Jaw Cysts in Kano: Northern Nigeria
Iyogun CA, Ochicha O, Sule AA, Adebola RA

Abstract

Background and Objective: Jaw cysts are quite common in dental practice, but there has been no published study from northern Nigeria. We therefore carried out this retrospective study to document the pattern in Kano. Materials and Method: This was a six year (2006 to 2012) retrospective study of all cysts of the mandible and maxilla diagnosed at the pathology department of Aminu Kano Teaching Hospital, Kano. Results: Fifty-four histologically diagnosed jaw cysts were seen during the six year study period, comprising 32 males and 22 females (M:F = 1.4:1). The age range was 3 to 87 years with highest occurrence in the 2nd and 3rd decades. Dentigerous and radicular cysts were the commonest comprising 48.2% and 29.6% respectively. While dentigerous cysts peaked in the 3rd, radicular cysts peaked in the 5th decade. Cysts were more frequent in the mandible than maxilla with a ratio of 1.7:1. Over four-fifth (81%) of dentigerous cysts were in the mandible while radicular cysts mostly occurred in the maxilla (62.5%). Other jaw cysts in this series were simple bone cysts (7.4%), aneurysmal bone cysts (5.5%), odontogenic keratocysts (3.7%), nasopalatine (3.7%) and eruption (1.9%). Conclusion: With regards to the frequency of different jaw cysts, our findings were broadly consistent with the few published Nigerian and sub-Sahara Africa reports, but at variance with most studies outside the continent which documented a preponderance of radicular cysts. However, other parameters (age, gender and site distribution) largely concur with global trends.

Key words: Jaw cysts; Nonodontogenic Cysts; Odontogenic Cysts; Keratocysts; Root Cysts; Dental; Nigeria.

Introduction

Cysts of the jaws are osteo-destructive lesions that are quite common in dental practice. Most of these are derived from epithelial rests within the jaw bones. Unlike most other parts of the skeleton, the teeth are largely parts derived from odontogenic epithelium (dental lamina), remnants of which may persist as epithelial rests that may later give rise to jaw cysts. Other maxillofacial cysts arise from epithelial clusters trapped along the fusion lines of embryologic facial processes. Pseudocysts - not lined by epithelium - also occur in the jaws. Collectively, these jaw cysts are classified into 2 broad groups – odontogenic and non-odontogenic, with the more common odontogenic group being subdivided into inflammatory, developmental and neoplastic. However in common medical parlance, jaw cysts usually refers to non-neoplastic cavities within the jaw bones which is the focus of present study.

The distinction between neoplastic and non-neoplastic jaw cysts is not always clear cut, as with odontogenic keratocyst which was previously designated a developmental cyst, but has recently been reclassified as a benign neoplasm. Furthermore, odontogenic cysts have been severally documented to give rise to neoplasms. Here in Kano, the largest city in northern Nigeria, there has been no formal study of this common clinical problem. In fact there are no published reports on jaw cysts from northern Nigeria. We therefore endeavour to document and evaluate the pattern in our locality.

Materials and Methods

This was a six year retrospective study (2006-2012) of all histologically diagnosed jaw cysts at the pathology department of Aminu Kano Teaching Hospital, Kano (AKTH). The hospital is the only tertiary health institution offering histopathology services in Kano state. Biodata (age, sex, site) were obtained from laboratory records, and histology slides of all cases were retrieved and reviewed. All specimens had been fixed in 10% formal saline, decalcified with 10% formic acid then routinely processed for paraffin embedding. Later 5µ sections were then stained with haematoxylin and eosin. Diagnosis was

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based on WHO classification of jaw cysts.\textsuperscript{1,2}

**Results**

Fifty-four jaw cysts were documented during the 7 year study period in patients aged from 3 to 61 years. Males were slightly more preponderant with an overall M:F ratio of 1.4:1. Table 1 shows the relative frequency and age distribution of different jaw cysts. Dentigerous and radicular cysts were by far the commonest comprising 48.2\% and 29.6\% respectively, distantly followed by simple bone (7.4\%) and aneurysmal bone cysts (5.5\%). In general, cysts most commonly occurred in young people in the 2nd and 3rd decades, peaking in the twenties then gradually declining thereafter.

Table 2 shows the gender and site distribution of jaw cysts in Kano. Dentigerous cysts were overwhelmingly preponderant among males, while radicular cysts were almost equally distributed among both sexes. Over four-fifth (81\%) of dentigerous cysts occurred in the mandible while radicular cysts more frequently (62.5\%) involved the maxilla. Overall cysts were more common in the mandible than maxilla with a ratio of 1.7:1.

<table>
<thead>
<tr>
<th>Type of cyst</th>
<th>No. of cases</th>
<th>%</th>
<th>&lt;10-19 years</th>
<th>10-19 Years</th>
<th>20-29 years</th>
<th>30-39 years</th>
<th>40-49 Years</th>
<th>50-59 Years</th>
<th>&gt;60 years</th>
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</thead>
<tbody>
<tr>
<td>Dentigerous</td>
<td>26</td>
<td>48.2</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Radicular</td>
<td>16</td>
<td>29.6</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Simple bone</td>
<td>4</td>
<td>7.4</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Aneurysmal bone</td>
<td>3</td>
<td>5.5</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Odontogenic keratocyst</td>
<td>2</td>
<td>3.7</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nasopalatine</td>
<td>2</td>
<td>3.7</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eruption</td>
<td>1</td>
<td>1.9</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
<td>100</td>
<td><strong>5</strong></td>
<td><strong>12</strong></td>
<td><strong>13</strong></td>
<td><strong>8</strong></td>
<td><strong>7</strong></td>
<td><strong>3</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

Table 1: Relative frequency and age distribution of jaw cysts in Kano

<table>
<thead>
<tr>
<th>Type of cyst</th>
<th>No. of cases</th>
<th>Male</th>
<th>Female</th>
<th>Mandible</th>
<th>Maxilla</th>
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</thead>
<tbody>
<tr>
<td>Dentigerous</td>
<td>26</td>
<td>17</td>
<td>9</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Radicular</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Simple bone</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Aneurysmal bone</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Odontogenic keratocyst</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Nasopalatine</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Eruption</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
<td><strong>32</strong></td>
<td><strong>22</strong></td>
<td><strong>34</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

Table 2: Site and gender distribution of jaw cysts in Kano

**Discussion**

Only 54 jaw cysts were documented in this 7-year review, which is quite small for the largest city in northern Nigeria that is also capital of the most populous state in the country estimated at 11 million from our 2006 national census.\textsuperscript{7} Similar paltry figures were documented in other Nigerian studies. In Enugu, Oji documented only 20 cases in a 10 year study\textsuperscript{8}, while a more recent 10 year study in Ibadan, the second largest city in southern Nigeria documented 92 cases.\textsuperscript{9} Such small sample size undermines the statistical significance of these Nigerian studies. Reports from other parts of sub-Saharan Africa are very scanty. A Kenyan study spanning two decades reported only 194 cases.\textsuperscript{10} Studies outside the African continent document many more cases. A 2 year study in Pakistan documented 100 cases; an 8-year Turkish study documented 459 cases, while 10 year French study reported 697 cases.\textsuperscript{11-14}

It is possible that the smaller sample sizes of Nigerian studies indicate lower incidence, but it is more likely that jaw cysts are underreported for a variety of reasons. Foremost of which is low patronage of orthodox medical care by our poverty...
stricken populace who can’t be bothered with expensive maxillofacial surgery they can ill-afford for benign jaw cysts that are not life threatening and do not significantly impair their quality of life. Another contributory factor to under-reporting of cases is the proliferation of private dental clinics which perform jaw cystectomies but do not bother sending specimens for histological diagnosis, as the diagnosis is often obvious with good clinical history and plain x-ray.

Overall, jaw cysts in this series were slightly more preponderant among males (M:F = 1.4:1). This is similar to most other published reports within and outside Nigeria – 1.5:1 in Enugu, 1.3:1 in Libya, 1.7:1 in Pakistan, 1.2:1 in India, 1.1:1 in Ibadan, 1.1:1 in Turkey, 1.1:1 in Chile.8,9,11-16 Two studies from Kenya and France however documented much higher male preponderance, almost twice that of females; M:F=1.8:1 and 1.9:1 respectively.8,12 Conversely two Brazilian studies reported slight female preponderance.17,18

Poorer dental hygiene and increased risk of maxillofacial trauma among men have been proposed to explain male preponderance, particularly for radicular cysts.14 While increased risk of trauma among men is understandable, there’s no hard evidence that men indeed have poorer dental hygiene. More so as the preceding caries would have occurred; years or decades earlier in childhood when there is no significant gender disparity. In this series there was no significant gender predilection among patients with radicular cysts, while the aforementioned Brazilian studies actually documented slight female preponderance.17,18 Furthermore, increased trauma risk and the unproven poor male dental hygiene hypotheses do not explain male preponderance documented in other jaw cysts.

Dentigerous cysts emerged the commonest jaw cysts in this review accounting for almost half (48.6%) of all cases. This is consistent with reports from Enugu in Nigeria’s south east,6 but at variance with Ibadan in our south west where dentigerous cyst is displaced to distant second (12%) by radicular cysts (50%).17 In Lagos, also in the south west, dentigerous (22.2%) and periapical (21.4%) cysts were almost equal in frequency.19 With exception of this study, the authors are not aware of any published reports on jaw cysts from Northern Nigeria. Going by the few aforementioned southern studies, it would appear that there is at present no discernible consistent pattern across the nation. Further studies are therefore required to shed more light on the issue.

One possible explanation for the apparent disparities in relative frequencies between dentigerous and periapical cysts in the pathology based southern Nigerian studies, is that both cysts can be histologically similar. Both are lined by squamous epithelium, and inflammation is not uncommon in dentigerous cysts. Thus in the absence of adequate clinical/radiological information, and with incomplete fragmented surgical biopsy specimens, one may be mistaken for the other. Furthermore, it’s been reported that root apex inflammation of a deciduous tooth can give rise to dentigerous cyst around an unerupted permanent tooth.20

As earlier stated published studies from sub-Saharan Africa are scanty, however a recent Kenyan study also documents dentigerous cysts as their most frequent jaw cyst. In most other parts of the developed and developing world radicular cysts were overwhelmingly preponderant – France (53.5%), UK (52.3%), Germany (56.9%), Greece (59.6%), Turkey (54.7%), Chile (65.7%), India (69.3%), Brazil (61.4%), Pakistan (70%), and Libya (68.1%).11-18,21-24

Radicular cysts were the second most frequent jaw cyst in Kano, comprising 29.6% of all cases. As earlier pointed out, this relative low frequency is at variance with most other parts of the world where radicular cysts are more common, but is consistent with several reports from sub-Saharan Africa – notably Kenya (24%), Lagos (21.4%), Enugu (15%).6,10,19 Our lower rates of radicular cysts can be attributed to lower rates of dental caries, which often afflicts more affluent societies with higher consumption of sugary snacks.

With regards to age distribution, jaw cysts in our series mostly occurred in the 2nd and 3rd decades, with the more preponderant dentigerous cyst largely accounting for this early peak. Radicular cysts on the other hand peaked later in the 5th decade. This age profile of dentigerous and other developmental cysts occurring in younger
age group (adolescents, young adults), while periapical cysts peak later in life, concurs with most other parts of the world. The differing age distribution reflect the fact that both dentigerous and radicular cysts are long term complications of initiating pathologies beginning several years or decades earlier – one during embryological development of tooth in intrauterine life, and the other later in childhood dental caries or maxillofacial trauma. Over all jaw cysts in this series were more prevalent in the mandible than maxilla with a mandible-maxilla ratio of 1.7:1. Globally there appears to be no consistent pattern of mandible/maxilla involvement with some studies documenting more cysts in the maxilla (Pakistan, Chile, India, Libya), while others document more mandibular cysts (France, Turkey, Ibadan).

Given the paucity of published reports from sub-Saharan Africa, it is premature to draw conclusions as to a general pattern. Nonetheless, with regards to relative frequencies of common jaw cysts, our findings were broadly consistent with the few available published reports from sub-Saharan Africa, though at variance with most other parts of the world where radicular cysts predominate. Other parameters (age, gender distribution, jaw distribution) however largely conform to global trends.

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