## Original

# **Retrospective analysis of 36 ameloblastoma cases in Laos**

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(Received February 27, 2013; Accepted May 18, 2013)

Abstract: We conducted a retrospective study of 36 cases of ameloblastoma from the files of Mittaphap Hospital in Vientiane Capital, Laos. Clinical findings showed an average patient age of  $31.0 \pm 3.8$  years, with a slight male preponderance. Radiographically, all of the lesions showed multicystic radiotranslucency. Twenty-four patients underwent tumor resection and 12 underwent tumor enucleation. Of those patients, four underwent additional surgery because of tumor recurrence. This is the first report in the English literature of ameloblastoma cases from Laos. (J Oral Sci 55, 199-201, 2013)

Keywords: ameloblastoma; clinical findings; incidence; Laos.

#### Introduction

Ameloblastoma is a locally aggressive odontogenic neoplasm that shows frequent local recurrence. In cases that are not completely excised, the recurrence rate may reach 90% (1-5).

Laos is a landlocked country in the middle of the Indochina peninsula, with 7 million citizens, living in 16 provinces and one capital city. In 2008, the Laotian government developed the Lao National Cancer Center at Mittaphap Hospital. The International Agency for Research on Cancer (IARC) has estimated that there are

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5,700 new cancer patients and about 4,200 cancer deaths annually in Laos (6). The most common cancer in males is liver cancer, followed by lung cancer, whereas cancers of the uterine cervix and liver are common in females. Cancer of the lip and oral cavity is the 8th most common cancer, with an incidence of 3.0% (6). However, as there are no detailed data on odontogenic tumors, the Lao National Cancer Center has reviewed all of the patient records.

The present study was designed to investigate the incidence of ameloblastoma in the patient records at the Head and Neck Division, Mittaphap Hospital, between 2004 and 2010, and to compare them with various reports from other parts of the world, based on the WHO classification (7).

# **Materials and Methods**

Oral and maxillofacial lesions treated at Mittaphap Hospital were reviewed, and cases of ameloblastoma were extracted. The resected materials were checked by the Pathology Division, Faculty of Medicine, University of Health Sciences.

This study was approved by the ethics committees of Mittaphap Hospital and the University of Health Sciences (No. 038, 2013).

# Results

### **Clinical findings**

The Head & Neck Surgery Division collected 237 cases of oro-facial lesions for the period 2004-2010, including 36 cases (15.2%) of ameloblastoma. The patients included 16 females and 20 males, with a mean age of  $31.0 \pm 3.8$  years (range 11-60 years). Most of the amelo-

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**Fig. 1** Clinical and radiological findings in a patient with ameloblastoma. (A) Gross findings: mandibular swelling was noted on the right side of the jaw (black arrows). (B) Radiological findings: multiple cyst-like radiolucency was found in the right side of the mandible. Root resorption was easily evident at the apex of the affected teeth (white arrows).



**Fig. 2** Intraoperative and postoperative state of the patient. (A) Intraoperative findings. The patient underwent hemimandibulectomy. (B) State of the patient at 5 days after surgery. There are no apparent complications.

blastoma patients admitted to Mittaphap Hospital were at an advanced stage of disease (Figs. 1A and 1B). The major complaint was jaw swelling (100%), followed by pain (27.8%). Radiographically, all of the lesions showed multicystic radio-translucency. The patients at Mittaphap Hospital were treated by tumor enucleation (12 cases), resection or hemimandibulectomy (24 cases). The patients who underwent hemimandibulectomy lost their mastication function after surgery and were advised to undergo jawbone reconstruction in Vietnam or Thailand, as such reconstruction is difficult in Laos due to lack of basic medical equipment and clinical experience (Figs. 2A and 2B). Among these patients, nine were followed up after surgery and four underwent reoperation due to tumor recurrence.

#### **Pathological findings**

Enucleated tissues were fixed in 10% neutral-buffered formalin, embedded in paraffin, sectioned and stained with hematoxylin and eosin (HE). Slide specimens were checked by pathologists and confirmed as ameloblastoma. Of these cases, two were reviewed by Japanese pathologists (NM and KK), and diagnosed as ameloblastoma, multicystic type.

Histologically, the lesions were composed of solid sheets and cystic tumor nests within a fibrous stroma. The cystic tumor nests contained eosinophilic-amorphous materials and cuboidal peripheral cells with a stellate



**Fig. 3** Photomicrograph of ameloblastoma. (A) Solid and cystic tumor nests within a fibrous stroma (HE, bar = 500  $\mu$ m). (B) Peripheral palisading cells enclose stellate reticulum-like tissue (HE, bar = 50  $\mu$ m).

reticulum-like lining. In the solid-sheet nests, peripheral palisading cells enclosed stellate reticulum-like tissue. Occasional squamous metaplasia was found (Figs. 3A and 3B).

#### Discussion

Odontogenic tumors are derived from the epithelial and/ or mesenchymal remnants of the tooth-forming apparatus (8). Among these tumors, ameloblastoma is a slowly growing, locally invasive, epithelial odontogenic tumor of the jaws (7).

Several reviews of ameloblastoma have been published (Table 1). Ameloblastoma is the most common benign tumor of the jaw, as reported in previous studies from India (2.4%) (9) and Brazil (0.8%) (3). On the other hand, keratocystic odontogenic tumor is the most common in China (1.5%) (10), and complex odontoma is the most common benign tumor in Chile (0.3%) (11), both being followed by ameloblastoma (1.4% and 0.3%), respectively) (10,11). Ameloblastoma appears to be less common in South America than in Asia. This may reflect ethnic or socioeconomic differences, poor nutrition, or limited access to medical treatment in developing countries. In Laos, ameloblastoma accounts for 15.2% of all tumors taken from the head and neck region, the incidence being far higher than that in any other country. These differences may be due to shortages of radiographic instruments and limited access to hospitals.

Country	Incidence of ameloblastoma in head and neck lesions (%)	Gender		$A \approx (M \approx + SD)$
		Male (%)	Female (%)	Age (Mean $\pm$ SD)
Laos	15.2	55.6	44.4	$31.0\pm3.8$
Nigeria (12)	Undescribed	65.0	35.0	29.0
India (9)	2.4	57.1	42.9	Undescribed
China (10)	1.4	53.3	46.7	$34.7\pm15.5$
Brazil (3)	0.8	54.5	45.5	$27.7\pm14.2$
Chile (11)	0.3	45.9	54.1	$37.4 \pm 18.4$

 Table 1 Comparison of the incidence, gender and age distribution of ameloblastoma in different countries, and in this study

Because radiographic instruments, especially panoramic X-ray radiographic equipment, are unfamiliar in Laos, it is difficult to identify head and neck lesions at an early stage. As ameloblastoma shows aggressive behavior, and can easily cause significant jaw swelling, such cases were abundant in this investigation.

Cases of ameloblastoma have been reported to show a roughly equal gender distribution, although a female preponderance has been reported in Chile (11), while a male predominance has been reported in Nigeria (12), India (9), Brazil (3) and China (10). In the present study, we found an almost equal distribution of occurrence between the genders (slightly more common in males).

The mean age of incidence in this study was  $31.0 \pm 3.8$  years, which concurs with Chile  $(37.4 \pm 18.4)$  (11) and China  $(34.7 \pm 15.5)$  (10), whereas the mean patient age in Nigeria (29.0) (12) and Brazil (27.7  $\pm 14.2$ ) (3) was lower than 30 years. Both the gender and age distributions show close agreement among countries.

In this series, jaw swelling was the most common clinical feature, followed by pain, which was also in line with Nigerian records (100% and 31.3%, respectively) (12).

It is important that patients with ameloblastoma undergo prompt medical examination and treatment at an early stage. Thus, health education is necessary to ensure that patients with oral and maxillofacial lesions seek medical advice and are followed up for a minimum of 5 years after treatment for ameloblastoma. Sustainable support in terms of medical supplies and education are essential for improving the medical situation in Laos.

Although ameloblastoma has been recognized for over a century and a half (8), this is the first clinicopathological survey to have been conducted in Laos. Since the Laotian economy has rapidly grown, the number of tumor patients is expected to increase as average life expectancy is extended. To improve the level of medical treatment in Laos, a clinicopathological survey for tumors, including those of the maxillofacial region, is required.

# Acknowledgments

This work was partly supported by the International Scientific Exchange Fund of the Japan Dental Association.

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