Evaluating the Accuracy Rates of Clinical and Radiographic Diagnoses Compared with Histopathologic Diagnosis of Oral Exophytic Lesions

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Abstract

Introduction: The aim of this study was to identify the reasons for failure in clinical, radiographic, and histopathologic diagnoses as well as their interactions with each other. **Methods:** Personal information and lesion characteristics of 51 patients with central or peripheral exophytic lesions were collected in Mashhad dental school. Specialists determined clinical and radiographic diagnoses and after taking biopsy, the clinical and radiographic diagnoses were compared with histopathologic diagnosis. **Results:** Fifty three patients with oral exophytic lesions were evaluated among which 66.6% were peripheral and 33.4% were central exophytic lesions. Males constituted 52.9% of the patients while 47.1% were female. The first clinical and radiographic diagnoses were not confirmed with the histopathologic diagnosis in some patients. 80.4% of the first clinical diagnoses were consistent with the pathologic reports and in other cases, the clinical diagnosis were not confirmed histopathologically. In addition, radiographic diagnoses in six patients were not consistent with pathologic diagnosis. **Conclusion:** Great concordance was observed between clinical and radiographic diagnosis with pathologic reports.

Key words: Clinical diagnosis, exophytic lesion, histopathology, radiography.

Introduction

The oral cavity and jaws can be the location of many diseases including exophytic lesions with 25.8% prevalence which may arise from osseous (central) or extra osseous (peripheral) tissues (1). Exophytic lesions are often difficult to diagnose clinically due to different histopathologic processes, which can lead to same lesions. For example, tumors appear similar to cysts, hyperplasia similar to tumors, and benign tumors similar to malignant types. Good clinical judgment is based on the interpretation of the clinical examination and patient history to form a reasonable differential diagnosis and then ordering appropriate radiographs that will help narrow the field. Making an accurate diagnosis of lesions affecting the bones, including the jaws, requires correlative assessment of clinical, radiographic and histologic findings. Although the histopathologic diagnosis is the basis of treatment for most lesions, in some subjects it cannot be the basis regardless of clinical and radiographic diagnoses (2,3).

Clinical diagnosis of central lesions, in particular, requires radiographic examinations although it cannot show many characteristics (4). In addition, it occasionally needs a description of a surgeon, when coming across with such lesions, the description of their consistency, color, and other findings can greatly help in correct diagnosis, determining their nature and treatment plan. However, occasionally, a surgeon does not remove the specimen from the proper level; thus, the nature of the lesion cannot be identified. In such cases, biopsy should be done from the deeper parts of the lesion (2).

Most patients are likely to view a biopsy procedure with suspicion and to become anxious regarding the impending tissue diagnosis. It is important to study the accuracy level of the clinical diagnoses made by clinicians against the final diagnosis obtained by histopathologic examination. A paucity of data is available on the assessment of the diagnostic concordance between the clinical and histopathologic and radiographic diagnosis of oral exophytic lesions in Iran. Sarabadani et al. (5) evaluated consistency rates of clinical and histopathologic diagnoses of oral soft tissue lesions. In this research, a total of 81.7% (62 subjects) of clinical diagnoses were consistent with histopathologic reports. Hoseinpour Jajarm and Mohtasham (6) revealed a close relationship between clinical diagnosis and pathology report.

The aims of this study were to find out the reasons for failure in clinical, radiographic, and histopathologic diagnoses as well as their concordance with each other.

Materials and Methods

In this descriptive cross sectional study, 51 patients with oral exophytic lesions were evaluated in the Department of Oral Medicine, Faculty of Dentistry, Mashhad University of Medical Science.

The sampling size in this study was estimated according to the ratio estimation in a community. In addition, preliminary studies showed that every month on average seven patients suffering from exophytic lesions were referred to the Mashhad School of Dentistry. Therefore, considering p=0.5 (the greatest amount), α=0.05, and d=0.04, a total of 51 patients with peripheral or central oral exophytic lesions were evaluated in this study. The inclusion criteria for oral exophytic lesions for the present study were all lesions involving oral tissues with documented clinical, radiographic, and histopathologic diagnosis and lesions with incomplete data were excluded (exclusion criteria). For each patient a questionnaire containing clinical and radiographic questions was prepared. Based on these questions, related specialists gave their clinical and radiographic diagnoses, separately. Moreover, if necessary, laboratory tests, aspirations, and occasionally complementary radiographs were taken from each subject.

After biopsy, the specimens were sent to the Oral Pathology Department, Mashhad Faculty of Dentistry for pathologically diagnoses. Then clinical and radiographic diagnoses were compared with histopathologic diagnosis. The statistical analysis was carried out using SPSS 11.0 (SPSS 11.0 Windows, SPSS Inc, Chicago); the statistical tests such as Chi-Square (X^2), and Fisher exact test were applied.

Results

In the present study, 51 subjects with oral exophytic lesions were evaluated. Of the 51 patients, 34 (66.6%) were peripheral and 17 (33.4%) were central. 27 subjects were males (52.9%) and 24 were females (47.1%). The majority of the lesions came from the patients within the age range of 6 to 15 years (23.5%). Females outnumbered males in all age groups, barring the 16 to 25-year age group and the older than 61- year age group (Table 1).

Table 1. Incidence of lesions by age and sex

Age	Number (Percent)	Male (Percent)	Female (Percent)
6-15	12(23.5%)	5(9.8%)	7(13.7%)
16-25	10(19.6%)	8(15.7%)	2(3.9%)
26-40	9(17.6%)	4(7.8%)	5(9.8%)
41-60	11(21.6%)	5(9.8%)	6(11.8%)
≥61	9(17.6%)	5(9.8%)	4(7.8%)
Total	51(100%)	27(52.9%)	24(47.1%)

The lesions were grouped into 12 main categories (12 main categories including: reactive lesions of soft and hard oral tissue, benign and malignant hard oral tissue, hamartomes of hard and soft oral tissues, benign and malignant of soft oral tissue, cysts of hard and soft oral tissue, infections of hard and soft oral tissues) according to structural and histologic nature of tissue. 47.2% of lesions were reactive lesions of oral soft tissue and the lowest frequency of lesions was benign tumors and odontogenic cysts of oral lesions.

Radiographic diagnosis was given for all of the central lesions and four lesions with peripheral exophytic lesions, it was because these lesions affected on the bone which caused radiographic changes.

The histopathologic diagnoses confirmed the 1st clinical diagnoses in 41 (80.4%) but not in 10 (19.6%) lesions. Also, of 21 subjects with radiographic diagnoses, in 15 (71.4%), the 1st radiographic diagnosis were confirmed by histopathologic diagnosis, but not in 6 (28.6%) subjects (Table 2).

Furthermore, in 30 (58.8%) subjects radiographic diagnoses were not given since the lesions were peripheral.

In two subjects, the oral pathologist re-examined the slides due to emphasis of the oral medicine specialists. Comparison of the 1st and 2nd clinical diagnoses of all patients with modified histopathologic diagnoses showed that in 46 (90.2%) subjects, results were confirmed, but there was no such confirmation in 5

(9.8%). Also, in 21 patients, the 1st and 2nd radiographic diagnoses were confirmed with the modified histopathologic diagnoses in 17 (80.9%) subjects, and in 4 (19.1%) subjects no confirmation was found (Table 3).

Instances of exophytic lesion in which there is a disagreement between the results of their clinical or radiographic diagnoses with histopathologic diagnosis are listed in Table 4.

Table 2. Frequency rate of investigated cases based on analysis of concordance rates of 1st clinical and radiographic diagnoses with histpathologic diagnosis

Concordance of 1st clinical with histopathologic diagnosis	Concordance of 1st radiographic with histopathologic diagnosis	First radiographic diagnosis is confirmed histopathologically	First radiographic diagnosis is not confirmed histopathologically	Total
		Number (Percentage)	Number (Percentage)	Number (Percentage)
First clinical diagnosis is confirmed histopathologically		14 (66.7%)	0 (0%)	14 (66.7%)
First clinical diagnosis is not confirmed histopathologically		1 (4.8%)	6 (28.6%)	7 (33.3%)
Total		15 (71.4%)	6 (28.6%)	21 (100%)

Table 3. Frequency rate of investigated cases based on analysis of concordance of 1st & 2nd clinical and radiographic diagnoses with modified histopathologic diagnosis

Concordance of 1st or 2nd clinical diagnosis with modified histopathologic diagnosis	Concordance of 1st or 2nd radiographic diagnosis with modified histopathologic diagnosis	1st or 2nd radiographic diagnosis confirmed with modified histopathologic diagnosis	1st or 2nd radiographic diagnosis not confirmed with modified histopathologic diagnosis	Total
		Number (Percentage)	Number(Percentage)	Number(Percentage)
1st or 2nd clinical diagnosis confirmed with modified histopathologic diagnosis		16 (76.1%)	1 (0%)	17 (80.8%)
1st or 2nd clinical diagnosis not confirmed with modified histopathologic diagnosis		1 (4.8%)	3 (100%)	4 (19.2%)
Total		17 (80.9%)	4 (19.1%)	21 (100%)

Table 4. Instances (n=10) of exophytic lesion in which there is disagreements between the results of their clinical or radiographic diagnoses with histopathologic diagnosis

Patient's No.	Lesion's Type	1st clinical diagnosis	2nd clinical diagnosis	1st radiographic diagnosis	2nd radiographic diagnosis	Pathologic diagnosis	Modified pathologic diagnosis	Conformity of 1st or 2nd clinical diagnosis with modified histo-pathologic diagnosis	Conformity of 1st or 2nd radiographic diagnosis with modified histo-pathologic diagnosis
7	peripheral	Salivary gland's tumor	Salivary gland's hyperthrophy	(-)*	(-)*	Salivary gland's hypertrophy	Salivary gland's hypertrophy	Yes	(-)*
9	Central	Central giant cell granuloma	Ameloblastoma	Cemento-ossifying fibroma	Fibrous dysplasia	Cemento-ossifying fibroma	Cemento-ossifying fibroma	No	Yes
12	Central	Central giant cell granuloma	Radicular cyst	Radicular cyst	Central giant cell granuloma	Aneurysmal bone cyst	Aneurysmal bone cyst	No	No
19	Central	Dentigerous cyst	Adenomatoid odontogenic tumor	Dentigerous cyst	Adenomatoid odontogenic tumor	Infected lateral periodontal cyst	Infected follicular cyst	Yes	Yes
21	Central	Cemento-ossifying fibroma	Fibrous dysplasia	Cemento-ossifying fibroma	Fibrous dysplasia	Fibrous dysplasia	Fibrous dysplasia	Yes	Yes
26	peripheral	Verrocus carcinoma	Peripheral giant cell granuloma	Peripheral giant cell granuloma	Eosinophilic granuloma	Pyogenic granuloma	Pyogenic granuloma	No	No
28	Central	Cemento-ossifying fibroma	Fibrous dysplasia	Cemento-ossifying fibroma	Fibrous dysplasia	Focal cemento –osseous dysplasia	Focal cemento –osseous dysplasia	No	No
37	peripheral	Neurofibroma	Hemangioma	(--)	(--)	Hemangioma	Hemangioma	Yes	--
39	peripheral	Peripheral giant cell granuloma	Not mentioned	(--)	(--)	Neurofibroma	Neurofibroma	No	--
41	Central	Lymphoma	Metastatic tumor	Hyperparathyroidism	Paget's disease	Fibro-osseous lesions	Lymphoma	Yes	No

* The lesion was peripheral and there was no intra-bone change; thus, no radiographic diagnosis was mentioned

Discussion

It has been accepted that a close dialogue between the referring clinician and the reporting pathologist is beneficial to enhance the accuracy of the histopathologic diagnosis (7,8).

Pathologists value the clinical and radiographic details, and the provision of a clinical diagnosis or a differential diagnosis provides the pathologist with a summation of the clinician's thoughts regarding the biopsied lesion. Furthermore, an indication from the clinician of the context of the implied prognosis of the lesion (i.e., clinical suspicion of an existence of malignancy or a premalignant risk) helps the pathologist to plan the sectioning of the sample in the appropriate fashion to ensure adequate representation of the lesion for the histopathologic examination.

By comparing this study to similar studies, we did not find any close title, objective or method. However, Sardellah et al. (9) compared the accuracy rate of oral medicine prior to referring the patients with histopathologic diagnoses to an Oral Medicine Department. It was a retrospective investigation on the patients' referral forms during the last three years, conducted by family physicians with no dental degree, other categories of physicians, and general dental practitioners. Of 678 subjects, 305 (45%) included clinical diagnoses and no radiographic diagnoses of lesions had been given. Finally, it was proposed that Italian physicians and dentists had limited information in oral medicine.

Williams et al. (10) in their 20-year study recorded an overall concordance rate of 44.6%, 53.6%, and 56.4% in 1975, 1984, and 1994, respectively, for the GDPs. In contrast, Bornstein et al. (8) reported that a specialist's diagnosis was more accurate than the referring clinician's diagnosis (70% compared with 6.6%, respectively).

Hoseinpour Jajarm and Mohtasham (6) evaluated the concordance between clinical diagnosis and pathology report of patients referring to department of oral medicine of Mashhad Faculty of Dentistry and revealed 81.2% of the clinical diagnoses were consistent with pathology reports. In 18.8%, the clinical diagnosis was not confirmed histopathologically. The greatest concordance was observed for lichen planus, inflammatory hyperplasia and leukoplakia whereas pemphigus, SCC and systemic lupus erythematosus revealed the lowest concordance.

Deihimi et al. (11) worked on archaic files in a retrospective study in which only the title was somehow similar to this study. Thirty-four of them did not have definite clinical or histopathologic diagnosis and no radiographic discussion was included. In fact, only the accuracy rates of clinical diagnoses with histopathologic diagnoses were consistent, while not mentioning lesions' types and reasons for differences in diagnoses.

Powsner et al. (12) in an investigation titled "Clinicians Are from Mars and Pathologists are From Venus" compared the clinicians' comprehension with pathologists' intents in written pathology reports. They concluded that the surgeons misunderstand pathologists' reports at 30% of the time, surgical experience reduced but did not eliminate the problem, a communication gap existed between pathologists and surgeons as well as familiarity with report format and clinical experience helped reduce this gap.

Basically, the ideal to reach the final diagnosis is to evaluate all clinical and radiographic findings and histopathology of the lesion altogether which lead to a diagnostic agreement, acceptable to all. Clinical diagnosis of a central lesion necessitates radiographic interpretation. It is followed by removing the bone from the upper level of the lesion for biopsy by a surgeon and determining its exact location and nature. In some subjects, this occurs superficially and only from epithelium changes located in the surface of submucosal and non-epithelial lesion (pseudo epithelial hyperplasia) in which probability of SCC report is high (13,14).

For example, in this study, biopsy from the bone reaction around lymphoma without adequate depth and extension caused false diagnosis and a fibro-osseous lesion was reported (Fig. 1 and Table 4). Also, due to disregarding radiographic feature of a central lesion, the pathologist reported a lateral periodontal cyst for a follicular cyst (Fig. 2).

Moreover, an atypical appearance in Aneurismal Bone cyst (ABC) contributed to false clinical and radiographic diagnoses. This lesion caused perforation in the cortex of bone which was a false characteristic for diagnosis (15). Inaccurate background history in another patient resulted in another clinical misunderstanding. It was due to his low-level of education and therefore poor cooperation between him and the clinicians.

Color change to purple in some regions of the lesion, 2-month duration according to the patient's report, and a saddle-shaped appearance indicated that the clinical diagnosis was PGCG (13,16), although the pathologist reported neurofibroma.
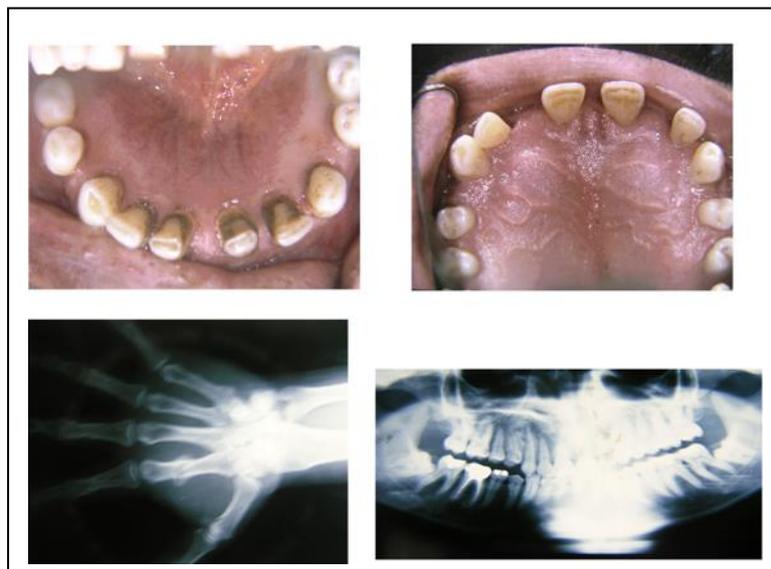
Figure 1. Lymphoma: clinical and radiographic features

Figure 2. Infected follicular cyst: clinical and radiographic features

In another subject, rapid investigation disregarding occlusal and periapical radiographs led to a false clinical diagnosis, also. For the lesion located in the anterior part of mandible (17), central giant cell granuloma (CGCG) was suggested whereas the pathologist's report was cemento-ossifying fibroma (COF) (Fig. 3).

In the last subject, because of a rough surface with some keratotic areas, irritated by denture, and saucer-shaped erosion, the histopathologic diagnosis for this peripheral lesion was pyogenic granuloma (10,11). However, in the same subject, the first clinical diagnosis was verrucous carcinoma and the second was a peripheral GCG with pseudo epithelial hyperplasia, which is an atypical form of pyogenic granoluma (Fig. 4).

The clinical, radiographic, and histopathologic similarities between various oral and jaw exophytic lesions sometimes make the diagnostic agreement impossible. Moreover, expert specialists can arrive at the best treatment plan when considering the importance of lesion characteristics. According to some failures reported in clinical diagnosis, attention to details in clinical examination and taking history is recommended to reach a correct diagnosis.
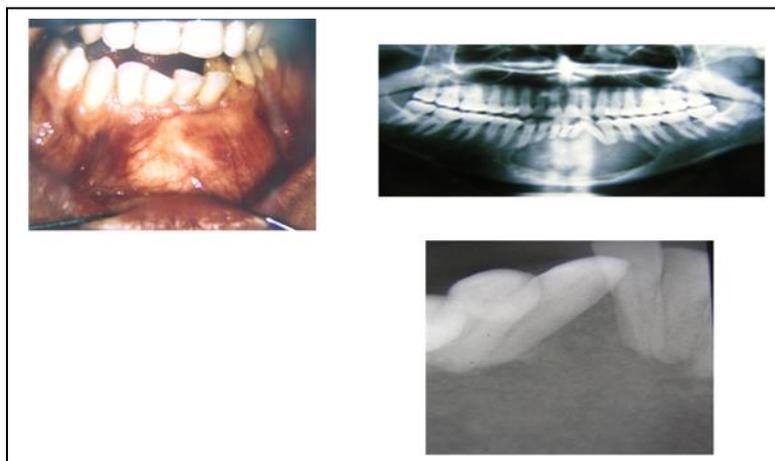
Figure 3. Cemento-ossifying fibroma: clinical and radiographic features

Figure 4. Pyogenic granuloma: clinical and radiographic features

Conclusion

The clinical, radiographic, and histopathologic concordance achieved by oral health care practitioners in Mashhad Dental School was moderate and endorses the need for histopathologic assessment to complement the clinical and radiographic assessment in the definitive diagnosis of oral exophytic pathologic features.

Acknowledgement

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