

# Masterclass in Oral Diseases

## Oral Biopsies

with

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## Oral biopsies, an essential part of dental practice



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### Introduction

A definitive diagnosis for oral diseases/ lesions usually requires a tissue biopsy supported by a histological report from an oral pathologist. This is the gold standard for diagnosing oral diseases/ lesions, however, a diagnosis may be possible based on clinical appearance and a detailed history. In general, a biopsy should be avoided if there is no clear referral plan for a definitive diagnosis and relevant treatment after the removal of the tissue. It is unacceptable to put a patient through a surgical procedure that may have a high-cost impact (when pathology fees are added) and then have no outcome to the process.

This does not imply that, as a clinician, you are required to treat the disease. It just means there must be a prior identified process whereby the patient will be treated for the diagnosed disease/lesion. This may require that the patient needs to travel long distances, and frequently, should the diagnosis be oral cancer. The expertise required to treat an oral disease/lesion, should be identified beforehand and a relationship must be established with a competent referral clinician. Although cancer treatment centres are found in most larger towns/ cities, the surgeons required to perform the final excision biopsy may not be available outside larger metropolises.

In order to understand the histological report and to choose the most appropriate area for biopsy, one must have a thorough knowledge of the histological differences of oral mucosae and the distribution of the different types within the oral cavity. Most biopsies in the oral cavity that are intended to obtain a diagnosis of oral mucosal disease, requires a biopsy with a surgical depth of not more than 3-4mm. This is within the scope of practice of all dentists and all that is needed is to recognise abnormal from normal when examining the oral mucosa.

This Masterclass will have the following learning objectives:

- examination of the oral cavity
- know the different types of oral mucosae
- learn biopsy techniques
- understanding suturing materials and techniques for wound closure.

A video is presented to illustrate the surgical biopsy and suturing techniques (scan QR code).

### Examination of the oral cavity

The oral cavity is anteriorly bounded by the lips, posteriorly by the faucial pillars whilst the hard palate is the superior boundary and anterior two thirds of the tongue and floor of mouth inferior boundary. The oral cavity can be examined by direct vision and palpation and are both actions that are important to detect lesions, lumps, and changes in colour. The clinician must ensure the full extent of the oral cavity is examined, in detail, by vision and palpation. This should be done using the dental light or other source of good illumination.

To examine the oral cavity properly, one must pull the tongue forward and sideways by holding the tip of tongue with gauze (Figure 1).

Using a dental mirror while at same time asking patient to relax the tongue, the tongue can be moved away from teeth to inspect the posterior floor of the mouth (Figure 2).

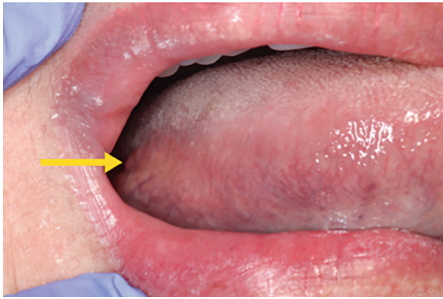


Figure 1: Tongue pulled out with a gauze swab to give a good grip and the lateral aspect inspected all the way to the foliate papillae at the back (arrow)



Figure 2: Tongue moved away from teeth for visual inspection of posterior floor of mouth.

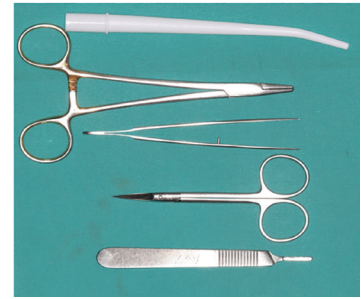


Figure 3: Basic biopsy kit includes Plastic suction with small tip, needle holder, a fine-tipped tissue forceps, suture scissors and scalpel handle.

Oral cancer found in these two areas are often diagnosed late since it is not regularly examined properly as described above. The buccal and lip mucosa are easy to examine, and the complete surface should be inspected and palpated. The tongue can be depressed with the dental mirror to inspect the faucial arches and oro-pharynx as far back as the tonsillar folds- especially if the patient is asked to say "Aah".

### Different types of oral mucosae

The mucous membrane lining the inside of the oral cavity is called the Oral Mucosa and consists of 3 layers, namely, the oral epithelium, lamina propria and oral submucosa. In certain areas the submucosa may be absent and the lamina propria attached directly to underlying muscle or bone. The oral submucosa contains minor salivary glands which are quite numerous, especially in lip mucosa, and can be problematic when taking a biopsy in the latter site.<sup>1</sup>

The oral cavity has three different mucosal surfaces, namely:

- Oral (lining) mucosa, consisting of non-keratinized stratified squamous epithelium. This is found on the movable surfaces inside of lips, cheeks, floor of mouth and ventral surface of tongue. The vermilion or "lip-red" links the labial mucosa with skin at the lips.
- Masticatory mucosa is made up of gingiva and the soft tissue of the hard palate, consisting of keratinized or para-keratinized stratified squamous epithelium tightly bound to underlying bone.
- Specialized mucosa (keratinized or non-keratinized) is found on the dorsal and upper lateral surfaces of the tongue. This is modified for taste and sensory perception and the dorsal surface of tongue is covered in papillae (hairlike filiform and slightly more rounded fungiform papillae) and taste buds. The fungiform papillae may appear as red dots if their surfaces are not keratinized. The posterior border of the oral cavity is formed by the circumvallate papillae on the dorsal surface of tongue.<sup>1</sup>

Oral mucosal epithelium has a high turnover rate and is replaced every 2-3 weeks, with the buccal mucosa

being the fastest at 2 weeks and hard palate the slowest at 24 days.<sup>1</sup> This may explain why white/red lesions may sometimes disappear within weeks if the cause is removed, such as a sharp tooth edge. It also explains the fast healing of oral wounds.

Due to the nature of masticatory mucosa being attached to underlying bone, it is often not possible to close a biopsy wound in attached gingiva/hard palate.

### Biopsy techniques

A biopsy sample of the oral mucosa must be fixed in formalin, as soon as possible, and forwarded to an oral pathologist for a histological evaluation. As a clinician you will almost always ask for the histology to be stained with H&E (haematoxylin and eosin). It is important for clinicians to realise that oral mucosal lesions may be due to a local disease but may also be a manifestation of skin diseases or systemic conditions. This is why it is almost always indicated to take a biopsy of any lesion that does not disappear 2-3 weeks after removing an obvious irritating factor such as a sharp tooth/denture.

The techniques that oral clinicians must master are surgical and punch biopsies. Both are invasive procedures which will lead to bleeding and may need to be closed with sutures. Most oral biopsies are however surgical biopsies that sample a larger area than punch biopsies and will include a normal adjacent tissue field with the abnormal lesion.

### Surgical biopsy (see video for procedure)

Surgical biopsy remains the gold standard for analysis of oral mucosal pathology, and especially for oral cancer.<sup>2</sup> To perform a biopsy, a small surgical instrument set is required (Figure 3), consisting of a fine-toothed tissue forceps (so as not to damage the tissue), a scalpel handle for 15 or 15C scalpel blades, suction with a small 2-3mm tip which can be plastic or metal, needle forceps for suturing and suture scissors (which can also be used for removing pedunculated lesions or extending an incision).

Surgical biopsies can be excisional where the whole



Figure 4a: Pedunculated lesion which can be easily excised using scissors or scalpel.



Figure 4b: Lesion excised and closed with 6/0 sutures.

lesion is removed, if small enough, or incisional where a sample of a large lesion is taken.

### Incisional biopsy

Incisional biopsies should ideally include part of the abnormal lesion and cross the border of the lesion to include some normal tissue as well.

### Incisional biopsies are indicated when:

- The lesion is too large to remove by complete excision.
- A diagnosis is required before a decision is made on the most appropriate treatment, especially if the patient has no symptoms or is not convinced anything is wrong.
- A malignancy is suspected.

### Excisional biopsy

Excisional biopsies (Figure 4a, b) are therapeutic by removing the abnormality and for diagnostic purposes.

Each clinician will have to know their limitations in removing a lesion completely. Novices may want to remove lesions not exceeding 5mm in diameter whereas experienced specialists may remove lesions exceeding 10mm in size or even larger.

As surgical biopsies are invasive, the clinician must plan the closure of the wound before removing the sample/lesion. The buccal mucosa may be much easier to close than the floor of mouth and the lip may require careful planning as the aesthetic demands or risks for creating a surgically

induced defect are high.

Once the size of the incision and the outline is planned, a scalpel blade is used to “draw” the outline by piercing just through the epithelium. This will leave a shallow bleeding line showing the biopsy outline before removing the lesion (Figure 5a-c).

If satisfied with the biopsy size, the incision can be taken 3-4mm deep in a wedge format that will allow easy closure of the wound. The biopsy tissue to be removed can be stabilised by holding it with a fine tissue forceps or by looping a suture through the sample to be removed (This is demonstrated in the video).

If the clinician suspects a malignancy, an excision biopsy should never be attempted, as this will leave no remaining lesion for the surgeon to plan the excisional treatment. Should a clinician be confident that the lesion is malignant, the patient may be directly referred to the surgeon who will perform the biopsy and excision surgery.

When a vascular lesion is to be biopsied, care should be taken as excessive bleeding may result. Excision in such cases would be better as the lesion can be removed without perforation into the vascular part of the lesion (Figures 6a, b).

### Punch biopsy

A punch biopsy is performed with a circular blade on a thin pencil-like handle (Figures 7a, b). The is used in a circular motion to punch through the mucosa into the lamina propria as deep as is deemed necessary.



Figure 5a: White lesion on lip that needs to be excised.

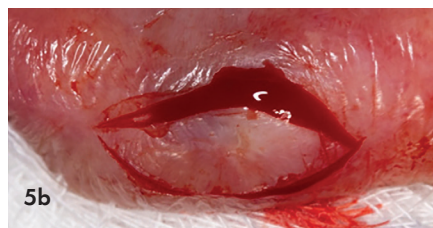


Figure 5b: Biopsy area outlined before cutting deeper to remove the specimen.



Figure 5c: Lesion closed with minimum distortion using a 6/0 suture.



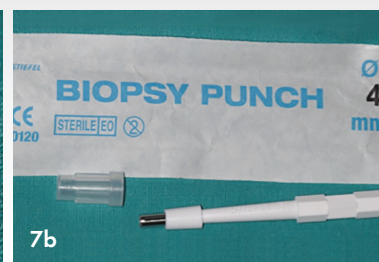
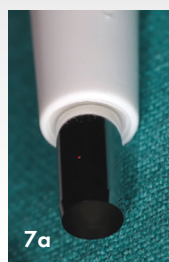


Figure 6a: Vascular lesion that needed to be removed on vermilion part of lip. This type of lesion should be approached with caution to prevent excessive bleeding.

Figure 6b: Vascular lesion excised widely to prevent excessive bleeding and closed with 6/0 suture.

Figure 7a: Biopsy punch with a 4mm diameter which can take a core up to 10mm deep.

Figure 7b: Speak to your local pathology lab about supplying a biopsy punch.

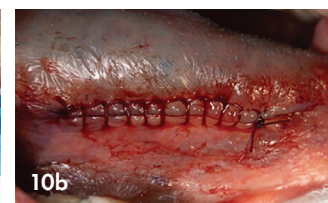
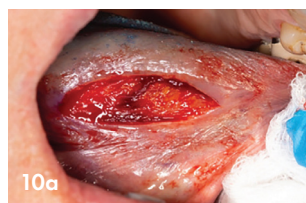
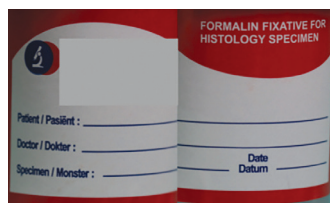
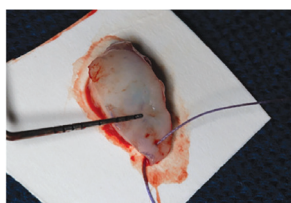


Figure 8: Specimen marked with an orientation suture to indicate anterior aspect and placed on blotting paper to prevent distortion in the formalin.

Figure 9: Labelled specimen bottle with formalin obtained from a pathology laboratory.

Figure 10a: Biopsy wound lateral aspect of tongue.

Figure 10b: Wound closed with a continuous suture with one knot either side of incision. This will be less irritating than individual sutures with multiple knots and is also easier to remove if needed.

A punch biopsy is a very simple procedure and is literally a “Point, push and twist” (see video). It may need a single suture to close if there is profuse bleeding. It is also suitable for multiple biopsies of a large lesion, which may be more representative of the disease than a single surgical biopsy. This is of course much easier than performing a surgical biopsy but has its limitations, namely:

- It harvests a small sample and may not render enough tissue for the pathologist if it is a complex disease or histology. It may be enough for oral cancer though, if taken from the tumour itself and is deep enough.
- Not suitable if the tissue is very soft and mobile.
- Not of value for a pedunculated lesion
- Leaves an open wound in firm tissue that may heal slower and with a scar due to healing by secondary intention.

### Removing and placing sample in biopsy bottle

Once the specimen tissue is removed, it should be placed on a small piece of blotting paper (use any rigid paper if no blotting paper is available) with the bleeding surface on the paper (Figure 8). This will stabilise the specimen and prevent it from rolling up, making it easier for the pathology lab to orientate the specimen correctly. Leave the specimen on the

paper while closing the wound to enable attachment to the paper, before placing it in the formalin, still on the paper. If the specimen needs to be marked with a suture to orientate the pathologist as to which part is anterior/superior, the assistant can hold a gauze on the biopsy wound if it bleeds profusely while the clinician marks the specimen with the suture before placing it on the paper (Figure 8).

Specimen bottles can be obtained from a pathology laboratory or ask your local pharmacist (figure 9).

If multiple specimens are taken, one specimen should be placed per bottle and each clearly marked with the following information:

- Patient’s full name
- Site of biopsy (i.e., left lateral tongue)
- Clinician’s name

The biopsy sample should be accompanied with a histology request form which can be obtained from the pathology lab you will send it to. This form will contain the full detail of patient, medical insurance details and what should be done with the sample (in all oral biopsies transported in formalin the request will be for “H&E histology”). In addition, you should supply the following information on the request form:

- Clinical appearance of lesions
- Duration of lesion and /or symptoms
- Relevant medical history and risk factors- and here of great importance is tobacco use (cigarettes per day for how many years?) and alcohol - how many units per week.
- Clinical differential diagnosis if you have any ideas (i.e. for any ulcer it may be "traumatic ulcer, oral cancer").

### Sutures and suturing techniques

Most biopsies are done in soft mobile tissue which will make the removal of sutures difficult after 7-14 days, since tissue may be swollen and sutures not visible.

It is advisable therefore to use absorbable sutures in case the patient may not be able to return for removal or sutures are too difficult to remove. Absorbable sutures may vary greatly in the time it takes to be absorbed. Chromic gut sutures are fast absorbing and are good alternatives to braided sutures that may take too long to absorb and may cause suture granulomas to form after a few weeks. Rapid absorbing braided sutures are a good alternative and have good knot security but are more expensive.

As suture knots will be irritating to the patient, it is worth utilizing a continuous suture to reduce the number of knots to one on either side of incision. This is demonstrated in the

video and can be seen in Figures 10a, b on the tongue, where knots may be an extra irritation to the patient.

As a rule of thumb, a 4/0 size suture on a reverse cutting needle of 19mm will work for most situations. On the lip vermilion it is better to use a small needle of 11-13mm and 6/0 suture (Figures 5c and 6b). This will be less visible and leave a smaller scar than a 4/0 suture.

### Conclusion

Oral diseases are an important part of dental practice and especially so if referral specialists are not close at hand. The more you involve yourself with oral diseases, the easier it will become to identify abnormalities, perform biopsies, and formulate differential diagnoses. To perform a biopsy is less invasive than removing a tooth and is within the scope of all dentists.

### References

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2. Yang G, Wei L, Thong BKS, Fu Y, Cheong IH, Kozlakidis Z, et al. A Systematic Review of Oral Biopsies, Sample Types, and Detection Techniques Applied in Relation to Oral Cancer Detection. *BioTech (Basel)*. 2022;11(1).