Original Research Article

Benign Tumours and Tumour-like Lesions of the Jaws

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Abstract

Purpose: The goal of this study was to look at the age, gender, prevalence, and location(s) of odontogenic and nonodontogenic benign malignancies, in addition with tumour-like lesions in the jaws, in an Indian population, especially in Eastern India, and to compare the results with previous literature. **Methods**: The data was gathered during a 1-year period starting from January 2021 to November 2021 from files collected from a selected hospital. The data was studied descriptively in terms of age, gender, prevalence, lesion place and type. **Results**: During a one-year period, 200 benign tumours and tumour-like lesions of the jaws were chosen. Thirty-four (or 17%) of these lesions were odontogenic benign tumours, while 166 (or 83%) were nonodontogenic benign tumours and tumour-like lesions. **Conclusion**: The findings of this study demonstrated that the location and characteristics of benign tumours and tumour-like lesions of the oral cavity and jaws in the Indian population, particularly in the Eastern region of India, differ from those seen in other populations.

Keywords: Odontogenic tumours, Nonodontogenic benign tumours, jaw cavity, tumour-like lesions, benign tumours.

Introduction

A wide range of pathologies can affect the jaw, ranging from inflammatory processes to malignant neoplasms. Jaw lesions can be exceedingly aggressive, resulting in pain, paraesthesia, edoema, drainage, tooth loss, root resorption, facial deformity, and other significant complications[1, 2]. The jaw cavity is affected by an array of lesions. Tumours of odontogenic and nonodontogenic origin, and tumour-like lesions, are also included[3]. Based on the population and geographic area, the frequency or ratio of various lesions varies. Lesions are also defined by other criteria such as age, gender, and location. Ameloblastoma, odontoma, and myxoma are benign odontogenic tumours that typically affect the jaw[4]. Non-odontogenic benign tumours do arise in the jaws, but they are uncommon. Odontogenic carcinoma, osteosarcoma, Ewing's tumour, multiple myeloma, and metastasis are all malignant tumours that affect the jaw. The mandibular alveolar ridge, lower buccal sulcus, sublingual sulcus, and mandibular retro molar trigone are all affected by oral cancer of the mandibular region, which primarily affects the jaw via direct extension[5, 6]. A great number of investigations of jaw tumours and tumour-like lesions have been conducted in various demographics and geographical areas. The Indian population has extremely limited knowledge on nonodontogenic benign tumours and tumour-like abnormalities[7, 8, 9].

In this investigation, X-ray was used to characterise individuals who presented with jaw lesions for the first time. The major mode of inquiry was a CT scan, which was performed on all of the patients in the trial. In one case, an MRI was used to further characterise the patient in order to make a particular diagnosis[10, 11, 12]. Histopathological data were used to confirm the radiological diagnosis. A statistical breakdown of the cases was also obtained in terms of age and sex distribution[6]. The goal of this study was to look at the prevalence, gender, age, and location of odontogenic and nonodontogenic benign tumours, as well as tumour-like lesions in the mandibular cavity in an Indian population, particularly in the Eastern parts of India, and to compare the results with previous studies.

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Methods

Biopsy records of individuals identified with odontogenic and nonodontogenic tumours and tumor-like lesions were collected from the files of a designated hospital in India from January 2021 to November 2021. All case data were re-evaluated in order to classify the lesions using the World Health Organization's (WHO) odontogenic tumours classification system, which was updated in 2005. They were studied descriptively in terms of prevalence, age, sex, lesion type, and location. Nonodontogenic benign tumours and tumour-like lesions were classified into two groups: benign odontogenic tumours and benign odontogenic tumours. Soft tissue and bone-related lesions were divided into two categories. The study excluded malignant tumours and incomplete clinical data reports with a doubtful or contested diagnosis. Based on the location of the odontogenic tumour, the maxilla and mandible were divided into three anatomic zones: anterior, premolar, and molar. The molar region of the jaw included the angle and ramus. Nonodontogenic benign lesions were seen in the maxilla, mandible, palate, cheek, tongue, and lip.

The Siemens 800 mA (Model-KlinoskopH/ Fluoro-vision-3000) machine was used to examine all of the instances. The SIEMENS SYNGO SOMARIS/ 5 VA47C spiral CT scanner was used to evaluate all of the patients. The MRI was performed on a SIEMENS TIM AVANTO 1.5T SCANNER. Histopathological findings were compared to radiological diagnosis (X-ray, CT, and MRI).

Results

330 biopsies linked to the oral cavity and jaws were identified over the course of a year. A total of 200 benign and tumour-like oral cavity and jaw lesions were selected. 34 odontogenic benign tumours (17%), 166 nonodontogenic benign tumours (83%) and tumour-like lesions were found. The patients were divided into 101 males and 99 females. The patients were between the ages of one and eighty-five (mean age: 39.5 years, standard deviation [SD]: 19.8 years).

Table 1: Gender distribution of the tumours

Pathology	Male	Female	Male:female ratio	Total (%)
Odontogenic				
KCOT	35	16	2.2:1	51 (42.2)
Compound odontoma	11	12	1:1.1	23 (19)
Complex odontoma	10	7	1.4:1	17 (14.1)
Ameloblastoma	4	10	1:2.5	14 (11.6)
Odontogenic myxoma	2	8	1:4	10 (8.3)
Cementoblastoma	0	2	Female	2 (1.6)
CCOT	1	0	Male	1 (0.8)
Ameloblastic fibro-odontoma	0	1	Female	1 (0.8)
Odontogenic fibroma	0	1	Female	1 (0.8)
CEOT	1	0	Male	1 (0.8)
Total (odontogenic tumors)	64	57	1.1:1	121 (100)
Nonodontogenic				
Soft tissue-related lesions				
PGCG	97	123	1:1.3	220 (37.4)
Epulis fissuratum	41	68	1:1.7	109 (18.5)
Fibroma	24	33	1:1.4	57 (9.7)
Pyogenic granuloma	18	32	1:1.8	50 (8.5)
Capillary hemangioma	8	11	1:1.4	19 (3.2)
Cavernous hemangioma	2	2	1.1	4 (0.7)
Papilloma	6	14	1:2.3	20 (3.4)
Pleomorphic adenoma	8	7	1.1:1	15 (2.5)
Verruca vulgaris	1	2	1:2	3 (0.5)
Fibrolipoma	2		Male	2 (0.3)
Total	207	292	1:1.4	499 (84.7)
Bone-related lesions				
CGCG	19	32	1:1.7	51 (8.7)
Ossifying fibroma	4	7	1:1.8	11 (1.9)
Osteoma	2	8	1:4	10 (1.7)
Torus/exostosis	3	7	1:2.3	10 (1.7)
Fibrous dysplasia	1	6	1:6	7 (1.3)
Total	29	60	1:2	89 (15.3)
Total (nonodontogenic)	236	352	1:1.5	588 (100)
All of pathologies	300	409	1:1.4	709

KCOT=Keratocystic odontogenic tumor; CCOT=Calcifying cystic odontogenic tumor; CEOT=Calcifying epithelial odontogenic tumor; PGCG=Peripheral giant cell granuloma; CGCG=Central giant cell granuloma

Table 2: Age distribution of the tumours

Pathology	0-9	10-19	20-29	30-39	40-49	50-59	60-69	>70	Age (mean)
Odontogenic									
KCOT	0	8	9	10	13	8	1	2	37.7
Compound odontoma	2	11	6	3	1	0	0	0	20.3
Complex odontoma	0	3	8	2	2	1	1	0	29.7
Ameloblastoma	0	1	3	2	5	1	2	0	39.6
Odontogenic myxoma	0	0	4	2	1	1	1	1	39.2
Cementoblastoma	0	1	0	0	0	0	1	0	39.5
CCOT	0	0	0	0	0	1	0	0	56
Ameloblastic fibro-odontoma	0	1	0	0	0	0	0	0	16
Odontogenic fibroma	0	0	0	1	0	0	0	0	34
CEOT	0	0	0	0	0	0	0	1	71
Total	2	25	30	20	22	12	6	4	33.9
Nonodontogenic									
Soft tissue-related lesions									
PGCG	19	54	21	26	32	32	28	8	35.1
Epulis fissuratum	0	0	0	0	24	41	30	14	55.3
Fibroma	2	1	2	9	14	15	9	5	49.2
Pyogenic granuloma	2	10	13	7	8	5	3	2	34.2
Capillary hemangioma	1	2	8	0	4	1	2	1	35.2
Cavernous hemangioma	0	1	1	0	0	0	2	0	42.5
Papilloma	2	2	0	4	5	2	2	3	40.3
Pleomorphic adenoma	0	1	1	3	5	4	1	0	44.7
Verruca vulgaris	0	1	0	0	1	1	0	0	36.7
Fibrolipoma	0	0	0	0	0	0	0	2	74.5
Total	26	72	46	49	93	101	77	35	41.8
Bone-related lesions									
CGCG	2	6	6	11	13	6	6	1	38.9
Ossifying fibroma	1	2	1	5	1	1	0	0	28.1
Osteoma	0	0	1	3	1	2	2	1	49.7
Torus/exostosis	0	2	0	0	5	1	1	1	40.1
Fibrous dysplasia	0	0	4	1	2	0	0	0	31.6
Total	3	10	12	20	22	10	9	3	38.9
Total (nonodontogenic)	29	82	58	69	115	111	86	38	41.4

KCOT=Keratocystic odontogenic tumor; CCOT=Calcifying cystic odontogenic tumor; CEOT=Calcifying epithelial odontogenic tumor; PGCG=Peripheral giant cell granuloma; CGCG=Central giant cell granuloma

Odontogenic benign tumours

The patients ranged in age from 6 to 79 years old, with a median age of 33.9 years (SD 17.4). These tumours were most common in people aged 10 to 49, with a peak frequency in their third decades of life. Keratocystic Odontogenic Tumours (KCOT) were the most common (42.2%), followed by odontomas (33.1%), ameloblastomas (11.6%), and odontogenic myxomas (10.6%). (8.3 percent). Tables 1 and 2 illustrate the gender and age distribution of odontogenic tumours in this Indian population. As demonstrated, the mandible was home to 68.6% of the lesions, with the molar/ramus region accounting for 43.8 percent of the total. The most common tumours found in the mandible's molar/ramus were KCOTs (46.3 percent). Odontomas were the most prevalent tumours in the maxilla, while most other odontogenic tumours were more common in the jaw.

Nonodontogenic benign tumours and tumour-like lesions

The patients ranged in age from 1 to 85 years old, with an average age of 41.4 ± 19.9 years. These lesions were most common between the ages of 40 and 69 with a peak occurrence in the fifth decades of life. In soft tissue related lesions, the most frequently occurring lesions were the peripheral giant cell granulomas (PGCGs). This was followed by epulis fissuratum, pyogenic granulomas, hemangiomas, papillomas, pleomorphic adenomas, verruca vulgaris, and fibrolipomas. Among bone related lesions, the most frequent lesions were the central giant cell granulomas (CGCGs). This was followed by ossifying fibromas, osteomas, torus/exostosis, and fibrous dysplasia.

Tables 1 and 2 show the gender and age distribution of nonodontogenic benign tumours and tumour-like lesions in an Indian population. Soft tissue lesions in the maxilla and mandible were revealed to contain the most PGCGs. The most common soft tissue lesions identified in the cheek, palate, lip, and tongue were fibromas, pleomorphic adenomas, papillomas, and fibromas, respectively. The most common bone lesions found in the maxilla and mandible were CGCGs. The majority of bone-related illnesses were discovered in the mandible, with the exception of fibrous dysplasia, which was more common in the maxilla.

Discussion

Tumors that arise from epithelial and/or mesenchymal elements in tooth-producing tissues or their remains are known as odontogenic tumours. From hamartomatous tissue proliferation to malignant neoplasms with the potential to spread to other regions of the body, the lesions are diverse[12]. In humans, odontogenic tumours are extremely rare, accounting for fewer than 1% of all jaw tumours. They're most commonly seen intraosseously in the mandible and

maxilla, although they can also be found extraosseously in the gingiva[13]. Since then, there have been various discussions on the terminology and classification of odontogenic tumours[13, 14].

In this study, benign odontogenic tumours accounted for 5.2 percent of oral cavity and jaw biopsies. This is higher than other studies' reports, but similar to other studies' reports that were higher than 5%. These disparities could be caused by differences in geographic location or biopsy frequency[15]. Furthermore, benign odontogenic tumours accounted for 17% of all benign tumours, including lesions of the oral cavity and jaws[16]. This incidence is consistent with findings from studies that looked at odontogenic tumours as part of tumours and tumour-like lesions. In this study, gender prevalence was approximately equal, which was similar to what had been discovered in earlier investigations. In the Chinese population, there is a male predominance. Odontogenic tumours were discovered most frequently in the third decades of life in this investigation. This conclusion is consistent with population reports from China[17, 18]. In this study, like in earlier investigations, odontogenic tumours were more prevalent in the mandible.

In this study, KCOTs were the most common odontogenic tumours (42.2%)[19]. Other research in Brazil and China have found similar results. According to research in India, China, Libya, South Africa, Sri Lanka, and Turkey, KCOTs were the second most common tumours after ameloblastomas[20]. In this study, the KCOTs were most commonly identified in the mandibular posterior region, which is consistent with previous findings. They were seen in all age categories except early childhood, with a significant incidence in the fifth decades of life. People with KCOTs were on average 37.7 years old, with males outnumbering females (2.2:1). In a comprehensive analysis, MacDonald Jankowski noted that they affected people of all ages, but were most common in the third decade of life and had a male predominance. In this study, odontomas were the second most prevalent odontogenic tumours[21]. In the literature, the prevalence of odontomas appears to range from 2.2 percent to 75.6 percent. The wide variation in the prevalence of these tumours among studies could be attributed to doctors' different biopsy choices for these tumours[22].

Ameloblastomas were found to be less common in this study than in most previous studies. In comparison to ameloblastomas, some studies have found a high frequency of odontomas, while others have found a high incidence of KCOTs[9, 20]. The increased female prevalence among ameloblastoma patients in this study agrees with the findings of several investigations, but differs from many other publications. The mandible was home to nearly 93 percent of the ameloblastomas, with a high mandible to maxilla ratio. This discovery is quite similar to Sriram and Shetty's findings (95 percent, 18.1:1)[21]. When compared to previous investigations, the ameloblastoma ratios were quite high. Reichart et al. discovered a ratio of roughly 5.4:1 in an exhaustive analysis of 3,677 cases of ameloblastomas[22]. The molar ramus region (71.4 percent) was the most typically afflicted site in this study, which is consistent to prior studies[23].

The investigation discovered one case of osteopetrosis with osteomyelitis of the jaw presenting with swelling, discomfort, and a leaking sinus. Multiple dense curving lines paralleling the iliac crest and sandwich vertebrae were detected on radiography, as well as thickening and increased density of the calvarium and base of the skull. One case of osteoradionecrosis involving the mandible was discovered, with a history of head and neck radiotherapy and the evacuation of a carious tooth. There were sections that were both radiopaque and radiolucent, with irregular trabecular gaps. On CT, there were many sequestrated bone fragments. The majority of instances of squamous cell carcinoma involved the mandible, with peak frequency in the fourth and fifth decades. Similar findings were reported by Chidzonga MM et al[24] and Sharma P et al[25]; however, Shenoi R et al[26] showed a peak incidence in the sixth decade. On imaging, a soft tissue lesion with ill-defined bone erosions was discovered.

Conclusion

According to this study, the distribution and characteristics of benign tumours and tumour-like lesions of the oral cavity and jaws in the Indian population, particularly in the Eastern region of India, exhibit several distinctions as well as similarities with findings from other populations. The findings of this study, as well as similar studies conducted in different nations and demographics, will aid clinicians and pathologists in assessing benign tumours and tumour-like abnormalities. On MRI, bone lesions are difficult to distinguish. However, MRI provides extra information and aids in the diagnosis of the lesion in cases of early involvement of the bone marrow, particularly in inflammatory situations. The limitations are a higher cost and a longer scan time. As a result, it should only be utilised in specific circumstances to better characterise lesions and arrive at a diagnosis.

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