A STUDY OF MANAGEMENT OF SINONASAL TUMOURS

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ABSTRACT

BACKGROUND

Sino Nasal Tumours present more unresolved problems for both surgeons and radio therapist.

The objectives of the study were to evaluate the epidemiology and aetiology of Sino Nasal Tumours.

MATERIALS AND METHODS

34 Cases of Sino Nasal Tumours admitted and treated at Government ENT Hospital, Hyderabad between 2015 July till October 2017.

Having confirmed the diagnosis and preoperative preparation, the patients were operated or sent for Radio Therapy. The findings at operation were recorded and tissues sent for pathological examination for confirmation of diagnosis.

RESULTS

Institute's ethical committee approval was taken prior to this study. A total of 34 Patients with Sino Nasal Tumours was studied of which benign tumours were 25 (septal haemangioma, fibrous, dysplasia, inverted papilloma and Nasopharyngeal angiofibromas), malignant were 9 (Squamous cell carcinoma, adenocarcinoma of ethnical sinus, adenoid cysts, carcinomas of maxillary sinus, non-Hodgkin's lymphoma of maxillary sinuses). Men are affected more than women. Treatment- curative therapy was offered for most of the patients- surgery and radiotherapy. Followed up regularly at 1 month, 3 months, 6 months, 9 months & 1 year.

CONCLUSION

Sinonasal tumours present to ENT Surgeon in late stage. CT Scan of PNS and DNE Examinations are valuable in diagnosis, staging and plan of treatment.

KEYWORDS

Papilloma, Adenocarcinoma, Adenoid Cystic Carcinoma.

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BACKGROUND

Sinonasal Tumours present more unresolved problems for both surgeons and radiotherapist. A variety of factors are responsible for the poor prognosis associated with cancer in these anatomical regions. These include (1) the advanced stage of the disease at the time of diagnosis (2) the complex anatomy of the region involved and (3) the reluctance of many surgeons to pursue an aggressive form of treatment. Because malignancy of the nasal cavity and paranasal sinuses so often masquerades as a chronic inflammatory condition, the patient and the physicians are very often deluded into procrastination. Patients rarely seek medical help until their neoplasms are advanced, the average delay between the onset of the first symptoms and final diagnosis being 6 months.

Early neoplasms are small localized, treatable and uncommon. Survival for patients with such lesion approximates 75% for 5 years. Survival for patients with late or advanced cases is reduced to approximately 7%. Patients who present with carcinoma in the intermediate group may be expected to have an over 50%.5 Years survival depended on the response to therapy.

Sinonasal malignancies have an incidence of 0.5-1% per 1,00,000 per year.[1] They account for 0.2-0.8% of all malignancies and 3 percent of upper aero digestive tract neoplasms.[2] Most develop in the fifth and sixth decades of life. The incidence in men is twice that of women.[3] In the past it was considered that certain races were more susceptible to Sinus Malignancies than others but this misconception is explicable by occupational exposure to carcinogens.

This topic has been chosen because sinonasal tumours are a rate find in otorhinolaryngology and head and neck oncology. These sinonasal tumours are a challenge due to the nonspecific symptoms in the early stages.

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Aims and Objectives of the Study

- To study the epidemiology and aetiology of sinonasal tumours.
- To know common presenting features of disease.
- To evaluate various treatment modalities.
- To determine prognostic factors particularly in co-relation with staging and histopathology of the lesion.

Review of Literature

Sinonasal tumours more unresolved problems for both surgeons and radiotherapists. The fate of patients with disease is highly dependent upon the cooperation between these two groups of physicians.

Aetiology

Although the exact aetiology is obscure certain occupations actually have a predilection for developing sinonasal tumours.

A. Occupation
   1. Wood Workers - Acheson et al, reported higher rates of nasal cavity sinus adenocarcinoma in the High Wycombe area than elsewhere and proposed that this was caused by exposure to wood dust. It is thought that biologically active compounds in wood dust impair mucociliary clearance and predispose to carcinogenesis[4] interestingly Sino Nasal adenocarcinoma that develops in wood workers have better programme than other nasal adenocarcinoma 10/4.
   2. Radium Dial Painters
   3. Exposure to certain hydrocarbons
   4. Mustard Gas manufacturing
   5. Nickel smelting.[5]
   6. Chromium Manufacturing.

B. Contrast Media - Thorotrast

C. Chronic Sinusitis and Polyposis

   There is no evidence that chronic sinusitis predisposes to cancer. The incidence of chronic sinusitis in patient with sinonasal malignancies is the same as that in the general population.[2]

D. Inverted Papilloma of Nasal Cavity.

Malignant Tumours of the Nose and Sinuses in Children

Fortunately cancer of the Nose and Sinuses is very rare in childhood. Out of 416 Patients, Frazell found only three cases in the first decade of life. The Youngest child in his series was 22 months old with adenocarcinoma of the nasal cavity. As a general rule treatment for the malignancy is similar to that in the adult.

Specific Investigations

CT Paranasal Air Sinuses

CT Features are mostly nonspecific demonstration a soft tissue density in nasal cavity with some enhancement. Location of mass is one of the few clues towards correct diagnosis.

Focal Hyperostosis

Which tends to occur at the side of tumour origin suggests metastatic calcification. When mass enlarges, there may be bone resorption and destruction.

MRI Scan

Demonstrate a distinctive appearance referred to as Convoluted Cerebriform Pattern Seen on T2 Weighted and Contrast enhance T1 weighted images. This sign is seen in 50-75% of cases and is uncommon in other sinonasal tumours.

Diagnostic Nasal Endoscopy

Most conclusive investigation. It shows irregular, reddish-grey, friable, fleshy polypoidal masses of variable consistency with a tendency with a tendency so bleed on touch and on probing. Sometimes they may extend from nasal vestibule upto choana. Punch / Edge biopsy can be taken simultaneously.

VLS to look for laryngeal papillomatosis.

Stage - 1	Tumour confined to nasal cavity with no evidence of malignancy.
Stage - 2	Tumour involving the osteomeatal complex, Ethmoid air sinuses, and / or medial portion of maxillary PNS with involvement of nasal cavity without any evidence of malignancy.
Stage - 3	Tumour involving the lateral, inferior, superior, anterior or posterior walls of Maxillary air sinus, Sphenoid air sinus, and / or the frontal air Sinus with or without involvement of the nasal cavity, the medical portion of the maxillary PNS and the ethmoid air sinuses without the evidence of malignancy.
Stage - 4	All malignant tumours and those tumours with extranasal and extrasinus infection Management - Endoscopic approach. Lateral Rhinotomy with medial Maxillectomy Midfacial degloving

Haemangioma

Haemangiomas are rare, vascular tumours of the sinonasal tract that most commonly involve the nasal vestibule and nasal septum with reports of Paranasal sinus origin. These lesions are classified as either cavernous or capillary based on the predominant vessel size with the majority of the capillary type.

Contrast CT and MRI is important in diagnostic evaluation and treatment planning. Surgical excision remains the mainstay of therapy with shifts in approach paralleling that on JNA with recent reports.

Juvenile angiofibroma accounts for less than 0.5 Percent of all head and neck tumours. As this tumour is almost exclusively found in adolescent boys, there has always been much speculation and indirect evidence that sex hormone receptors play some part in its development.

Diagnosis is based on the CT and MR appearances that are sometimes confirmed by Angiography.

Fisch Staging

Stage - 1	Tumour limited to the nasopharyngeal cavity, bone destruction negligible or limited to the sphenopalatine foremen.
Stage - 2	Tumour invading the pterygopalatine fossa or the maxillary, ethmoid or sphenoid sinus with bone destruction.
Stage - 3	Tumour invading the infratemporal fossa or orbital region (a) Without intracranial involvement. (b) With intracranial Extradural (parasellar) involvement.
Stage - 4	Intracranial Intradural Tumour. (a) Without infiltration of the cavernous sinus, pituitary fossa or optic chiasm. (b) With infiltration of the cavernous sinus, pituitary fossa or optic chiasm.

Management

Endoscopic

- Lateral rhinotomy
- Weber Ferguson's approach
- Midfacial degloving approach

Fibrous - Dysplasia:

Fibrous dysplasias is a skeletal developmental anomaly of the bone forming mesenchyme that manifests as a defect in osteoblastic differentiation and maturation.

The Following Disease Patterns are Recognized:

- Monostotic form
- Polyostotic form
- Craniofacial Form
- Cherubism.

70 - 80% is monostotic forms, sites of involvement most commonly include the frontal, sphenoid, maxillary and ethmoidal bones.

Haemangiopericytoma

It is of vascular origin arising from Zimmermann pericyte cell 20 percent of them develop in nasal cavity and sinuses.[6] Patient presents with nasal obstruction, epistaxis, and proptosis. Distant metastasis is common to lungs, liver and bone. Diagnosis is by biopsy, Treatment is by radiotherapy followed by wide local excision.

Malignant Tumours-

Epithelial Tumours

Squamous cell carcinoma - Most common sinonasal malignancy.[7] It comprises about 65% of the tumours involving the nasal cavity and sinuses.

Histological Appearance

It is a malignant epithelial tumour where cells are arranged into groups of alveoli with stroma between the groups but no between the cells of group. The stroma varies in amount and largely determines the physical character of the tumour. Cut surface presents fictitious appearance of multiple separate masses but they are all extensions of central mass.

Spread

In general, sinonasal Carcinomas led to fill the sinus cavity before eroding its bony walls. Periosteum perichondrium and dura seem to act as a Temporary barrier and resist tumour expansion to some extent, a feature possibly explained by the fibroelastic connective tissue component of these tissues.[8] The Tumours spread from sinuses into the nasal cavity, the cheek; the Orbit; the palate and into the infratemporal and pterygopalatine fossae and cranium.

Histological Grading

Broder has graded them into four categories according to the proportion of differentiated and undifferentiated cells coupled with absence or presence of pickle cells hyperchromatism and mitotic figures-

Grade I	This is a least malignant tumour and shows less than 25% of cells with anaplasia or loss of differentiation.
Grade II	It shows 25-50% of cells with anaplasia.
Grade III	It shows 50-75% of cells with anaplasia.
Grade IV	100% of cells are anaplastic and is practically impossible to tell the parent type of structure from which the growth has arisen. They are highly malignant but usually radiosensitive.

So this grading helps in determining the prognosis and estimating the sensitivity for radiotherapy. But it is preferable to speak as type I, II, III and IV instead of Grade - I, II, III and IV. As the grading implies physiological character of tumour which cannot be determined by microscopic examination. Majority of squamous cell carcinoma of nose and paranasal sinuses are anaplastic type and non-cornified Type.

Basal Cell Carcinoma

Basal Cell Carcinoma does not primarily occur in the paranasal sinuses. It involves these secondarily by invasion from a lesion on the skin surface, particularly from the upper medical cheek region near the medial canthus. Early and small lesions may respond to irradiation. More often surgery is necessary to completely eradicate disease in this location. Because this lesion spreads along the basal layer, satellite areas of activity are common. Once it has become this advanced, it is most difficult to eradicate.

Adenoid Cystic Carcinoma

The tumour is composed of groups of small cells with defined borders and rare mitotic figures. The cells usually arrange in

three patterns that the present in varying proportions - Tubular, Cribriform and Soli Low Grade adenoid Cystic Carcinomas have poor defined irregular margins. All high grade lesions have moderate to prominent nuclear pleomorphism and mitotic figures. Some of these lesions show a striking resemblance to moderately differentiated colonic adenocarcinoma. The epithelium tends to be stratified rather than a single layer thickness. One third of these patients have distance metastasis.

Contra Indications to Surgery

1. Involvement of both optic nerves.
2. Involvement of base of skull (Foramen Ovale, sphenopalatine fossa)
3. Invasion of middle cranial fossa (Posterior Orbit)
4. Extension into Nasopharynx
5. Inoperable cervical metastasis.
6. Distance Metastatic Diseases
7. Patient refuse to accept procedure.[9]

Surgical Approach

The tumours be respected by different methods:

1. Extended lateral rhinotomy incision (Weber - Fergusson)
2. A Lateral rhinotomy approach.
3. A Tansoral transpalatal facial degloving approach (Sub labial approach)
4. Endoscopic approach
5. Craniofacial resection.

Maxillectomy

Joseph Bonsol of Lyons carried out first successful total maxillectomy for osteosarcoma - in 1827,

Other Surgical Procedures Include:

1. Medial Maxillectomy
2. Palatial Fenestration
3. Orbital Exenteration
4. Anterior Craniofacial Resection
5. Lateral craniofacial resection.

Role of Radiation in Paranasal Sinus Tumours-
Indication-

For early lesions of T1-T2 Radiation is recommended in the adjuvant setting, if the margins are positive or if there is any perineural invasion. For the advanced operable sessions upto T4a Chemoradiation is advised in the adjuvant setting if there is margins positivity and extracapsular nodal spread.

For the T4b lesions of any histology, which invades the orbital apex, dura, brain, middle cranial fossa, cranial nerves other than maxillary division of trigeminal nerve (V2) nasopharynx or clivus - Definitive RT or Chemo RT is advised. For all node positive lesions adjuvant RT is recommended to the primary and the neck.

Dose

For the Definitive RT 6600 cGy is delivered at 200 cGy/day and for 5 days a week to the primary and involved nodal stations.

For the post-operative adjuvant RT 6000 cGy is delivered at 200 cGy/day and for 5 days a week to the primary and involved nodal stations.

The dose to uninvolved nodal stations should receive 6000 cGy is delivered at 200 cGy / day and for 5 days a week.

Method

- Conventional RT
- Dimensional Conformal Radiation Therapy (30-CRT)
- Intensity Modulated Radiation Therapy (IMRT)
- Image Guided Radiation Therapy (IGRT)

Chemotherapy

Cisplatin alone is more common used as radiation sensitizer in the concurrent CT-RT Schedules. Chemo radiation has high toxicity burden and has to performed by trained teams only.

The other drugs being used are S FU, Paclitaxel and Cetuximab. Previously bleomycin was also used.

In the induction phase combination drugs like docetaxel, cisplatin and 5Fu are used.

MATERIALS AND METHODS

Patients and Methods

The patients attending as out patients in Govt. E.N.T. Hospital, Kothi, Hyderabad from July 2015 to October 2017 were taken up for study.

All cases suspected as sinonasal tumours were admitted and detailed study was carried out.

Sinonasal tumours were studies in detail and date of 34 Patients collected was analysed with respect to:

- The Age of the Patient
- Sex Distribution
- Symptomatology and clinical features
- Extent of Tumour Spread
- Mode of Treatment given
- Response to treatment and follow up.[10]

Relevant routine haematological, biochemical and radiological investigations including CT Scan were done in all patients to supplement physical examination.

Biopsy

Most of Patient had nasal mass. A biopsy was taken from all cases and histopathological examination was done.

Treatment

Depending on clinical assessment of extent of the tumour and the condition of patient treatment was planner. Curative therapy was offered for most patients. Curative treatment consisted of surgery or surgery followed by radiotherapy.

Follow Up

Patients were followed regularly - 1 month, 3 months, 6 months and 1 year intervals.

RESULTS

This study was conducted between the periods from July 2015 to October 2017 in a tertiary referral centre. Institutes ethical committee approval was taken prior to conducting this study.

We included 34 patients with benign and malignant lesions of the sinonasal cavity in our study. The results are mentioned as follows-

Benign Lesions- Total 25

Nature of lesion Number	Number
Septal Hemangioma	4
Fibrous Dysplasia	1
Inverted papilloma	4
Nasopharyngeal angiofibroma	16
Table 1	

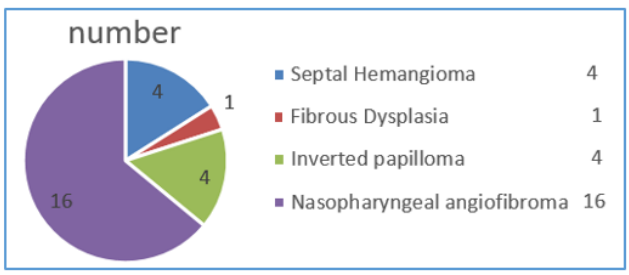

Figure 1

In our study, most common benign tumour was Nasopharyngeal angiofibroma (64%) followed by Capillary haemangioma of septum and Inverted papilloma (16%). Least common was Fibrous dysplasia (4%).

Malignant lesion –Total 9.

Nature of Lesion Number	Number
Squamous cell carcinoma of maxillary sinus	4
Adenocarcinoma of ethmoid sinus	1
Adenoid cystic carcinoma of maxillary sinus	3
Non Hodgkin's lymphoma of maxillary sinus	1
Table 2	

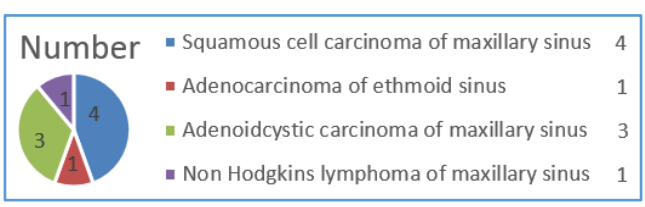

Figure 2

Most common nature of malignant lesion was Squamous cell Carcinoma (44.44%) followed by Adenoid cystic Carcinoma (33.33%). Most common paranasal sinus involved was maxillary (88%) followed by ethmoid (12%). In our study no cases of sphenoid or frontal sinus involvement reported.

Aetiology	Benign	Malignant
History of smoking	0	8
Alcohol	0	8
Tobacco	0	0
Occupation exposure to fumes/wood dust	0	1
Family history	0	0
Table 3		

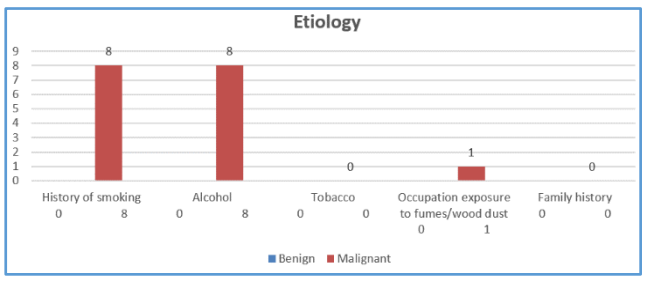

Figure 3

In our study most common aetiology of malignant lesions was smoking and alcohol followed by occupational exposure to wood dust.

Age Incidence

Age Incidence	Benign	Malignant
1-10	0	0
11-20	13	0
21-30	6	0
31-40	1	1
41-50	0	4
51-60	5	1
61-70	0	3
Table 4		

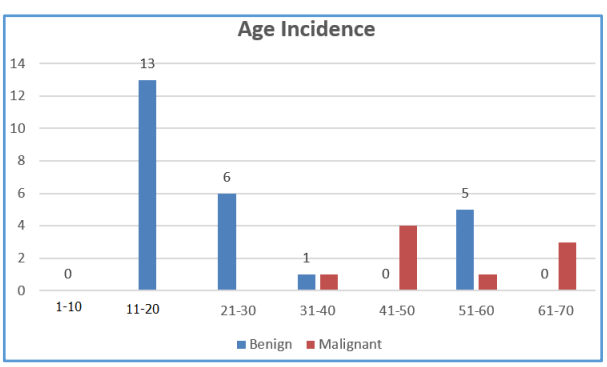

Figure 4

In our study, most common age of presentation of benign tumours was 11-20 years. Most common age of presentation of malignant tumours was 41-50 years followed by 61-70 years.

No cases between 1-10 years were reported.

Duration of Complaints:-

Time duration	Benign	Malignant
1-29 days	2	0
1-3 months	10	3
4-6 months	8	3
7-12 months	2	3
1 year and above	3	0

Table 5

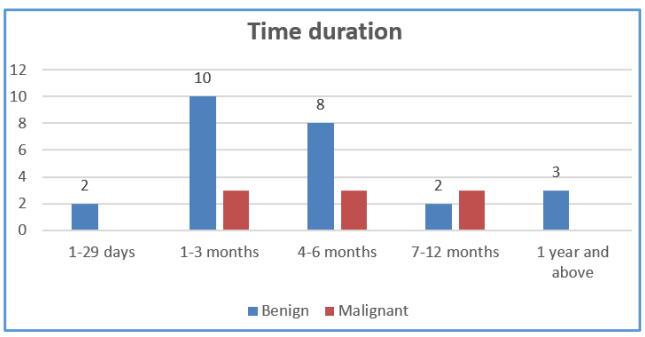

Figure 5

Benign

40% of patients had a 1-3 months duration of complaints, this was followed by 4-6 months in 32%, 1 to $1^{1/2}$ years in 12% of patients, 7-12 months in 8% and 1-29 days in 8%.

Malignant

33.33% of patients had 1-3 months duration of complaints, 4-6months in 33.33% and 7-12 months in 33.33%.

Symptoms

Symptoms	Benign	Malignant
Cheek swelling	2	4
Nasal Obstruction	16	8
Loosening of teeth	0	3
Epistaxis	18	3
Facial Pain	0	1
Nasal mass	2	2
Proptosis	0	2
Ulcer over hard Palate	0	2

Table 6

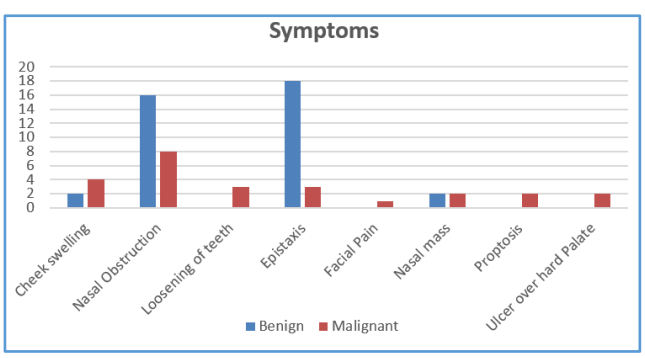

Figure 6

Epistaxis (72%) was the most common symptom of benign tumours in our study followed by nasal obstruction (64%).

Nasal obstruction (88%) was the most common symptom of malignant tumours followed by cheek swelling (44%).

Signs

Signs	Benign	Malignant
Nasal mass	24	9
Bleeding on touch	20	9
Paraesthesia over cheek	0	6

Table 7

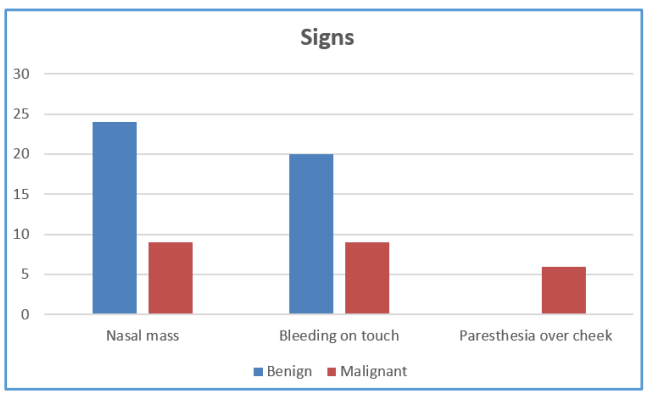

Figure 7

Most common sign of benign tumours was nasal mass (96%) followed by bleeding on probing (80%).

Most common sign in malignant tumours was nasal mass and bleeding on probing (100%) followed by paraesthesia over cheek (66%).

Site of Tumour Origin

Site	Benign	Malignant
Septum	4	0
Lateral Wall	4	0
Sphenopalatine foramen	16	0
Maxillary sinus	1	8
Ethmoid sinus	0	1

Table 8

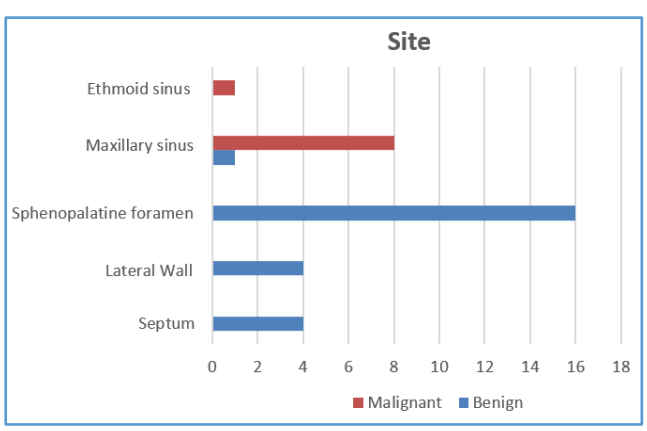

Figure 8

Most common site of origin of benign tumours in our study was Sphenopalatine foramen (64%) followed by septum and lateral wall (16%).

Most common site of origin of malignant tumours in our study was maxillary sinus (88%) followed by Ethmoid sinus (12%).

CT Findings in Benign Lesions

Septal Haemangioma: Soft tissue mass origin from the anterior part of the septum with no extension into nasal cavity or sinuses.

Inverted Papilloma

Number
Only lateral wall of nose 1
Extension into nasal cavity 1
Extension into maxillary sinus 1
Extension into frontoethmoidal sinuses 1
Table 9

CT Findings

Hyperostosis and areas of calcification and infiltration into underlying bone.

Based upon the extent of lesion the approach for surgical excision was decided. The approaches were medial maxillectomy and endoscopic resection.

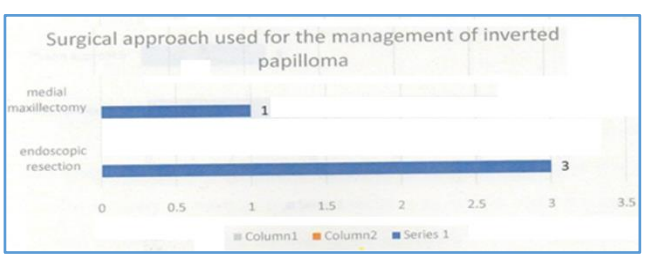

Figure 9

Nasopharyngeal Angiofibroma

Confined to nasopharynx 2
Extension into nasal cavity 4
Extension into one or more sinuses 5
Extension into pterygopalatine and infratemporal fossa 5
Table 10

CT Finding

Widening of sphenopalatine foramen, bowing of posterior wall of maxillary sinus or soft tissue density extending into nasal cavity, paranasal sinuses, pterygopalatine fossa and infratemporal fossa with destruction of bony walls.

Surgical approach was decided based on the extent of the lesion. The approaches used were endoscopic excision, lateral rhinotomy and Weber Ferguson incision.

Approaches used for the Management of JNA

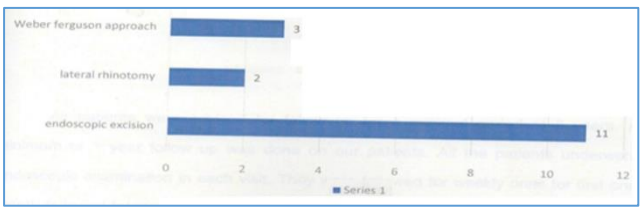

Figure 10

Fibrous Dysplasia-
CT findings

Ground glass mass with calcifications surrounded by maxillary sinus wall.

Malignant Tumour CT Findings and Surgical Approach-
CT Finding

Haziness of sinus with infiltration or erosion of bone. Soft tissue density lesion seen involving the maxillary sinus or ethmoid sinus and with erosion of either medial, anterior and posterolateral walls of the maxilla or with destruction of the floor of the orbit and intraorbital extension.

Surgical Approach Used

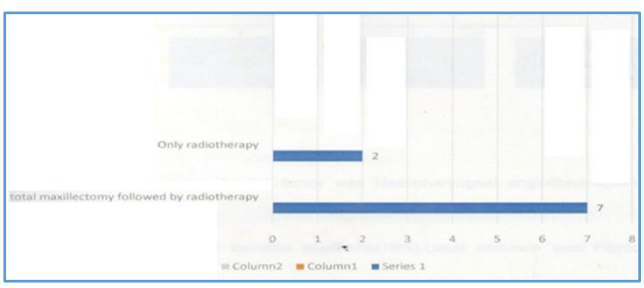

Figure 11

All patients were advised for follow up for a minimal period of 5 years. A minimum of 1 year follow up was done on our patients. All the patients underwent endoscopic examination in each visit. They were followed for weekly once for first one month followed by every 15 days for 3 months followed by monthly visit for 6 months. They were then followed every 3 months for rest of the period.

A post OP CT Scan was done in all our patients at the end of 6 months. The results are as follows:

More than half the patients (77.77%) had no recurrence while 1 case had recurrent disease. There are no cases of nodal recurrence and distal metastasis. 1 patient was not available for follow up:

Histological Classification

Figure 12

In our study, most common benign tumour was Nasopharyngeal angiofibroma (64%) followed by Capillary haemangioma of septum and Inverted papilloma (16%). Least common was Fibrous dysplasia (4%).

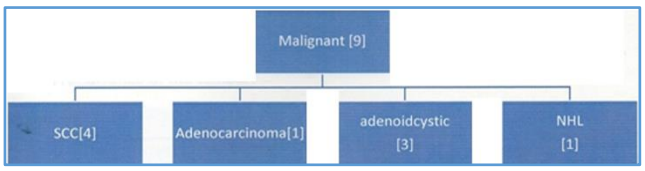

Figure 13

Most common nature of malignant lesion was Squamous cell carcinoma (44.44%) followed by Adenoid cystic carcinoma (33.33%).

Approaches used in the Management of Sinonasal Carcinomas:

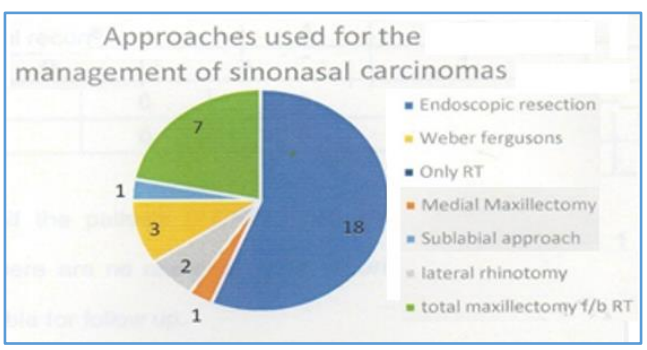

Figure 14

Classification for Benign Tumours-
Krouse's Staging for Inverted Papilloma-

Stage 1	3
Stage 2	3
Table 11	

In our Study most common stage of presentation of inverted papilloma according to Krouse staging was stage 1(75%) followed by stage 2*25%).

Fisch Classification for JNA-

Stage 1	2
Stage 2	11
Stage 3	3
Table 12	

Most common stage of presentation of JNA was stage 2 (68.75%), followed by stage 3a (18.75%) and stage 1 (12.5%).

TNM Classification for Malignant Tumours

T1	0
T2	1
T3	3
T4a	5
T4b	0
Table 13	

More than half of the cases presented with advanced tumour grading T4a (55.55%) followed byT3 (33.33%).

Nodal Staging and Metastasis

No	9
No	9
Table 14	

In our study no cases of Nodal or distance metastasis were reported.

CT findings in Benign Lesions
Septal Haemangioma: Soft tissue mass origin from the anterior part of the Septum with no extension into nasal cavity or sinuses.

Inverted Papilloma

Only Lateral wall of nose	1
Extension into nasal cavity	1
Extension into maxillary sinus	1
Extension into frontoethmoidal sinuses	1
Table 15	

CT Findings
Hyperostosis and areas of calcification and infiltration into underlying bone.

Based upon the extension of lesion the approach for surgical excision was decided. The approaches were medial maxillectomy and endoscopic resection.

Nasopharyngeal Angiofibroma

Confined to Nasopharynx	2
Extension into nasal cavity	4
Extension into one or more sinuses	5
Extension into pterygopalatine and infratemporal fossa	5
Table 16	

CT Findings
Widening of sphenopalatine foramen, bowing of posterior wall of maxillary sinus or soft tissue density extending into nasal cavity, paranasal sinuses, pterygopalatine fossa and infratemporal fossa with destruction of bony walls.

Surgical approach was decided based on the extent of the lesion. The approaches used were endoscopic excision, lateral rhinotomy and Weber Ferguson incision.

Fibrous Dysplasia
CT Findings
Ground Glass mass with calcifications surrounded by maxillary sinus wall.

Malignant Tumour CT Findings and Surgical approach
CT Findings
Haziness of sinus with infiltration or erosion of bone, soft tissue density lesion seen involving the maxillary sinus or ethmoid sinus and with erosion of either medial, anterior and posterolateral walls of the maxilla or with destruction of the floor of the orbit and intraorbital extension.

Surgical Approach Used
All patients were advised for follow up for a minimal period of 5 years. A minimum of 1 year follow up was done on our patients. All the Patients underwent endoscopic examination in each visit. They were followed for weekly once for first one month followed by every 15 days for 3 months followed by monthly visit for 6 months. They were then followed every 3 months for rest of the period.

A Post-op CT Scan was Done in all Our Patients at the End of 6 Months. The Results are as Follows:
More than half the patients (77.77%) had no recurrence while 1 case had recurrent disease. There are no cases of nodal recurrence and distal metastasis. 1 Patient was not available for follows up:

Histological Classification
In our study, most common benign tumour was Nasopharyngeal Angiofibroma (64%) followed by Capillary.

Haemangioma of septum and inverted papilloma (16%), Least common was Fibrous dysplasia (4%).

Most common nature of Malignant lesion was Squamous cell carcinoma (44.44%) followed by Adenoid Cystic Carcinoma (33.33%).

Approaches used in the Management of Sinonasal Carcinomas
Endoscopic resection was done in (52.9%) of cases followed by Total maxillectomy with adjuvant radiotherapy (20.58%). Weber Fergusson approach (8.82%) Lateral rhinotomy (5.88%), Sublabial approach (2.94%) and Radiotherapy (2.94%).

Over all Recurrence of the Tumour
Benign

	Septal Haemangioma (4)	Inverted Papilloma (4)	JNA (16)	Fibrous Dysplasia (1)
No Recurrence	5	4	10	0
Local Recurrence	0	0	0	1
Lost in follow Up	0	0	6	0

Table 17

More than half the patients (72%) had no recurrence.

1 Patient of fibrous dysplasia had local recurrence. 6 Patients of JNA lost follows up.

Malignant

Malignant	SCC	Adeno Carcinoma	Adenoid cystic Carcinoma	NHL
No recurrence	4	0	3	0
Local recurrence	0	1	0	0
Nodal recurrence	0	0	0	0
Distance Metastasis	0	0	0	0
Lost follow Up	0	0	0	1

Table 18

More than half the patients (77.77%) had no recurrence while 1 case had recurrent disease. There are no cases of nodal recurrence and distal metastasis. 1 Patient was not available for follow up.

Complications-
Immediate Complications

Complication	Benign	Malignant
Bleeding	8	5
Periorbital Oedema	6	4

Table 19

Most common immediate complication was bleeding both in benign and malignant tumours in our study.

Delayed Complications

Complication	Benign	Malignant
Synechiae	6	3
Epiphora	0	2

Table 20

Most common delayed complication was synechiae formation followed by epiphora.

DISCUSSION

A total of 34 lesions was studied of which 25 were benign and 9 were malignant. Among the benign lesions the most common lesion was a juvenile nasopharyngeal angiofibroma and among the malignant lesions it was squamous cell carcinoma of maxillary sinus.

Exposure to industrial fumes, wood dust, nickel refining and leather tanning have all been implicated in the carcinogenesis of various type of sinonasal malignant tumours in particular, wood dust and leather tanning exposures are well associated with increased risk for adenocarcinoma. Other etiologic agents have been reported including mineral oils, chromium compounds, isopropyl oils, lacquer paint, soldering and welding, and radium dial painting, recent studies demonstrated a higher incidence of nasal cancers in cigarette smokers. We found the history of smoking and alcohol consumption to be associated with malignant lesions that benign lesions.

We found predilection males to be more than females in both benign as well as malignant cases, the sex ratio in benign lesion was 7.3:1 while in malignant lesions it was 1.25:1 which correlated with study done by Dinesh Garg et al where they had a sex ratio of 1.98:1.

Majority of the Patients in the benign group presented with complaints with a time duration since 1-3 months, while those patients with malignant lesions complained of symptoms from 1 month to 1 year.

The current technique has allowed endoscopic resection of benign and malignant tumours and also their extension into orbit and skull base. This minimally invasive approach avoid facial incisions, ostectomies, tracheostomies and various other morbidities. This results in shorter recovery time, aesthetically pleasing results with shorter recovery time.

The important of accurate pretreatment evaluation and staging with these tumours is critical. The stage and type of tumour determines the prognosis.

The cure rates of upto 80% are attainable with early stage tumours if they are completely excised. Follow up must be frequent and meticulous especially during the first 2 years following treatment as there are highest chances of recurrence lifetime follow up is mandatory.

CONCLUSION

1. Sinonasal tumours present to ENT Surgeon in late stage.
2. CT Scan of PNS and DNE Examinations are valuable in diagnosis, staging and plan of treatment.
3. Biopsy of the lesion and the histopathological diagnosis will give us the correct plan for the management of the disease for treating the patient surgically or important diagnostic tool before deciding the treatment plan.
4. The Treatment modality has to be tailored according to the individual lesion Surgery, radiation and chemotherapy either singly or in combination was the treatment modality in our study.
5. Surgery is ideal choice for treatment of benign tumours. In early stages endoscopy approach is the best modality with less comorbidities. In late stage tumours external approach is best modality of treatment. Type of external approach is decided based on site and extent of the lesion.
6. Surgery is ideal choice of management of T3 and T4a Malignant lesions followed by adjuvant radiotherapy.
7. In inoperable cases and surgically unfit patients, radiotherapy is the treatment of choice.
8. Follow up must be frequent and meticulous especially during the first 2 years following treatment as chances of recurrence is high; lifetime follow up is mandatory.

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