

## Case Report

# Harnessing stereomicroscopy in pathological diagnosis: A case report on oral mucocele

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## ABSTRACT

The pre-analytic phase of a histopathology laboratory begins with the gross examination of biopsy specimens for orientation and dissecting the area of suspicion in histological diagnosis. This step is routinely performed by junior residents or laboratory technicians and very rarely by the diagnosing pathologists. Following conventional method of grossing, the macroscopic features recorded are subjective and limited and the photographs taken of the surgical specimens are often pixilated when magnified. The present case report describes the application of stereomicroscopy in gross examination of a case of oral mucocele and its function in histologic diagnosis.

**Keywords:** Stereo zoom microscope, Oral mucocele, Gross examination, Macroscopy

## INTRODUCTION

Histopathological examination is a vital component in attaining a confirmatory diagnosis of a pathological lesion. Any artifacts or inaccuracies can lead to compromising diagnosis. Tissue specimens received for microscopic observation have to be gross examined for recording the macroscopic features before tissue processing. Grossing is a challenging procedure when done with naked eyes, that is, conventionally, which, unfortunately, is also the most underrated step in the pre-analytic phase of tissue processing. Moreover, the specimens received may not be adequate to enable proper grossing and dissection. The stereo zoom microscope when used as an adjunct to the macroscopic observation facilitates the pathologist to avert the inadvertent errors that are frequently encountered in gross examination. This microscope can aid in the correct identification and proper orientation of the specimen due to its functionality of three-dimensional imaging with a wide zoom ratio and high numerical aperture.

This article presents a case report of an oral mucocele in which a stereo zoom microscope was used as an aid in grossing to enhance the macroscopic recording of the biopsy specimen and to correlate with the histopathological analysis.

## CASE REPORT

A 23-year-old male patient reported to a private dental clinic with the chief complaint of swelling on the inner aspect of the lower lip for the past 2 weeks. Patient's history revealed trauma to

the lower lip before 3 weeks. Intraoral examination showed a swelling which was soft, round, hemispherical, and bluish in color. The lesion was non-tender, movable, and fluctuant. Based on the history and clinical findings of the lesion, a provisional diagnosis of oral mucocele was given. For confirmatory diagnosis, the surgically excised lesion was sent for histopathological diagnosis to the department of oral pathology and oral microbiology.

Gross examination with naked eye in the daylight revealed a central whitish blue color fluid-filled cavity surrounded by yellowish-brown tissue along with a part of tissue which was brown in color that appeared to be a minor salivary gland. The blue mucinous material had an amorphous appearance, a jelly consistency when manipulated with tweezers and did not have cellular architecture [Figure 1]. On stereomicroscopic evaluation, in addition to the above features, an obvious separation of the content with the enclosed tissue was observed and it was compelling to note the white to whitish-yellow color thin, loosely layered connective tissue with shadow of blood vessels in between. In the area of salivary glands, brown-colored irregular projections and salivary ducts were observed [Figure 2].

The histopathological features of the soft-tissue lesion under compound microscope displayed the presence of amorphous material like mucous-filled spaces containing numerous chronic inflammatory cells such as mucinophages (mucin-engulfed macrophages) and lymphocytes [Figure 3]. This space was surrounded by thick fibrous granulation tissue with loose collagen fibers, fibroblasts, enlarged blood vessels, and chronic inflammatory cells. Stratified squamous epithelium of the adjacent oral mucosa is also seen [Figure 4]. Mucous salivary acini and salivary ducts are seen in some areas [Figure 5].

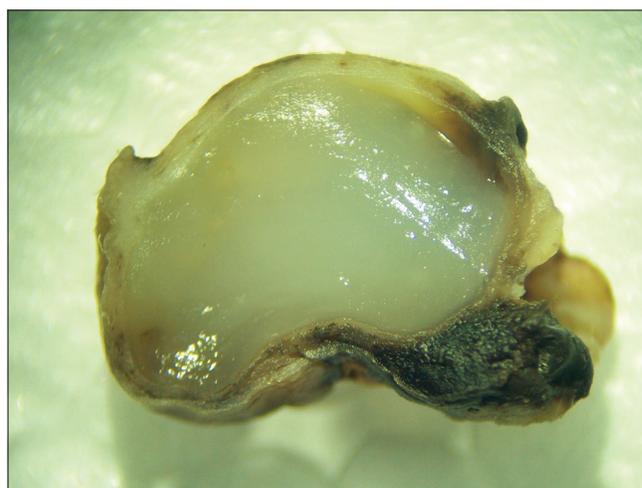
## DISCUSSION

Histopathological diagnoses of the pathological lesions usually correspond to the clinical diagnosis rendered at the time of clinical examination. The specimen obtained from the patient is subjected to a series of steps before placed on

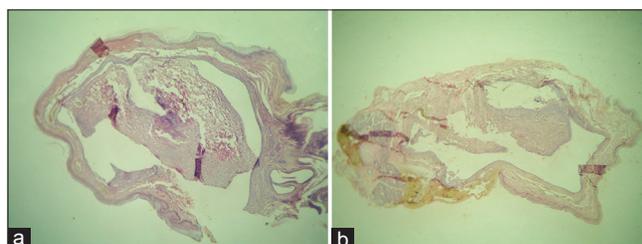


**Figure 1:** Gross examination by conventional method (with naked eye).

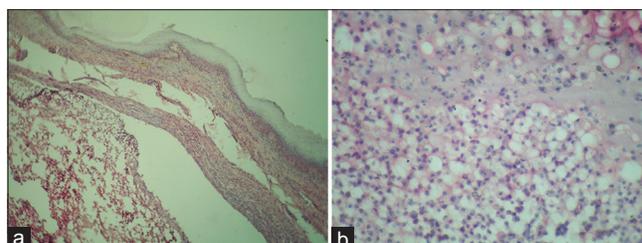
the mechanical stage of the microscope for diagnosis. The preliminary step in histological diagnosis is the macroscopic examination of biopsy specimen which is referred to as "Grossing." This step involves the examination and dissection of the surgical specimens with sectioning of the area of suspicion or interest for microscopic observation.<sup>[1]</sup> This forms one of the most critical step of analyzing the specimen performed with the naked eye in identifying the most appropriate area of the specimen for microscopic observation. The selected sections of the specimen will then be subjected to the tissue processing. Improper grossing can result in incorrect diagnosis which may lead to erroneous treatment and management of patients.



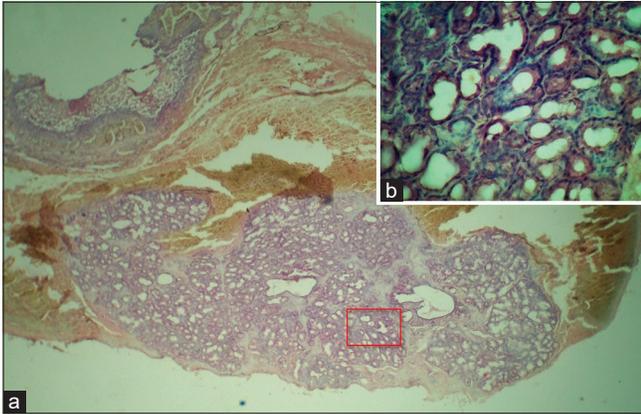
**Figure 2:** Cross-section of an oral mucocele under stereomicroscope (0.4×).



**Figure 3:** (a and b) Histopathological section of oral mucocele under stereo zoom microscope (H&E, 0.4×).



**Figure 4:** (a) Microscopic section of granulation tissue of oral mucocele (H&E, 10×), (b) chronic inflammatory cells seen in mucin-filled cavity (H&E, 40×).



**Figure 5:** Microscopic section of (a) salivary gland acinar cells (H&E,4x) and (b) salivary ducts seen in the oral mucocele (H&E, 40x).

Stereomicroscope is an optical multipurpose instrument invented for observing tissues at low magnification.<sup>[2]</sup> It is also called as dissecting microscope. It uses reflected light from the objects for examination in three dimensions. Using this microscope as an aid to grossing helps us to clearly visualize, orient, and record the macroscopic features of the specimens that are considered as the fundamental requirements of gross examination. Even the dimensional changes that distort the specimen caused as result of tissue processing can be appreciated better under the stereomicroscope.<sup>[3]</sup> The present case in this article is a patient diagnosed with oral mucocele. Mucoceles are the most common benign minor salivary gland disorders and the second most common benign soft-tissue masses of the oral cavity, following fibrous hyperplasia.<sup>[4]</sup> These can be mostly be easily diagnosed clinically with history and clinical examination, biopsy is unwarranted, and since treatment includes surgical excision, the specimens are inevitably sent for histological diagnosis. The present case exhibited the typical clinical features of the mucocele in their origin, location, and appearance.

As part of treatment, surgical excision was performed and sent for histological diagnosis. The specimen was gross examined by conventional method as well as under stereo zoom microscope. The stereo zoom microscope used in this case enables magnification of  $\times 0.4-4.5$ . Under stereomicroscopy, it was fascinating to appreciate the macroscopic features that we expect to see in the histopathological slide. To point out a few, the thin, loose connective tissue with shadow of blood vessels, salivary gland tissue, and the obvious separation of mucinous content with surrounding tissue layers which can only be seen under histopathological slide were visible under low magnification of the stereo zoom microscope. These details were difficult to appreciate or record while grossing only with naked eye. The stereomicroscope, when used,

definitely enhances and provides additional macroscopic features for recording the macroscopic features and enabled the proper dissection when compared with the conventional method of gross examination.

Another advantage is that macroscopic features recorded with the naked eye have its limitations as close observation of the specimen is not possible as formalin vapors can irritate the epithelial linings of the eye and the nasal cavity. Even if one resorts to recording the macroscopic features using a digital camera, the photograph has to be zoomed into to visualize the features which cause pixilation of images. Visual recording of the macroscopic features is also possible either using the same eyepiece camera used for image analysis or using an eyepiece adaptor for mounting a digital camera or smartphone. The desired macroscopic feature can be located in the specimen and if needed can be magnified and thus the loss of clarity or distortion due to digital pixilation is avoided.

## CONCLUSION

Grossing forms one of the most important steps in deriving a confirmatory diagnosis of a pathological lesion. The errors arising during gross examination are carried over to the subsequent steps often leading to a misdiagnosis most of which can be prevented with the use of stereomicroscopy. The present case is a typical example using the stereo zoom microscope in not only aiding in documenting the macroscopic features but also capturing images of the biopsy surgical specimens enhancing the practice of grossing by harnessing stereomicroscope during the pathological diagnosis.

## Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

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## Conflicts of interest

Dr. P. Rajathi, co-author of this manuscript, is Associate Editor of this journal.

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