STUDY OF RELATIONSHIP OF INFERIOR TURBINATE AND UNCINATE PROCESS ANGULATIONS WITH THE LATERAL WALL OF NASAL CAVITY IN PATIENTS WITH SEPTAL SPUR" - A ONE YEAR OBSERVATIONAL STUDY.

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LIST OF ABBREVIATIONS

CT	Computed tomography
HU	Hounsfield unit
IT	Inferior turbinate
LW	Lateral wall of nose
MT	Middle turbinate
OMC/OMU	Osteo-meatal complex / Osteo-meatal Unit
PNS	Paranasal sinus
UP	Uncinate process

ABSTRACT:

BACKGROUND

Deviated nasal septum being often witnessed anatomical discrepancy in adult leading to disturbance in the airway and breathing difficulty. The patient often presents with symptom of nasal obstruction. Initially in the deviated side and later in the non-deviated side due to the compensatory hypertrophy.

The deviation of the septum and septal spur has effect on development of structures of lateral nasal wall such as inferior turbinate, uncinate and osteomeatal complex. This fore-mentioned anatomical variation will lead to hampered drainage of the sinuses draining into the middle meatus leading to infection of sinuses. Computed tomography of the nose and paranasal sinus is an essential tool. It is helpful in identifying any anatomical variations pre-operatively and also acts as a roadmap during sinus surgery using endoscopy.

OBJECTIVE:

Aim of our study is to measure and compare angulation between inferior concha and uncinate with lateral nasal wall in patients with septal spur.

MATERIALS AND METHODS:

Our study is a prospective and observational study and carried out among cases with symptoms suggestive of deviated nasal septum with septal spur willing to undertake Computed tomography of nose and PNS and septoplasty in ENT & HNS department, KAHER Belgaum, for a period of 1year from January 2020 to March 2021.

Overall, 38 patients were included in study. All cases underwent Computed tomography of nose and PNS and septoplasty. The CT of nose and paranasal sinus of the patients were measured for the angulations of IT and uncinate made with lateral nasal wall of on the concave and the convex side and compared.

RESULT:

In our study population of 38 patients, the angulation of IT with lateral nasal wall in concave side was determined as 64.9˚ (in the range of 40.5˚ to 98.8˚) and in convex side 56.2˚ (32.3˚ to 86.5˚). The angulation of uncinate with lateral wall of nose in concave side was measured as 137.33˚ (119.4˚ to 166.4˚) and in convex side 150.35˚ (128.2˚–177.5˚). On comparing angulation of the concave and the convex side was statistically significant.

CONCLUSION:

This significant difference in angulations of inferior concha and uncinate with lateral nasal wall is proven. Hence it is suggested to do inferior concha reducing procedure in concave side for better improvement of the obstruction symptom and nasal airflow. The variation in the uncinate process angulation predispose to development of chronic sinusitis. As a preventive measure for chronic sinusitis, the uncinate process can be addressed at the time of septoplasty.

KEY WORDS: inferior turbinate, uncinate process, lateral nasal wall, angulations

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INTRODUCTION

Deviated nasal septum is then most often witnessed anatomical discrepancy in adults.[1] The deviation causes disturbance in the airway pattern leading to difficulty in breathing, sinusitis and infection. [2-4] In these cases, later there can happen obstruction to both the nasal cavities caused due to the unaffected side hypertrophied inferior turbinate (IT).[5] The development of osteomeatal complex, IT and uncinate are affected by the septal spur.[6,7]

The osteomeatal unit is a compartment placed in MT in between lateral nasal wall and MT where anterior ethmoidal air cells, maxillary and frontal sinuses drainage happens. Development of chronic sinusitis can occur due to improper drainage of these sinuses happens when there is variation in any one of apparatuses forming the osteomeatal unit. The latin term Uncinate process means “hooked out growth”. It is sagitally placed slim, bone leaf like structure running in antero-superior to postero-inferior course, lying in parallel to ethmoid bulla front surface. Superior attachment may vary, it can be either to base of skull superiorly, lamina papyracea laterally, or MT medially.[8]

Uncinate process acts as a guiding structure for the endoscopic endonasal surgeries, so any deformities in the uncinate process will hamper the surgery.[9] The deviation in the septum causes narrowing of the osteomeatal unit, in turn causing complications-maxillary or ethmoidal sinusitis.[10] The uncinate process being the important structure in the nasal cavity, its deformity will cause maxillary and ethmoidal sinus infections due to the blockage in the drainage.

In our study, we will compare the angle formed by uncinate and inferior turbinate with lateral nasal wall of nose in convex side with the non-deviated side in cases with deviated nasal septum and spur. So as to assure need for correction of these

deformities along with the correction of septum. This study has not been done in our part of the country and hence to study our population we would like to conduct this study.

OBJECTIVE

The study aims to measure and compare the angulation between IT and uncinate with lateral nasal wall in patients with septal spur.

REVIEW OF LITERATURE

- Sule Demirci, MD et al [10], studied the association of nasal turbinates and septal body, in the 199 CT scan of paranasal sinuses they observed that the turbinates and the septal body were more prominent on the non-deviated side on comparison with deviated side.

- In the study carried out by Erol Egeli, MD et al, [11] they evaluated inferior turbinate in 23 cases with deviated nasal septum by CT scan and concluded that composition and dimension of the compensatory inferior concha hypertrophy is present on contralateral side of deviation.

- Sumit Mrig et al, [12] carried a study on pre-operative computed tomographic inferior turbinate evaluation on 50 cases having nasal septal deviation, the results revelaed that there is hypertrophy of the bony component which alters the nasal resistance.

- Jennifer Setlut, MD and Parul Goyal, MD [13]conducted a study on relationship between size of body of septum and deviation of septum on 100 patients undergoing CT scan of PNS. Their study reported the inferior turbinate hypertrophy and prominent septal body on contralateral side of the deviation.

- In a study conducted by R.k. Mundra, Yamini Gupta, Richi Sinha[14] on 61 patients with chronic rhinosinusitis, found that the major cause for chronic rhinosinuitis is deviated nasal septum where there are structural compensatory variations in middle concha and other lateral nasal wall structured to osteomeatal complex obstruction.

Embryology of nose: [15,16]

The nose development is always dealt along with the face development. The development of face happens between 4th – 8th week of intrauterine life. The face develops from five swellings namely, the unpaired frontonasal process and paired mandibular and maxillary process. These swellings develop around the stomodeum also called as primitive mouth. At 5th week of intrauterine life in the frontonasal process a couple of ectodermal thickenings appears called nasal placodes. At 6th week, nasal pit is formed by the introversion of the ectoderm in centre of nasal placode. The lateral and medial nasal processes are raised rims of these nasal pits. In the 6th and 7th weeks, the maxillary processes grow medially as they increase in size on either side, causing the bilateral medial nasal processes to come together. Also, as maxillary processes grow medially, cause fusion of them with lateral process and medial nasal process separating the stomodeum and the nasal pits.

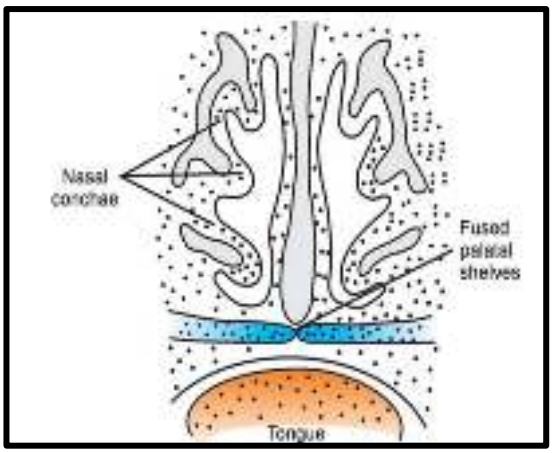


Figure 1: 6week embryo, showing nasal pit, medial and lateral nasal process formation.[16]

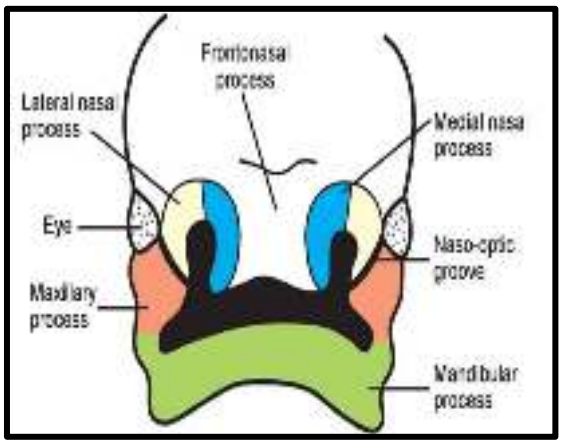


Figure 2: Definitive oral and nasal cavity formation.[16]

The bilateral medial prominences unite at surface and inner level to form intermaxillary segment. This forms the nasal prominence, the central bridge of the nose and the philtrum. Behind the intermaxillary process deepening of the nasal pits form a single nasal cavity. In later stages, the septum of nose is designed by backward growth of intermaxillary process. Lateral nasal wall of nose and alae are formed from lateral process. In lateral nasal wall multiple elevations in the anteroposterior fashion develops, leading to formation of turbinates.

The palate and septum development:[17]

The maxillary and frontonasal processes fuse anteriorly to form the primitive palate. From posterior margin of frontonasal process a central ridge develops in roof of oral cavity and stretches posteriorly to opening of pouch of Rathke. This converts into septum of nose that continues anteriorly with parting between primitive cavities of nose. Primitive septum primarily formed completely of the cartilage. Ossification of upper part forms ethmoid bine perpendicular plate and vomer in postero-inferior part, leaving anteroinferior quadrilateral cartilage plate. Dual ossification centres emerge for vomer at 8^{th} fetal week on both the sides of cartilage, combining to produce a bony groove which is deep and there the cartilage fits. Both bony lamellae fuses and part of cartilage gets absorbed as growth continues. Near puberty, there will be a completely united lamellae and everted alae. Moreover, a groove forms anteriorly indicating bilaminar origin of vomer. During the 10^{th} and 11^{th} week nasal bones formation happens.

Nose - Lateral wall:[18]

Lateral wall of nose can be discussed separately by bones that form them and the mucosa covering them.

The Maxilla:

Nose lateral wall formed by medial surface of bone maxilla, which has a huge opening which during life is covered by processes from the surrounding bony structures. They are, in the antero- inferior part the uncinate process, inferiorly maxillary process arising from inferior turbinate, palatine bone gives the perpendicular plate in the posterior portion. The maxilla in front of the maxillary hiatus forms the frontonasal process extending superiorly to attach with nasal and frontal bone. The inferior concha articulates to conchal crest in frontonasal process.

Figure 3: Lateral nasal wall – shown by articulated bones.[18]

Figure 4: Lateral nasal wall – shown by disarticulated bones.[18]

The Inferior turbinate:[18]

Scroll-like bone runs straight from anterior to posterior. It has free inferior margin which covers the meatus below the turbinate. The attachments are to the maxilla superiorly and the palatine bone posteriorly. It has triple processes, lacrimal process attaches with lacrimal bone, the ethmoid process articulating with uncinate process then lastly the maxillary process.

Nose - Lateral wall:[19,20]

Lateral wall of nose has inferior, middle and superior conchae. Ethmoid bones extends as middle and superior turbinates. The inferior concha is an individual bone. There are areas between these nose lateral wall and turbinates called the meatus, inferior middle and superior meatuses respectively. Each meatus has their own anatomical importance. The inferior meatus have drainage of lacrimal sac via its duct. Middle meatus is common draining of anterior ethmoid, frontal and maxillary sinus. Superior meatus has drainage of posterior ethmoid air cells. Venous sinusoids and vascular channels fill turbinates so they serve to humidify and warm air. They also help in modifying the resistance of nasal airflow. Under sympathetic control turbinates dilate and constrict in retaliation to the surrounding environment. Every 0.5–3 hours the nasal cycle occurs results in congestion and decongestion of turbinates. Due to chronic congestion and hypertrophy of the turbinates they are the most common reason for nasal obstruction.

Osteo-meatal complex:[19]

The osteomeatal complex is formed by following structures, uncinate, ethmoid bulla and infundibulum. This complex is where drainage of sinuses frontal, maxillary and anterior ethmoid happens.

Figure 5: Osteomeatal complex.[19]

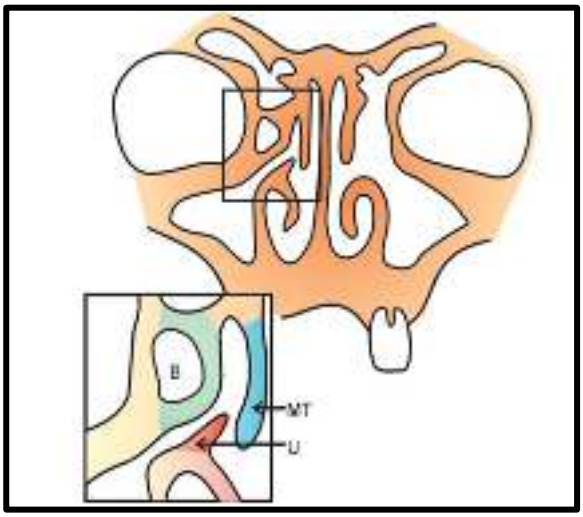


Figure 6: Schematic diagram of Osteomeatal complex – coronal section.[19]

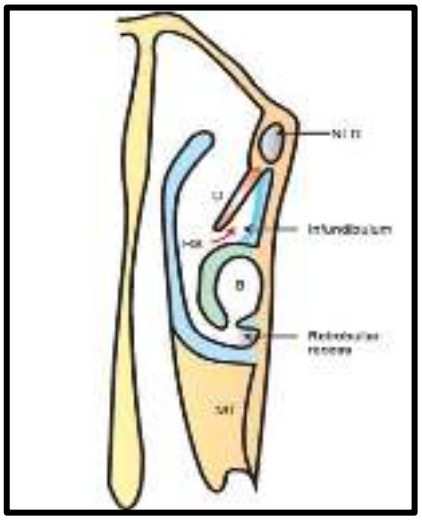


Figure 7: Schematic diagram of Osteomeatal complex – Axial section.[19]

The uncinate process is more anteriorly placed. Then comes the bulla ethmoidalis, which is adequately pneumatized and persistent air cell of the anterior ethmoidal air cell. Hiatus semilunaris, a two-dimensional semilunar groove separates Uncinate and bulla ethmoidalis. This groove leads into infundibulum, a 3D space.

Uncinate process:[19-23]

A free curved bony process lying in the middle meatus and also covers partially opening of the maxillary sinus. It attaches anteriorly with lacrimal bone and posterior end to inferior concha and palatine bone perpendicular plate. There are different insertions for the uncinate process can be either into the skull base, medial orbital wall or middle turbinate. And in cases more than 50% this process has multiple attachments. This variation in attachment is significant in determining the frontal sinus drainage direction. In 85% of cases insertion is into the medial wall of the orbital this causing medial side of uncinate process to receive frontal sinus drainage. Almost 15% of cases there is isolated attachment of this process to middle concha or

base of skull where frontal sinus drainage becomes more obvious at the time of surgery as it drains lateral to the process.

Attaching to Lamina laterally:

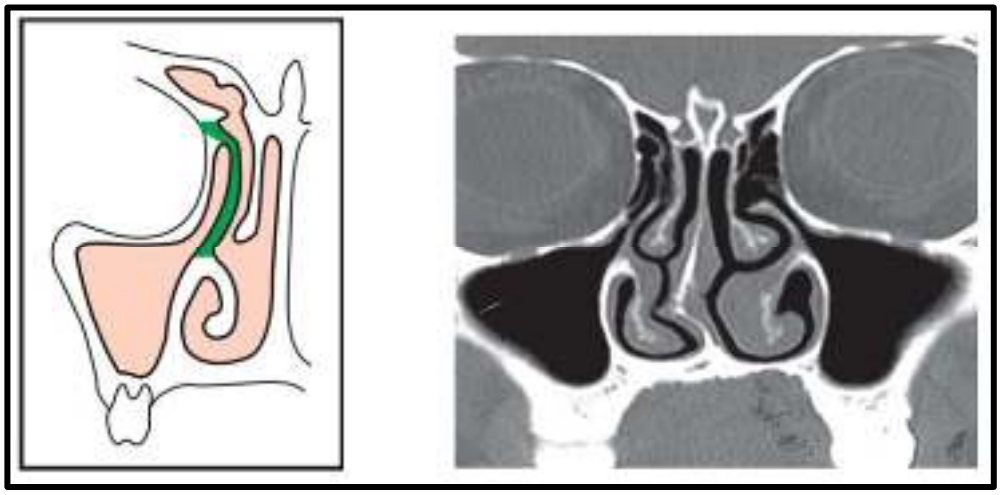


Figure 8: Uncinate attaching laterally to Lamina (a) Schematic diagram (b) CT scan PNS Coronal section.[34]

Attaching to cribriform plate:

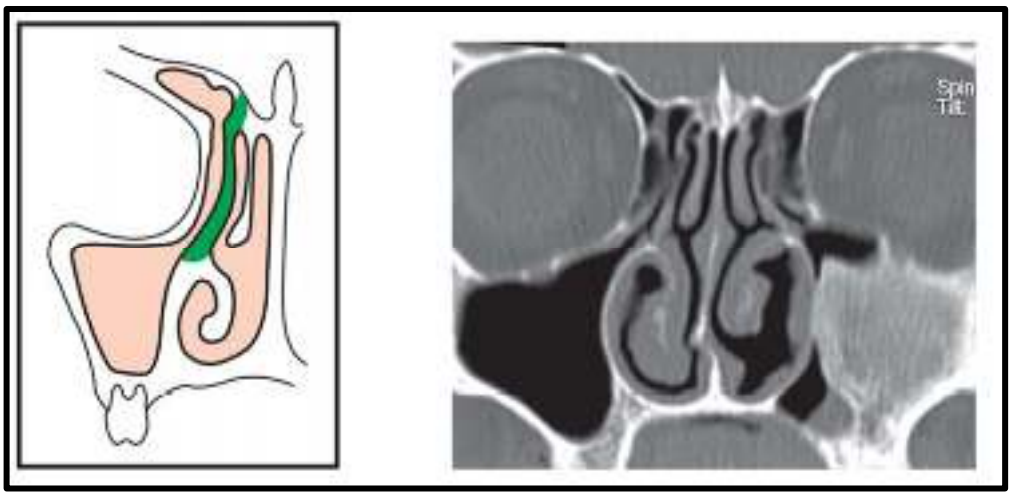


Figure 9: Uncinate process attaching to Cribriform plate (a) Schematic diagram (b) CT scan PNS Coronal section.[34]

Attaching medially to middle turbinate:

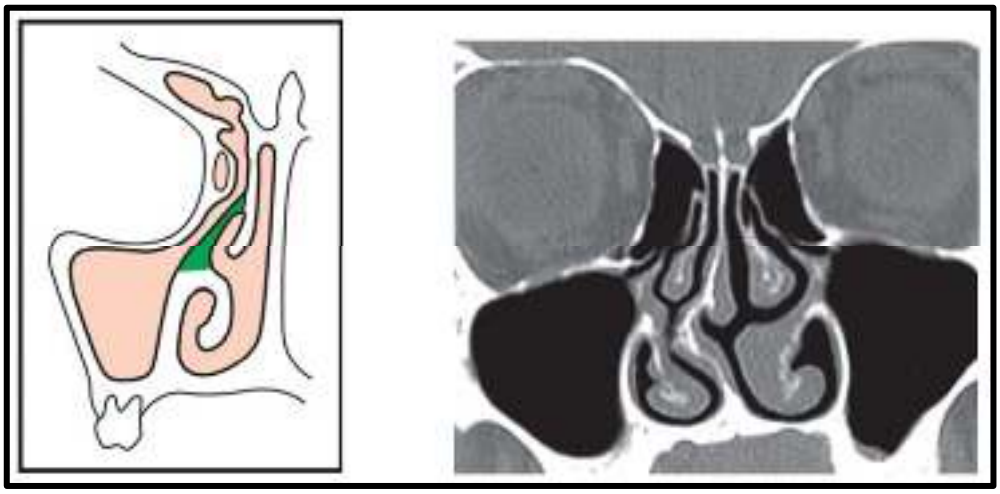


Figure 10: Uncinate process attaching to middle concha (a) Schematic diagram (b) CT scan PNS Coronal section.[34]

Lying free in middle meatus:

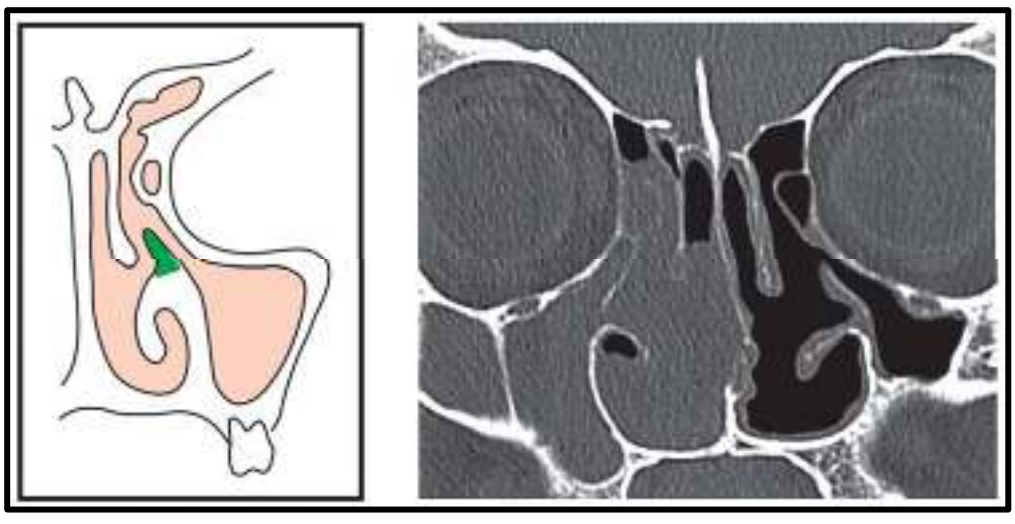


Figure 11: Uncinate process lying free in Middle meatus (a) Schematic diagram (b) CT scan PNS Coronal section.[34]

Pneumatized uncinate process:

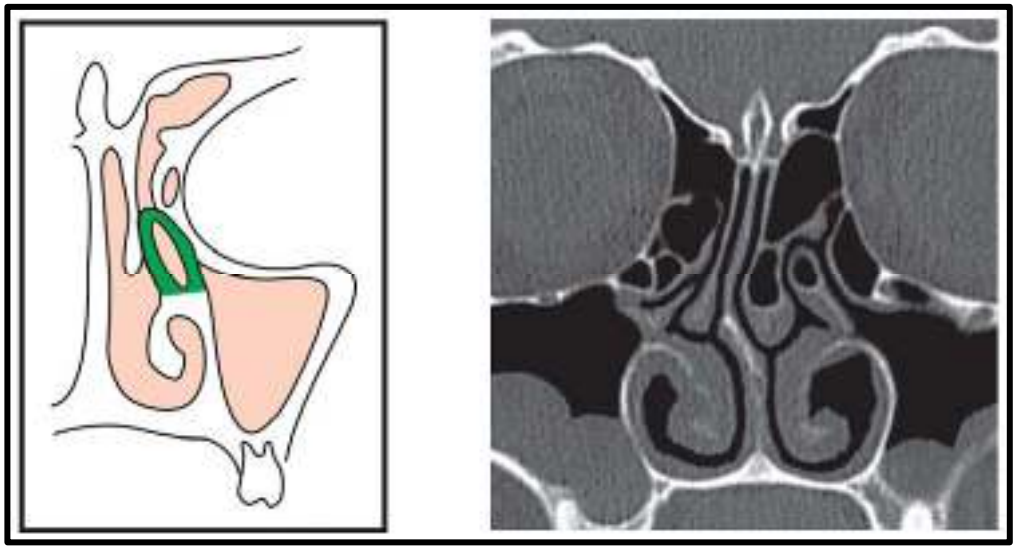


Figure 12: Pneumatized Uncinate process (a) Schematic diagram (b) CT scan PNS Coronal section.[34]

Uncinate process anatomic variations:

1. Medially bent or curved uncinate process: the most common and pathologically significant variation.

2. Laterally bent (atelectatic) uncinate process: laterally bent uncinate process to various extents can narrow the ethmoid infundibulum. A concha bullosa, paradoxical middle turbinate or disease process laterally, narrowing the infundibulum.

3. Elongated or enlarged uncinate processes: The uncinate process may extent too far posteriorly, impinging its free posterior margin onto ethmoid bulla, thereby significantly narrowing the hiatus semilunaris.

4. Horizontally oriented uncinate process

5. Pathologic or secondary changes in uncinate process: The bony plate of uncinate process may become demineralised in chronic polyposis or other inflammatory diseases making it invisible on radiographs.

Mucosa over the uncinate process may be polypoidal or sometimes there may be perforation in the uncinate process due to chronic inflammatory conditions. Yang QT et

al[24] carried out study on 80 cases with the help of CT PNS with image. Isobe et al[25] gave classification of uncinate process variations. The types as follows:

I: Infero-posterior end of process attaches with inferior turbinate

IB: Antero-inferior margin of the process attaches with inferior turbinate to close the anterior nasal fontanelle.

N: Tip of process being free

S: Tip of process attaches to structures present superiorly they are - medial orbital wall, bulla.

P: Tip attached to palatine bone perpendicular plate.

The variations can also occur in certain combinations denoted by the alphabets. They are IS, IP, SP, and ISP.

Li Z et al[26] in his study concluded that hyperplasia of uncinate found in 19.36% and uncinate deviation found in 45.27%. Joe JK et al[27] studied 85% typical uncinate and 15% uncinate which are medially. Jareoncharsri p[28] in his study discovered uncinate process to be abnormal in 9.6%. Chao TK[29] studied that 1% of the study population had uncinate pneumatization on both the sides and 1% had bulky uncinate process mimicking middle choncha. Wang R et al[30] classified the process based on their

variation:

1. Deviation to medial side
2. Deviation to lateral side

3. Pneumatised
4. Enlarged

Septum:[20]

Septum of nose separates nasal airway to dual nasal cavities, supports nasal dorsum, maintenance of the nasal tip and forms portion of valve of nose. Deviation of septum leads to obstruction of nasal airway and altered cosmetic appearance. Septum of nose is made by bone, cartilage and membrane portions.

Bone portion:

1. Ethmoidal bone perpendicular plate - forming upper 1/3rd of septum of nose, continues superiorly with lamina cribrosa and crista galli, posteriorly articulates with sphenoid crest, postero-inferiorly with vomer bone and antero-inferiorly with cartilage of septum.
2. Vomer - forming inferior and posterior septum of nose, attaches with rostrum of sphenoid forming vomero vaginal canals, inferiorly articulates with the nasal crest, anteriorly attaching with quadrangular cartilage, posteriorly bone is free forming the free margin of septum.
3. Crest of maxilla bone
4. Palatine bone

Cartilage portion:

Quadrangular cartilage also known as Septal cartilage - bound strongly by collagenous fibres to Os nasale, ethmoid bone perpendicular plate and vomer. It is

continuous with (upper) lateral cartilages towards nasal bridge. In-between vomer and ethmoid bone perpendicular plate a projection of cartilage of septum called the sphenoidal process or septal tail extends posteriorly. The inferior attachment is by within the maxillary crest and is bound by looser connective tissue. This pseudoarthrosis permits mobility of base of the septal cartilage reducing the risk of fracture or dislocation with trauma.

Membranous portion:

It is a segment of connective tissue present in between distal portion of cartilage of septum and columella.

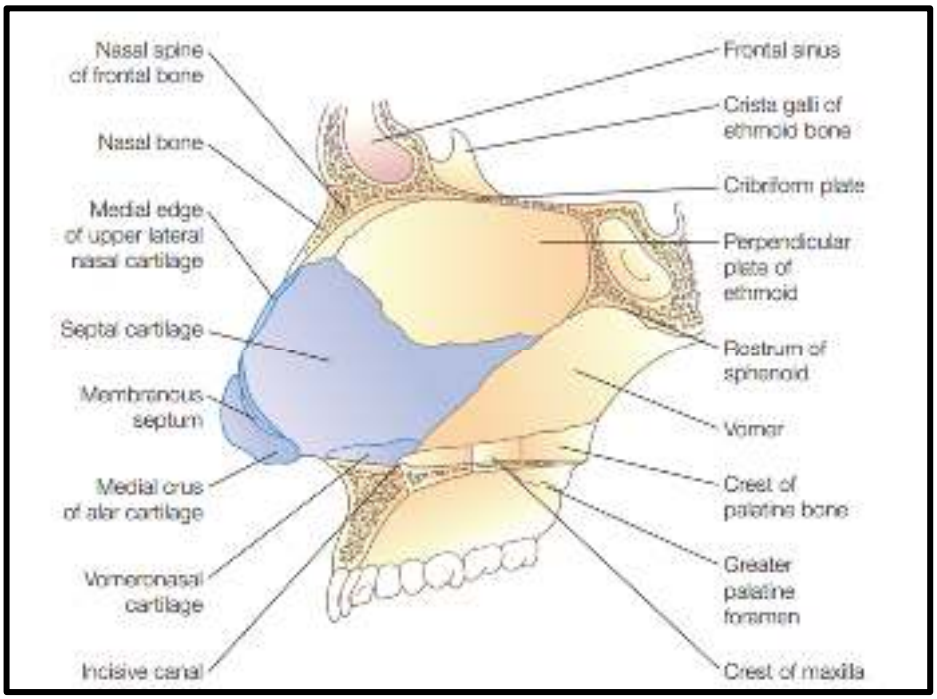


Figure 13: The Septum: Cartilagenous and Bony part.[20]

Septal deviation:

`In 1958, Cottle[31,32] is the first person to define septal distortions which he divided into 4 groups: “large spurs caudal deflection, subluxation and tension septum”.

Later in 1987, Mladina made simplified classification into 6 types: which has been put into two groups: 4 vertical abnormalities (type 1, 2, 3and 4), and 2 horizontal abnormalities (type 5 and 6). Passali deformity, a 7th type is also described by Mladina, combination of all 6 types.

Type 1: mild one-sided vertical crest in nasal valve area and the crest mildly restricts function of valve.

Type 2: One-sided vertical ridge staying in close proximity to anterior valve of nose; producing impaired nasal as well as pulmonary breathing.

Type 3: One-sided vertical ridge and convexity is next to anterior end of head of middle concha. Most common type.

Type 4: Vertical deformity on both the sides of the septum combined with other types which are previously described.

Type 5: One-sided deformity, septal spur causing one -sided deformity in horizontal direction, rising anterior till posterior, mimicking a crest resulting in the tip abutting in most cases region of the sphenopalatine foramen. It produces impaired nasal breathing only on one side. The other side of septum is mostly even. At times, this kind of deformity leads to hemicranial pains (Sluder’s headache) which is a same sided recurrent attack of headache. This deformity is considered to have inheritance feature.

Type 6: Deformity in horizontal direction, has 2 different components: one side - anteriorly placed septal crest in the base with other side - massive wing of the intermaxillary bone. A horizontal groove, characteristic of this type should be present

in between septum and wing of intermaxillary bone. This type has more than 96% of children with cleft lip/palate.

Type 7: Crumbled septum, which contains a combination of above-mentioned deformities.[32,33]

- The deviation of nasal septum can also present as sharp spurs lying at junction of cartilage with the vomer. These spurs are better seen in coronal scans.

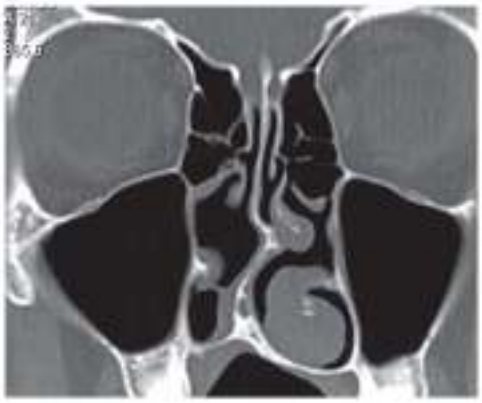


Figure 14: CT PNS in Coronal plane showing Nasal Septal Spur.[34]

Septal deviation compromises the osteomeatal complex causing impaired drainage of the sinuses.

Concha bullosa or hypertrophied turbinates can occur associated with the deviated septum on the roomy side. These variations also compromise the osteomeatal complex.

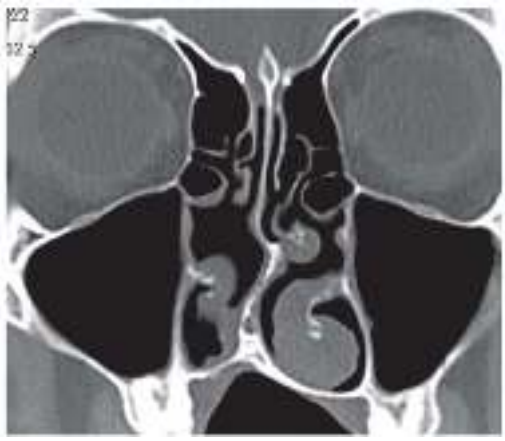


Figure 15: CT PNS in Coronal plane showing Inferior turbinate hypertrophy.[34]

- There can be a pneumatized septum.[34]

Figure 16: CT PNS in Coronal plane showing Pneumatized septum.[34]

Radiological anatomy:[35]

The computed tomography is the well-suited radiological investigation for visualizing the mucosal and bone framework of sino nasal cavity. The soft tissue window setting range should be between 150 to 400 HU. The bone window setting to be equivalent to or more than 4000 Hounsfield Unit. The widespread window settings permit most precise estimation of air and soft-tissue interfaces. During CT scan the patient to be placed in supine position, angulation of the patient the table to be perpendicular to hard palate, the plane of scan is parallel to the inferior orbitomeatal, the field of view is 14-16cm, thickness of the cuts 0.625-1.0 milli meter, exposure 125 kilo Voltage peak and 80-160 milliampere-seconds. The pictures can later be recreated in coronal and sagittal planes. On an average scan, the cranial limit is just superior level of frontal sinus and caudal limit at the level below the teeth along the maxillary bone. This is simply visualized in lateral scout view. In a regular study as 1.25- to 2.5 millimeter continuous scans should be obtained all through scan volume. The axial cuts of the scan have three distinct levels where interpretation is difficult, they are the anterior skull base, the floor of orbit and the hard palate. As these structures are in parallel to the axial plane the extension of disease into them are difficult to interpret. Thus, a coronal reconstruction of the scan is always needed.

The Nasal Septum:

The deviations of septum of nose, nasal spurs could be studied well on a coronal section. Spurs are triangular bony protrusions usually occur at intersection of ethmoid bone perpendicular plate and vomer.

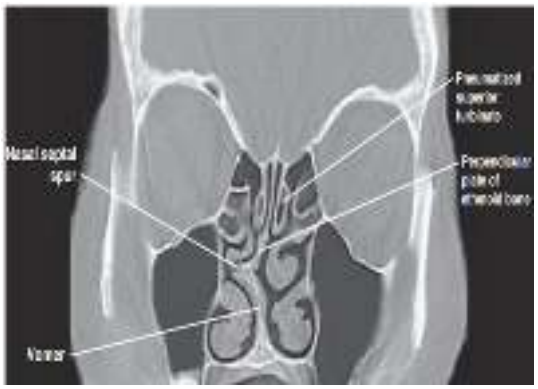


Figure 17: CT-Scan PNS Coronal view - Nasal septal spur towards the right side.[35]

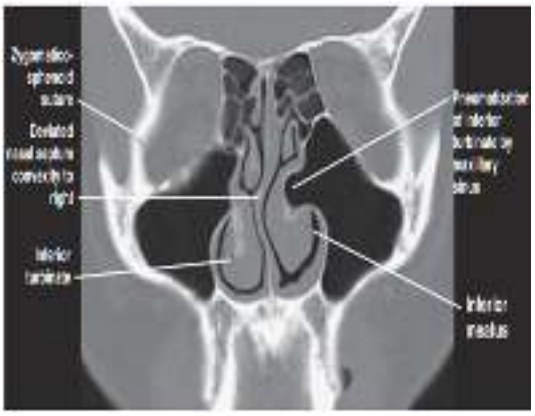


Figure 18: CT-Scan PNS Coronal view - Nasal septal deviation towards the right side.[35]

Osteo-meatal Complex:[36]

The components of the osteo-meatal complex i.e., Uncinate process, bulla ethmoidalis, semilunar hiatus and infundibulum are seen leading into normal ostium of maxillary sinus.

Compromise of osteomeatal complex can occur in cases of septal spurs impinge upon, hypertrophy of the turbinates or concha bullosa. Variations in attachment and anatomy of uncinate process can be studied in detail to gain knowledge about the frontal sinus drainage.

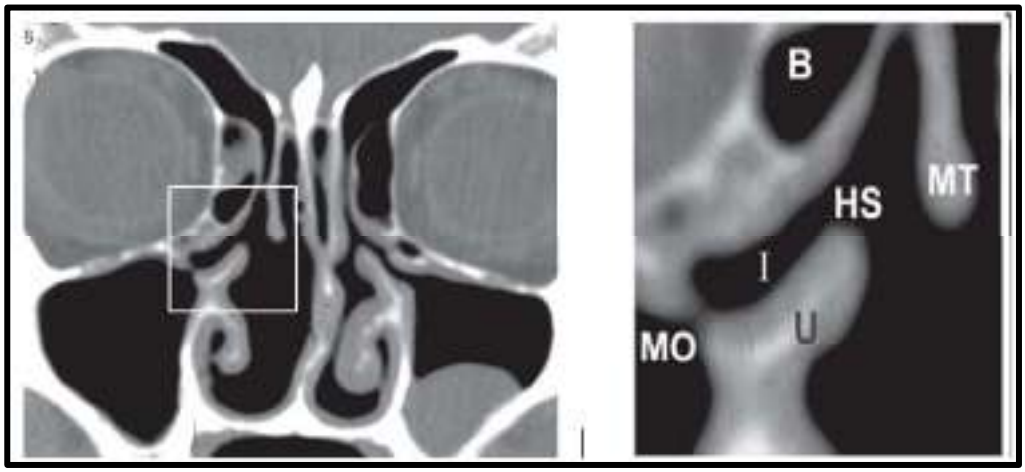


Figure 19: CT-Scan PNS Coronal view – Osteomeatal complex.[36]

MATERIALS AND METHODS

The study was carried out among cases who came to our OPD and diagnosed with deviated septum and septal spur and were willing to undergo computed tomography of nose and PNS and Septoplasty in ENT & HNS department, KAHER Belgaum, for a period of 1year.

Study Design: Observational study

Study Period: 1year 3months [January 2020- March 2021]

Sample Size: All patients undergoing computed tomography of nose and PNS and Septoplasty were included based on inclusion and exclusion criteria.

n= 38

Ethical Clearance– Obtained

Selection criteria

Inclusion criteria:

Cases of both sex between 18-60 years age group who are attending ENT & HNS department in KLE Dr. Prabhakar Kore charitable hospital,

1. and has been advised CT scan of Paranasal Sinus by the ENT consultant.
2. septal spur present in the CT scan of PNS
3. patients who are willing to undergo CT scan of PNS
4. after excluding certain patients mentioned under exclusion criteria by history, clinical examination and relevant investigations.

Exclusion criteria:

1. Patients with previous nasal surgery
2. Patients with deviated nasal septum on examination but no septal spur
3. Patients with any other nasal pathologies other than deviated nasal septum.

Methodology:

- After taking informed consent from the patient, their details and a through clinical history will be obtained for duration of nasal obstruction, septum deviation, duration and nature of any previous treatment.
- All patients will be clinically examined including general clinical examination, careful examination of ear, nose, throat.
- CT scan of Paranasal sinuses with high-resolution characteristics of 140kV and 25 mA. The series images will have a thickness of 1.3mm and cross-sectional period of 1s.
- In CT scan, angle formed between

  (1) The inferior turbinate and nasal cavity - lateral wall

  (2) The uncinate process and nasal cavity - lateral wall

  were measured on both convex and concave side at 3 consecutive sections in osteo-meatal unit level at distance about 1.3mm and the average obtained on both the sides will be compared.

RESULTS

Total of 38 cases were evaluated in our study. Of which all patients have deviated nasal septum and spur.

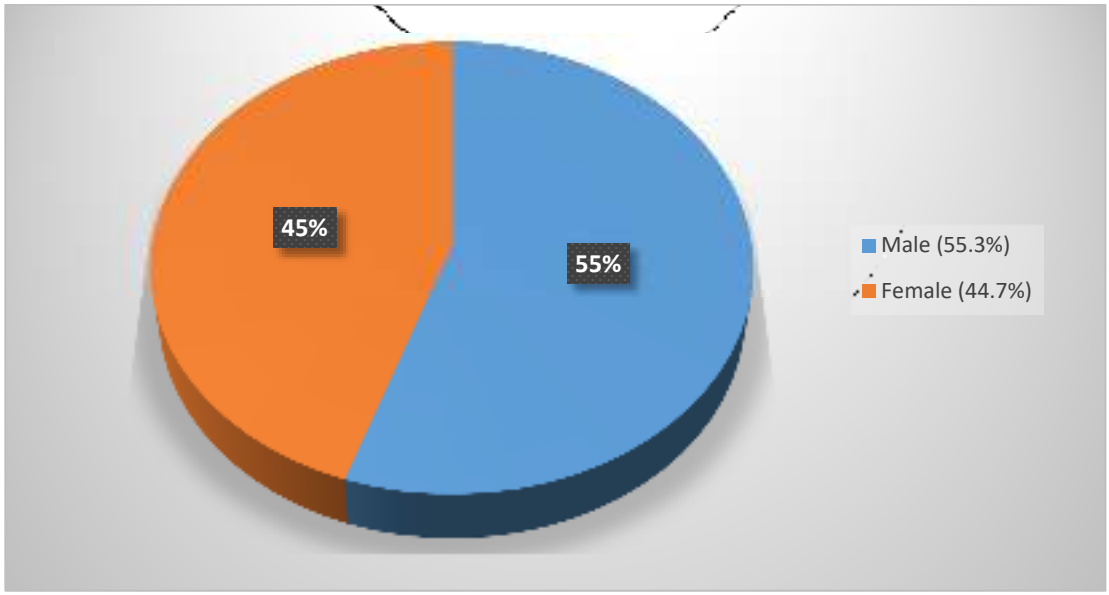
GENDER WISE DISTRIBUTION OF PATIENTS

Table 1 and graph 1 represents the distribution of the patients based on their gender. Out of the 38 cases included in our study, 21 males and 17 females which accounts to 55.3% and 44.7% of our study population respectively. Male: female ratio is 1.2:1.

Table 1: Gender wise distribution of patients

Gender	No. of patients	% Of patients
Male	21	55.3
Female	17	44.7
Total	38	100.00

Graph 1: Gender wise distribution of patients



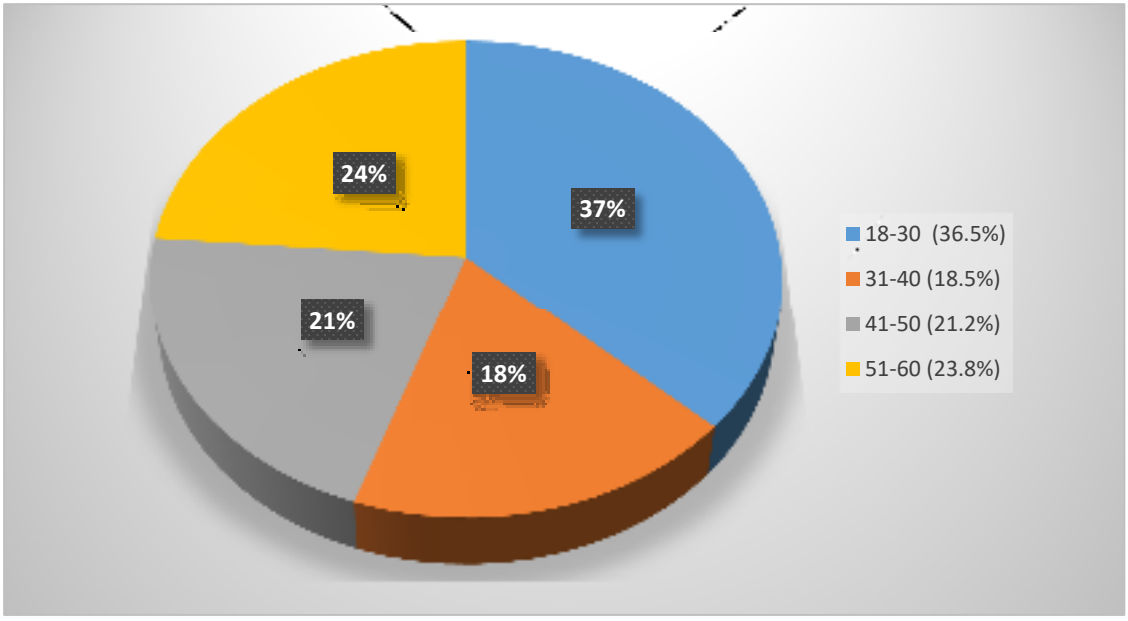
AGE DISTRIBUTION OF PATIENTS

Out of the 38 patients enrolled in our study, 14 patients (36.5%) belonging to age group 18-30 years, 7 patients (18.5%) belong to age group of 31-40 years, 8 patients (21.2%) belonging to age group of 41-50 years and 9 patients (23.8%) belonging to age group 51-60years.

Table 2: Patient distribution according to age

Age groups	No of patients	% of patients
18-30yrs	14	36.5
31-40yrs	7	18.5
41-50yrs	8	21.2
51-60yrs	9	23.8
Total	38	100.00
Mean age	38.1	
SD age	14.3	

Graph 2: Patient distribution according to age



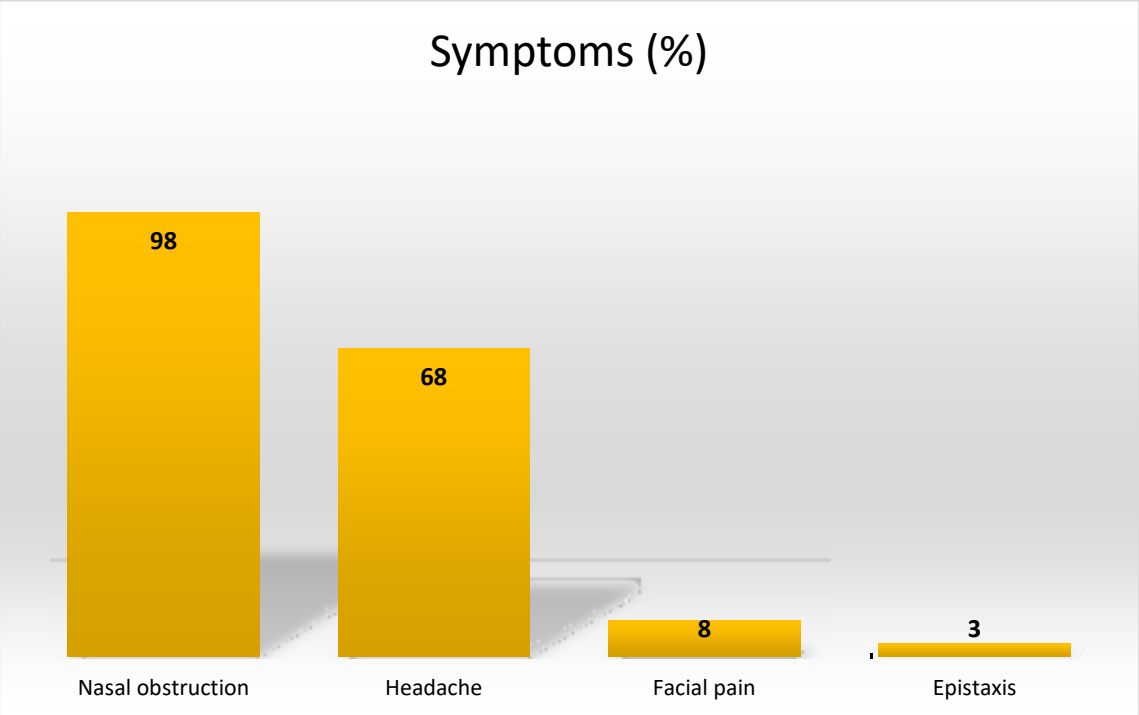
SYMPTOMS:

The patients presented with one or more of following clinical symptoms: Obstruction of nose (98%), Headache (68%), Facial pain (8%) and Epistaxis (3%). The frequency of symptoms is depicted in the graph below.

Table 3: Frequency of presenting symptoms

SYMPTOMS	PERCENTAGE
Nasal obstruction	98
Headache	68
Facial pain	8
Epistaxis	3

Graph 3: Frequency of presenting symptoms



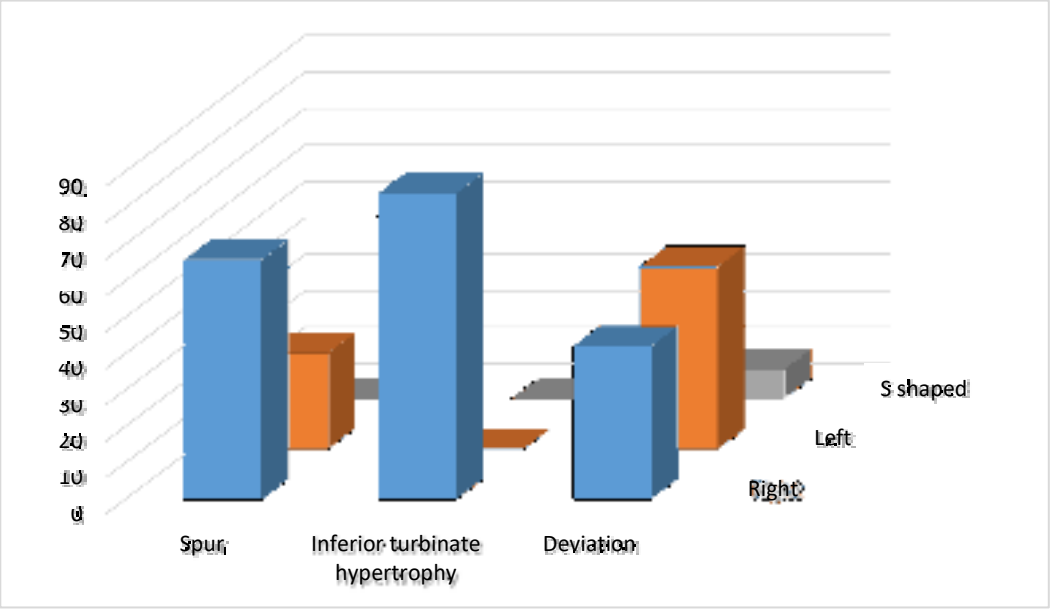
CLINICAL FINDINGS:

Among the 38 patients of study population, on clinical examination by anterior rhinoscopy, deviated nasal septum towards the left side is seen in 50% (19 patients) of study population, deviation towards the right seen in 42.1% (16 patients) and S shaped deviation in 7.9% (3 patients). Inferior turbinate hypertrophy in the concave side is seen in 32 (84.2%) patients. Spur in observed in the deviated side in 10 (26.3%) and in the non-deviated side in 25 (65.7%) of patients.

Table 4: Comparison of the clinical finding

Findings	Deviated nasal septum			Spur		Inferior turbinate hypertrophy
	Left	Right	S-Shaped	On deviated side	On non-deviated side	
Number of patients	19	16	3	10	25	32
Percentage	50%	42.1%	7.9%	26.3%	65.7%	84.2%

Graph 4: Comparison of the clinical finding



COMPUTED TOMOGRAPHY SCAN OF NOSE AND PNS:

In our study population of 38 patients, according to the inclusion criteria all the patients had deviated nasal septum and bony spur and the same noted in the CT findings.

The angulation of IT with lateral nasal wall in concave side was determined as 64.9˚ (in the range of 40.5˚ to 98.8˚) and in convex side 56.2˚ (32.3˚ to 86.5˚). On comparing angulation at convex and concave side was significant statistically. The angulation of uncinate with lateral nasal wall in concave side was measured as 137.33˚ (119.4˚ to 166.4˚) and in convex side 150.35˚ (128.2˚–177.5˚). On comparing these values, they were significant statistically.

Table 5: Comparison of Angulation between IT and Uncinate with lateral wall of nose in concave and convex side of the deviated nasal septum

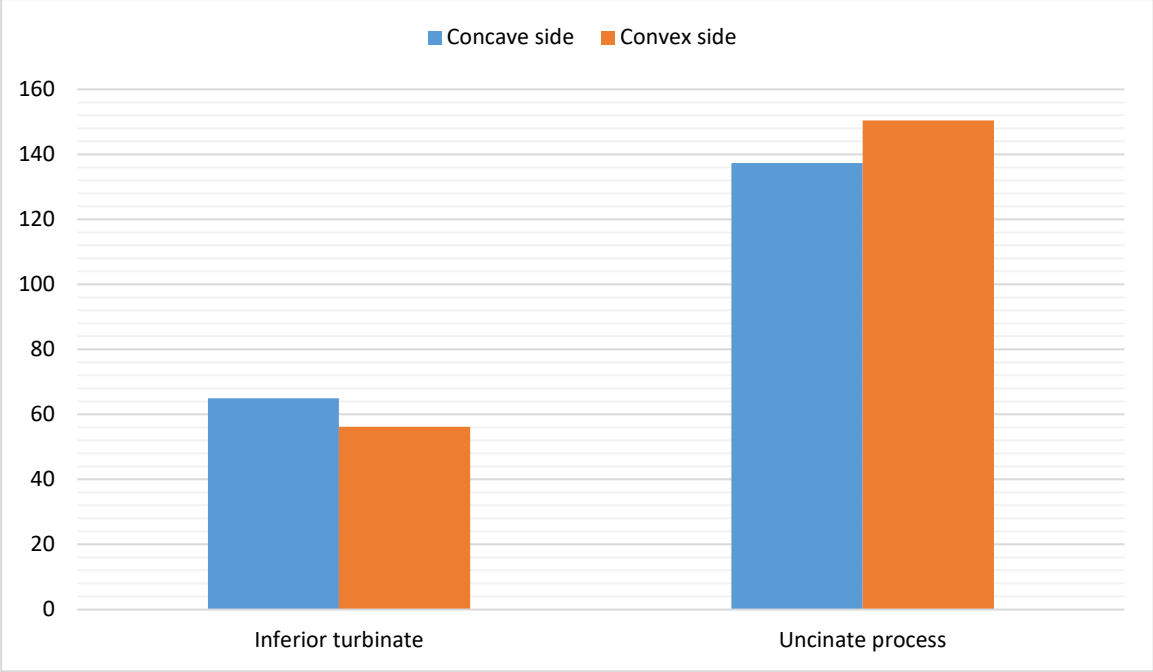
	Mean	Range	Standard deviation	Confidence interval	Angle value average
Angulation of IT with lateral wall of nose in concave side	64.9˚	40.5˚–98.8˚	14.7	6.14	64.9˚ ± 6.14˚
Angulation of IT with lateral wall of nose in convex side	56.2˚	32.3˚–86.5˚	13.5	5.64	56.16˚ ± 5.64˚
Angulation of Uncinate with lateral wall of nose in concave side	137.33˚	119.4˚–166.4˚	13.9	5.8	137.32˚ ± 5.8˚
Angulation of Uncinate with lateral wall of nose in convex side	150.35˚	128.2˚–177.5˚	12.7	5.3	150.34˚ ± 5.3˚

Table 6: Evaluation of the measurements (Independent samples t test)

	Angulation average	p-value
Angulation of IT with lateral wall of nose in concave side	64.9˚ ± 6.14˚	0.004
Angulation of IT with lateral wall of nose in convex side	56.16˚ ± 5.64˚	
Angulation of Uncinate with lateral wall of nose in concave side	137.32˚ ± 5.8˚	0.001
Angulation of Uncinate with lateral wall of nose in convex side	150.34˚ ± 5.3˚	

"p<0.05 statistically significant Independent samples T test"

Graph 5: Comparison of angle value average measurements.



Out of the 38 patients, 7 patients (18.4%) had mucosal thickening of the paranasal sinuses. In the CT finding of these 7 patients, 6 patients had paranasal sinus mucosal thickening in the side of the septal deviation.

DISCUSSION

Deviated nasal septum being most frequent cause of obstruction of nose all over the world, can either present with or without inferior turbinate hypertrophy. Apart from causing nasal obstruction the septal deviation can also cause obstruction of the sinus drainage leading to chronic sinusitis.

The inferior concha is composed with the bone part covered with the mucosa which is rich in venous blood supply. The inferior concha hypertrophy in cases of deviated septum is attributed to both the bony and the mucosal component. A study carried out by Ertap Akog˘ lu et al[37] stated that compensatory enlargement of contralateral side inferior concha happens with both bony and mucosal component.

The uncinate process is the key component of the osteomeatal complex, aiding in drainage and ventilation of PNS. Also, a significant surgical landmark while endoscopic sinus operation. Any variation in anatomy of Uncinate will have effect on drainage and ventilation of paranasal sinuses leading to chronic sinusitis. Hence knowing the variations in the anatomy of uncinate is necessary in view of improved treatment and betterment of the patient with chronic rhinosinusitis.[38]

Computed tomography scan of PNS is a significant tool in cases of chronic rhinosinusitis to provide a road map of the varied anatomy and also to localize the pathology. Nisar Hussain Dar, et al[39] in their study stated about computed tomography of nose and PNS is important not only in cases of chronic sinusitis but also in cases of deviated nasal septum. Wherein the anatomical variations and other associated hidden pathologies can be identified and treated alongside septoplasty avoiding any further second surgery.

In our study, we have used CT of nose of PNS of cases with septal deviation and spur to measure angulations of inferior concha and uncinate made with nasal

lateral wall. Angulations of these structures also play an important role in nasal obstruction and paranasal sinus infection. There are very few references in the literature that mentions about the angulations of these structures and no constant normal range of measurements has ever been quoted.

The study has been discussed under the following heading:

1. **Gender wise distribution of patients:** In the study population of 38 patients, 21 males and 17 females which accounts to 55.3% and 44.7% of our study population respectively. The male: female is 1.2:1. Comparing with a study carried out by Vinnakota Sriprakash[40] in the year 2017 in the population confined to southern part of India, the number of males affected are more than the females, which is similar to our study. No specific reason has been quoted in the literature for this difference in gender distribution.
2. **Age distribution of patients:** Out of the 38 patients enrolled in our study, 14 patients (36.5%) belonging to age group 18-30 years, 7 patients (18.5%) belonging to age group of 31-40 years, 8 patients (21.2%) belonging to age group of 41-50 years and 9 patients (23.8%) belonging to age group 51-60years. Maximum number of patients are confined to the younger age group between 18-30, which is similar to the study by Vinnakota Sriprakash.[40]
3. **Comparison of the clinical findings:** Among the 38 patients of study population, on clinical examination by anterior rhinoscopy, deviated nasal septum towards the left side is seen in 50% (19 patients) of study population, deviation towards the right seen in 42.1% (16 patients) and S shaped deviation in 7.9% (3 patients). Spur in observed in the deviated side in 10 (26.3%) and in the non-deviated side in 25 (65.7%) of patients. It is comparable with study carried out by Michaela Cellina, et al [41] in the year 2020, 594 CT scans has been

observed out of which 43.9% had left-sided deviation, 36.4% had right-sided deviation and 18.5% had S-shaped septal deviation. Spur in 34% of patients irrespective of the side of deviation and most of these patients with spur presented with headache as the primary symptom. Inferior turbinate hypertrophy in the concave side is seen in 32 (84.2%) patients. In a study of 1906 patients with nasal obstruction by David W. Clark., et al[42] observed that 74% of patients had inferior turbinate hypertrophy.

4. **Computed tomography scan of PNS:** The angle of IT with the lateral nasal wall in the concave side was determined as 64.9˚ (in the range of 40.5˚ to 98.8˚) and in the convex side 56.2˚ (32.3˚ to 86.5˚). On comparing angles at concave and convex side was significant statistically. Angle of uncinate with lateral nasal wall in concave side was measured as 137.33˚ (119.4˚ to 166.4˚) and in convex side 150.35˚ (128.2˚–177.5˚). On comparing between these values were statistically significant. To conclude, in the convex i.e., the deviated side, the inferior turbinate angulation was less and the uncinate process angulation was more obtuse. And vice versa for the concave or the non-deviated side, the inferior turbinate has more angulation and the uncinate process angulation was less obtuse. The results are comparable with the study conducted by Hacer Baran, et.al[43] in 2019 in Turkey on the angulations of the IT and the uncinate with the lateral wall in cases with septal spur, the results are similar. It was a comparative study of the angulations on both concave and convex side between cases with septal spur and general population. Study concluded that there is significant variation in convex and concave side angulations in case group and no difference in the control group. There is no other evidence in the literature for the

comparison or the range of normal angulations of the IT or the uncinate with lateral nasal wall.

In 2016, Junguo Wang et al.,[44] performed comparison study of lateral nasal structures between cases with nasal septal deviation and normal population based on the Computed tomography. They concluded that the deviated nasal septum causes long-term effects on nasal lateral wall, paranasal sinuses and maxillary bone leading to chronic nasal obstruction, chronic rhinosinusitis, headache and epistaxis.

In a study conducted by Yong Min Kim[45] in 2011, they concluded that there was a strong correlation of deviated nasal septum with the development of structures of nasal lateral wall and facial asymmetry.

In our study, the difference between the angle formed by inferior concha with the nasal lateral wall in concave side and convex side was statistically significant. This implies that there is notable effect in the development of bone component of the inferior concha due to deviated septum. Hence leading to nasal blockage symptom even in the non-deviated side. In these cases, correcting only the nasal septal deviation will lead to relief of the symptom only in the convex side but not in the concave side. In order to achieve complete relieve of the nasal obstruction along with septoplasty inferior turbinate reduction surgery has to be carried out.

The difference in uncinate angulation with nose lateral wall in concave and convex side was statistically significant. Uncinate being significant anatomical structure in osteo-meatal complex the variation in this structure can affect the drainage of PNS tracking down to infection and chronic sinusitis. In order to learn more about effect of uncinate angulation variation on PNS a prospective study with longer follow-up period is needed.

CONCLUSION

The significant difference in the angulations of inferior concha and uncinate with lateral nasal wall is statistically proven in our study. The angulation of inferior turbinate is greater on the concave side and the angulation of uncinate process is greater on the convex side.

Hence it is suggested to do inferior concha reducing procedure in concave side for better improvement of the obstruction symptom and nasal airflow.

The variation in the uncinate process angulation is likely to predispose for the development of chronic sinusitis. As a preventive measure for chronic sinusitis, the uncinate process can be addressed at the time of septoplasty if any anomaly is detected causing narrowing of the osteomeatal complex.

It is suggested to conduct a multi-centre study with larger population to have an improved analysis and stronger evidence of the altered angulations and their effects.

SUMMARY

The study conducted in Department of ENT and HNS, Jawaharlal Nehru Medical College and KAHER from January 2020 to March 2021. The objective was to measure and compare the angulation between inferior turbinate and uncinate with lateral nasal wall in cases with septal spur.

We studied 38 cases of deviated nasal septum with septal spur. All patients underwent CT scan of the nose and PNS and measurement of inferior concha and uncinate angulation with the lateral wall of nose in both concave and convex side has been performed and compared.

The difference in angulation on concave and convex side is statistically significant. The inferior turbinate angulation is less on convex side and more on concave side and it is vice versa for the uncinate i.e., the angulation is less on concave side and more on convex side.

The significant difference in angulations of inferior concha and uncinate with lateral nasal wall is statistically proven in our study. Hence it is suggested to do inferior concha reducing procedure in concave side for better improvement of the obstruction symptom and nasal airflow. The variation in the uncinate process angulation is likely to predispose for the development of chronic sinusitis. As a preventive measure for chronic sinusitis, the uncinate process can be addressed at the time of septoplasty if any anomaly is detected causing narrowing of the osteomeatal complex. It is suggested to conduct a multi-centre study with larger population to have an improved analysis and stronger evidence of the altered angulations and their effects.

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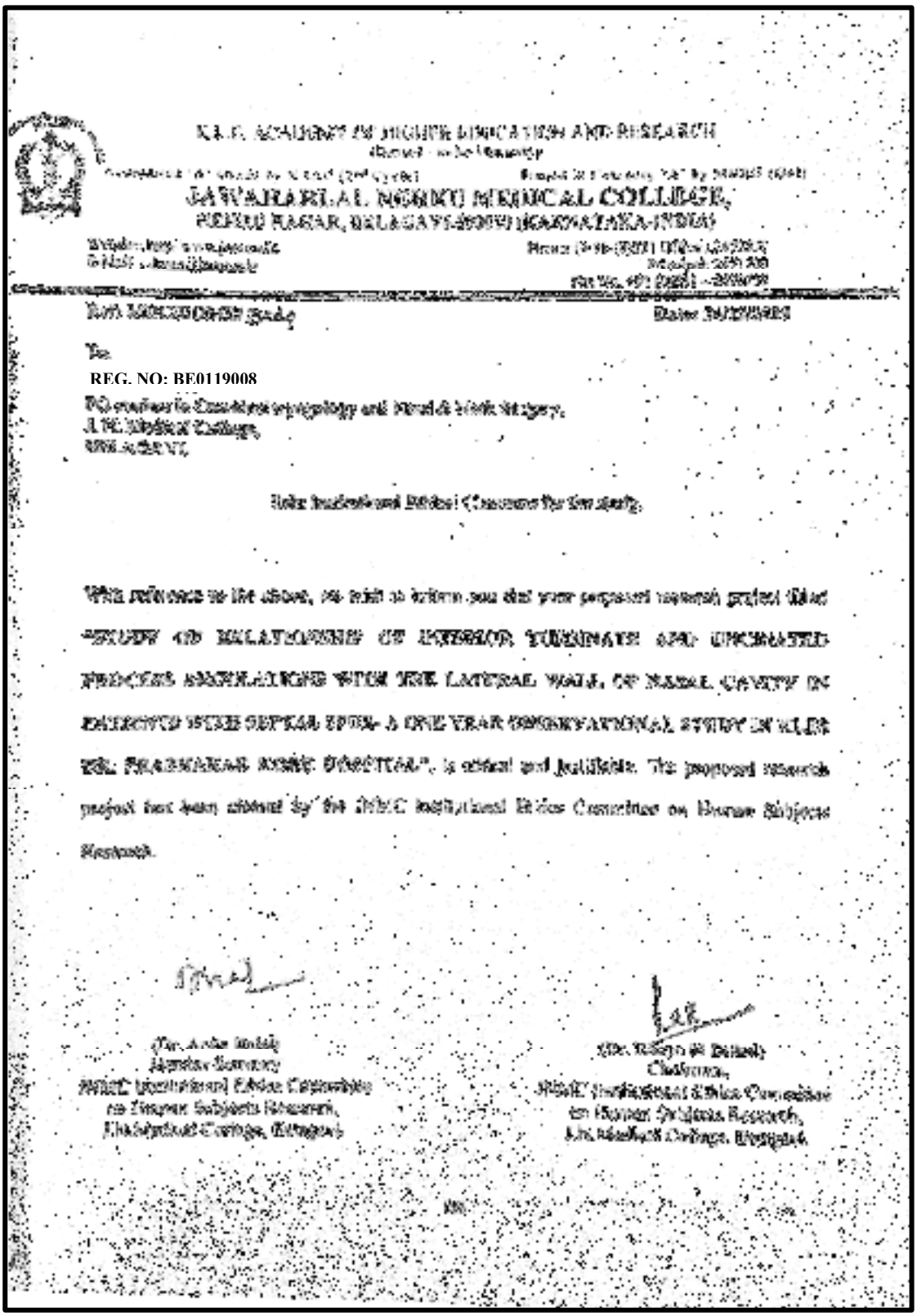
ANNEXURE I
ETHICAL CLEARANCE.



K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed-to-be-University)

JAWAHARLAL NEHRU MEDICAL COLLEGE,
PEENYA PANAR, BELAGAVI-590010 (KARNATAKA-INDIA)

Ref: KAHER/

Date:

To,

REG. NO: BE0119008

PG student in Conservative dentistry and Endodontics,
J.N. Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled "STUDY ON RELATIONSHIP OF APICAL TERMINUS AND UNINSTRUMENTED PERIODONTAL LIGAMENT WITH THE LATERAL WALL OF NASAL CAVITY IN PATIENTS WITH SEPTAL SPUR- A CBCT AND CONVENTIONAL RADIOGRAPHIC STUDY IN KLE'S DR. PRABHAKAR KORE HOSPITAL", is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Arun Inamdar)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N. Medical College, Belagavi

(Dr. Rajeev B. Dalali)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N. Medical College, Belagavi

ANNEXURE II

INFORMED CONSENT

TITLE: Study of relationship of inferior turbinate and uncinate process angulations with the lateral wall of nasal cavity in patients with septal spur - a One-year observational study.

INVESTIGATOR:

REG. NO: BE0119008, Post Graduate M.S. E.N.T, JNMC, Belgaum.

CO-INVESTIGATOR:

_____, Professor, Department of Otorhinolaryngology and Head and Neck Surgery.

INTRODUCTION AND PURPOSE:

The purpose of the study is to observe the difference in angles of the inferior turbinate and the uncinate process between the deviated and non-deviated side in a patient with deviated nasal septum.

PROCEDURE:

If you agree to participate in this study, the relevant data will be collected as per the proforma and the final diagnosis will be confirmed.

After getting inducted in the study, you will be evaluated for deviation in the septum on clinical examination. Patient will then have to undergo CT scan examination and the scan will be studied.

BENEFITS:

Patient will not be eligible for any kind of monetary benefits or any free services.

RISKS:

Methods applied to do the study are safe.

COST OF PARTICIPATION:

The cost of the Investigation will be borne by the Study Subject. The other indirect expenses will be borne by the Investigator.

PRIVACY AND CONFIDENTIALITY:

The results of the study may be published in journals for scientific purposes. However, your identity will not be revealed. All information collected will be coded so that no one other than the investigator will know your identity.

WITHDRAWAL FROM THE STUDY:

You can withdraw from the study at any time if you wish to do so.

AUTHORIZATION TO PUBLISH THE RESULTS:

The researcher may use the information gathered from this study for presentation in scientific meetings. However, your identity will not be revealed.

QUERIES AND CONTACT:

If you have any queries regarding the study, you can contact **REG. NO: BE0119008** without any hesitation on Mobile no: 9677209255 and the guide Dr. _____ Mobile No:9341103203. If you have any questions about rights as a research participant you can contact Dr Roopa M Bellad, Professor, department of Paediatrics, Jawaharlal Nehru Medical College Institutional Ethics Committee on human subjects' research.

CONSENT SUMMARY:

I have been explained all the contents of this consent form in my local language and having understood and clarified all my queries about the study to the best of my knowledge, I hereby give my voluntary consent for participation in the study. I do sign the informed consent form in front of an eyewitness whom I recognize.

Name and Signature/ left thumb impression of the participant:

Name and Signature of the interviewer:

Name and Signature/ left thumb impression of the eyewitness (Relative):

Signature of the guide: **Date:**

ಮಾಹಿತಿ ಕನ್ಸೆಂಟ್

"ಸೆಪ್ಟಲ್ ಸ್ಪೂರ್‌ನೊಂದಿಗಿನ ರೋಗಿಗಳಲ್ಲಿ ನಾಸಲ್ ಕ್ಯಾವಿಟಿಯ ಲ್ಯಾಟರಲ್ ವಾಲ್‌ನೊಂದಿಗೆ ಇನ್ಫೀರಿಯರ್ ಟರ್ಬಿನೇಟ್ ಮತ್ತು ಅನ್‌ಸಿನೇಟ್ ಪ್ರೊಸೆಸ್ ಆಂಗ್ಯುಲೇಶನ್‌ಗಳ ಅಧ್ಯಯನ" - ಒಂದು ವರ್ಷದ ಒಬ್ಸರ್ವೇಷನಲ್ ಸ್ಟಡಿ.

ಪ್ರಿನ್ಸಿಪಾಲ್ ಇನ್ವೆಸ್ಟಿಗೇಟರ್: REG. NO: BE0119008

ಸ್ನಾತಕೊತ್ತರ ವಿದ್ಯಾರ್ಥಿ

ಒಟೊರಿನೋಲರಿಂಗೋಲಜಿ ಇಲಾಖೆ.

ಸಹ-ಸಂಶೋಧಕ: _____

ಪ್ರೊಫೆಸರ್, ಒಟೊರಿನೋಲರಿಂಗೋಲಜಿ ಮತ್ತು ಹೆಡ್ ಮತ್ತು ನೆಕ್ ಸರ್ಜರಿ ವಿಭಾಗ.

ಪರಿಚಯ ಮತ್ತು ಉದ್ದೇಶ:

ಕೆಳಮಟ್ಟದ ಟರ್ಬಿನೇಟ್ನ ಕೋನಗಳಲ್ಲಿನ ವ್ಯತ್ಯಾಸ ಮತ್ತು ವಿಚಲನಗೊಂಡ ಮೂಗಿನ ಸೆಪ್ಟಮ್ ಹೊಂದಿರುವ ರೋಗಿಯಲ್ಲಿ ವಿಚಲನಗೊಂಡ ಮತ್ತು ವಿಚಲನಗೊಳ್ಳದ ಬದಿಯ ನಡುವಿನ ಅನಿಯಮಿತ ಪ್ರಕ್ರಿಯೆಯನ್ನು ಗಮನಿಸುವುದು ಅಧ್ಯಯನದ ಉದ್ದೇಶವಾಗಿದೆ.

ವಿಧಾನ:

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಒಪ್ಪಿದರೆ, ಪ್ರೊಫಾರ್ಮಾದ ಪ್ರಕಾರ ಸಂಬಂಧಿತ ಡೇಟಾವನ್ನು ಸಂಗ್ರಹಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಅಂತಿಮ ರೋಗನಿರ್ಣಯವನ್ನು ದೃ will ೀಕರಿಸಲಾಗುತ್ತದೆ.

ಅಧ್ಯಯನದಲ್ಲಿ ಸೇರ್ಪಡೆಗೊಂಡ ನಂತರ, ಕ್ಲಿನಿಕಲ್ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಸೆಪ್ಟಮ್ನಲ್ಲಿನ ವಿಚಲನಕ್ಕಾಗಿ ನಿಮ್ಮನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುತ್ತದೆ. ನಂತರ ರೋಗಿಯು ಸಿಟಿ ಸ್ಕ್ಯಾನ್ ಪರೀಕ್ಷೆಗೆ ಒಳಗಾಗಬೇಕಾಗುತ್ತದೆ ಮತ್ತು ಸ್ಕ್ಯಾನ್ ಅನ್ನು ಅಧ್ಯಯನ ಮಾಡಲಾಗುತ್ತದೆ.

ಪ್ರಯೋಜನಗಳು:

ರೋಗಿಯು ಯಾವುದೇ ರೀತಿಯ ವಿತ್ತೀಯ ಸೌಲಭ್ಯಗಳಿಗೆ ಅಥವಾ ಯಾವುದೇ ಉಚಿತ ಸೇವೆಗಳಿಗೆ ಅರ್ಹನಾಗಿರುವುದಿಲ್ಲ.

ಅಪಾಯಗಳು:

ಅಧ್ಯಯನ ಮಾಡಲು ಅನ್ವಯಿಸಲಾದ ವಿಧಾನಗಳು ಸುರಕ್ಷಿತವಾಗಿವೆ.

ಭಾಗವಹಿಸುವಿಕೆಯ ವೆಚ್ಚ:

ತನಿಖೆಯ ವೆಚ್ಚವನ್ನು ಅಧ್ಯಯನ ವಿಷಯವು ಭರಿಸುತ್ತದೆ. ಇತರ ಪರೋಕ್ಷ ವೆಚ್ಚಗಳನ್ನು ತನಿಖಾಧಿಕಾರಿ ಭರಿಸುತ್ತಾರೆ.

ಗೌಪ್ಯತೆ ಮತ್ತು ಗೌಪ್ಯತೆ:

ಅಧ್ಯಯನದ ಫಲಿತಾಂಶಗಳನ್ನು ವೈಜ್ಞಾನಿಕ ಉದ್ದೇಶಗಳಿಗಾಗಿ ನಿಯತಕಾಲಿಕಗಳಲ್ಲಿ ಪ್ರಕಟಿಸಬಹುದು. ಆದಾಗ್ಯೂ, ನಿಮ್ಮ ಗುರುತು ಬಹಿರಂಗಗೊಳ್ಳುವುದಿಲ್ಲ. ಸಂಗ್ರಹಿಸಿದ ಎಲ್ಲಾ ಮಾಹಿತಿಯನ್ನು ಕೋಡ್ ಮಾಡಲಾಗುವುದು ಇದರಿಂದ ತನಿಖಾಧಿಕಾರಿಯನ್ನು ಹೊರತುಪಡಿಸಿ ಬೇರೆ ಯಾರಿಗೂ ನಿಮ್ಮ ಗುರುತು ತಿಳಿಯುವುದಿಲ್ಲ.

ಅಧ್ಯಯನದಿಂದ:

ನೀವು ಬಯಸಿದರೆ ನೀವು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಅಧ್ಯಯನದಿಂದ ಹಿಂದೆ ಸರಿಯಬಹುದು.

ಫಲಿತಾಂಶಗಳನ್ನು ಪ್ರಕಟಿಸಲು ಅಧಿಕಾರ:

ಸಂಶೋಧಕರು ಈ ಅಧ್ಯಯನದಿಂದ ಸಂಗ್ರಹಿಸಿದ ಮಾಹಿತಿಯನ್ನು ವೈಜ್ಞಾನಿಕ ಸಭೆಗಳಲ್ಲಿ ಪ್ರಸ್ತುತಪಡಿಸಲು ಬಳಸಬಹುದು. ಆದಾಗ್ಯೂ, ನಿಮ್ಮ ಗುರುತು ಬಹಿರಂಗಗೊಳ್ಳುವುದಿಲ್ಲ.

ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಪರ್ಕ:

ಅಧ್ಯಯನಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ನೀವು ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ನೀವು ಮೊಬೈಲ್ ಸಂಖ್ಯೆ: 9677209255 ಮತ್ತು ಮಾರ್ಗದರ್ಶಿ ಡಾ. _____ ಮೊಬೈಲ್ ಸಂಖ್ಯೆ: 9341103203 ನಲ್ಲಿ ಯಾವುದೇ ಹಿಂಜರಿಕೆಯಿಲ್ಲದೆ ಡಾ. REG. NO: BE0119008 ಅವರನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು. ಸಂಶೋಧನಾ ಪಾಲ್ಗೊಳ್ಳುವವರಾಗಿ ನೀವು ಹಕ್ಕುಗಳ ಬಗ್ಗೆ ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ಪೀಡಿಯಾಟ್ರಿಕ್ಸ್ ವಿಭಾಗದ ಪ್ರಾಧ್ಯಾಪಕ ಡಾ.ರೂಪಾ ಎಂ ಬೆಲ್ಲಾಡ್ ಅವರನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು, ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜು ಸಾಂಸ್ಥಿಕ ನೈತಿಕ ಸಮಿತಿಯ ಮಾನವ ವಿಷಯಗಳ ಸಂಶೋಧನೆ.

ಕನ್ಸೆಂಟ್ ಸಾರಾಂಶ:

ಈ ಒಪ್ಪಿಗೆಯ ರೂಪದ ಎಲ್ಲಾ ವಿಷಯಗಳನ್ನು ನನ್ನ ಸ್ಥಳೀಯ ಭಾಷೆಯಲ್ಲಿ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ಅಧ್ಯಯನದ ಬಗ್ಗೆ ನನ್ನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳನ್ನು ನನ್ನ ಜ್ಞಾನದ ಅತ್ಯುತ್ತಮವಾಗಿ ಅರ್ಥಮಾಡಿಕೊಂಡಿದ್ದೇನೆ ಮತ್ತು ಸ್ಪಷ್ಟಪಡಿಸಿದ್ದೇನೆ, ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನನ್ನ ಸ್ವಯಂಪ್ರೇರಿತ ಒಪ್ಪಿಗೆಯನ್ನು ನಾನು ಈ ಮೂಲಕ ನೀಡುತ್ತೇನೆ. ನಾನು ಗುರುತಿಸಿದ ಪ್ರತ್ಯಕ್ಷದರ್ಶಿಯ ಮುಂದೆ ಮಾಹಿತಿಯುಕ್ತ ಒಪ್ಪಿಗೆ ಪತ್ರಕ್ಕೆ ಸಹಿ ಮಾಡುತ್ತೇನೆ.

ಭಾಗವಹಿಸುವವರ ಹೆಸರು ಮತ್ತು ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ:

ಸಂದರ್ಶಕರ ಹೆಸರು ಮತ್ತು ಸಹಿ:

ಪ್ರತ್ಯಕ್ಷದರ್ಶಿಯ ಹೆಸರು ಮತ್ತು ಸಹಿ / ಎಡ ಹೆಬ್ಬೆರಳು ಅನಿಸಿಕೆ (ಸಾಪೇಕ್ಷ):

ಮಾರ್ಗದರ್ಶಿಯ ಸಹಿ: ದಿನಾಂಕ:

<u>सूचित सहमति</u>

"सहकार्य - एक साल की राष्ट्रीय अध्ययन के साथ पेटेंट में नाभि कैविटी के लेटेरल दीवार के साथ संयुक्ताक्षरी और अनौपचारिक प्रक्रिया के संबंध के अध्ययन।

प्रिंसिपल इन्वेस्टिगेटर: REG. NO: BE0119008

स्नातकोत्तर छात्र विभाग।

सह-निवेशक: DR. _____

प्राध्यापक, ओटोरहिनोलारिंजोलोजी विभाग और हेड एंड नेक सर्जरी।

परिचय और भविष्य:

अध्ययन का उद्देश्य हीन नाक के कोण में अंतर का निरीक्षण करना है और भटकती हुई नाक सेप्टम के साथ एक रोगी में गैर-विचलित पक्ष के बीच होने वाली अनिश्चित प्रक्रिया है।

प्रक्रिया:

यदि आप इस अध्ययन में भाग लेने के लिए सहमत हैं, तो प्रासंगिक डेटा प्रोफार्मा के अनुसार एकत्र किया जाएगा और अंतिम निदान की पुष्टि की जाएगी।

अध्ययन में शामिल होने के बाद, आपको नैदानिक परीक्षा पर सेप्टम में विचलन के लिए मूल्यांकन किया जाएगा। तब रोगी को सीटी स्कैन परीक्षा से गुजरना होगा और स्कैन का अध्ययन किया जाएगा।

लाभ:

रोगी किसी भी तरह के मौद्रिक लाभ या किसी भी मुफ्त सेवाओं के लिए पात्र नहीं होगा।

जोखिम:

अध्ययन करने के लिए लागू तरीके सुरक्षित हैं।

साझेदारी का हिस्सा:

जांच की लागत अध्ययन विषय द्वारा वहन की जाएगी। अन्य अप्रत्यक्ष खर्चों को अन्वेषक द्वारा वहन किया जाएगा।

गोपनीयता और गोपनीयता:

अध्ययन के परिणाम वैज्ञानिक उद्देश्यों के लिए पत्रिकाओं में प्रकाशित हो सकते हैं। हालांकि, आपकी पहचान उजागर नहीं की जाएगी। एकत्रित की गई सभी सूचनाओं को कोडित किया जाएगा ताकि जांचकर्ता के अलावा कोई भी आपकी पहचान को न जान सके।

अध्ययन से विदधावल:

आप चाहें तो किसी भी समय अध्ययन से पीछे हट सकते हैं।

परिणामों को प्रकाशित करने के लिए धन्यवाद:

शोधकर्ता वैज्ञानिक अध्ययनों में प्रस्तुतिकरण के लिए इस अध्ययन से प्राप्त जानकारी का उपयोग कर सकते हैं। हालांकि, आपकी पहचान उजागर नहीं की जाएगी।

प्रश्न और संपर्क:

यदि अध्ययन के संबंध में आपके कोई प्रश्न हैं, तो आप डॉ। REG. NO: BE0119008

मोबाइल नंबर: 9677209255 और डॉ। _____ मोबाइल नंबर: 9341103203 पर बिना किसी संकोच के संपर्क कर सकते हैं। यदि आप एक अनुसंधान भागीदार के रूप में अधिकारों के बारे में कोई प्रश्न पूछना चाहते हैं, तो आप डॉ। रूपा एम बेलाड, प्रोफेसर, बाल रोग विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज संस्थागत आचार समिति के मानव विषयों के शोध से संपर्क कर सकते हैं।

सहमति सारांश:

मुझे अपनी स्थानीय भाषा में इस सहमति फॉर्म की सभी सामग्री समझाई गई है और अध्ययन के बारे में मेरे सभी प्रश्नों को अपने सर्वश्रेष्ठ ज्ञान के लिए समझा और स्पष्ट किया है, जिससे मैं अध्ययन में भाग लेने के लिए अपनी स्वैच्छिक सहमति देता हूं। मैं एक प्रत्यक्षदर्शी के सामने सूचित सहमति पत्र पर हस्ताक्षर करता हूं जिसे मैं पहचानता हूं।

प्रतिभागी का नाम और हस्ताक्षर / बाएं अंगूठे का निशान:

साक्षात्कारकर्ता का नाम और हस्ताक्षर:

नाम और हस्ताक्षर / प्रत्यक्षदर्शी के बाएं अंगूठे का निशान (सापेक्ष):

गाइड का हस्ताक्षर: दिनांक:

<u>माहितीपूर्ण संमती</u>

"सेप्टल स्पुर सह पाटबंधामधील नाट्यासंबंधित वृत्तीच्या नाकासंबंधीच्या पर्वांशी संबंधित अनियमित संबंध आणि अनसिनेट प्रोसेस ऑग्युलेशन्सच्या संबंधाचा अभ्यास" -एक वर्ष पर्यवेक्षण अभ्यास.

प्रिन्सिपल इन्व्हेस्टिगेटर: REG. NO: BE0119008

पदव्युत्तर विद्यार्थी

विभाग.

सहकारी अन्वेषक: डॉ._____

प्राध्यापक, ऑटोरिनोलरिंगोलॉजी विभाग आणि प्रमुख आणि मान शल्यक्रिया.

परिचय आणि उद्देश:

अभ्यासाचा हेतू निकृष्ट टर्बिनेटच्या कोनात फरक आणि विचलित अनुनासिक सेप्टम असलेल्या रूग्णाच्या विचलित आणि न विचलित बाजूच्या दरम्यानची प्रक्रिया करणे हे आहे.

प्रक्रिया:

आपण या अभ्यासामध्ये भाग घेण्यास सहमती दर्शविल्यास, संबंधित आकडेवारी प्रोफार्मा नुसार गोळा केली जाईल आणि अंतिम निदानाची पुष्टी होईल.

अभ्यासामध्ये सामील झाल्यानंतर, क्लिनिकल तपासणीच्या सेप्टममध्ये विचलनासाठी आपले मूल्यांकन केले जाईल. त्यानंतर रुग्णांना सीटी स्कॅन तपासणी करावी लागेल आणि स्कॅनचा अभ्यास केला जाईल.

फायदे:

रुग्ण कोणत्याही प्रकारच्या आर्थिक लाभांसाठी किंवा कोणत्याही विनामूल्य सेवांसाठी पात्र ठरणार नाही.

जोखीम:

अभ्यासासाठी लागू केलेल्या पद्धती सुरक्षित आहेत.

सहभागाचा खर्चः

अन्वेषणाचा खर्च अभ्यास विषयाद्वारे वहन केला जाईल. अन्य अप्रत्यक्ष खर्च अन्वेषक तपासेल.

गोपनीयता आणि गोपनीयता:

अभ्यासाचे निकाल वैज्ञानिक उद्देशाने नियतकालिकांमध्ये प्रकाशित केले जाऊ शकतात. तथापि, आपली ओळख उघड केली जाणार नाही. संकलित केलेली सर्व माहिती कोडित केली जाईल जेणेकरून अन्वेषक सोडून इतर कोणालाही आपली ओळख पटणार नाही.

अभ्यासानुसार

आपली इच्छा असल्यास आपण कधीही अभ्यासामधून माघार घेऊ शकता.

परिणाम प्रकाशित करण्यासाठी प्रमाणीकरण:

संशोधक या अभ्यासामधून गोळा केलेल्या माहितीचा उपयोग वैज्ञानिक बैठकींमध्ये सादरीकरणासाठी करू शकतात. तथापि, आपली ओळख उघड केली जाणार नाही.

प्रश्न आणि संपर्क:

अभ्यासासंदर्भात काही शंका असल्यास मोबाईल क्रमांक: 67 67207२० 25 55 and आणि मार्गदर्शक डॉ. _____ मोबाइल नं. संशोधन सहभागी म्हणून आपल्याला हक्कांबद्दल काही प्रश्न असल्यास आपण डॉ. रूपा एम. बेलाड, प्रोफेसर, बाल रोगशास्त्र विभाग, जवाहरलाल नेहरू मेडिकल कॉलेज मानवी विषयांच्या संशोधनावरील संस्थागत नीतिशास्त्र समितीशी संपर्क साधू शकता.

संक्षिप्त सारांश:

या संमती फॉर्मची सर्व सामग्री मला माझ्या स्थानिक भाषेत स्पष्ट केली गेली आहे आणि अभ्यासाबद्दल माझ्या सर्व प्रश्नांना माझ्या माहितीनुसार समजून घेतल्यावर आणि त्या स्पष्ट केल्यावर मी अभ्यासात सहभागासाठी माझी स्वेच्छा संमती देतो. मी ज्यांना मी ओळखतो त्या प्रत्यक्षदर्शीसमोर माहिती संमती फॉर्मवर सही करतो.

सहभागीचे नाव व स्वाक्षरी / डाव्या अंगठ्याचा ठसा:

मुलाखतदाराचे नाव व स्वाक्षरीः

नाव आणि स्वाक्षरी / प्रत्यक्षदर्शीच्या डाव्या अंगठ्याचा ठसा (संबंधित):

मार्गदर्शकाची सही: तारीख:

ANNEXURE III

PROFORMA

‘“STUDY OF RELATIONSHIP OF INFERIOR TURBINATE AND UNCINATE PROCESS ANGULATIONS WITH THE LATERAL WALL OF NASAL CAVITY IN PATIENTS WITH SEPTAL SPUR”-A ONE YEAR OBSERVATIONAL STUDY.

Date:

O.P. No:

Name: Age:

Sex: Occupation:

Address: Phone No:

CLINICAL PROFILE:

CHIEF COMPLAINT:

HISTORY OF PRESENT ILLNESS

PAST HISTORY:

PERSONAL HISTORY:

FAMILY HISTORY:

I) GENERAL PHYSICAL EXAMINATION

Blood Pressure:

Pulse:

Respiratory Rate:

Pallor

Icterus

Clubbing

Cyanosis

Lymphadenopathy

Oedema

II) ENT Examination

EAR EXAMINATION:

Right

Left

Pinna

Pre auricular area

Post auricular area

External auditory canal

Tympanic membrane

TUNING FORK TESTS:

Rinne's test 256 Hz

512 Hz

1024 Hz

Weber's test:

Absolute Bone Conduction test:

FACIAL NERVE EXAMINATION

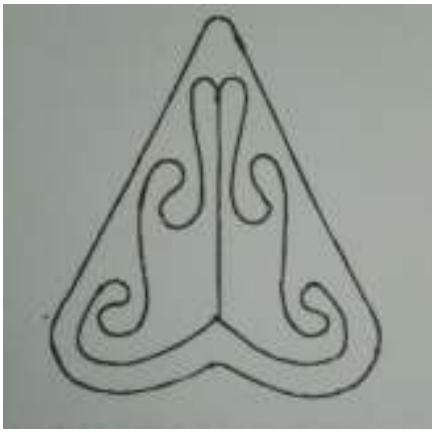
NOSE EXAMINATION

External appearance

- Root
- Bridge
- Dorsum
- Alae
- Tip
- Columella

Cold spatula test

Anterior Rhinoscopy



Posterior Rhinoscopy

Paranasal Sinus Examination

THROAT EXAMINATION:

NECK EXAMINATION:

DIAGNOSIS:

CT SCAN PARANASAL SINUS:

Angle between the inferior turbinate and the lateral wall of nasal cavity on the convex side:Angle between the inferior turbinate and the lateral wall of nasal cavity on the concave side:Angle between the uncinate process and the lateral wall of nasal cavity on the convex side:Angle between the uncinate process and the lateral wall of nasal cavity on the concave side:

ANNEXURE IV

PHOTOGRAPHS

Image 1: Endoscopic image showing Septal spur in the left side.

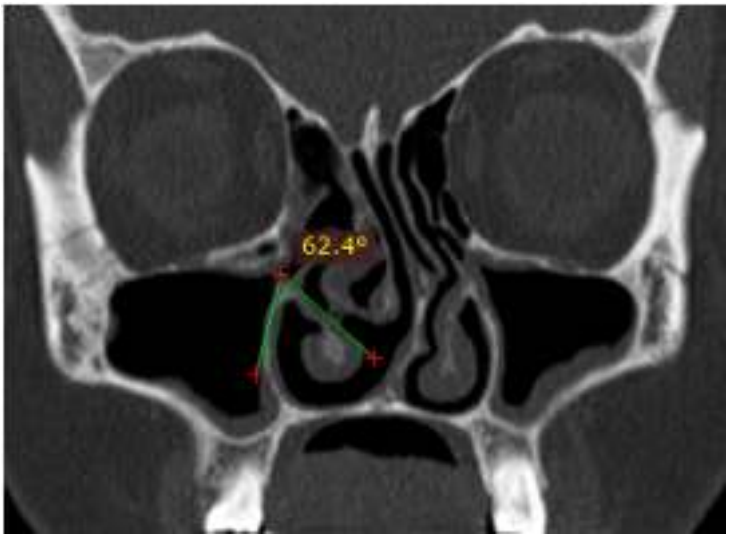


Image 2: Measurement of Angle between Inferior turbinate and Lateral wall – Concave side

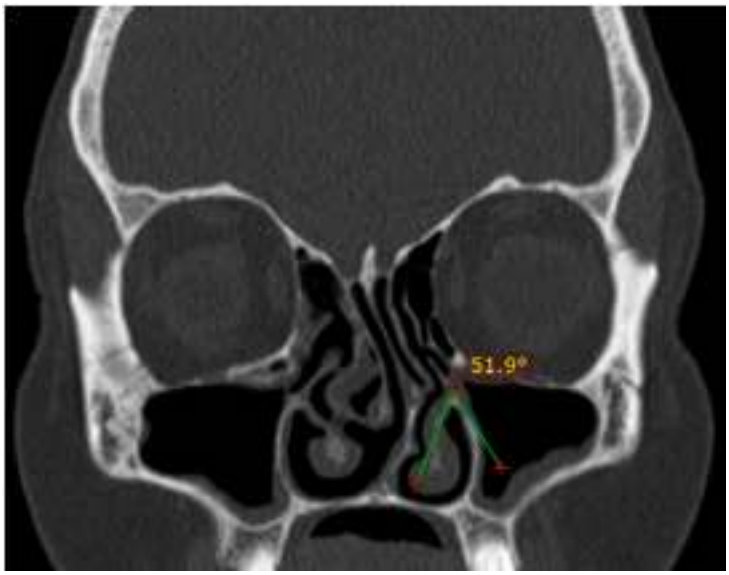


Image 3: Measurement of Angle between Inferior turbinate and Lateral wall – Convex side

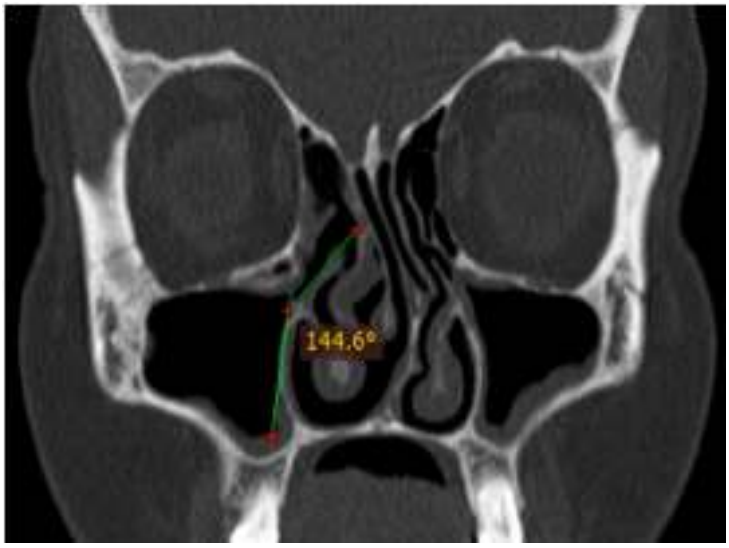


Image 4: Measurement of Angle between Uncinate process and Lateral wall – Concave side

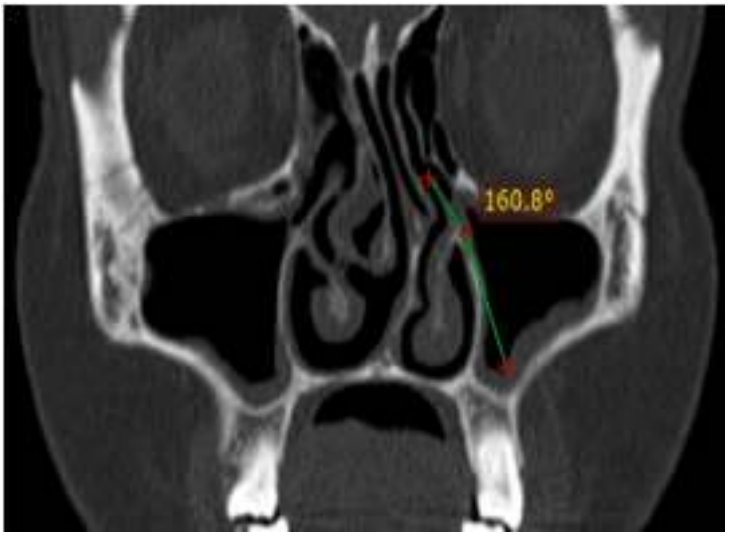


Image 5: Measurement of Angle between Uncinate process and Lateral wall – Convex side

ANNEXURE V - KEY TO MASTERCHART

IT – Inferior turbinate

UP – Uncinate process

LW – Lateral wall of nose

B/w – Between

S.no	Patient No.	Age (In years)	Sex	Angle b/w IT & LW - Concave side	Angle b/w IT & LW - Convex side	Angle b/w UP & LW - Concave side	Angle b/w UP & LW - Convex side
1	5652138	58	Male	98.8	86.5	125.4	143.2
2	5597492	46	Female	90.3	60.7	122.3	170.5
3	5586616	36	Female	73.1	65.7	123.6	135.8
4	5561232	21	Male	95.5	75.8	144.4	170
5	5612442	21	Male	73.8	69	166.4	177.5
6	5423355	40	Male	44.6	44.7	152.9	153.1
7	C26290	50	Male	85.4	61.9	148.4	159.3
8	C27743	59	Male	66.3	61.3	149.5	156.8
9	5796434	34	Female	56.2	48.1	142.6	154.5
10	5904696	41	Male	64.1	52.4	136.9	138.2
11	C27947	58	Female	67.2	52.6	140.9	156.8
12	5881023	42	Male	62.2	50.7	142	154.1
13	5351657	35	Female	69.1	52.9	138.7	143.6
14	5289821	21	Female	53.7	48.9	134.1	137.2
15	C28114	53	Male	40.5	37.9	131.5	135.2
16	5833691	60	Male	73.7	55.1	138.8	159.4
17	C24970	43	Female	68.8	56.8	119.8	150.9
18	C28022	47	Female	47.5	41.6	123.4	128.2
19	C25464	22	Male	59.8	46.4	142	158.4
20	C24509	24	Male	98.2	85.1	123.7	141.9
21	5897249	30	Male	84.3	60.7	122.3	170.5
22	C21760	20	Female	54	82.5	157.1	146.2
23	5810928	60	Male	46.9	68.8	155.1	148.1
24	C19653	45	Male	66.4	58.6	159.6	169.9
25	C19726	28	Female	62.4	61.1	156.1	168.3

26	C20482	18	Female	61.9	74.8	144.1	138.3
27	C20478	36	Female	54.7	66.1	153.8	146.2
28	C21742	57	Male	60.6	69.1	162.9	168
29	C24758	39	Female	58.9	39.1	132.6	151.1
30	C25269	58	Female	60.1	44.3	119.4	132.5
31	C23789	21	Male	53.1	40.4	129.5	142.2
32	C28217	25	Male	52.4	41.4	129.4	143.6
33	C25821	18	Female	60.4	52.3	125.5	142.5
34	C24454	36	Male	76.2	52.3	132.4	156.3
35	C28055	18	Male	45.2	32.3	121.7	148.6
36	C24970	43	Female	57.7	42.4	126.8	146.5
37	C29358	27	Female	62.4	49.8	123.4	137.3
38	C20978	57	Male	60.1	44.3	119.4	132.5