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NASAL CUTANEOUS MALIGNANCY: MANAGEMENT DILEMMA AND OUR EXPERIENCE

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ABSTRACT Nose is a highly complex structure composed of skin of variable thickness, subcutaneous fat, cartilage, bone and nasal lining mucosa. From the pathological standpoint, skin cancers are subdivided into melanoma and non-melanoma skin cancer (NMSC). Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) account for a vast majority of NMSC (>95%) which affect the nasal skin. This was a retrospective study done in collaboration with Dept of Otolaryngology, CNMC&H, Department of plastic surgery,R.G Kar Medical College, Kolkata from 2010 to 2019. A total number of 22 cases of nasal cutaneous malignancies with or without deeper invasion that presented to the hospital were taken up in this study. Age prevalence of nasal cutaneous malignancy was highest from in age group of 40-60 years. Male constituted 36 % while females made 63% of total cases. 54.54 % of nasal cutaneous malignant lesions were located at dorsum of the nose. Squamous cell carcinoma consisted of 45% of total nasal malignancy cases in study. Rest were BCC(30%),melanoma(10 %), lymphoma(10%), NK cell tumour (5%), PNET(4.5%). Management of nasal cutaneous Carcinomas needs multidisciplinary approach & was outlined. Early diagnosis may be missed due to resemblance with other dermatological conditions. Superficial lesions can be managed with wide surgical excision and reconstruction. Radiological studies of the lesions may change the plan of management & is recommended for all malignant lesions.

KEYWORDS :

INTRODUCTION

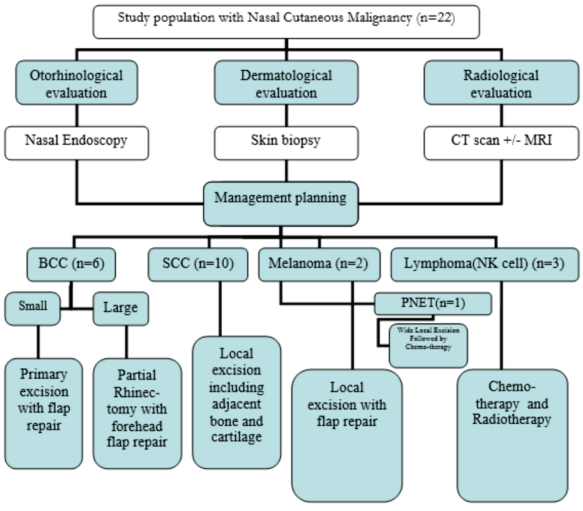
Nose is a highly complex structure composed of skin of variable thickness, subcutaneous fat, cartilage, bone and nasal lining mucosa. The cutaneous surface of the upper two third of nose is thin, non-sebaceous, and mobile, whereas the lower third is thick, sebaceous, and relatively immobile. The supportive structure of the upper two thirds of the nose is primarily nasal bone, whereas for the lower third it is cartilage. Common dermatoses which may affect the nasal region includes rosacea, lupus erythematosus, lupus pernio as well as malignant and benign tumors. Sometimes malignant cutaneous lesions of nose mimic non-malignant lesions affecting the mid-face like DLE, keratoacanthoma, Wegener's granulomatosis, cutaneous nocardiosis etc. Usually cancer of nasal skin is well circumscribed, superficial and has an excellent prognosis. However, deep invasions occur in the late stage with the involvement of nasal cartilaginous or bony pyramid. Apart from malignancies arising *de novo* from the nasal skin, intranasal malignancy like squamous cell carcinoma or adenocarcinoma of ethmoid and maxilla may also extend to the nasal skin and present as cutaneous lesion.

From the pathological standpoint, skin cancers are subdivided into melanoma and non-melanoma skin cancer (NMSC). Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) account for a vast majority of NMSC (>95%) which affect the nasal skin. The less common malignant skin tumors that affect the nose have neither specific etiologic factor nor a demonstratable racial predilection. They include adenexal skin tumors, hemangioendotheliosarcoma, leiomyosarcoma, merkel cell tumor, atypical fibroxanthoma and malignant lymphoma.

MATERIALS AND METHODS

This was a retrospective study done in collaboration with Dept of Otolaryngology, CNMC&H & Department of plastic surgery,R.G Kar Medical College, Kolkata from 2010 to 2019. A total number of 22 cases of nasal cutaneous malignancies with or without deeper invasion that presented to the hospital were taken up in this study(Fig.1). All the patients in the present study underwent detailed otorhinological, dermatological work-up that included nasal endoscopy and biopsy from the lesion. The neck was examined in all the cases to exclude metastasis. All patients in the present series underwent CT scan to evaluate the extent of tumor and to localize the lesion supported by MRI whenever necessary. Surgical planning was made according to the histopathology, size of the tumour and depth of deeper tissue invasion. Small BCC was treated by primary excision with adequate margin and local flap repair and in larger lesions, partial rhinectomy with forehead flap repair was done. In SCC, wide local excision including adjacent bone and cartilage was our treatment protocol. Melanoma was treated with adequate excision for tumour free margin.

Fig1-Management Protocol.



RESULTS & DISCUSSION

All patients were analysed with regards to age, sex, anatomical location, histopathological type, surgical approaches employed for their removal and their median survival rate as detailed below.

AGE DISTRIBUTION :

Age prevalence of nasal cutaneous malignancy was highest from in age group of 40-60 years.

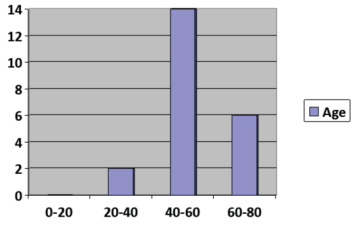


Fig2-Showing age distribution for cases in study.

SEX DISTRIBUTION :
Male constituted 36 % while females made 63% of total cases.

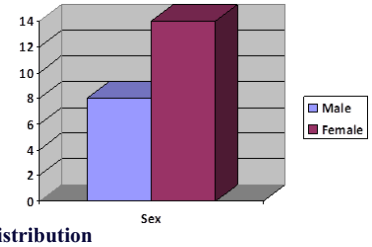


Fig3-Sex Distribution

ANATOMICAL LOCATION –
54.54 % of nasal cutaneous malignant lesions were located at dorsum of the nose.

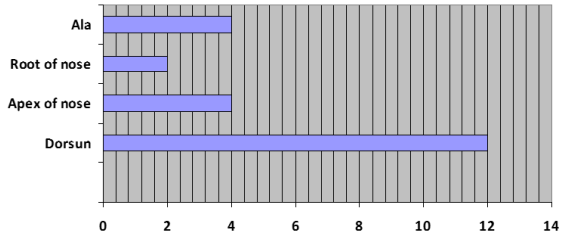


Fig.4- Anatomicat locations of lesions

HISTOPATHOLOGY (Table I)
Histopathological diagnoses of the excised masses are described in (Table I) for nasal cutaneous malignancy. Squamous cell carcinoma consisted of 45% of total nasal malignancy cases in study. Rest were BCC(30%),melanoma(10 %), lymphoma(10%), NK cell tumour (5%), PNET(4.5%).

Table-1-Showing histopathology distribution of cases in study.

Histopathology	Number of patients	Percentage
SCC	10	45%
BCC	6	30%
Melanoma	2	10%
NK cell tumour	1	5%
Lymphoma	2	10%
PNET	1	4.5

In pubmed search giving keywords nasal cutaneous malignancy, total 531 citations were found. With the keyword nasal skin cancer, a total of 3718 articles were found among which 376 were review articles.

External nasal framework can be involved by different types of malignant lesions. In one series 86% of cases were diagnosed as basal or squamous cell carcinoma[1], though malignant melanoma can also involve the external nasal framework.

The pathophysiology of non-melanoma skin cancers (NMSC) is multi-factorial and relevant causes or association can be considered in terms of environmental and intrinsic factors. Intrinsic Risk factors may include skin-type, immune competence and genetically predisposing syndromes. Relevant environmental exposures include ionizing radiation, and a variety of chemical agents[2].Risk factor for development of melanoma includes ultraviolet radiation exposure, skin type, positive family history & presence of larger nevi[3]

Cutaneous malignancy involving nasal skin is a common disease of the Western world. Incidence and frequency of SCC varies in different parts of the world; with the highest incidence in Australia (250 per 100,000 Population/year in 1990) [2].

BCC is the most common malignancy among the whites [4] and accounts for more than 90% of all malignant cutaneous lesions of the head and neck [5]. Because UV light associated with chronic sun exposure is the main risk factor, BCC commonly occurs on the face, with the nose being the most frequently affected location and the alae, dorsum and tip being the parts most frequently affected [6]. Although various dermatopathologic types of BCC, including nodular, micronodular, superficial ,cystic, infiltrative and morpheaform exist, a mixed histology is often seen. Histologic types correlate with malignant potential and recurrence and suggests clinical margins of resection. Nodular and cystic lesions are relatively indolent in contradistinction to the superficial, infiltrative, morpheaform and micronodular subtypes which are biologically more aggressive. Superficial BCC has an increased risk of recurrence due to an increased tendency of incomplete primary excision. Infiltrative and morpheaform BCC also has got an increased tendency to recur and is associated with aggressive local invasive behavior.

SCC is the second most common skin cancer after BCC, usually arising in damaged skin and is often preceded by sun damage, actnic keratosis or radiation damage. SCC usually presents as a painless, erythematous, poorly defined lesion with elevated borders. Compared to BCC, these tumours are more aggressive & nodal metastasis is common.

Melanoma incidence is increasing worldwide and in the nose they usually present as pigmented lesion, though it can present in an amelanotic form and can be mistaken for a benign lesion. Therefore, it has become customary practice to perform a biopsy on any lesion in which there has been a change in appearance or behaviour. Changes in appearance may include changes in border irregularity, tone, color and size. Changes in behavior may include bleeding,itching,and altered texture. The clinical criterion that is currently used in the evaluation of suspected melanoma is the ABCD algorithm which includes asymmetrical uneven growth rate, irregular border, variation & shading in colour & large(>6 mm) diameter[7].

Anatomical location in nasal subunit is also important in predicting biological behaviour and spread of the tumour. In general alar cancer carries good prognosis whereas anatomic location within the columella carries with it a much poorer prognosis than do other nasal cutaneous lesions.Advanced carcinoma of external nose is almost always associated with prior inadequate therapy[8]. While tumor histology and biologic behavior remain important prognostic indicators, Management of nasal cutaneous cancer calls for multidisciplinary approach and needs close cooperation between dermatologist, otolaryngologist, reconstructive surgeon and oncologist. Controversy and dilemma exists in management of nasal skin cancer in the following points:

1) Whether to take pre operative biopsy or directly go for excisional biopsy?
2) Indication of frozen section?
3) How much margin is necessary?
4) Inadequate margin: What to do and when to do it?
4) Whether to go for primary repair or not?
5) Role of Mohs micrographic surgery?
6) What is the significance of perineural and mucoperiosteal invasion?
7) What should be the method for reconstruction: repair or prostheses?

Though nasal skin is a superficial structure., advanced malignancy can invade deeper structure. Tumours involving nasal columella have been noted for their aggressive behavior, and these columellar malignancies exhibit perhaps the highest incidence of recurrence and metastasis of all nasal and midfacial cancers of cutaneous origin. Periosteal invasion of maxillary bone and nasal floor may occur “barrier free”. Submucosal infiltration of the nasal septum easily develops, leading to potentially lethal invasion of the anterior cranial base. Rapid extension of cancer to the adjacent bony and cartilaginous facial structures requires extensive oncological resections for control. For these reasons all nasal cutaneous lesions excepting small alar lesion should be assessed by CT scan or MRI.

Preoperative biopsy is mandatory in all cases of nasal cutaneous malignancy . It provides proper histological type of cancer and

biological behaviour of the tumour. Excisional biopsy in case of superficial BCC has an increased risk of recurrence because the tumour may extend beyond the margin or margins may be obscured by the erythema and associated inflammation. For suspected melanoma, various biopsy techniques may be used, including excisional, punch or incisional and shave. For suspicious lesions measuring less than 1 cm, an excisional biopsy with a 1-2 mm margin is recommended. For suspicious lesions measuring greater than 1 cm in diameter, an incisional or punch biopsy is usually performed to avoid lymphatic dissemination[7]

In treatment of BCC, as margin size increases, recurrence rate decreases. An appropriate margin should be balanced with the risk of recurrence with loss of function or diminished cosmesis. For smaller lesion like nodular and superficial BCC, excision with 5 mm margin has been recommended and gives a 95% cure rate [9]. The chance of residual tumour in micronodular, infiltrative and morpheaform are 18.6%, 26.5% and 33.3% respectively [10]. With later type, excision upto 1cm margin is recommended. Large lesion may require wider margin excision because margin positivity and recurrence rate increases with size [11]. BCC is sensitive to radiation with a cure rate of 92%. It is usually reserved for elderly patients who are poor candidates for surgery. Micrographiccontrolled surgery is the gold standard with the lowest rate of recurrence (1.0-5,6%) [12-14]. In our institution, we usually treat BCC with wide local excision & reconstruction by local flap (Fig.5A,B,C)

Fig5A- Preoperative picture of Superficial BCC.

Fig5B&5C- Post-operative status reconstruction by local flap.

In SCC, the mainstay of treatment is surgical resection. For lesions smaller than 2 cm, a 4 mm margin is probably adequate; lesions larger than 2 cm may be better managed by surgical resection with 1 cm margin. Surgical margin is determined according to the size of the primary lesion, location, grade, depth of invasion, differentiation, invasion of the surrounding structures and patient factor (age, general health and aesthetic factor). In invasive melanoma, comparison of excision margin of 1 cm and 3 cm with at least 2 mm thickness shows that excision margin of 1 cm is associated with significantly greater risk (p=0.05) of loco-regional recurrence [15]. Frozen sections are very useful in considering the excision margin and depth of the lesion but in the present series it was not done and instead we performed wide excision with adequate margin.

Papadopoulos T et al studied of 34 patients with cutaneous melanoma of the nose treated in a single unit. Desmoplastic neurotropic melanoma and lentigo maligna melanoma were the most common histological tumour types in their series. Local recurrence occurred in eight patients, and in six cases appeared to be a result of inadequate excision margins.. They concluded that adequate surgical excision is the mainstay of successful treatment for melanoma of the nose. Excision margins for nasal melanoma should not be any less than for melanoma elsewhere. Careful planning is required, not only to gain local disease control and the best chance of cure, but also to achieve functionally and aesthetically acceptable results. Regional lymph node metastases were associated with a very poor prognosis[16].

Types of Malignancies	Factors determining margin of excision	Margin of excision
Melanoma	Thickness of melanoma	
	Melanoma in situ	5mm
	<1 mm	1 cm
	1-2 mm	1-2 cm
	2-4 mm	2 cm
	>4 mm	2 cm
Basal cell carcinoma	Histopathological types	
	Nodular and Superficial BCC	5 mm
	Micronodular, Infiltrative and Morpheaform	1 cm
Squamous cell carcinoma	Size of the lesion	
	≤ 2cm	4mm
	> 2cm	> 4mm

Treatment option for BCC patients with a positive margin includes observation, re-excision and radiation. Although supported by some authors, observation alone may be a poor choice. Most authors suggest early re-excison for margin positive BCC; but radiotherapy may be a second option if re-excision is not desired. In SCC though, early re-excision remains the treatment-of-choice in the event of positive resection margin and the goal is to minimize the risk of recurrence and metastasis.

Aggressive SCC, BCC or melanoma in nose usually requires partial or total rhinectomy.

Regarding primary repair, factors that must be considered include the age and life expectancy of the patient, the presence of other co-morbidities, the histopathology of the neoplasm, the location of the lesion, the degree of disfigurement, the physical fitness of the patient, the technical difficulties in repair, and the psychological fitness of the patient.

Nasal reconstruction ultimately is based upon a complex series of issues but can be performed with few complications in an effort to restore self-image. Early cutaneous nasal carcinoma can be treated by excision with repair by local flap like glabellar flap, nasolabial flap, cheek rotation flap and inferiorly based rhomboid flap and laterally based V-Y advancement flap. Flap repair should be considered when adequacy of surgical margin is established. In melanoma of nose, small defects measuring less than 5 mm are usually closed primarily with minimal distortion. However larger defects may require more complex reconstructive techniques to maintain the natural nasal contour.

However, partial or total rhinectomy is considered to be aesthetically disturbing to both the patient and surgeon. In a series of 14 patients requiring total rhinectomy, Harrison [17] used nasal prosthesis to improve cosmetic appearance. Nasal prosthesis was also adopted by Stanley & Olsen [1]. They believed that total rhinectomy is an oncologically sound operation but their experience of reconstruction was not very satisfactory.

In partial rhinectomy, cutaneous cover for nasal reconstruction may be achieved by using local flap like forehead flap or converse scalping flap (fig. 6A,B,C).

Fig.6A-Preoperative picture of nasal cutaneous malignancy.

Fig.6B & C - Postoperative picture of partial rhinectomy, cutaneous cover for nasal reconstruction achieved by using forehead flap.

- When the amount of skin to be carried is small, as in heminasal reconstruction, primary closure is simple and midline forehead pedicle is more convenient. When large areas of tissue are to be covered, such as in subtotal nasal reconstruction, scalping flap proved to be superior in terms of vascular supply and thus provides more predictable healing . 5 years survival rate in the present series 60%. Causes of mortality in the present series are aggressive tumors, cranial base involvement & inadequate excisions with primary reconstuctions leading to recurrence under the flap.

CONCLUSION:

Management of nasal cutaneous Carcinomas needs multidisciplinary approach. Early diagnosis – missed due to resemblance with other dermatological conditions. Superficial lesions can be managed with wide surgical excision and reconstruction. Radiological studies of the lesions may change the plan of management & is recommended for malignant lesions. Delayed reconstruction is indicated in aggressive tumours. Well designed nasal prosthesis- accepted option for the better reconstruction .

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