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Diagnostic Accuracy of FNAC vs Histopathology in the Oral Lesions

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ABSTRACT

The oral cavity is complex and is an abode to a diverse range of pathologies. Clinicians encounter various oral lesions, arising from a range of different etiologies. Both the diagnosis and treatment of oral cavity lesions are integral parts of oral health care. Diagnostic techniques like cytopathology and histopathology are used as gold standards to diagnose oral lesions. However cytological evaluation in oral lesions is limited owing to heterogeneity of cell populations and difficulties in obtaining sufficient sample for aspirations.

The objective of this study was to evaluate the ability of cytological procedures to accurately diagnose and to correlate the same with clinical and histopathological diagnosis. The study showed that in majority of the cases, the final histopathological diagnosis was different when compared to clinical and cytopathological diagnosis thus proving that the histopathological diagnosis is more accurate and appropriate.

Keywords: FNAC, Cytology, Histopathology

INTRODUCTION

The oral cavity is home to a diverse range of cysts, neoplasms and tumors. Early and accurate identification of these is a priority to establish a proper treatment plan and minimize the risk to the patient.[1] The art and science of cytology and cytopathology was recognized and implemented as early as the 18th and 19th centuries.[3] However the progress and the standardization of this branch of pathology was not found completely, until the late years of the 20th century. The first American Board of Examination in cytopathology was undertaken in the year 1989. The science of cytopathology is currently well standardized with two major branches, exfoliative and aspirational cytology.

Cytological study of oral cells is a non invasive technique that is well accepted by the patient. They are affordable, either minimally or non-invasive and the interpretation is quick. Additionally, material obtained by these procedures can also be used for cytologic ancillary testing, microbiology culture, and molecular studies. However its limitations such as low sensitivity, the need for additional staining, interpretation challenges, and sample quality concerns, must be carefully considered to ensure accurate diagnosis and effective patient management. There also exists a less than 1% probability of needle tract metastasis or tumor seeding.[2]

Biopsy on the other hand is an invasive technique with surgical implications and technique limitations. It allows for excellent sample collection. There are two types commonly performed; Incisional biopsy and excisional biopsy. The type depends on the

size and site of the lesion and the amount of sample required.

Even though biopsy is fundamental, it is a diagnostic method with limited sensitivity as it depends on the subjective interpretation of the examining pathologist. It also has psychological implications for many patients. It can also lead to complications such as bleeding, infection, swelling and damage to the adjacent structures. If an incisional biopsy is performed, future procedures may be required as well.[3] In some lesions the need for open biopsy procedure can be avoided with appropriate and accurate cytology. Hence the objective of this study was to evaluate the ability of cytological procedures to accurately diagnose and to correlate the same with clinical and histopathological diagnosis.

MATERIALS & METHODS

This study was conducted in the Department of Oral Pathology, The Oxford Dental College. Total number of 26 cytopathological cases were taken for the study from the archival cases. The cytological diagnosis of these cases was correlated with the clinical and histopathological diagnosis.

RESULT

Demographic Data:

Table 1: Genders

Male	Female
16	10

Table 2: AGE

<20	20-40	40-60	>60
2	9	11	4

Table 3: Type of sample

CYTOLOGY		HISTOPATHOLOGY	
FNAC	**EXFOLIATIVE**	**EXCISIONAL**	**INCISIONAL**
22	4	6	4

Table 4: Master chart

S. No	Age	Gender	Clinical diagnosis	Cyto Pathological procedure	Cyto-Pathological report	Type of biopsy	Histopathology report
1	70	F	Candidiasis	Exfoliative	Candidal infection	Incisional	Oral candidiasis
2	36	F	Apthous stomatitis	Exfoliative	Depapillation of dorsum of tongue	-	-
3	42	M	Dentigerous cyst	FNAC	-	-	-
4	14	F	Odontogenic tumor	FNAC	Odontogenic tumor	-	-
5	25	M	Dentigerous cyst	FNAC	Developmental odontogenic cyst	-	-
6	27	F	Dentigerous cyst	FNAC	Infected cyst of odontogenic origin	-	-
7	2.8	F	Oral candidiasis	Exfoliative	Candidal infection	-	-
8	20	F	Residual cyst	FNAC	Non specific inflamation	-	-
9	30	M	Palatal swelling	FNAC	Infected	Incisional	Naso palatine

					odontogenic cyst		duct cyst
10	50	M	Chronic periapical abcess	FNAC	Non specific infection	Excisional	Primary intra osseous squamous cell carcinoma
11	7	M	Pseudomembranous candidiasis	Exfoliative	Probability of allergic response	-	-
12	48	M	Dentigerous cyst associated with Odontoma	FNAC	Infected odontogenic cyst	Excisional	Dentigerous cyst
13	41	M	Periapical cyst	FNAC	Infected cyst	Excisional	Periapical cyst
14	65	F	Radicular cyst	FNAC	In conclusive	Excisional	Unicystic ameloblastoma
15	20	M	OKC	-	-	-	OKC
16	85	M	Residual cyst	-	In conclusive	-	-
17	29	M	Periapical cyst	FNAC	Infected cyst	Excisional	Nasopalatine duct cyst
18	38	F	Infected Radicular cyst	FNAC	In conclusive	-	-
19	45	M	Chronic osteomyelitis	FNAC	In conclusive	Incisional	Moderately differentiated oral squamous cell carcinoma
20	50	F	Ameloblastoma / CEOT	FNAC	Odontogenic lesion	-	-
21	47	M	Infected dentigerous cyst	FNAC	Infected cyst	-	-
22	42	F	Residual cyst	FNAC	In conclusive	-	-
23	65	F	Radicular cyst	FNAC	In conclusive	-	-
24	46	M	Traumatic bone cyst	FNAC	Odontogenic cyst	Excisional	OKC
25	47	M	Aneurysmal bone cyst	FNAC	No definitive diagnosis	Incisional	In conclusive
26	47	M	Minor salivary gland tumor	FNAC	Pleomorphic adenoma	-	-

DISCUSSION

Exfoliative cytology is the microscopic examination of shed, desquamated cells from body surfaces or cells harvested by rubbing or brushing a lesional tissue surface. [4] Fine needle aspirational cytology is the microscopic evaluation of cells extracted through a fine gauge needle from a lesional site. The role of fine needle aspiration cytology/biopsy (FNAC/FNAB) in the diagnostic evaluation of neoplastic and non-neoplastic lesions has increased dramatically.[5] This cost-effective and easy procedure can reduce the need for conventional biopsies, which are more traumatic.[6,7] However over the years histopathological examination is regarded as the gold standard in diagnostic oral pathology to confirm the clinical diagnosis. Hence the objective of this study was to investigate the ability of cytological procedures to accurately diagnose oral lesions and to correlate the same with clinical findings and histopathological diagnosis.

Out of 26 cases of our study, 16 were males and 10 were females. The most commonly affected age group was 40-60 year age group, followed by 20-40 year age group, the >60 year age group was next and the least affected was <20 year age group.

Table 3 shows that for 22 cases FNAC was done and 4 cases exfoliative cytology was done. 10 of these cases had a follow-up and underwent biopsy for histopathological diagnosis. Of these 10 cases, excisional

biopsy was done for 6 cases and incisional biopsy for 4 cases. The fundamental indication for FNAC is a lesional mass that is palpable or visible by an imaging method. This technique may also assist in establishing a specific diagnosis for radiolucent lesions of the jaw. Thinning and destruction of cortical bone allows the use of thin needles to aspirate such lesions.[14] 16 cases out of 26 were clinically diagnosed as Odontogenic cysts and FNAC procedure was performed. 7 cases cytologically confirmed the clinical diagnosis and 4 cases confirmed them through histopathology.

OSCC accounts for about 90% of all the malignancies in the oral cavity.[8] Among 26 cases, 1 case was histopathologically reported to be primary intraosseous squamous cell carcinoma whose FNAC was reported as non-specific infection and clinical diagnosis was of chronic periapical abscess. 1 case was histopathologically reported as moderately differentiated OSCC with clinical diagnosis of osteomyelitis and the cytology report was inconclusive.

Salivary gland fine-needle aspiration cytology has become an accepted method of evaluating salivary gland tumors preoperatively.[9] 1 case with clinical diagnosis of minor salivary gland tumor was cytologically reported as pleomorphic adenoma.

Oral candidiasis (OC) is a very common fungal infection of oral cavity. In our study, 3 cases reported of oral candiasis which was further confirmed cytologically.

The diagnosis and treatment of oral cavity lesions is an integral part of oral health care.[10] We correlated the cytological diagnosis with clinical and histopathological diagnosis, the diagnosis was same in 3 cases. In 10 cases the cytological findings were same as in clinical diagnosis, 4 cases showed similar diagnosis in both cytopathology and histopathological study. However 8 cytopathological reports were inconclusive, 12 reports were non-specific. All 10 histopathological reports were conclusive and specific.

CONCLUSION

In conclusion, both cytopathological and histopathological tests play crucial roles in the diagnosis and management of various diseases, particularly cancers. Cytopathology offers a less invasive, faster, and more cost-effective method for obtaining diagnostic information, making it ideal for initial screenings and the evaluation of readily accessible tissues or fluids. However, its limitations in providing a comprehensive architectural context often necessitate further analysis through histopathology, which remains the gold standard for definitive diagnoses.

Histopathology, with its ability to assess tissue architecture and provide a detailed examination of disease processes, offers a more thorough and precise diagnostic approach. Despite being more invasive and time-consuming, its value in guiding treatment decisions and prognosis is unparalleled.

Ultimately, the choice between cytopathology and histopathology depends on the clinical context, the nature of the suspected disease, and the need for either a preliminary assessment or a definitive diagnosis. The complementary use of both techniques ensures a more accurate and comprehensive understanding of disease pathology, leading to better patient outcomes.

The current study compared the cytopathology with histopathological diagnosis. Our study showed changes in the final diagnosis when compared to clinical and cytopathological diagnosis thus proving that the histopathological diagnosis is more accurate and appropriate.

Declaration by Authors

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REFERENCES

1. Farzinnia G, Sasannia M, Torab Si, Rezazadeh F, Ranjbaran A and Azad A. Correlation between Clinical and Histopathological Diagnoses in Oral Cavity Lesions: A 12-Year Retrospective Study. International Journal of Dentistry. 2022.
2. Mehrotra R, Gupta A, Singh M, Ibrahim R. Application of cytology and molecular biology in diagnosing premalignant or malignant oral lesions. Molecular Cancer 2006. 5 : 11
3. Abbadi M A. Basics of cytology. Avicenna J Med. 2011 Jul-Sep; 1(1): 18–28.
4. M, S., Mohanty, L., Srinivasan, S., Jamadar, S., & Y, K. (2020). Comparison of cytological changes on palmar surface prior and post usage of alcohol based hand sanitizer in health care professionals during covid 19 pandemic. A pilot study. International Journal of Medical Science And Diagnosis Research, 4(10). https://doi.org/10.32553/ijmsdr.v4i10.682
5. Singh S, Garg N, Gupta S, Marwah N, Kalra R, Singh V, Sen R. Fine needle aspiration cytology in lesions of oral and maxillofacial region: Diagnostic pitfalls. J Cytol. 2011 Jul;28(3):93-7. doi: 10.4103/0970-9371.83461. PMID: 21897540; PMCID: PMC3159298.
6. Ufuk Tatli,Özgür Erdoğan,Aysun Uğuz, Yakup Üstün,Yaşar Sertdemır,and İbrahim Damlar. Diagnostic Concordance Characteristics of Oral Cavity Lesions. Volume 2013, Article ID 785929
7. Munazza Gillani , Farhan Akhtar, Zafar Ali, Irum Naz, Muhammad Atique, Muhammad Tahir Khadim. Diagnostic accuracy, sensitivity, specificity and positive predictive value of fine needle aspiration cytology (FNAC) in intra oral tumors. Asian Pacific Journal of Cancer Prevention, Vol 13, 2012
8. Dr Seema M ET AL. An Insight into Field Cancerization Through basic Fibroblast Growth Factor in Radical Neck Dissection. 2020; IJDSIR, 3 (5): 215 - 220
9. Griffith CC, Pai RK, Schneider F, Duvvuri U, Ferris RL, Johnson JT, Seethala RR. Salivary gland tumor fine-needle aspiration cytology: a proposal for a risk stratification classification. Am J Clin Pathol. 2015 Jun;143(6):839-53.
10. Meira HC, De Oliveira BM, Pereira IF, Naves MD, Mesquita RA, Santos VR. Oral candidiasis: A retrospective study of 276 Brazilian patients. J Oral Maxillofac Pathol 2017; 21:351-5

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