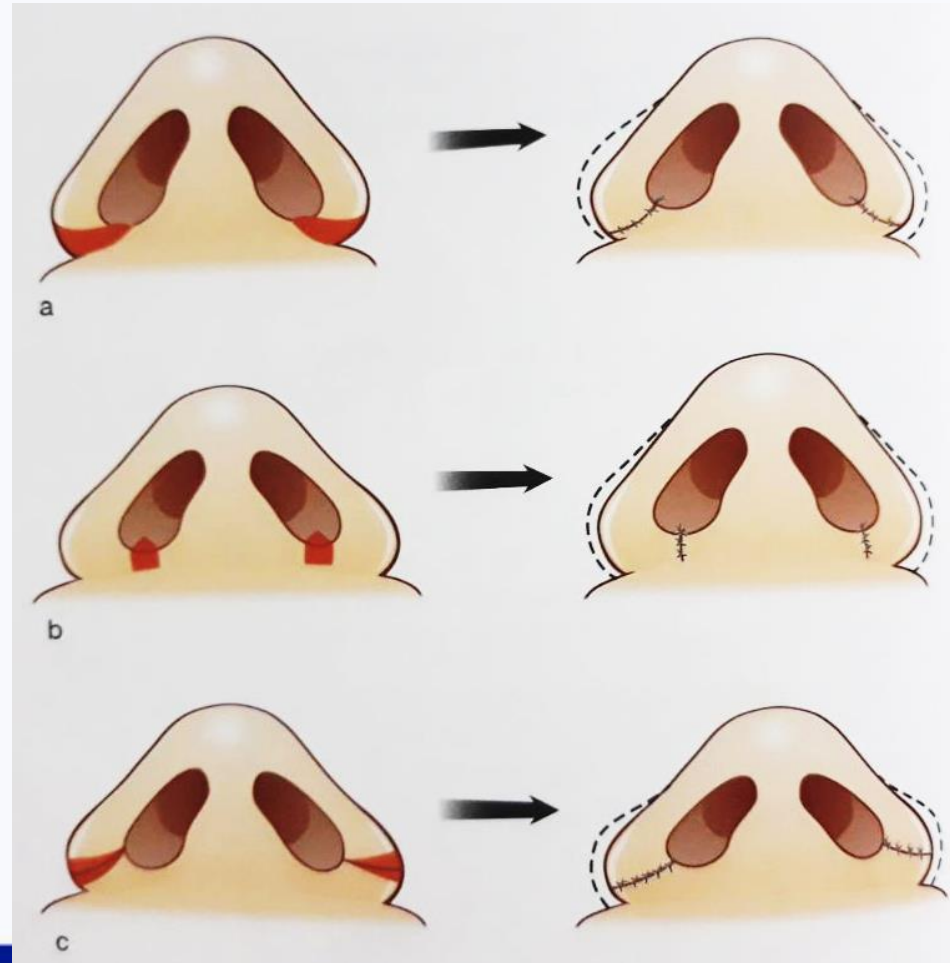
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Alarplasty

- Usually performed as a final step
- Resection should be conservative
 - Correction of over-resection is difficult and can cause static external nasal valve stenosis

Alarplasty

- Combined sill and sidewall excision design to reduce flaring and nasal base width
- Isolated nasal sill excision to reduce nasal base width
- Excision design to reduce alar flaring without alteration to the nostril size



Plan

- Septorhinoplasty, Open Approach
 - Lateral and medial nasal osteotomies
 - Recheck alignment of the septum
 - Removal of septal cartilage, leaving a 1cm anterior and dorsal strut
 - Septal extension graft, camouflage grafts
 - Alarplasty

- “Realistic expectation and thoroughly informed consent are the keystones on which the most important surgical outcome - a happy patient – is achieved”

Thank you!

