Types of septal deviation rate of each type morbidity and associated sinus pathology

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List of abbreviation

NO.	Title	Page
1	C.T	Computed Tomography
2	DNS	Deviated nasal Septum
3	U	Unilateral
4	B	Bilateral

Abstract

Background

- Septal deviation is a common disorder and its role in pathogenesis of sinus pathology remain uncertain ,
- Different type of septal deviation affects sinuses in different feature.
- Design of study : prospective study

Objective

- Rate of each type of septal deviation .
- Morbidity of septal deviation .
- Associated sinonasal pathology .

Patient and methods

- About 150 patients. collected from out patient clinic from AL.Yarmouk teaching hospital from April 2017 till Augest 2018 who complain from nasal obstruction, nasal discharge, facial pain others for at least 3month, patients presented without previous diagnosis.
- All patients collected due to symtomatic septal deviation, then examination done either by ant. Rhinoscopy using head light and killian nasal speculam, endoscopy rigid type 4mm (0^0&30^0) and fibroptic (nasopharyngeal)
- Doing C.T scan for each patient to observe change in each type on paranasal sinuses ,the shape of deviation which seen by endoscopy and exclude other nasal and paranasal pathology
- Data collected in questioner or statistic reading method using P.value .
- Observe rate of each type ,morbidity of septal deviation consequence of pathology of each type regarding of sinuses .

Results

- In this current study for 150 case symptomatic septal deviation we observe :
- C-shape (91)60.6%

- S-shape (59) 39.3%
- we found 70 case associated with sinus pathology
- C-shape=32case 45.8%
- S-shape =38case 54.2%

Conculosion

- Deviated nasal septum associated with significant sinonasal disease especial S-shape DNS which show statically significant correlation with sinus disease .
- Nasal obstruction are the main complain of septal deviation .
- Bilateral sinus disease more associated with S-shape &unilateral sinus disease with C-shape .

Key words: Septal deviation, caudal dislocation, sinusitis, nasal obstruction

Introduction:

ANATOMY OF THE NOSE AND PARANASAL SINUSES

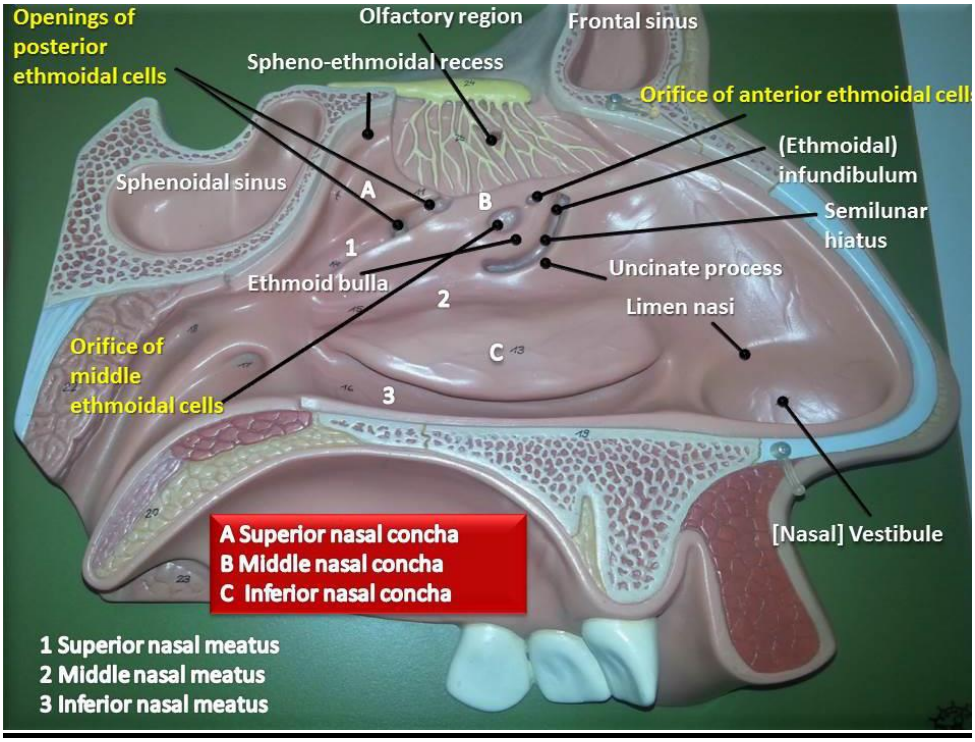
Nasal cavity

The nasal cavity extends from the external nares or nostrils to the posterior choanae, where it becomes continuous with the nasopharynx. Vertically, it extends from the palate to the cribiform plate, being broader at its base than superiorly where it narrows to the olfactory cleft. The nasal cavity is divided into two by a septum. Each half has a floor, a roof, a lateral wall and a medial (septal) wall.[1]

The floor is composed of the palatine process of the maxilla in its anterior three-quarters from side to side and its posterior one-quarter by the horizontal process of the palatine bone.

The roof is narrow from side to side, except posteriorly, and may be divided into frontonasal, ethmoidal and sphenoidal parts.

The inner surfaces of the maxillae, the lacrimal bones, the superior and middle turbinates, the inferior turbinate, and the medial pterygoid make up the lateral wall. The three scroll-like, pitted turbinate bones, or the conchae, on each side of the nose divide the nasal lumen into meati. The space between the inferior turbinate and floor of the nose is the inferior meatus, the space between the inferior and middle turbinates is the middle meatus, and the space above the middle turbinate is the superior meatus. Occasionally, there is a supreme turbinate. The middle and superior turbinates are extensions of the ethmoid bones, whereas the inferior turbinate is a separate bone attached by its superior border to the lateral nasal wall.[1]



F igure 1.1 : Anatomy of the nasal cavity[2]

Nasal septum

The nasal septum is composed of a small anterior membranous portion, cartilage and several bones: the perpendicular plate of the

ethmoid, the vomer and two bony crests of the maxilla and palatine The cartilaginous portion is composed of a quadrilateral cartilage with a contribution from the lower and upper lateral alar cartilages forming the anterior nasal septum [1] .

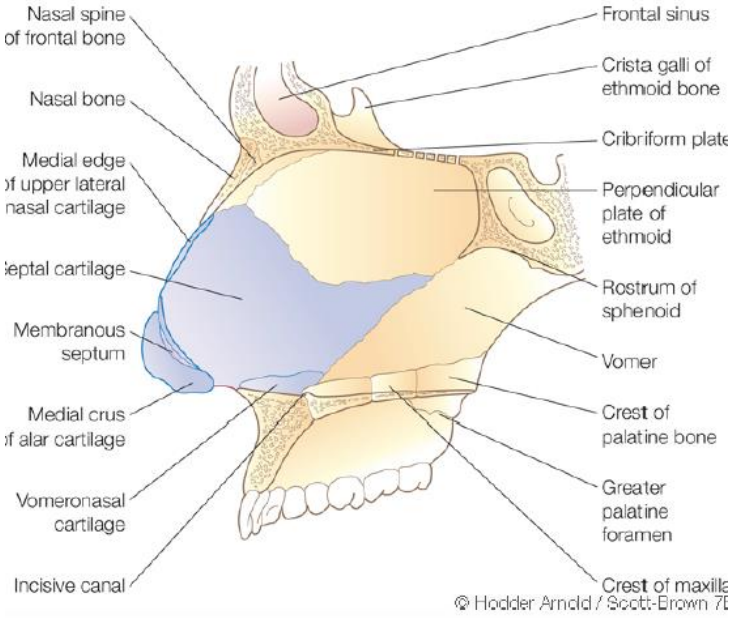


Figure 1.2 : ANATOMY of The nasal septum[1]

Anatomy of the ostiomeatal unit

The term "ostiomeatal unit" describes the area on the lateral nasal wall where the ostia of the paranasal sinuses (except for the sphenoid sinus) open into the nasal cavity in a duct-like fashion. The functionally significant anatomic structures of the ostiomeatal unit are the uncinate process, the semilunar hiatus, the frontal recess, the ethmoid bulla, the ethmoid infundibulum, and the maxillary sinus ostium

The frontal sinus is connected to the ostiomeatal unit via the frontal recess, which has an hourglass-like shape. The uncinate process is a thin fibrous or bony process on the lateral nasal wall that arises slightly behind the anterior border of the middle turbinate. Located between the posterior border of the uncinate process and the first ethmoid cell (the ethmoid bulla) is another slit like passage within the ostiomeatal complex, known as the semilunar hiatus. The space between the uncinate process, ethmoid bulla, and lamina papyracea of the ethmoid bone is called the ethmoid infundibulum. The ostiomeatal unit is

bounded medially (toward the nasal cavity) by the middle turbinate and laterally by the lamina papyracea[4]

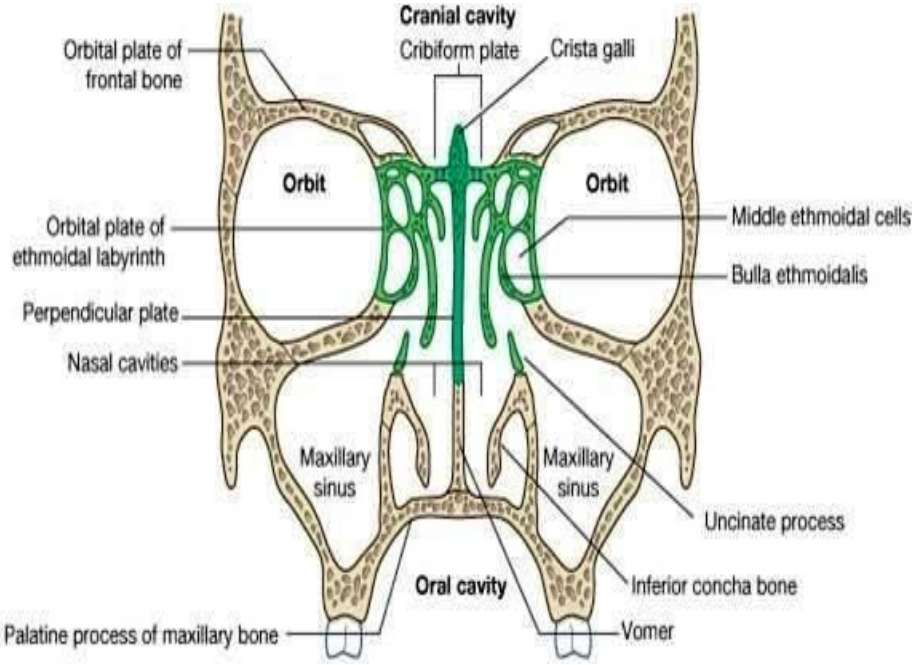


Figure 1.3 : Anatomy of Paranasal sinuses[5]

Paranasal sinuses

Ethmoidal Sinus

The ethmoid sinuses are the central structures of the nose with complex anatomy; they are best visualized as a box-like structure with open anterior and inferior faces. The lateral portions form the medial walls of the orbits, the sphenoid establishes the posterior face, the superior surface is formed by the skull base of the anterior cranial fossa, and many of the key structures of the lateral nasal wall, derived from basal lamellas, extend posteroinferiorly from the skull base[4].

The lateral wall of the ethmoid sinus or lamina papyracea forms the paper-thin medial wall of the orbit. The midline vertical plate of the ethmoid bone is composed of a superior portion in the anterior cranial fossa called the crista galli and an inferior portion in the nasal cavity called the perpendicular plate of the ethmoid bone that contributes to the nasal septum. The anterior cranial fossa is separated from the

ethmoid air cells superiorly by the horizontal plate of the ethmoid bone, which is composed of the thin medial cribriform plate and the thicker, more lateral ethmoid roof. The ethmoid roof articulates with the cribriform plate at the lateral lamella of the cribriform plate, which is the thinnest bone in the entire skull base. [5]

Maxillary Sinus

The maxillary sinus is the pneumatized space within the maxillary bone and is the largest of the paranasal sinuses. The anterior wall forms the facial surface of the maxilla, the posterior wall borders the pterygopalatine fossa, the medial wall constitutes the lateral wall of the nasal cavity, the floor of the sinus is the alveolar process, and the superior wall serves as the orbital floor

The natural ostium of the maxillary sinus opens into the superior aspect of the medial wall to drain into the ethmoidal infundibulum. Accessory maxillary sinus ostia are found in 15% to 40% of subjects, most commonly superior and posterior to the uncinate process above the insertion of the inferior turbinate.[5]

Frontal Sinus

The size of the frontal sinus varies depending on the degree of pneumatization, may be completely absent (5%), and is usually divided by an intersinus septum. The frontal sinus lies within the frontal bone between thick anterior table and a relatively thin posterior table, separating the sinus from the frontal lobe of the brain. The floor of the frontal sinus corresponds to the anterior roof of the orbit. The frontal sinus drainage pathway has an hourglass shape and opens in the nose at the level of frontal recess. The narrowest point of this tract is called the frontal infundibulum of ostium and located at the most inferomedial aspect of the sinus.[5]

Sphenoid Sinus

The sphenoid sinus has many important neurovascular relationships. The internal carotid artery is lateral to the sphenoid sinus as it courses through the cavernous sinus producing a prominence in the lateral sphenoid sinus wall. An optic nerve prominence is present in 40% of individuals with dehiscence in 6 %.

The sinus cavities are variable in size and shape. Pneumatization can extend into the greater wing, pterygoid processes and rostrum. Four general forms of pneumatization are described:

1. Conchal pneumatization, with only a rudimentary sinus (2-3%).

2. Presellar, in which the sinus is pneumatized as far as the anterior bony wall of the pituitary fossa (11%).

3. Sellar, in which pneumatization extends back beneath the pituitary fossa (59%).

4. Mixed (27%)

The sphenoid sinus ostium opens into the sphenoethmoidal recess. [4]

The turbinates

These are usually three (rarely four), and they appear as delicate shelf like bony structures protruding from the lateral nasal wall covered by ciliated columnar mucous epithelium. The superior, middle, and inferior turbinates are present in almost all individuals, and a very small supreme turbinate may also occur. The supreme, superior, and middle turbinates are included in the ethmoid bone. The inferior turbinate is a separate bone.[1]

The superior turbinate

It measures about 1.5 cm in length and is attached to the lamina papyracea of the ethmoid bone by a thin bony partition. The superior meatus contains the ostia of the posterior ethmoidal cell. A small ridge; the superme turbinate is sometime visible above the superior turbinate.[4]

The middle turbinate

Is about 4 centimeter in length. The anterior end of the middle turbinate inserts into the ascending process (the ethmoid crest) of the maxilla and the posteromedial edge of the agger nasi. The superior attachment is in the paramedian sagittal plane and adheres to the lateral edge of the perforated portion of the cribriform plate along the ethmoid roof to a more vertical orientation along the lamina papyracea of the ethmoid bone. This twisting attachment of the middle turbinate bends within the middle third of the basal lamella, resulting in a prominent anterior vertical portion and a posterior descending horizontal plate. The posterior portion of the insertion of the middle turbinate runs in a horizontal plane forming the roof of the posterior middle meatus.[4]

This posterior end is attached to the ethmoid crest of the perpendicular plate of the palatine bone. Pneumatization of the middle turbinate is frequent at its anterior end and in the main body mass. The middle meatus lies between the middle and inferior turbinate attachments. The lateral wall of the middle meatus is the most important area of the lateral wall of the nasal cavity, as many of the paranasal sinuses open here [4]

Inferior Turbinate

The inferior turbinate is an independent anatomical structure. The bone is scroll shaped and attached to the conchal ridge of the medial process of the maxilla and the palatine bone. It also articulates with the lacrimal bone by its lacrimal process and covers the lacrimal groove to form the bony canal for the nasolacrimal duct. The inferior meatus lies inferolateral to the inferior turbinate. The nasolacrimal duct is the only structure that opens in this meatus[4]

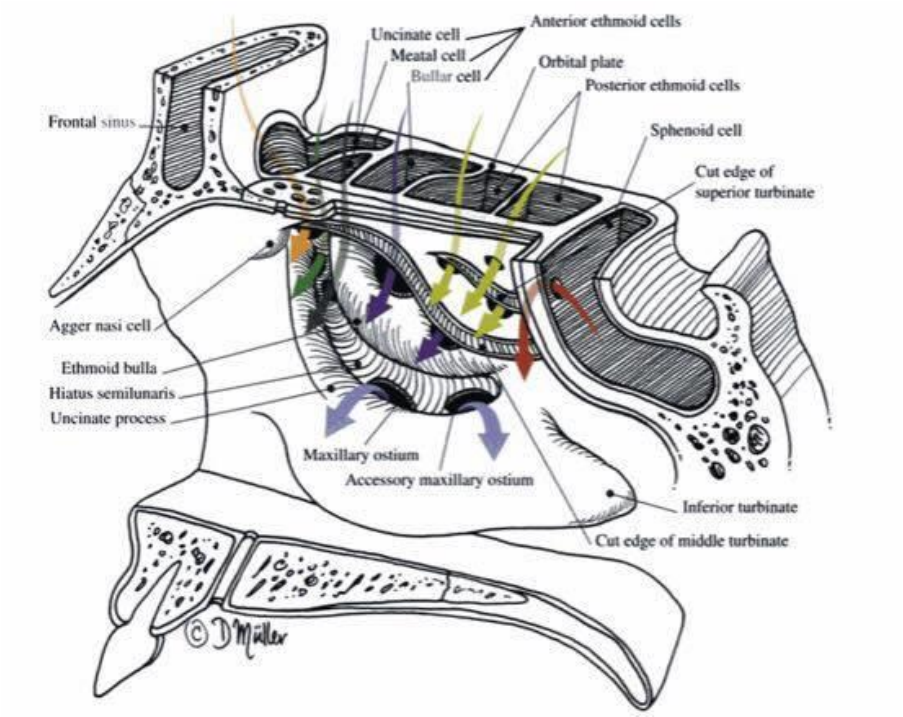


Figure 1.4 : Drainage system of the paranasal sinunes[4]

MUCOCILIARY PHYSIOLOGY

The mucosal lining of the paranasal sinuses is made up of a ciliated cuboidal epithelium. The mucous blanket of sinonasal cavities is composed of two layers: the gel and sol phases.The gel phase, or the superficial layer, is produced by goblet and submucosal glands and provides an environment that traps foreign particulate matter, which can then be cleared through the mucociliary clearance actions of the cilia. The sol phase, or the deep layer, is produced by microvilli and provides a fluid that facilitates ciliary motility as well as movement of the gel layer. The mucous blanket consists of mucoglycoproteins, immunoglobulins, interferon, inflammatory cells, and a variety of other immunologic substances[6]

Cilia move mucus at a rate of 3 to 25 mm/min toward natural sinus ostia and ultimately to the nasopharynx and oropharynx where the transported mucus is swallowed.[5]

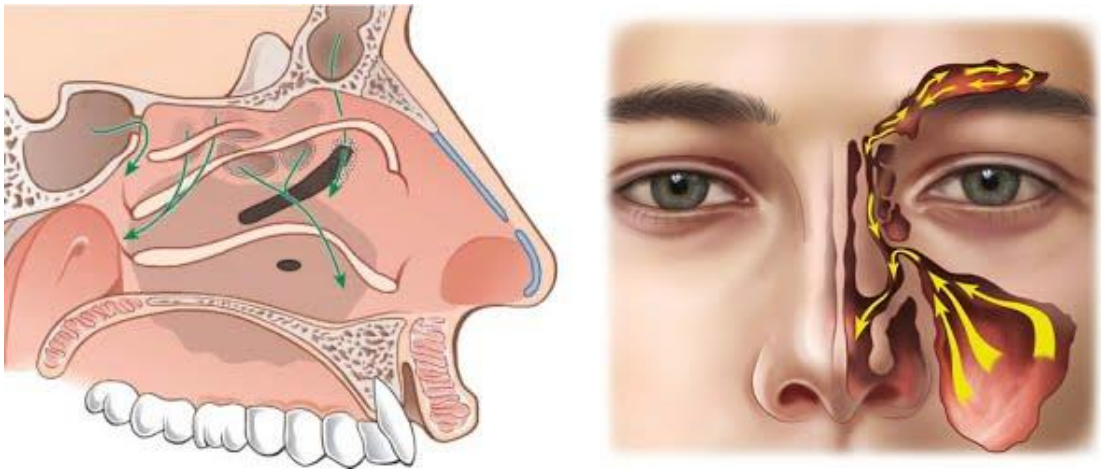


Figure 1.5 : The mucociliary clearance pattern of the sinuses[4]

Nasal septal deviation

Nasal septal deviation or deviated nasal septum is physical disorder of the nose ,involving displacement of nasal septum. some displacement is common ,affecting 80% of people ,most unknowingly.[10]

Sever septal deviation cause symptoms of difficulty breathing and require treatment. Symptoms of deviated nasal septum include infection of the sinuses ,snoring and sleep apnea , ,facial pain ,nosebleeds, mild to sever lose ability to smell.

The nasal septum is the bone and cartilage in the nose that that separate the nasal cavity into the two nostrils.the cartilage is called the quadrilateral cartilage and the bones comprising the septum include the maxillary crest ,vomer,and the perpendicular plate of ethmoid .Normaly ,the septum lies centrally and thus the nasal passages are symmetrical .adeviated septum is an abnormal condition in which the top the top of cartilaginous ridge leans to the left or to the right ,causing obstruction of the affected nasal passage.The condition can result in poor drainage .people can also complain of difficulty breathing ,headache, bloody nose, sleeping disorder as snoring.

It’s common for nasal septa to depart from the exact centerline;the septum only consider deviated if the shift is substantial or causes problems.many people with adeviation are unaware they have it until

some pain is produced. By itself ,adeviated septum can go undetected for years and thus be without any need for correction ,and can classify degree of deviation in to :(mild simple deflection , moderate cross deflection but not touch the lat wall ,sever deflection obstructed touch the lat wall).

The most frequently caused by impacted trauma ,such as by a blow to the face ,it can also be congenital disorder

Diagnosed clinically

History

symptoms

.Nasal obstruction

.Epstaxis

.Headache

.Sinusitis

Sign

nasal deformity

Anosmia

Investigation

Radiology [11]

Assessment of the patients

History

The best initiated by nasal symptoms noting duration periodicity, nocturnal variation , associated trauma and previous surgery

The enquiry should cover the presence of nasal obstruction or congestion ,facial pain,hyposmia,rhinorhoea,post nasal drip and secondary symptoms sneezing,itching,dry mouth

Understanding the symptoms and their association is not useful diagnostically but also create of level of quality life impairment suffered[7].

Examination

Examination of the nose:

- Examine the nose externally from the front and side views, looking at the skin type and thickness, scars and lesion

- Tilt the head of the patient backwards to examine the columella and the vestibule.

- Check the patency of the nasal airway on each side with a metallic tongue depressor or by occluding the nostril with the thumb and asking the patient to sniff through the nose.

- Inspect nasal cavities using killian nasal speculum and assess the nasal septum for deviation, perforation, vessels, mucosal lesions, inferior turbinates (hypertrophy, mucosal changes), nasal masses (polyps, lesions).

- Perform a rigid naso-endoscopy after application of decogestant (often combined with local anasthesia)to inspect the nasal cavity and post-nasal space[7]

Rigid naso-endoscopy:

This is regarded as the standard technique for assessing the nose. It may be performed with the patient seated or laying supine on an examination couch.

- Use a 4mm 0° and 30° endoscope. A 2.7mm scope can be helpful in a narrow nose.

- Use the standard three-pass technique.
  Flexible Nasopharyngeal fibrotic endoscopy .

COMPUTED TOMOGRAPHY

CT is the current imaging standard for the evaluation of sinuses diseases because of its exquisite ability to display and differentiate hypertrophic mucosa, bone, and air.

It has poor soft tissue contrast and should not be relied upon for assessment of soft tissues. Iodinated contrast administration is unnecessary for evaluation of rhinosinusitis and should be reserved to assess neoplastic diseases and complications of acute sinusitis in select cases.[8]

Types of septal deviation

C-shape: rt side vertical S-shape: rt side vertical

Figure1-6; Types of septal deviation [9]

Aims of the study

- The rate of each type of septal deviation.
- Morbidity of septal deviation
  The effect of each type of septal deviation on paranasal sinuses.

Patients and Methods:

150 patients. collected from out patient of Al.yarmouk teaching hospital from April 2017 till august 2018. who complain from nasal

obstruction nasal discharge facial pain others for at least 3month. patients presented without previous diagnosis, All patients collected due to symptomatic septal deviation. then examination done either by anterior rhinoscopy using head light and killian nasal speculum, endoscopy rigid rod hopkin type 4mm&2-7mm(0^0,30^0) and fibroptic (nasopharyngeal)flexible endoscopy.

Doing C.T scan for each patient. To observe change in each type on para nasal sinuses ,the shape of deviation which seen by endoscopy and exclude other intranasal and para nasal pathology.

Data collected in quasioner and statistic reading method using P.value(determine the significant of the results, if <0.05 significant,if >0.05 not significant)

Observe rate of each type ,morbidity of septal deviation consequence of pathology of each type regarding of sinuses.

Inclusion criteria

1.pt.age 18 and above

2. symtomatic septal deviation

3.degree of deviation ; moderat to sever(mild simple deflection not obstructed, moderate cross deflection but not touch the lat wall ,sever deflection obstructed touch the lat wall)

Exclusion criteria

1. Mild S.D
2. Allergic rhinitis
3. Concha bulosa&paradoxical middle turbinate
4. Intranasal mass
5. Post. Nasal mass

Questionnaire

Name gender

Occupation age group

Address

Chief complain ***duration***

1.nasal obstruction

2.nasal discharge

3.epistaxis

4.fascial pain

5.others

Finding

Anterior .Rhinoscopy

C

turbinate hypertrophy spur caudal dislocation

Endoscopic Finding

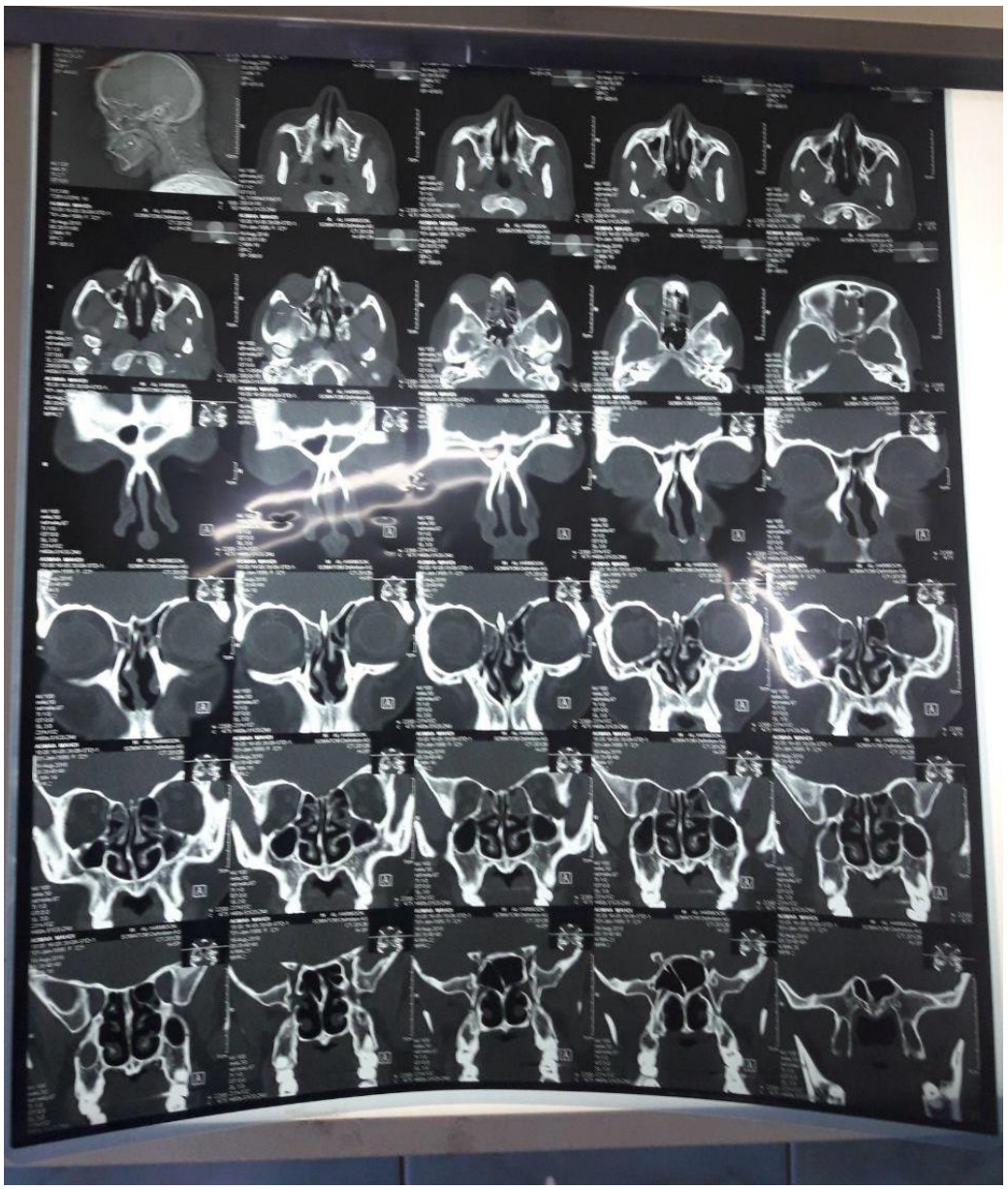
s

C

turbinate hypertrophy spur caudal dislocation

CT finding

Maxillary		ethmoid		frontal		sphenoid	
Bilat	uni	Bilat	uni	Bilat	uni	Bilat	uni



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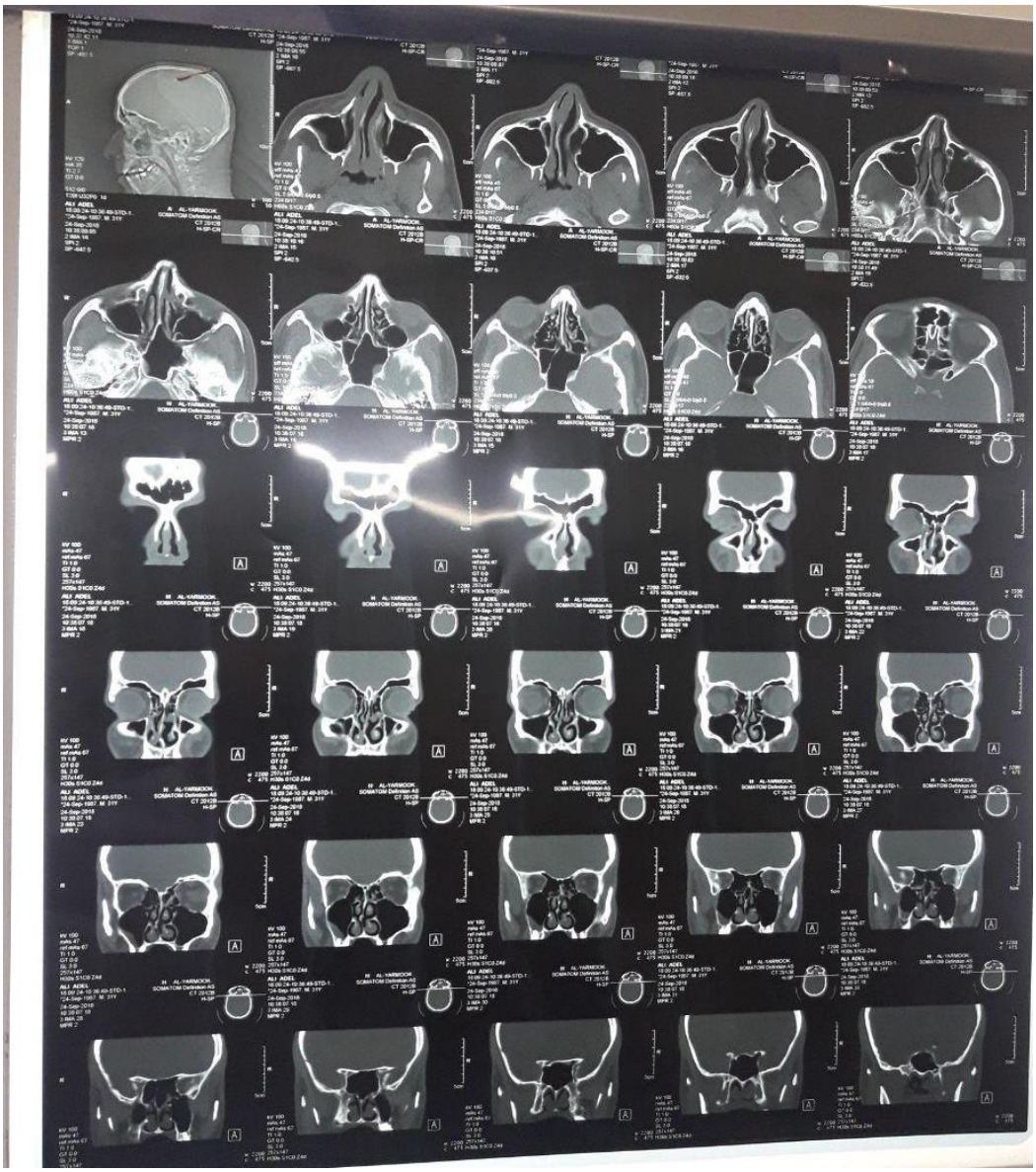
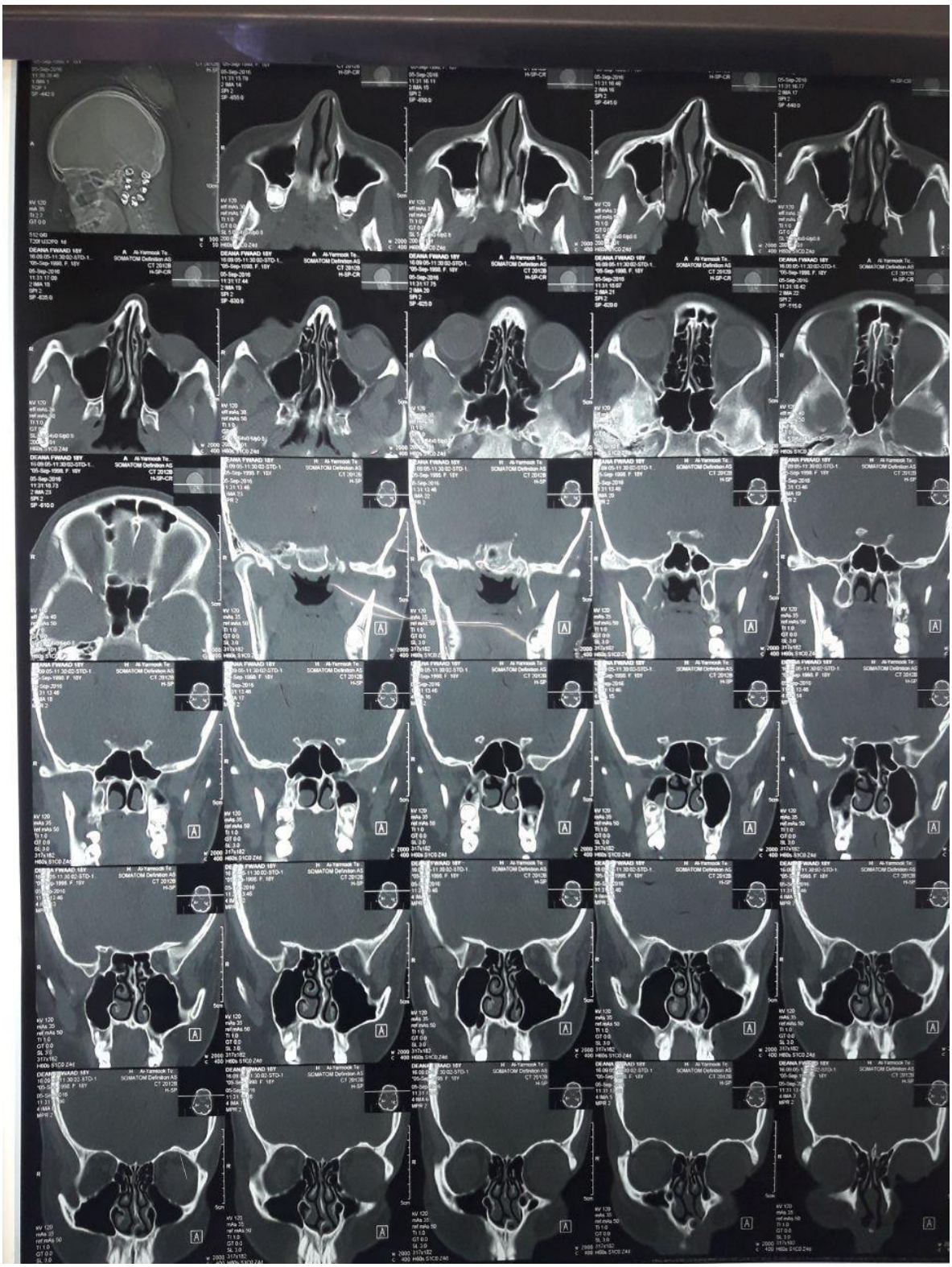
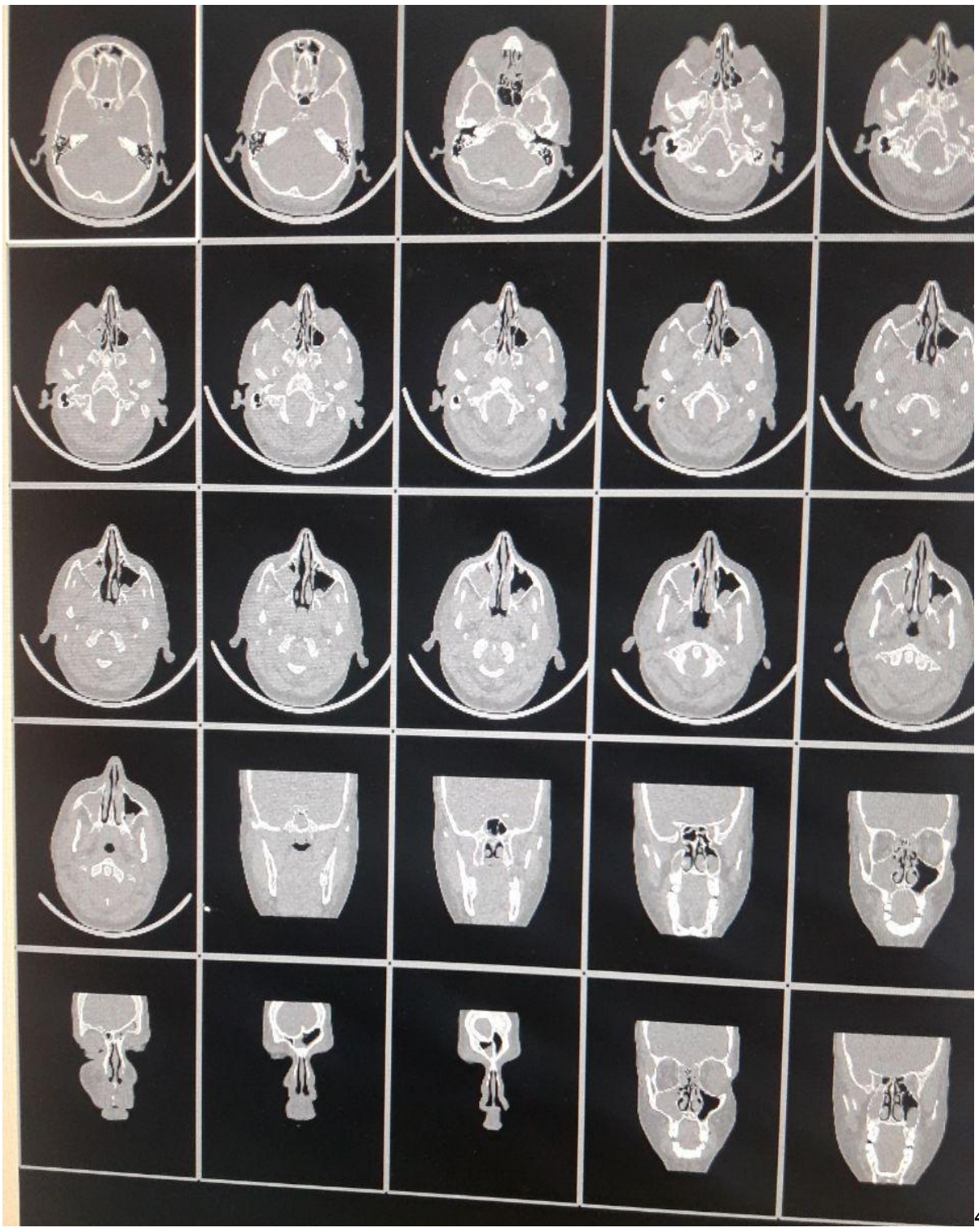


2

Cshape septal deviation with(2)&without sinusitis1





4

S_shape septal deviation wit4 ا&without sinusitis3

Results:

table no.1 : gender distribution&rate of each type

Gender	C-shape	S-Shape	Total %
Male	48	38	86(57.3%)
Female	43	21	64(42-6%)
Total	91(60.6%)	59(39.3%)	150(100%)

P.value >0.05 not significant

Table no.2morbidity of septal deviation

Symptoms	No of cases(150)	%
Nasal obstruction	147	98%
Post nasal drip	73	49.3%
Nasal discharge	64	42.6%
Facial pain	57	37.3%
Epstaxis	6	4%

Table 3:Association with each type of deviation

Types of deviation	No of cases (150)	%
C_shape+caudal	24	16%
C-shape+caudal+Inferior turbinate hyperatrophy	10	6.6%
C_shape+spur	14	9.3%
C-shape+spur+inferior turbinate hyper	9	6%

atrophy		
C_shape	20	13.3%
C-shape+ inferior turbinate hyper atrophy	13	8.6%
S_shape +caudal dislocation	11	7.3%
S-shape +caudal+ inferior turbinate hyper atrophy	8	5.3%
S_shape +spur	4	2.6%
S-shape+spur+ inferior turbinate hyper atrophy	7	4.6%
S_shape	10	6.6%
S-shape+ inferior turbinate hyper atrophy	20	13.3%
Total	150	100%

. P.value =.000046 highly significant

Table 4 : Age distribution

Age group	C_shape	S-shape	Total no	%
18-20	13	7	20	13.3%
21-30	29	16	45	30%
31-40	20	14	34	22.6%
41-50	19	16	35	23.3%
51-above	10	6	16	10.6%
	91	59	150	100%

P.value >0.05 not significant

Table 5 : Septal deviation associated with sinonasal pathology

Types of deviation	With S.N pathology	Without S.N pathology

C-shape(91)	32(35.16%)	59(64.8%)
S-shape(59)	38(64.4%)	21(35.5%)
Total(150)	70(46.6%)	80(53.3%)

P.value =0.00045 highiy significant

Table 6 : CT scan finding according to each type of septal deviation

Types of septal deviation	Maxillary sinus opacity		Maxillary ethmoid Sinus opacity		Ethmoid frontal sinus opacity		Maxillary ethmoid frontal Sinus opacity		Maxillary ethmoid frontal sphenoid Sinus opacity	
	U	B	U	B	U	B	U	B	U	B
C-shape	10	2	6	1	4	1	5	0	3	0
S-shape	0	2	1	8	0	5	2	6	1	13

P.value < 0.05 significant

Discussion:

There are three theories explaining physiopathological relation between The nasal septal deviation and chronic rhinosinusitis. The first of these is the mechanical theory which states that secretions accumulates in the sinus as a result of narrowing of the ostiomeatal complex and thus infections ensues in the retained secretions and causes chronic rhinosinusitis. The second theory is the aerodynamic theory. According to this theory, the mucociliary activity decreases following the nasal flow rate increase and mucosal dryness in relation with the nasal septal deviation and consequently, chronic rhinosinusitis develops. The third theory is the Bachert's pressure theory. According to this theory, deviation of the posterior nasal septum causes chronic rhinosinusitis by creating pressure and air flow changes within the maxillary sinuses [12]

1- gender distribution

in our study of 150 patients

female =64 (42.6%),male =86 (57.3)

in C-shape male =48 female=43

S-shape male=38 female=21

In the study by syed mohammad shoib,B.viswanatha[12] in 200 pt

Male =112(56%) female = 88(44%)

C-shape male=80 female=61

S-shape male =32 female=27

In study done by Madani et al [14]

Male 68.3 > female 31

2- Morbidity of septal deviation

Nasal obst are the predominant symptom in our study it present in 147 pt (98%)

Nasal discharge 63 pt (42%)

Post nasal drip 72 pt (48%)

Facial fullness 75 pt(50%)

Epstaxis 20 pt(13%)

Snoring=20%

Disturbance of smell=10%

In study M.Musharaf Baig,Ifra saeed[15]

Nasal obst =82%

Nasal discharge=20%

Head ache =45%

Epstaxis=10%

Hyposmia=32%

While study of Dr.Yugandhar etigadda&DR.Juveria 2017[13]

Nasal obst 100%

Nasal discharge=70%

Post nasal drip =60%

Facial pain =86%

Snoring=23%

Anosmia=13%

3-Rate of each type of septal deviation

In the present study

the rate Of C-shape(91 pt) 61% more than S- shape(59)39%

In study done by syed mohammed shoib ,B.viswanatha [12] 2016 on 200 pt Show rate of S-shape deviation = 59 pt (29.5%) C-shape deviation = 141pt (70.5%)

And study done by DR.Yugandhar Etigadda,Dr.Juveria majeed [13]2017 Rate of S-shape =13.3% C-shape =49.9%

4.Associated with deviation

In our study

1.C-+caudal+ inferior turbinate hyper atrophy =6.6%

2.C+caudal=16%

3.C-shape+spur+ inferior turbinate hyper atrophy =6

4.C-shape+spur=9.3

5.C_shape + inferior turbinate hyper atrophy =8.6

6.C_shape= 13.3

1.S+caudal+ inferior turbinate hyper atrophy =5.3

2.S_shape+caudal=7.3

3.S+spur+ inferior turbinate hyper atrophy = 4.6

4.S_shape+spur=2.6

5.S_shape+ inferior turbinate hyper atrophy = 13.3

6.S_shape=6.6

In the study done by syed mohammed shoib,B.viswanatha[12]

C-shape=24.5%

Caudal+C-shape=20%

C-shape+spur=36.5%

S-shape=29.5%

5.Age distribution

This study include wide range of age (18-above)

Peak of pt at age group (21-30) 30%

In the study done by syed mohammed shoib,B.viswanatha[12]

Take age from (15-60)

Peak of pt at age (21-30)

In the study of DR.Yugandhar Etigadda,Dr.juveria majeed[13]

Peak at age of(21-30)

6-Septal deviation associated with sinus pathology

In our study 150 case 70 of them have sinus pathology (46.6%)

In S-shape(59) 38 of them have sinus pathology (64.4%)

In C-shape(91) 32 of them have sinus pathology (35.15%)

In the study by prayaga N.srnivas moorthy ,Srikanth kolloju [16]

Of 100 pt septal deviation 54(54%) of them have sinus pathology

In C-shape=70 (34of them develop sinus pathology (48.5%)

S-shape=30 (20) of them develop sinus pathology (66.6%)

In the study by J.jardhan Rao,E.CVinay Kumar[17]

In 100 patient 26 have sinusitis(26%)

7- CT scan finding according to each type of deviation

in 150 pt

C-shape

Maxillary sinus opacity =12

Maxillary&ethmoid sinus opacity= 7

Ethmoid&Frontal sinus opacity=5

Maxillary&Ethmoid&Frontal sinus opacity =5

Maxillary&Ethmoid&Frontal&Sphenoid sinus opacity = 3

S-shape

Maxillary sinus opacity =2

Maxillary&ethmoid sinus opacity =9

Ethmoid&Frontal sinus opacity=5

Maxillary&Ethmoid&Frontal sinus opacity =8

Maxillary&Ethmoid&Frontal&Sphenoid sinus pacity =14

In the study done by syed mohammad shoib,B.viswanatha[12]

in 200 pt

Maxillary bilat=27.5%

Ethmoid sinus bilat =23%

Frontal sinus bilat =17.5%

Sphenoid sinus bilat =0%

Pansinusitis=0

S-shape

Maxillary bilat=25%

Ethmoid sinus bilat =9.5%

Frontal sinus bilat =18%

Sphenoid sinus bilat =5.5%

Pansinusitis=5.5%

While study of Dr.Yugandhar etigadda&DR.Juveria 2017[13]

on 30 patients

C_shape

No of patient with Pansinusitis= 4

S-shape

No of patient with Pansinusitis =9

In the study by J.jardhan Rao,E.CVinay Kumar[17]

C_shape

No of pt with sinusitis on CT_scan one or multible sinuses =7

S_shape

No of pt with sinusitis on CT_scan one or multiple sinuses=19

Septal deviation is risk factor for sinusitis

In our study 46.6%

In the study by J.jardhan Rao,E.CVinay Kumar[17] (26%)

In the study by prayaga N.srnivas moorthy ,Srikanth kolloju[16] (54%)

Conclusion:

Deviated nasal septum associated with significant sinonasal disease especially S-shape DNS which show Statically significant correlation with sinus disease.

1. Nasal obst are the main complain of moderate to sever septal deviation
2. In total number of patients ,number of pt with Sepal deviation C_shape>S_shape
3. Septal deviation more associated with age group (21-30) (30%)

5. S- shape type are more associated with sinus disease.

6. Bilateral sinus disease more associated with S-shape &unilateral sinus disease with C-shape

7. Pan sinusitis associated with S-shape and no pan sinusitis with C_shape.

8. Septal deviation risk factor for sinusitis .

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