



# Biopsy

# What is a Biopsy ?



- It is the process of taking a piece of tissue from living body for histopathological examination to provide diagnosis and treatment.

## **Autopsy:**

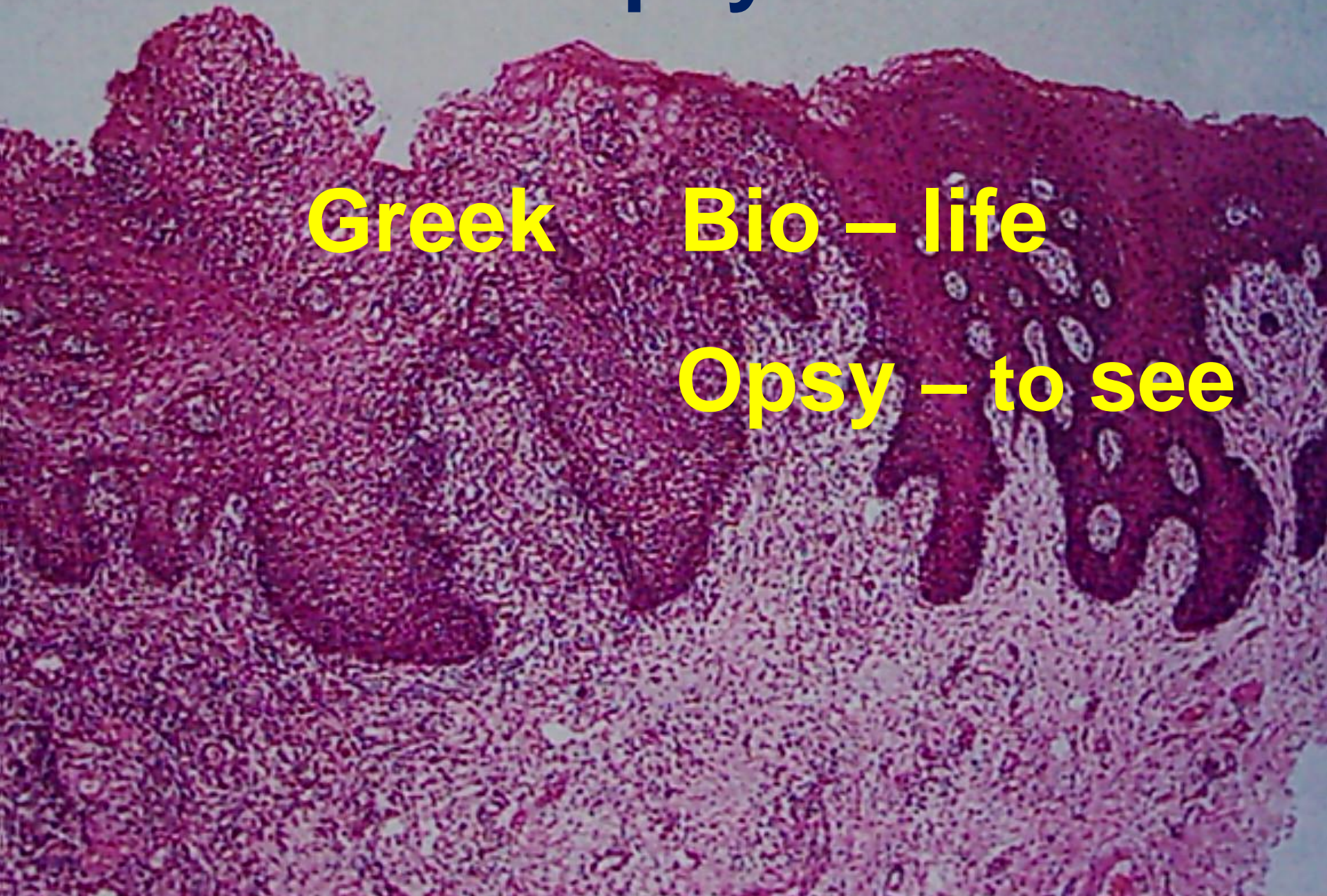
- it refers to the process of taking a piece of tissue from a dead body for establishing diagnosis.

# Biopsy

**Greek**

**Bio – life**

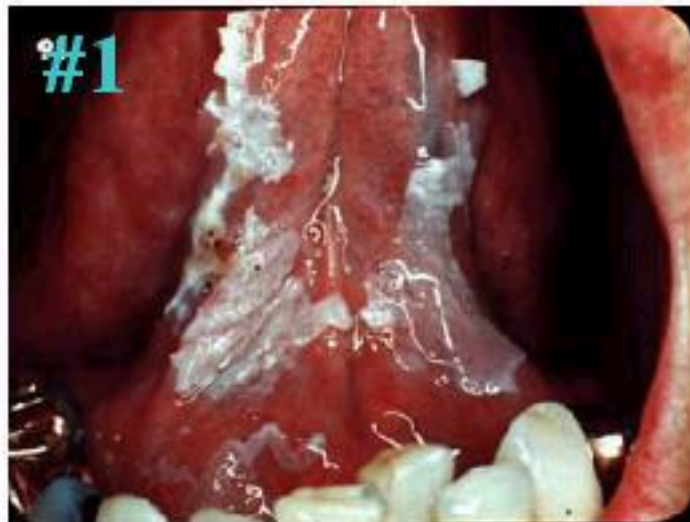
**Opsy – to see**



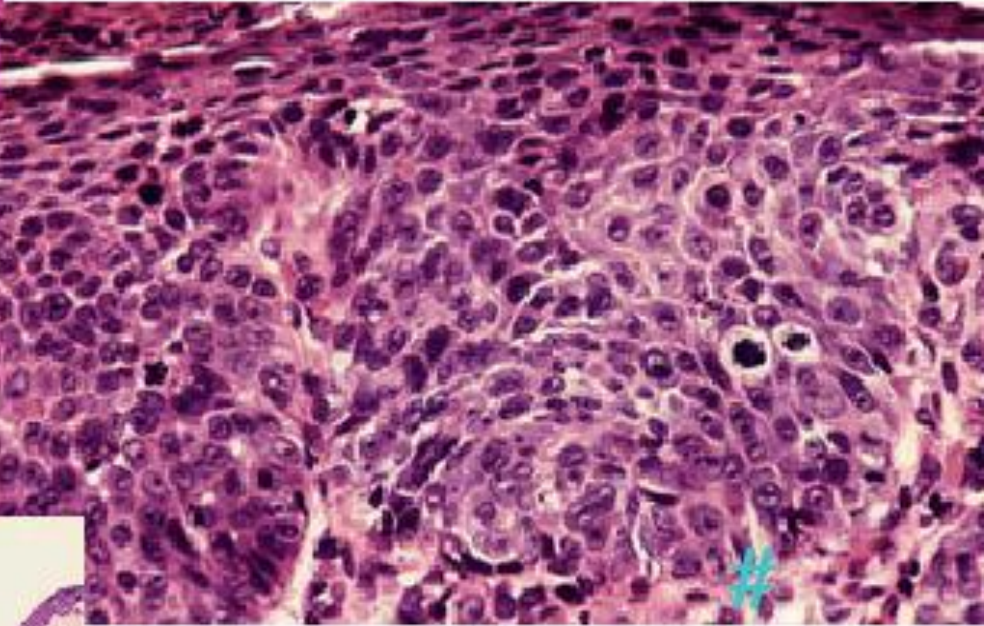
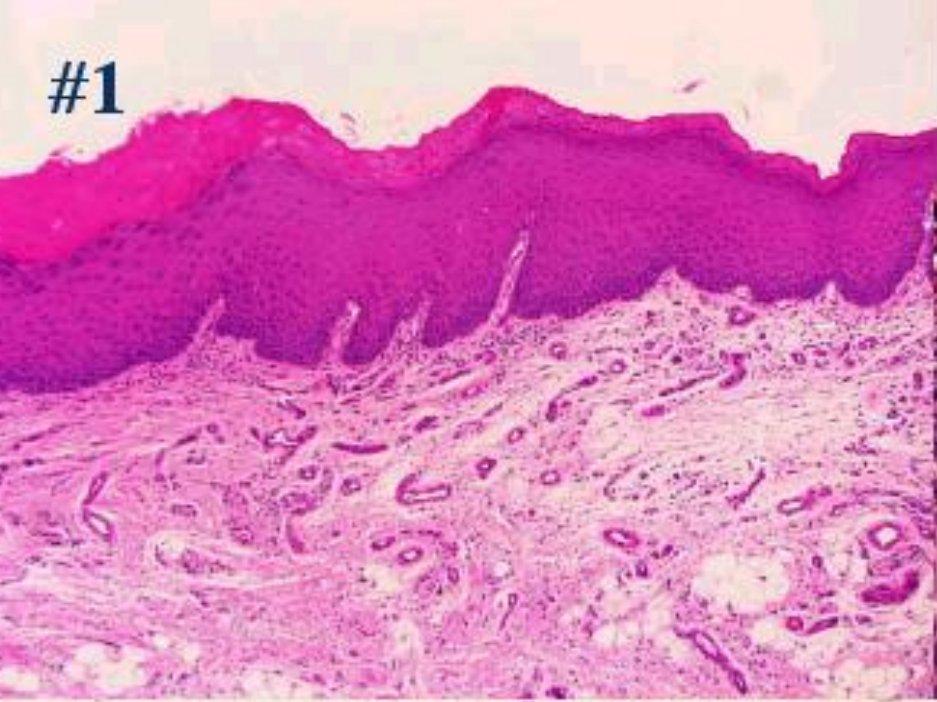
# Differential diagnosis and Reasons for the Histological evaluation (biopsy)

## Example:

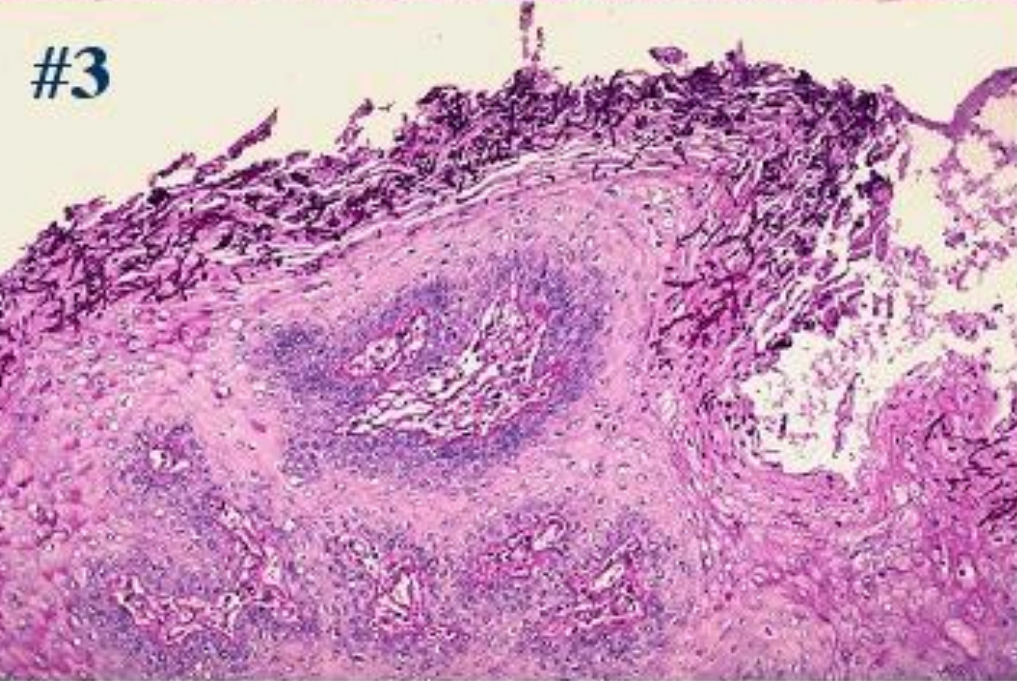
- 3 Cases of asymptomatic white mucosal lesions



#1



#3



2

# Indications for taking a biopsy



- Any lesion that persists for more than 2 weeks with no apparent etiologic basis
- Any inflammatory lesion that does not respond to local treatment after 10 to 14 days ( after removing local irritant )
- Persistent hyperkeratotic changes in surface tissues
- Any lesion which is suspected clinically as neoplasia, whether benign or malignant
- Bone lesions that are not specifically identified by clinical and radiographic finding
- Lesion that interfere with local function  
(e.g fibroma)

# Characteristics of lesions that raise the suspicion of malignancy.

- **Erythroplasia-** lesion is totally red or has a speckled red appearance
- **Ulceration-** lesion is ulcerated or presents as an ulcer
- **Duration-** lesion has persisted for more than two weeks
- **Growth rate-** lesion exhibits rapid growth
- **Bleeding-** lesion bleeds on gentle manipulation
- **Induration-** lesion and surrounding tissue is firm to touch
- **Fixation-** lesion feels attached to adjacent structures

# Types of Biopsy



- **Oral cytology:**
  - Exfoliative biopsy
  - Aspiration biopsy
  - Imprint cytology
- **Surgical biopsy:**
  - Incisional biopsy
  - Excisional biopsy
- **Drill biopsy**



# Oral cytology

**Cytology allows examination of individual cells, but can not provide the histologic features crucial for an accurate & definitive diagnosis.**

# Exfoliative Cytology

**Diagnosis from the cells that are scraped from the surface of a lesion**

# 1- Exfoliative Cytology

## Advantages



- It is a painless, bloodless, quick and simple procedure for general dentist
- Non invasive, so local anesthesia is not required
- It may be helpful when large areas of mucosal changes are noted ( **dysplastic changes** ), or in areas with difficult surgical access



- Useful for detecting virally –damaged cells, acantholytic cells of pemphigus, or candidal hyphae
- Most frequently used to screen for uterine cervix malignancy

# Disadvantage of oral cytology



- Unreliable for diagnosis of cancer (false +ve & false -ve results)
- Small specimen may be unrepresentative
- Expertise in oral cytology is not widely available

# procedures include:



The lesion is repeatedly scraped with a moistened tongue depressor or spatula type instrument.

The cells obtained are smeared on a glass slide and immediately fixed with a fixative spray or solution.







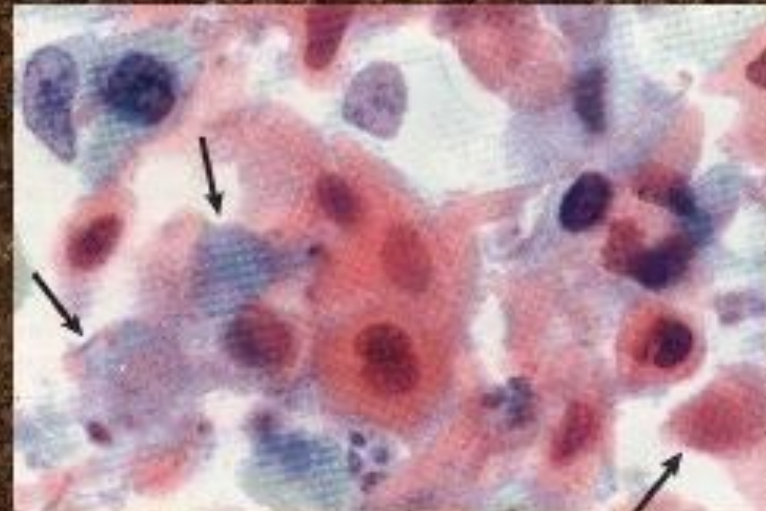
# Exfoliative cytology

EXFOLIATIVE CYTOLOGY  
Only Surface Cells Captured

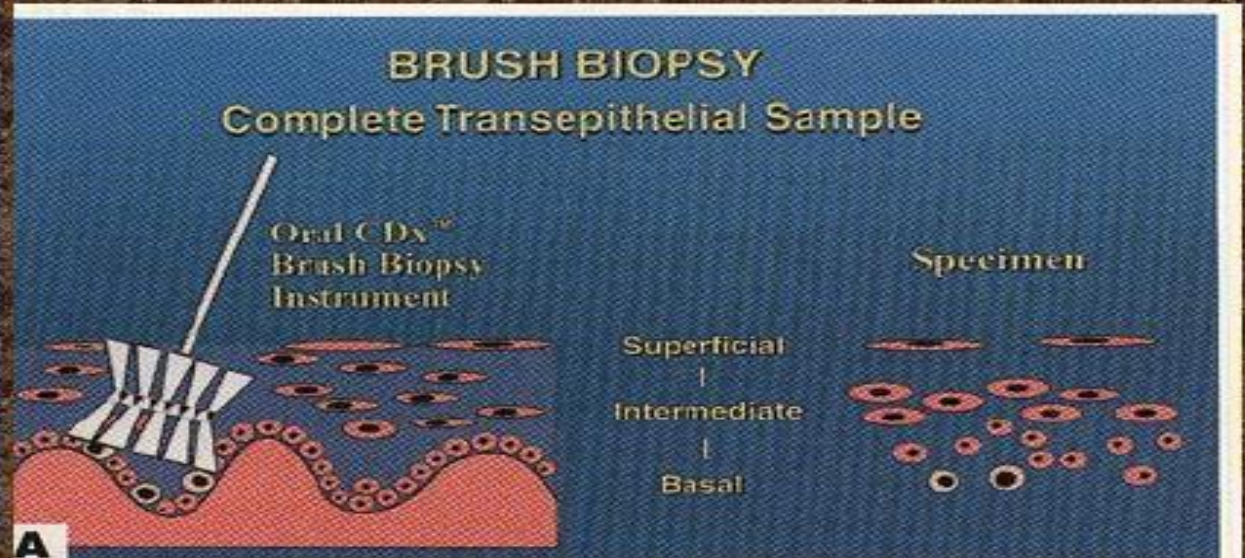
Broom sweep limited  
to superficial cells

Specimen

Superficial  
|  
Intermediate  
|  
Basal



# Brush Biopsy




**This technique uses a round stiff-brush to collect cells from surface & subsurface layers of a lesion by vigorous abrasion**

# **2- Aspiration cytology (FNA )**

## **Fine Needle Aspiration**

Aspiration biopsy is the use of a needle and syringe to penetrate a lesion for aspiration of its contents.

# Indications:

- 
- **To determine the content of the lesion ( fluid, air, or solid)**
  - **To ascertain the type of fluid within a lesion (clear fluid, pus, blood )**
  - Valuable in lymph nodes & parotid gland swelling**

# Aspiration



- An **18** gauge needle on a **5** or **10** ml syringe is inserted into the area under investigation after anesthesia is obtained.
- The syringe is aspirated and the needle redirected if necessary to find the fluid cavity.
- The aspirated material will be expressed onto a glass slide
- Fixing is done in **95%** alcohol, stain with **PAP** or **H&E** stain, then examined within a few minutes

- The inability to withdraw fluid or air indicates that the lesion is probably solid.**
- A radiolucent lesion in the jaw that yields strawcolored fluid on aspiration is most likely a cystic lesion.**
- If purulent exudate (pus) is withdrawn, then an inflammatory or infectious process should be considered.**
- The aspiration of blood might indicate a vascular malformation within the bone**

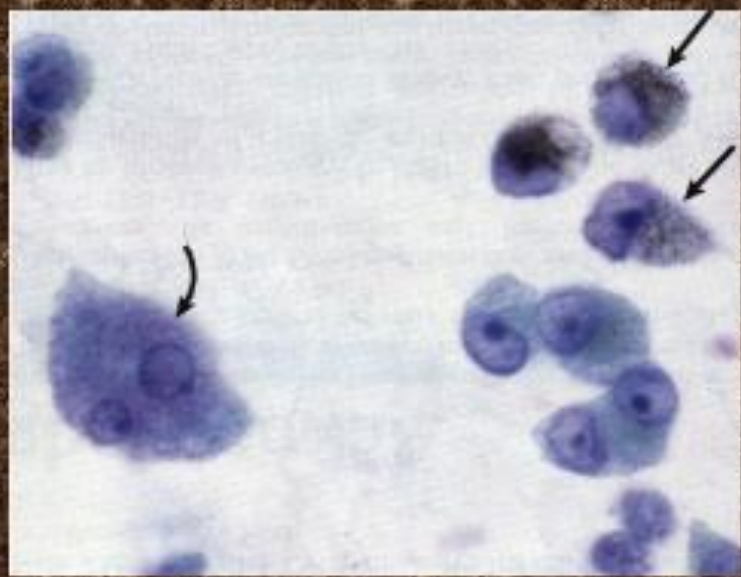
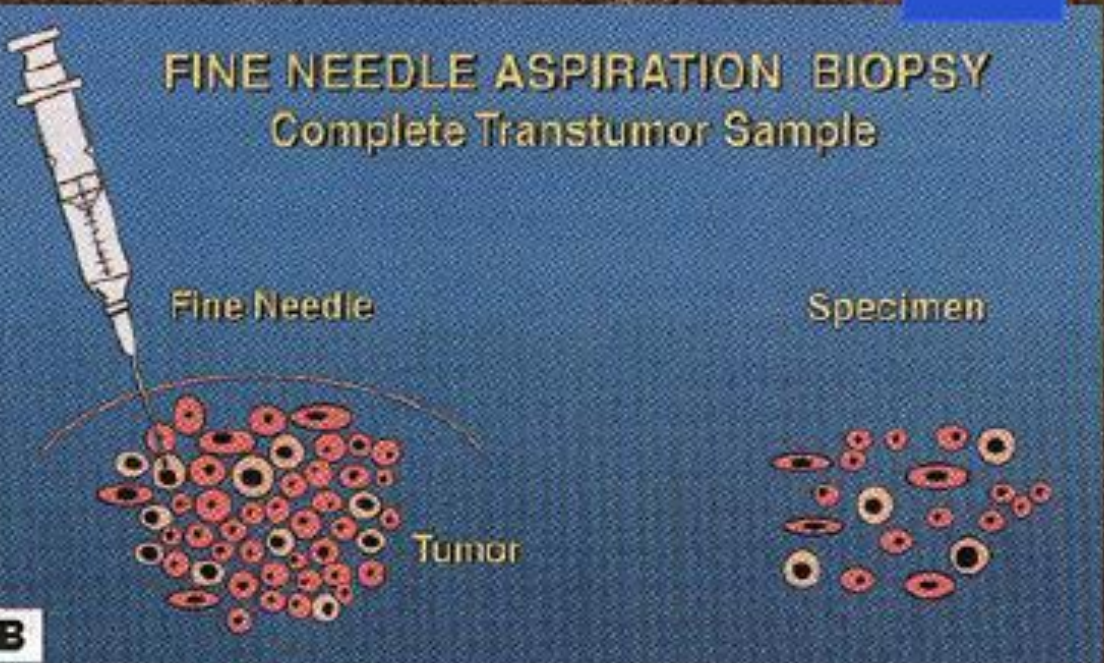


# Fine Needle Aspiration (FNA)





# Fine Needle Aspiration (FNA)



# 3-Imprint cytology



The procedure involves a gentle skidding of a glass slide over the cut surface of a resected tumor immediately after surgery.

The slide is fixed with **95%** ethyl alcohol for **5-6** second, followed by PAP staining that will detect tumor margin positively in less than 20 minutes.

It provides an immediate results with minimal artifacts, faster & cheaper.

The surgeon now gets a directive as to which site he should perform an extra clearance, thereby avoiding majority of recurrence.



# Surgical Biopsy

# A- Incisional Biopsy



- An incisional biopsy is a biopsy that samples only a particular portion or representative part of a lesion.
- If a lesion is large or has different characteristics in various locations more than one area may need to be sampled.
- It is used to determine the diagnosis before treatment.

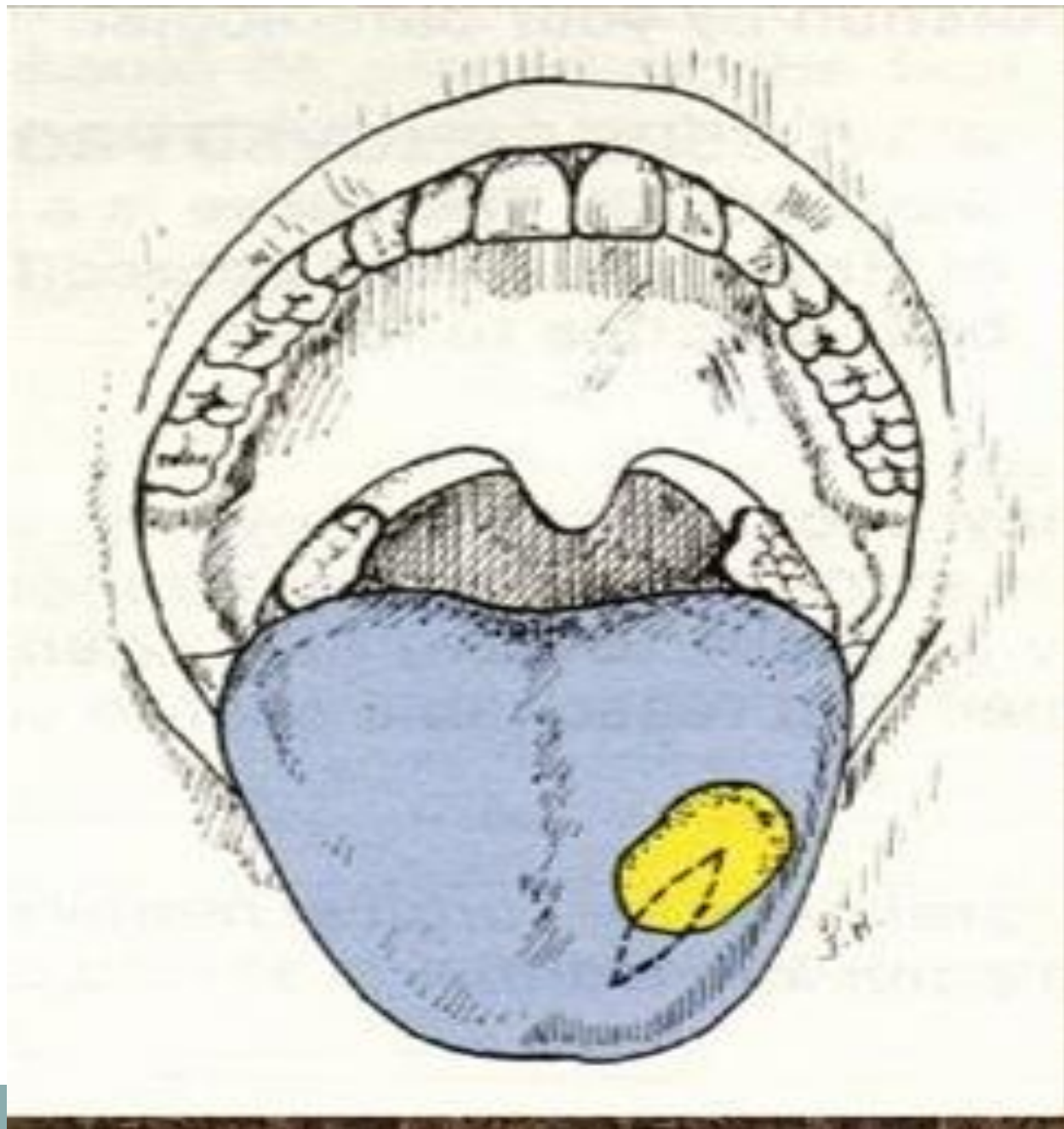


## Indications:

- In case where the lesion is larger than **1 cm** ( size limitation )
- When there is suspicion that the lesion is malignant

# Technique:

- After local anaesthesia, a wedge-shaped portion of the most representative part of the lesion is removed, usually from the periphery of the lesion, extending into the normal tissue as well
- Necrotic tissue should be avoided.
- A narrow deep specimen is better than a broad shallow one.





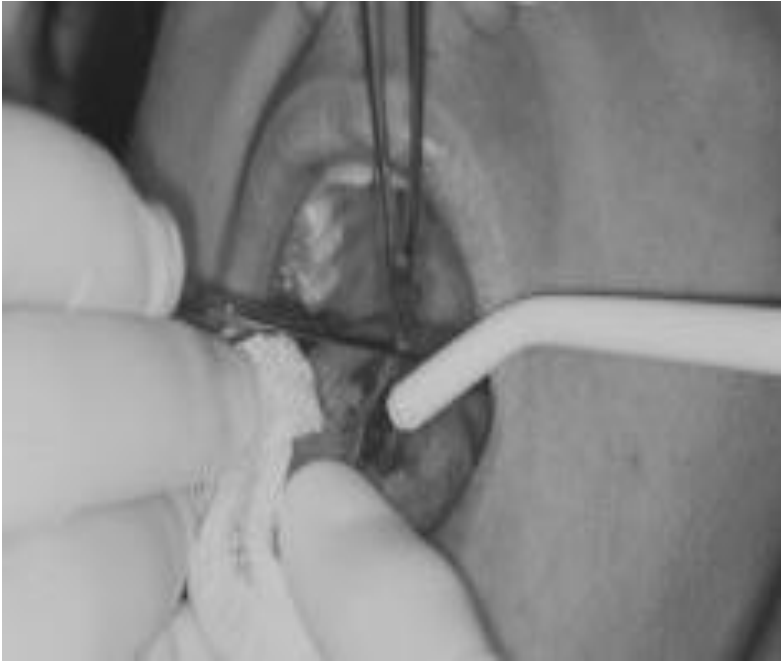
2



1



4



3



6



5



# B- Excisional Biopsy



An excisional biopsy implies the complete removal of the lesion.

It is used to confirm diagnosis & treatment

Indications:

- **Should be employed with small lesions. Less than 1 cm**
- **The lesion on clinical exam appears benign.**
- **When complete excision with a margin of normal tissue is possible without mutilation.**

## *Technique:*

The entire lesion with 2 to 3mm of normal appearing tissue surrounding the lesion is excised if benign.

### **Excisional biopsy**



# **Frozen sections**

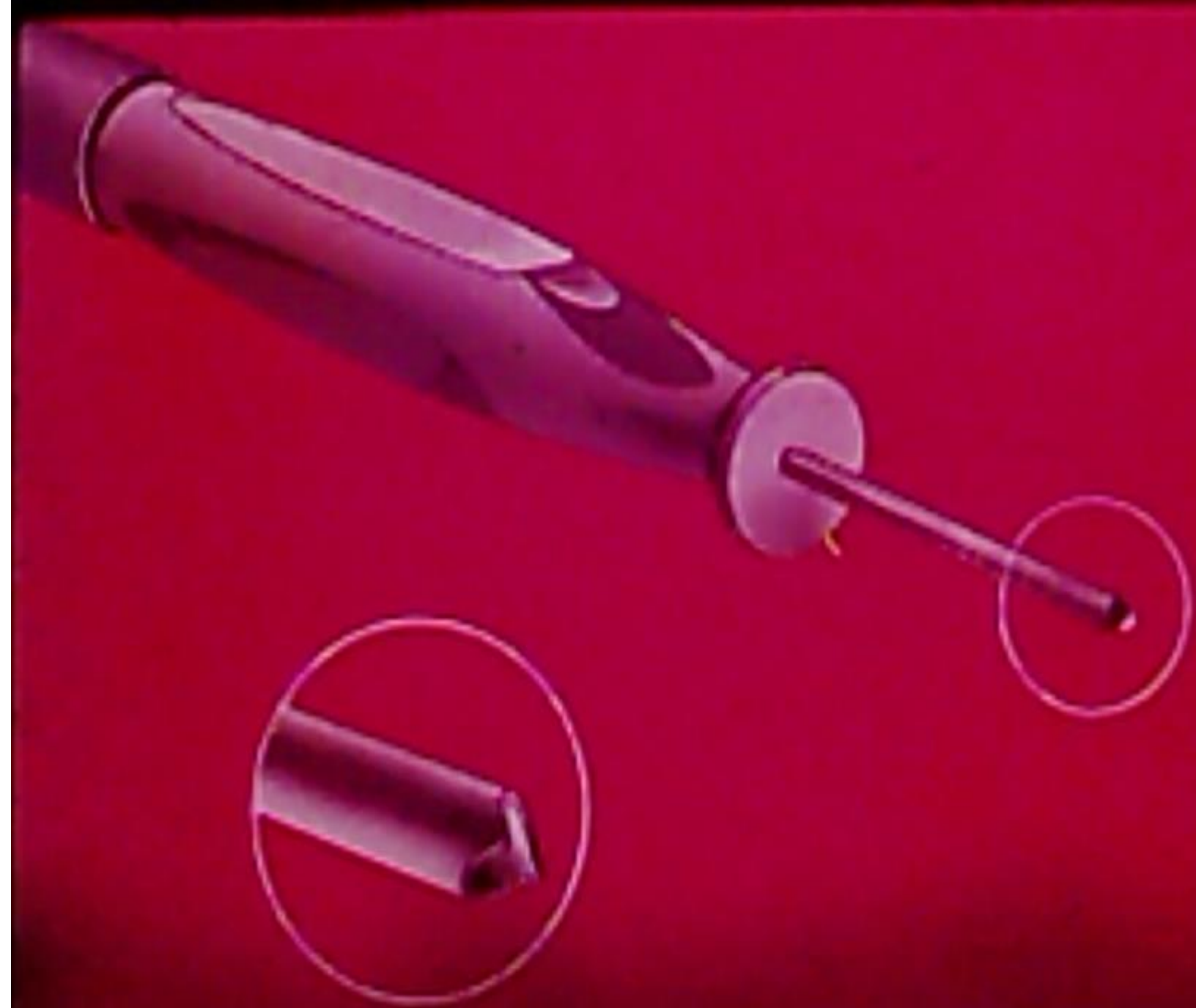
**This technique allows a stained slides to be examined within 10 minute of taking specimen.**

**The tissue quickly frozen to -70 C by immersion in liquid nitrogen.**

**It is used to assess whether excision margins are free of malignancy.**

# Drill biopsy

- **It is done in case of large hard bony lesion (intra osseous lesion) by the use of handpiece with a hallow drill, (aspirate bone inside it ).**
- **The obtained material can be used as a routine surgical specimen to prepare tissue section on glass slide.**
- **Intraosseous jaw lesions are most often the result of problems associated with the dentition.**



# **Principles for successful outcome of oral soft tissue biopsy**

# Anesthesia

- **Block anesthesia is preferred to infiltration**
- **When blocks are not possible distant infiltration may be used**
- **Never inject directly into the lesion**



# Tissue Stabilization

The tissue must be stabilized in order to accurately make incision, dissection, etc...

## Stabilization methods:

- **Digital ( finger ) stabilization**
- **Specialized retractors/forceps**
- **Retraction sutures**
- **Towel clips**

# Hemostasis



- Suction devices should be avoided, because the specimen may be lost in the suction
- Gauze compresses are usually adequate to maintain a clean surgical field
- Suction should only be used for a significant hemorrhage

# Incisions



- Incisions should be made with a scalpel.
- They should be converging
- Should extend beyond the suspected depth of the lesion
- They should parallel important structures
- Margins should include **2 to 3** mm of normal appearing tissue if the lesion is thought to be benign
- **5** mm or more may be necessary with lesions that appear malignant, vascular, pigmented, or have diffuse borders

# ● Handling of the tissue Specimen

- Direct handling of the lesion will expose it to crush injury, resulting in alteration the cellular architecture.

# Specimen Care

- The specimen should be immediately placed in 10% formalin solution, and be completely immersed.

# ● Margins of the biopsy

- Margins of the tissue should be identified to orient the pathologist. A silk suture is often adequate. Illustrations are also very helpful and should be included.

# Fixation

- Biopsy immediately fixed by 10% buffered formalin solution & not water, alcohol, or other liquids that destroy the tissue.

- **Benefit of formalin:**

- 1- Prevent autolysis & destruction of tissue.

- 2- Maintain tissue structures & details.

- 3- Act as anti-infectious agent.

- Formalin must be 10 times the size of the specimen.

- Large specimen should be cut into many pieces, to ensure reach of formalin to all part of the lesion.

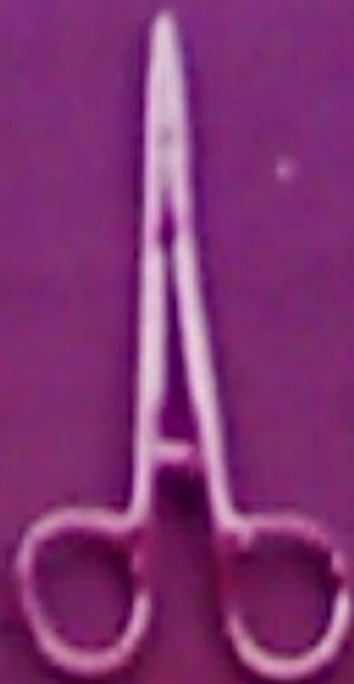
## Other fixative solutions are as follows:

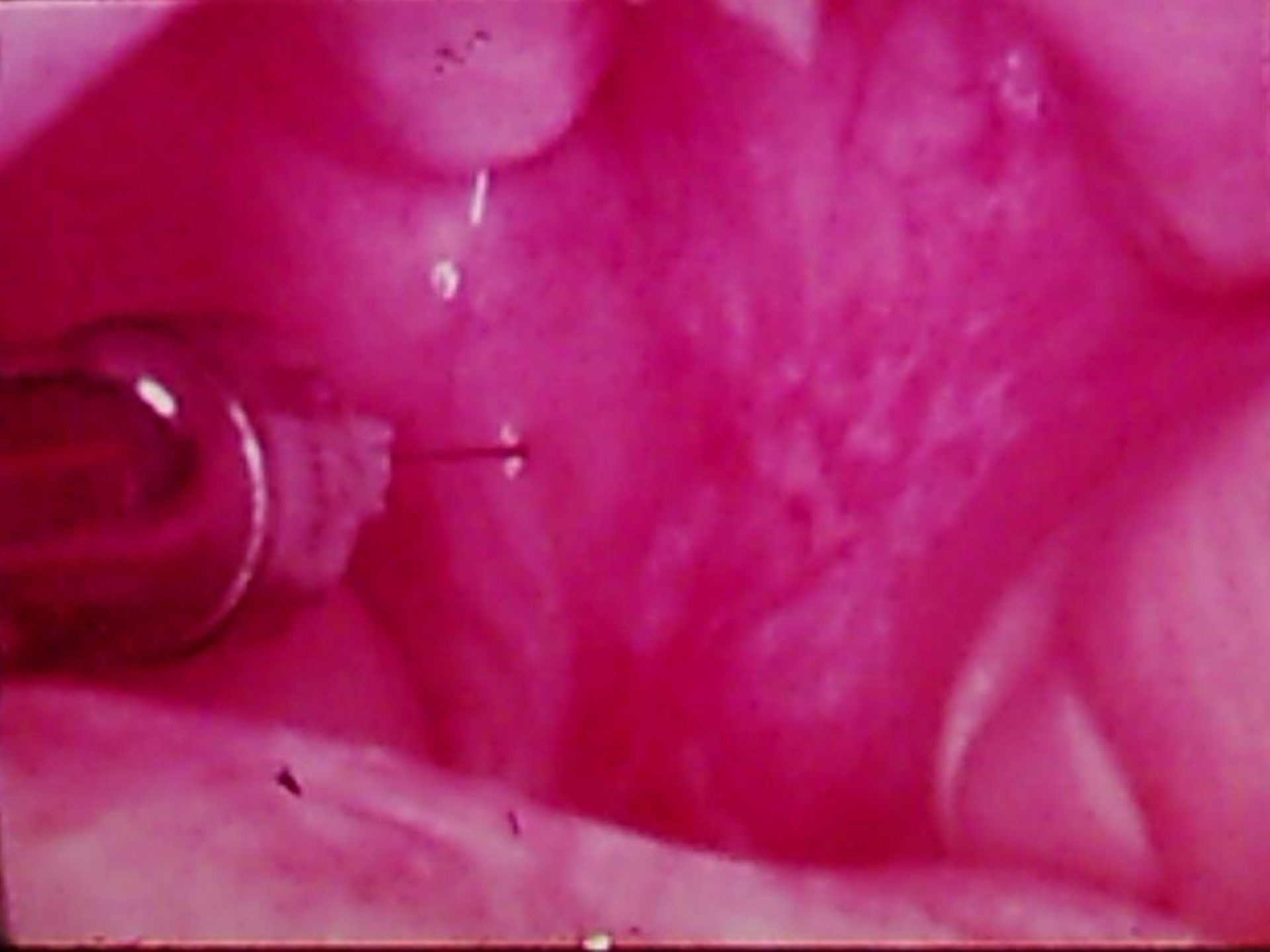
- 1- **Zenker fluid** ( which incorporate mercuric chloride )
- 2- **Bouin fixative** ( which contain picric acid )
- 3- **Carnoy fixative** ( mixture of ethanol, chloroform & glacial acetic acid )
- 4- **Methacarn fixative** (mixture of methanol, chloroform & glacial acetic acid )

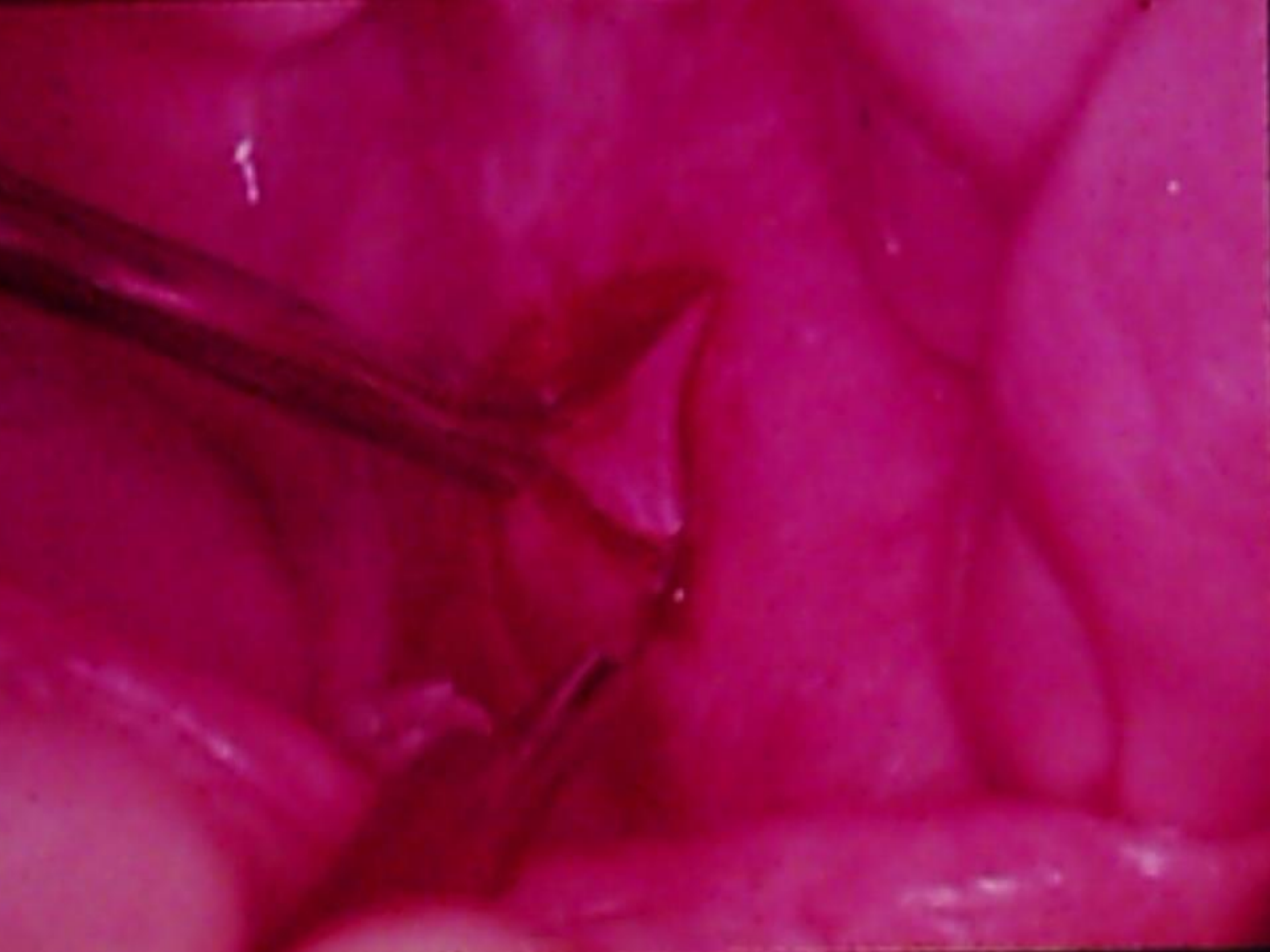


# Labelling

- **Each container should be identified with the patient's name, date & site of the biopsy**







# Surgical Closure

- Primary closure of the wound is usually possible
- Mucosal undermining may be necessary
- Elliptical incision on the hard palate or attached gingiva may be left to heal by secondary intention.

# Biopsy Data Sheet

- A biopsy data sheet should be completed and the specimen immediately labeled. All patient's history and descriptions of the lesion must be conveyed.

# When To Refer For Biopsy

- When the health of the patient requires special management that the dentist feel unprepared to handle
- The size and surgical difficulty is beyond the level of skill that the dentist feels he/she possesses
- If the dentist is concerned about the possibility of malignancy