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Biopsy

Abstract
The biopsy may very well be the most paramount procedure confronting the dentist and successful tissue diagnosis depends on proper surgical biopsy technique. Yet, how many who are faced with this procedure really know the principles involved and can carry them, out flawlessly as they must be? The practitioner who attempts this procedure without being aware of principles involved may prevent more competent hands from diagnosing a malignancy until it is too late. Data bares out the fact that the first man to see a lesion is in the best position to initiate a cure. The aim of this paper is to present some of the principles of biopsy technique so as to give an insight into the procedure of biopsy.

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Biopsy

*By Dr. Nathan Gross, D.D.S.**

The biopsy may very well be the most paramount procedure confronting the dentist and successful tissue diagnosis depends on proper surgical biopsy technique. Yet, how many who are faced with this procedure really know the principles involved and can carry them out flawlessly as they must be? The practitioner who attempts this procedure without being aware of principles involved may prevent more competent hands from diagnosing a malignancy until it is too late. Data bares out the fact that the first man to see a lesion is in the best position to initiate a cure. The aim of this paper is to present some of the principles of biopsy technique so as to give an insight into the procedure of biopsy.

Statistics show that there are two and a half times as many people living well into the oral cancer age as in 1900. By 1980 there will be six times as many people living into the oral cancer age as in 1900. This means that more and more the dentist's office must become a cancer detection site. Oral cancer is more serious and more important to the patient than any other condition with which it might possibly be confused. Statistics show that the majority of patients with neglected oral malignancy are dead in the short space of eighteen months after discovery. Therefore, the dentist with his biannual recall system is in the best position to examine the oral cavity of more so-called healthy patients and to make an early diagnosis. It is felt that the dentist sees an important lesion every few months. This includes malignant lesions of the lip and so-called pre-malignant and malignant lesions of the oral cavity. The dentist must arise to the situation because the responsibility is being thrown upon him by the laymen who are becoming educated in self cancer detection and presenting themselves for diagnosis more frequently.

The uses of a biopsy are:

(1) Diagnostic—verifying or establishing a diagnosis of a clinically suspicious lesion.
(2) Planning proper treatment—local or radical, surgery or irradiation.
(3) Checking progress of treatment—as to effectiveness.
(4) Checking extension of disease—whether invasive.
(5) Evaluation end result—whether free of recurrence.

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Biopsy should not be reserved for obviously malignant lesions, but should be used in ruling out malignancy in seemingly insignificant ones. A large percentage of negative biopsies should not be discouraging because this is the sign of an alert diagnostician and one positive biopsy of malignancy in an early lesion makes all the negatives worth while because this may be life saving to some individual.

The indications for biopsy should include:

(1) Any progressive ulcerated lesion which has been present for three weeks or one which fails to respond to therapy in three weeks should be biopsied.

(2) Any mass which has been present for three weeks or more should be biopsied.

(3) White patches in mucous membrane especially those having a wharty appearance.

(4) Areas which are intra-osseous and produce rarifaction and expansion of the cortical plates.

(5) Complete excision of small lesions as a method of diagnosis may also serve as treatment in some instances.

There are no contra-indications to biopsy, not even Vincent's stomatitis.

The *methods of biopsy* are:

(1) *Excisional or incisional biopsy*—In this type the scalpel or electro-surgical technique may be used. Since most lesions of the oral cavity are comparatively small, one must be careful in using the electro-surgical technique so as not to cook or distort the biopsy specimen and render it unreadable to the pathologist. If the lesion is small and the surgeon feels competent that he can remove the entire lesion without cutting across cancerous tissue, then this is justified and serves as a diagnostic as well as therapeutic procedure. This requires much training, skill, and experience and only those thus qualified should attempt this procedure because should you fail to remove the entire lesion, you will have broken the barriers set up by the body against the cancer and increase the possibility of metastasis.

(2) *Punch Biopsy*—This technique is used in inaccessible areas. The instrument kit contains a number of sharp circular detachable punches which are used in a rotary motion. After having rotated to desired depth of tissue, the specimen is detached at its base by either scissors or scalpel. Unless the circular punches are very sharp, crushing is great.

(3) *Aspiration Biopsy*—This technique is applied to lesions that lie below the surface of normal tissue, such as cystic tumors, lymph nodes, inaccessible areas. The apparatus required is an 18-gauge needle (approximately 5-10 cm. in length), a 10-20 c.c. syringe, glass slides for a smear, small strips of Gelfoam or fibrin foam

as a vehicle for some aspirated tissue and a specimen bottle containing 10% formalin.

A stab incision through the normal tissue prevents contamination of aspirated material by surface epithelium. The needle paths should be toward multiple boundaries of the lesion so as to get representative portions and decrease the possibility of false negatives. A negative aspiration biopsy means nothing although multiple negatives in skilled hands would be more substantiating. This technique is never conclusive in lympo-blastomatous disease. Also, variable results are obtained in mixed tumors (false positives). It is important to note that histologic cellular relations are far more important than cytologic study. The objections to this technique are that the needle ruptures the capsule (if present) and causes small fragments of tumor to be deposited along the needle tract. This allows cancer to grow out through the needle tract and spread. Therefore, the needle tract should be excised with the tumor.

(4) *Exfoliative Cytology*—This is based on the technique of Papanicolaou and consists of a smear of the lesion with the intention of obtaining cancerous cells. This technique requires a pathologist who is acquainted and skilled in reading these smears.

(5) *Currettage*—Sharp currettes are employed in lesions which are cavitated. This method may be used for intra-osseous lesions.

(6) *Frozen sections*—Rapid freezing by carbon dioxide allows for rapid viewing of specimen. Here a competent pathologist, who is acquainted with reading frozen sections, is necessary.

The Site of Biopsy

The selection of the site of biopsy is of the utmost importance because upon this hinges the accuracy of the diagnosis.

A site should be selected along the most advanced portion of the lesion because this will show best the potentiality of the lesion for invasion and also will give a picture of the growing portion of the lesion rather than the dying or necrotic portion. Areas nearest bone, cartilage, or teeth should be avoided if possible because this is where tumor beds are shallowest and are frequently sites of necrosis.

In white patches since the prickle cell can either form keratin or divide, and it cannot do both at the same time, the part which is most likely to show advanced precancerous change is any area that rather resembles granulation tissue, and may only be flecked with keratin.

In pedunculated lesions, the entire lesion should be removed by completely excising the base from surrounding normal tissue and should not be removed by snipping the pedicle.

Full thickness of an ulcer should be taken because the superficial portion is usually exudate, necrotic tissue or granulation tissue, the true nature of the lesion being found at the base.

In large lesions which vary in character, multiple specimens should be taken.

Tissue should be so removed that the area from which it was taken can easily be closed with a few sutures.

A pigmented lesion which is dark brown or black in color where color is believed due to melanin (mole or nevus type of lesion) should not be cut into but the entire lesion should be removed en-mass and serve as the biopsy specimen.

Lesions which are dark bluish or purplish in color and appear loculated, if small, should be totally excised because they usually are hemangiomatic and the hemorrhage produced on incision may be difficult to control.

Precautions in biopsy:

(1) Avoid the use of dyes and antiseptics that discolor tissue because they prevent proper preparation of the specimen.
(2) Plan incisions to avoid or minimize disfiguring the patient. Where possible, keep incisions parallel to Langer's lines of tension.
(3) Use care in use of tissue forceps so as not to crush or mutilate the tissue specimen.
(4) Avoid reducing the vermillion border of the lip by use of vertical incisions where possible.
(5) If specimen is removed with an electric knife, the specimen must be larger to allow for the zone of coagulation around the periphery.
(6) Encapsulated lesions should be removed en toto so as to prevent breaking the natural barrier set up.
(7) In the oral cavity, be careful that tumor tissue does not spill into the mouth from where it may be aspirated or swallowed.
(8) Principle of tumor surgery is to remove the entire malignant mass without cutting into it so as to minimize opportunities for metastasis and prevent implant nodules from being scattered in the tissue.
(9) Avoid unnecessary trauma, pressure, or other manipulation of tumor.
(10) Carry incision deep enough, but avoid penetration of underlying periosteum which may act as a natural barrier to cancer cells.
(11) Make sure that the surface is recognizable so the tissue may be cut perpendicular to the surface.
(12) Some lesions are like icebergs where bulk of the lesion extends beneath the surface laterally and in depth.
(13) Granulation tissue of repair favors rapid growth of the neoplasm.
(14) The surgeon should not section the specimen because he will not always choose the best plane.
(15) Avoid drying out the specimen by placing it in 10% formalin solution (4% formaldehyde) that is approximately twenty times the volume of the specimen.

(Continued on Page 20)

BIOPSY *(Continued)*

Conclusion

It is not easy to procure a good biopsy specimen, nor is it very difficult, but the procedure must be carefully planned and expeditiously carried out, and the provisional diagnosis must be borne in mind.

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WATER FLUORIDATION *(Continued)*

the use of topical fluorides in areas where artificial water fluoridation has been in effect for more than eight years or where the water naturally contains suitable concentrations of fluoride.

The effectiveness of topical fluoride applications on adults is questionable. Arnold et al[5] observed no reduction in caries activity when single whole mouth treatments of acidulated fluoride solution were used on adults of a military population. Rickles and Becks[6] found no reduction in caries activity when an acidulated solution was used but report a reduction with a neutral solution. In an experiment too small to make definite conclusions