MEDICINE

Cancer of the maxillary sinus and its management in Kumasi, Ghana

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ABSTRACT

During the period January 1980 to January 1986, 38 patients with an admission diagnosis of suspected carcinoma of the maxillary sinus were seen at the Komfo Anokye Teaching Hospital, Kumasi, Ghana. The review period has been subdivided into three two year periods and patients seen in each period contrasted in terms of age, sex and presenting signs and symptoms.

Of the total of 38 patients 9 (21%) were seen between 1980-1982, 12 (32%) between 1982-1984, and 18 (47%) from 1984-86. It is difficult if not impossible to determine to what extent this represents a real increase in incidence or change in awareness of the condition.

Most of the maxillary sinus cancers were of the squamous cell type. In a country where radiotherapy is not available this type has a very poor prognosis. The mode of management (radical surgery, radiotherapy and chemotherapy) is fully discussed.

A comparison with the existing literature has been made where possible and the data have been compared with the author's personal experience at the Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana

Keywords: cancer, maxillary sinus, chemotherapy, management

INTRODUCTION

Carcinoma of the maxillary sinus has hitherto fortunately been uncommon in Ghana. It occurs predominantly in persons aged 40 to 70 years. The fundamental factor underlying diagnosis is a high index of suspicion on the side of the surgeon or general practitioner who sees the patient for the first time. Diagnosis is frequently delayed because of vague and misleading symptoms that may mimick sinusitis. This leads to its detection at a stage when the patient presents with an ugly, bulky tumour that has already destroyed the bony walls of the sinus and has invaded its surrounding structures.

The treatment of maxillary sinus carcinoma is challenging owing to its rarity, the difficulty of early diagnosis and the proximity of the sinus to important organs such as the eye and brain. Because the majority of the patients conditions are diagnosed at an advanced stage a universally standardised method does not yet exist, although surgery, combined with radiation and chemotherapy has been tried.

The primary objective of this study in a country where radiotherapy is not available, was to discover and comment on the effectiveness of cytotoxic chemotherapy alone as opposed to a combination of surgery and chemotherapy.

PATIENTS

Thirty-eight patients with primary maxillary sinus carcinoma, who were seen at the ENT Clinic of Komfo Anokye Teaching Hospital between 1980-1986 were studied.

There were 23 men and 15 women. The youngest patient was 36 years old and the oldest was 79 years. the male to female ratio was 1:1:5

Patients with tumours arising in the maxillary sinus were included as well as patients whose tumours may well have spread to the maxillary sinus from the nasal cavity or ethmoid sinuses. Patients with tumours confined to the nasal cavity and ethmoid sinuses were not included.

Cases were staged in accordance with TNM classification of the American Joint Committee 1977[1] (Paranasal Sinus Staging System).

T_1 Tumours confined to the antral

TECHPOINT

RESEARCH FOR DEVELOPMENT

The revival of the journal of the University of Science and Technology is long overdue and it gives me great pleasure to announce its re-appearance.

Our University is reputed for applying its resources towards the development of this country. Apart from the highly specialised skilled manpower which the University produces to turn the wheels of industry in Ghana and elsewhere, it has been endeavouring to disseminate with considerable success the knowledge it has been accumulating through its R and D efforts. One of the most effective ways in which the University can henceforth inform the general public about its research findings is through the pages of this journal.

Although the ideas that will be expressed in this journal are entirely those of the authors themselves the University nonetheless finds it a pleasant duty to put its facilities at the disposal of all those engaged in finding solutions to the problems of this country to publish their work.

It is my hope that this journal will within a short time achieve excellence and gain reputation, even beyond the borders of this country.

PROFESSOR F.O.KWAMI
Vice-Chancellor

mucosa of the infrastructure with no bone erosion or destruction.

T_2 Tumour confined to the suprastructure mucosa without bone destruction or to the infrastructure with destruction of medial or inferior bony walls only.

T_3 More extensive tumour invading skin or cheek, orbit anterior ethmoid sinuses, or pterygoid muscle.

T_4 Massive tumour with invasion of cribriform plate, posterior ethmoids, sphenoid, nasopharynx, pterygoid plate, base of skull.

The distribution of the 38 patients is shown in Table 1.

The review period was sub-divided into three two year periods and the patients seen in each period contracted in terms of age, sex and presenting signs and symptoms.

The following symbols in Table 1 are defined as follows:

N_o no clinically positive nodes

N_1 single clinically positive homolateral nodel

N_2 two clinically positive homolateral nodel

N_3 massive homolateral nodels, bilateral nodels or contralateral nodels

M_4 (Metastasis) M_o no distant metastasis present.

M_1 distant metastasis present

TABLE 1: CANCER OF MAXILLARY ANTRUM DISTRIBUTION BY T AND N STAGE

NUMBER	N_0	N_1	N_2	N_3	TOTAL
T_1	4	-	-	-	4
T_2	6	1	-	-	7
T_3	9	3	1	-	13
T_4	8	2	3	1	14
TOTAL	27	6	4	1	38

DESCRIPTION OF ILLUSTRATION

Figure 1 shows the picture of a maxillary sinus cancer that has destroyed the medial wall of the sinus without breaking into the orbit.

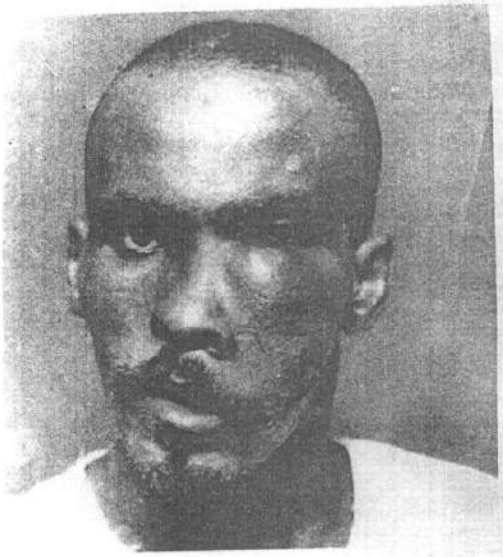

Figure 2 which is a radiograph of figure 1 shows that the cancer is limited to the sinus with no involvement of the orbit.

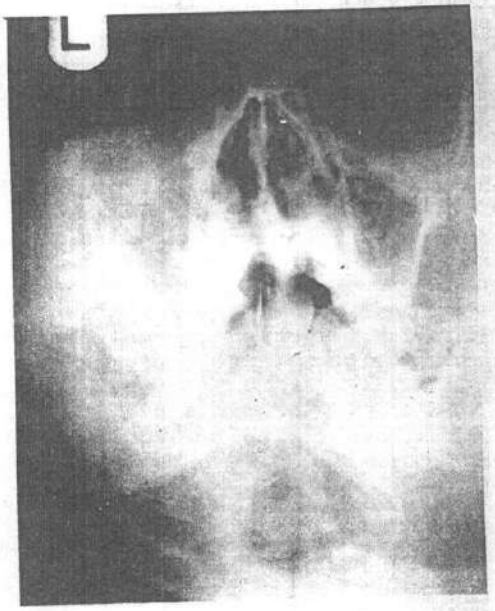

Figure 3 shows an advanced stage of maxillary sinus cancer when compared with figure 1 where the growth has invaded the orbit.

Figure 4 which is a radiograph of figure 3 confirms the growth in the sinus with extension to the orbit after destruction of the bony walls which form the floor of the orbit. Figure 5 and Figure 6 are further illustrations of the selected patients.

Figure 5.

Figure 6

MANAGEMENT

17 patients received chemotherapy only, 3 received chemotherapy followed by surgery and 11 received surgery followed by chemotherapy (Table 2) Radical surgery was performed on 14 patients and 12 patients out of the 17 received palliative chemotherapy. the remaining five were treated by chemotherapy with intent to radical surgery.

Eleven patients classified as T_1 and T_2 and $3T_3$ patients had major surgery as shown in Table 3.

We gave drugs as they were available, and were sometimes forced to use cyclophosphamide (Endoxan) injection alone since this was the only drug often available.

TABLE 2: METHOD OF MANAGEMENT

Method of Treatment,	Intent of Radical Surgery	Paliative	Total
Chemotherapy alone	5	12	17
Surgery followed by Chemotherapy	11	-	11
Chemotherapy followed by Surgery	3	-	3

indicators for tolerance of the patient to the cytostatic therapy.

RESULTS

Results were analysed according to control of primary tumour and regional metastases, survival, time to recurrence, complications and subsequent metastases. The tumour was considered uncontrolled if it recurred at any time at its original site after the completion of treatment. Those in whom therapy failed all had residual tumour at the primary site at death.

The histology of the tumours was: 24 squamous cell i.e. 63%; 7 adenocarcinomas i.e. 19% and 5 undifferentiated carcinomas i.e. 13%. In two cases only a clinical and radiographic diagnosis was possible.

TABLE 3: MAJOR SURGERY PRFORMED

	T_1	T_2	T_3	T_4
Partial maxillectomy plus orbital excentration	-	-	1	-
Cald-well Luc with transantral ethmoidectomy	1	2	2	-
Partial maxillectomy after Denker	2	6	-	-
Total	3	8	3	-

When bleomycin and methotrexate were available we gave them on alternate days as a 24-hour intravenous infusion for 9 days modified according to Moseley et al[2] Bleomycin was given at 0,75 units/kg (maximum dose 60 units).

Total dose of 300mg of Bleomycin was not exceeded. Methotrexate was given at a dose of 0,5mg/kg per day. Hydrocortisone (100mg) was given prior to the infusion to prevent hypersensitivity reactions. After resolution of toxicity from chemotherapy patients were assessed for surgery 4-6 weeks later. Three of the patients who had dramatic improvement were operated after chemotherapy. Cyclophosphomide injections up to a maximum dose of 500mg in a 500cc of normal saline as a 24-hour intravenous infusion on alternate days for 14 days were given. After a free period of 7 days the therapy was continued for another 2 weeks if no signs of toxicity were observed. Differential blood count, and platelet count were used as

Three out of nine T_3 lesions showed remarkable improvement by cytostatic chemotherapy. Two out of these three lesions could be controlled by subsequent surgery. There were 7 uncontrolled cases out of which 6 were treated with chemotherapy alone and 1 with chemotherapy and surgery. All but one of the uncontrolled cases were squamous cell carcinoma. This type of maxillary cancer has therefore a poor prognosis.

The overall controlled cases with chemotherapy and surgery lived longer than the other patients in the same category without surgery. In the T_1 and T_2 groups, which are considered together 7 responded very quickly but 4 required chemotherapy. The survival of the 11 patients in this group was 62% after 1 year, and 25% after 3 years and 18% after 5 years. The survival of T_3 and T_4 patients was very poor. Only 11% i.e. 3 lived for 1 year.

DISCUSSION

It is difficult to compare treatment results in the literature of carcinoma of the maxillary sinus as the reported clinical material and the therapeutic plans differ.

It is equally difficult to speculate on the aetiology of the maxillary sinus carcinoma. Sako[3] speculates that a chronic inflammatory process may predispose to development of carcinoma of the maxillary sinus.

Harrison[4] reports that the Bantus of South Africa have one of the highest known incidence of sinus cancer in the world. In this part of the world, as well as among the negroes of West Africa snuff mixing, powdered tobacco with a variety of incinerated plants are used from childhood.

A lot of anosmia in the tropics is the result of such habit. Indeed in Northern Ghana, most of the workers who carry night soil use special preparations in the nose to cause anosmia so as to make their work easier. It is postulated that these mixtures may contain carcinogenic material which when inhaled are deposited close to the middle meatus thus making it ideal for invasion of the maxillary and ethmoidal sinuses. Of the total of 38 patients 8 (21%) were seen between 1980-1982, 12 (32%) between 1982-1984, and 18(47%) from 1984-1986. This increase in number of cases of cancer of the maxillary antrum in our region may be partly attributed to change in awareness of the condition.

Since 1963, the combination of surgery, radiotherapy and chemotherapy has been widely adopted for malignancies of the paranasal sinuses in Japan. This method according to Suzaki[5] reduced the rate of local recurrences and improved the 5 year survival rate to approximately 70%. Marchetta et al[6] reported survival ranging from less than 10% to as high as 52% in selected cases. By contrast, our 5 year survival rate was only 18 per cent among patients who underwent surgery and chemotherapy. Those who were treated with chemotherapy alone, had only 11 per cent survival rate at 1 year, and none survival to 5 years. These survival rates vary considerably depending on the method of treatment and the selection of patients. It must be noted that the period under review needs a longer time to assess the follow up of the surviving patients. These figures are therefore likely to improve.

The success rate of chemotherapy alone may be slightly less or equal to that of radiotherapy alone. For example Sission[7] et al reported no five year survivals in a group treated with radiotherapy alone but a 22% five year survival with combined radical surgery and radiation therapy. Sako[3] reports an 8% survival rate treated by radiation alone, while Ahmaed et al [8] reported as high as 34% five year survival rate by radiation alone.

A review of the available literature supports the advantage of combined therapy. Even in our series, the patients who had combined surgery and chemotherapy survived a longer time. This is confirmed by Sato et al [9] who reported that combined therapy of surgery, radiation therapy and regional chemotherapy with fluoruracil reduced the rate of local recurrence and improved the two year survival rate, with the advantage of limiting the amount of resection needed. Though the efficacy of regional intra-arterial chemotherapy has been established, this method was not used for our chemotherapy. But good results were obtained with intravenous infusion method. The administration in infusion is helpful if not equally effective. Indeed this technique would be recommended as routine before possible surgery, for all T_3 and T_4 patients. In the 3 cases the cytotoxic chemotherapy produced such dramatic improvement that we decided to operate on them. Two were among the 25% of the patients who survived after 3 years; thus confirming chances of improvement in the survival rate.

CONCLUSIONS

In a country where radiotherapy is not available, surgery before chemotherapy in T_1 and T_2 cases is more effective than chemotherapy or surgery alone. Also chemotherapy followed by surgery in selected cases of T_3 and T_4 yields better results than chemotherapy alone.

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