THE CENTRAL AFRICAN JOURNAL OF MEDICINE

Vol. 55, Nos. 5/8 May/August 2009

CONTENTS

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Owned and Published by the Central African Journal of Medicine in Conjunction with the College of Health Sciences, University of Zimbabwe.

University Of Zimbabwe

Osteosarcoma of the jaws: a 23 year retrospective review

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Abstract

Objective: To review 31 cases of osteosarcoma of the jaws in Zimbabwe, and to retrospectively study the age, gender, site distribution, clinical features and treatment outcome of jaw osteosarcoma in Zimbabwe.
Design: Descriptive.
Setting: Oral and Maxillofacial surgical clinics at two specialist referral hospitals, Harare Central Hospital and Parirenyatwa Government Hospital, Harare, Zimbabwe.
Subjects: 31 cases of osteosarcoma of the jaws.
Method: Clinical records of patients who presented with osteosarcoma of the jaws during the period January 1981 to December 2003 were reviewed for age, gender, site of lesion, radiology, histopathology, treatment outcome and follow up.
Results: There were 31 cases of jaw osteosarcoma during the 23 year period: 45.2% (n=14) males and 54.8% (n=17) females, mean age 27 years. Of the cases 83.9% occurred in the mandible and 16.1% in the maxilla. Surgery was the treatment of choice. The majority of patients were lost to follow up within 12 months.
Conclusion: Jaw osteosarcoma is most common in the mandible with an equal male and female affliction in a relatively young age group.

Cent Afr J Med 2009;55(5/8) 40-3

Introduction

The term osteosarcoma refers to a heterogenous group of primary malignant neoplasms affecting bone-forming or mesenchymal tissue that have histopathologic evidence of osteogenic differentiation.[1] Several variants exist with the conventional or classical osteosarcoma being the most common and arising centrally within bones. This is further subdivided into either osteoblastic or chondroblastic variants depending on the predominant cell type. The classical osteosarcoma accounts for approximately 20% of primary bone tumours.[1,2] It is most common in the long bones with a bimodal age distribution, with a major peak in the second decade and a somewhat smaller peak after the age of 50 years.[3] Men tend to be more commonly affected than women. Pre-existing medical conditions such as Paget's disease of the bone or a history of radiotherapy has been implicated as a predisposing aetiologic factor. Jaw lesions are uncommon and compromise 6% of the total osteosarcomas. They characteristically affect patients considerably later than in the appendicular skeleton, with the first peak occurring somewhat later in the third decade.[5] A study in Nigeria found a frequency of 1.55 and an age range of 10 to 47 years, with a mean age of 27 years.[6] In Kenya and India (in a maxillary osteosarcoma) a mean age of 27 years (range zero to 65 years) was noted with equal sex distribution and half the patients under 20 years.[7,8]

Appendicular osteosarcoma in young patients tends to be aggressive and metastasize widely at an early stage with a 41% five year survival rate.[1,9] This, however, has improved to 70% when chemotherapy and surgery are combined for treatment.

The recommended treatment is radical resection.[10] Adjuvant chemotherapy for osteosarcoma of the long bones has resulted in improved survival.[8] The role of radiotherapy and chemotherapy in the treatment of osteosarcoma of the jaws has not been adequately studied.

Osteosarcoma of the jaws, with the exception of those arising from radiation fields, often show little cellular atypia and late metstasis.[1] Prognosis depends on site, stage and the presence or absence of underlying disease.[10] It is known that maxillary tumours have a worse prognosis than mandibular ones.

The aim of this paper was to review 31 cases of osteosarcoma of the jaws that were referred to the Oral and Maxillofacial Surgery Clinics at Harare Central

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Hospital and Parirenyatwa Hospital, Harare, Zimbabwe, for diagnosis and management during the 23 year period and site distribution, treatment and treatment outcome and follow up with those from other series.

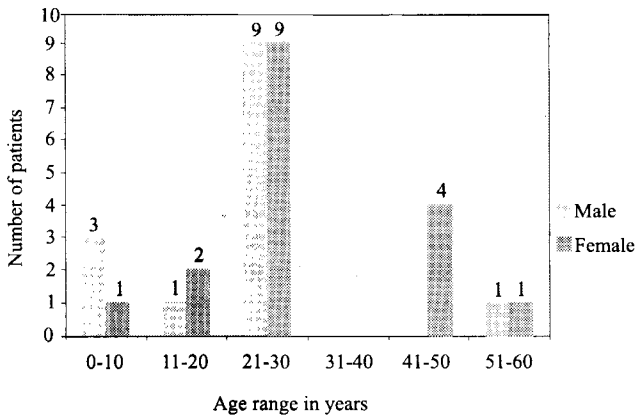
Materials and Methods

The clinical, radiographic and histopathologic records of patients referred to the oral and Maxillofacial Surgical Clinics at Harare Central Hospital and Parirenyatwa Government Hospital, Harare, Zimbabwe over the 23 year period January 1981 to December 2003 were obtained for retrospective review for the following information: patient's age, sex, presentation, radiology, treatment and survival.

Results

A total of 31 primary osteosarcoma of the jaws were recorded in these clinics. There were 14 males (45.2%) and 17 females (54.8%) with a mean age of 23.9 years and 29.6 years respectively; and male to female ratio of 1:1.2. the mean age for the whole group was 27 years with an age range of six to 60 years, (Figure 1).

Figure I: Age on presentation of the patients.



Twenty six tumours (83.9%) presented in the mandible (15 females and 11 males) and five (16.1%) in the maxilla (three males and two females). The mandibular tumours were most common in the body of the mandible with the maxillary tumours in the canine and premolar areas. All tumours were primary to the jaws. Table I shows the main presenting features and gender distribution. There was expansion of buccal and lingual bone.

Table I: Summary of clinical details from the 34 patients in this study.

No.	Age/Sex	Site of lesion	Clinical features
1	6/M	Right mandible	Ulcerated swelling, pain
2	5/M	Right mandible	Ulcerated right swelling, pain
3	29/M	Left mandible	Ulcerated swelling, pain
4	22/M	Left mandible	Ulcerated swelling, pain
5	19/M	Left maxilla	Swelling extending onto palate, pain
6	28/M	Right mandible	Ulcerated swelling, pain
7	5/M	Left mandible	Ulcerated swelling, pain
8	29/M	Right maxilla	Fungating lesion
9	22/M	Left mandible	Ulcerated swelling premolar region, pain
10	60/M	Right mandible	Ulcerated swelling body, pain
11	26/M	Right mandible	Ulcerated swelling angle, pain
12	24/M	Left mandible	Ulcerated swelling, pain
13	30/M	Right mandible	Firm swelling, pain
14	30/M	Right maxilla	Ulcerated swelling, canine region, pain
15	22/M	Left mandible	Ulcerated swelling, molar, pain
16	27/M	Left mandible	Ulcerated swelling, pain
17	44/M	Right mandible	Ulcerated swelling, pain
18	9/F	Left mandible	Ulcerated swelling, pain
19	22/F	Left mandible	Swelling, pain
20	25/F	Right mandible	Fungating lesion, pain
21	20/F	Right maxilla	Ulcerated swelling, pain
22	24/F	Left mandible	Ulcerated swelling, pain
23	14/F	Left mandible	Ulcerated swelling, pain
24	60/F	Left mandible	Ulcerated swelling, pain
25	22/F	Right mandible	Ulcerated swelling, pain
26	27/F	Left mandible	Ulcerated swelling, pain
27	29/F	Right mandible	Ulcerated swelling, pain
28	48/F	Right mandible	Ulcerated swelling, pain
29	19/F	Left maxilla	Ulcerated swelling, pain
30	47/M	Left mandible	Ulcerated swelling, pain
31	44/F	Left mandible	Ulcerated swelling, pain

The mean duration of the swelling at the time diagnosis was six months. No predisposing factors were noted. Radiographic evaluation revealed a variable pattern: all tumours were advanced exhibiting the usual "moth-eaten" radiolucencies or irregular poorly marginated radiopacities. Some cases exhibited the sunray or sunburst radiopaque appearance.

Histologically the tumours exhibited a varied pattern of osteoblastic, chondroblastic and myxoid differentiation activity.

Surgery, aimed at complete excision of the tumour was the treatment of choice in all the cases. No chemotherapy was used. All patients were lost to follow up within six months to a year without recurrence.

Discussion

Osteosarcom represent the second most common malignancy after myeloma but are rare in the head and neck.[16] Small retrospective studies represent the only opportunity for collation and comparison of several cases.[1] Osteosarcoma of the head and neck is considered to be distinct for osteosarcoma that arises in the long bones.[16] Most recently it had been noted that it occurs in older patients and distant metastases are uncommon. Most treatment failures are due to local recurrencies.[17,18] Multimodality therapy using chemotherapy and radiation treatment has led to improvements in the survival of extremity osteogenic sarcoma although the jaw sarcoma response still remains poor.16,19 Earliar studies have established that lesions occur over a wide age range, with a peak in fourth decade.[11,12]

The present study showed a peak in the third decade with small peaks in the first and fifth decade. This low mean age is similar to that among Nigerians,[6] (27 years), and Kenyans (29.7 years).[7] This is in contrast to the United Kingdom studies where the mean age is 39.6 years and in the Netherlands 37 years.[1,13] It would appear osteosarcoma occurs in a relatively young age in the African population, the youngest reported being three weeks old in Kenya.[2]

The age range is similar to that in other studies with an equal male to female affliction (male to female ratio of 1:1.2). This is in agreement with studies from Kenya.[2,7] The most common clinical presentation was of an ulcerated painful swelling. In common with other earlier studies there was a mandibular predominance.[1,2,7,11,14] However, other studies have reported an even distribution between mandibular and maxillary lesions.

The radiologic findings in the present study showed osteoblastic (sunburst) or a mixture of the two with poorly defined irregular margins that are characteristic of malignant lesions. These are similar findings as in other reported series.

Radical surgery remains the gold standard for the treatment of head and neck sarcom.[13] Resection wit clear margins is important in determining prognosis.[13,16,17,19] This gives disease-free survival of 82.5% after two years and 68.8% after five years with an overall 79.1% after five years. The role of radiotherapy and chemotherapy in the treatment of osteosarcoma of the jaws has not been proved,[2,15] although the use of adjuvant radiotherapy has been recommended. In the present series all patients underwent radical surgery but unfortunately were lost to follow up within a year of surgical excision. None had recurrences at the time to the last visit.

The present study is in agreement with other African studies in that patients tended to be relatively young, present late and difficult to follow up.

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