

# Soft Tissue Biopsy Techniques for the General Practitioner, Part 1

By Robert A. Convissar, DDS, FAGD, MALD

One of the most important services dentists can perform for their patients is an oral cancer examination. More than 30,000 cases of oral cancer are diagnosed in the United States every year, with almost 8,000 deaths reported. More cases of oral cancer are diagnosed each year than ovarian cancer, cervical cancer, or pancreatic cancer. More people die from oral cancer each year than from cervical cancer or melanoma. The 5-year survival rate for oral cancer is a very disappointing 50%.

As with every type of cancer, early detection is the key to increasing the odds of survival. Every member of the dental team must be well aware of how to perform a complete oral cancer examination. Excellent instructional manuals are available in the literature for dental assistants,<sup>2</sup> dental hygienists,<sup>3</sup> and for dentists.<sup>4</sup> The American Cancer Society also has an excellent oral cancer examination procedure manual for the dental team.<sup>5</sup> These manuals detail the steps in performing an oral cancer examination. A great deal of information on oral cancer diagnosis and treatment may be found on the Internet. The American Cancer Society ([www.cancer.org](http://www.cancer.org)) is an excellent source of information.

Once a suspicious lesion is discovered, at some point in treatment a biopsy should be performed in order to obtain a definitive diagnosis. Performing a soft tissue biopsy is a very simple, straightforward procedure that requires no special equipment. A #15 scalpel blade and college pliers are sufficient to perform most simple biopsies. Most biopsy procedures can be performed in less than 10 minutes from the initial placement of topical analgesia to the delivery of instructions for postoperative care.

Unfortunately, most general

dentists do not perform their own biopsies; rather, they refer them to dental specialists, including oral surgeons and periodontists. In 1995, the last year for which statistics are available, 32,800 biopsies were performed. Only 17.6% of these biopsies were performed by general practitioners.<sup>6</sup> This is a statistic that defies logical explanation, considering that general practitioners perform 40% of all endodontic surgical procedures, including root amputation and apicoectomy; 60% of periodontal surgical procedures; and 48% of bony surgical extractions.<sup>7</sup> Compared with soft tissue biopsies, all of these surgical procedures have a much more serious potential for morbidity, are more complicated and time consuming, and involve more steps and more skill.

Shafer et al<sup>8</sup> state: "The advantages of a biopsy so far outweigh its disadvantages or potential dangers that the biopsy is seldom, if ever contraindicated." This two-part paper will discuss the simple procedure of performing an oral soft tissue biopsy; why lesions are biopsied; which lesions should be biopsied; where, how, and when to biopsy, and; when to refer to a more experienced practitioner.

## TYPES OF BIOPSY TECHNIQUES

Biopsy is the excision of a small piece of tissue for microscopic examination. Currently, five different biopsy techniques can be performed in the oral cavity: incisional biopsy, excisional biopsy, oral cytology, aspiration biopsy, and oral brush biopsy. This paper will concentrate on excisional and incisional techniques. The other techniques are mentioned briefly.

Aspiration biopsy involves the use of a needle and syringe to withdraw material from within a lesion. This technique is usually



Figure 1. 57-year-old black female with diffuse white lesions on her attached gingiva.

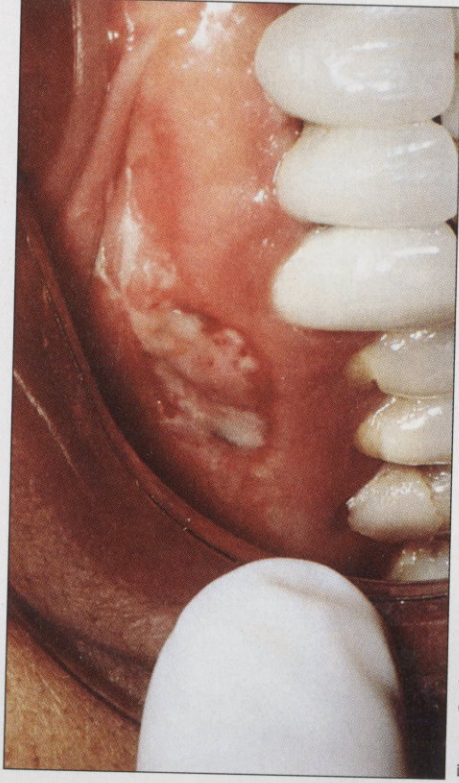


Figure 2. One week postbiopsy. Because this was an incisional, not excisional biopsy, note there is still lesion present mesial and distal to the biopsy site.

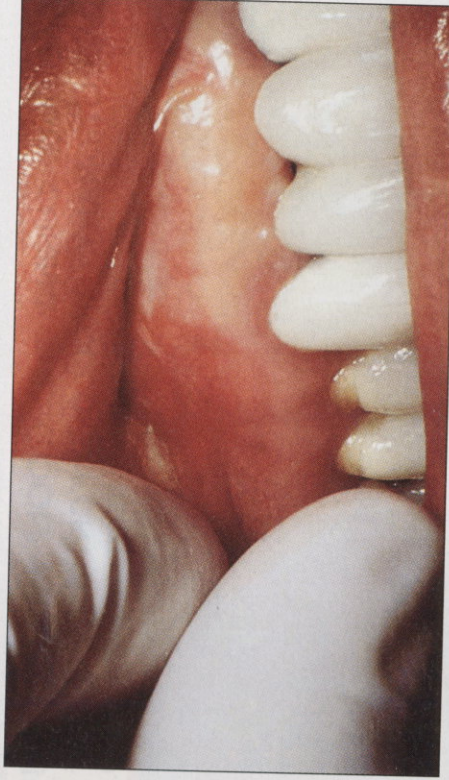


Figure 3. One month postbiopsy. Note complete healing of biopsy site, with lesion still present mesial and distal to biopsy site.

continued on page 46



## Soft Tissue Biopsy Technique

continued from page 44

used for radiolucent lesions of the jaw.

Oral cytology involves scraping a lesion firmly with a tongue depressor, smearing the cells onto a glass slide, fixing and staining them, and examining the cells microscopically. Oral cytology has been shown to be inaccurate and unreliable due to the high percentage of false-negative results. A review of the literature reported a 31% false-negative rate.<sup>10</sup>

Oral brush biopsy is the newest technique utilized in the oral cavity.

This technique is quite similar to oral cytology in the harvesting of cells for examination. One company has patented a computer-assisted brush biopsy analysis (OralScan Laboratories, Suffern, NY) and supplies the dentist with an oral brush biopsy instrument, glass slide, fixative, and pre-addressed container that is mailed to the laboratory for computer-assisted analysis of the specimen. This computer-assisted technique was first described in October 1999. This study involved 327 lesions that were evaluated both with scalpel and computer-assisted brush biopsy.<sup>11</sup> The technique was very effective when used to identify

squamous cell carcinoma. Many types of lesions were not included in the study, such as mucoceles, fibromas, lipomas, papillomas, and pigmented lesions with intact normal epithelium. These types of lesions cannot be diagnosed via brush biopsy.

It is important to consider the clinical protocol required with the brush biopsy procedure. As opposed to removing a lesion after discovery, if a lesion is examined via brush biopsy and found to warrant excision, the patient must be recalled for a second (excisional) procedure. If the brush biopsy results are negative, the patient may not require the surgical biopsy.

If the results are positive, the surgical biopsy/excision is required. In the latter case, a referral may be needed if the general practitioner performing the brush biopsy does not feel comfortable performing the secondary excision. Questions may arise regarding whether health insurance carriers will pay for two separate diagnostic procedures in the event the brush biopsy results warrant a second procedure.

A survey of dentists performing this brush biopsy technique stated that practitioners at first were unsure if they had removed an adequate amount of tissue for biopsy purposes, but with time the practitioners felt more secure.<sup>12</sup> The study involved only specialists in oral pathology/oral medicine and oral maxillofacial surgery, but there is no reason to believe that with experience, general dentists could not perform this procedure. OralScan Laboratories states that if the specimen is inadequate, there will be no charge for a repeat test. However, a repeat testing brings into question how patients, who may be anxious about

*"The advantages of a biopsy so far outweigh its disadvantages or potential dangers that the biopsy is seldom, if ever contraindicated."*

the biopsy, will react to the need for a repeat test.

More studies need to be performed to confirm the cost-effectiveness and accuracy of the brush biopsy technique, the type of learning curve involved, and appropriateness of use with specific lesions. Nevertheless, the new brush biopsy technique appears to be an important advance in the identification of oral cancer.

The final two oral biopsy techniques are excisional and incisional. Clinical Excisional biopsies remove

the entire lesion. Incisional biopsies remove only a part of the suspect tissue. Excisional biopsy is the preferred method of treatment for many minor oral lesions. There are instances, however, when it is impractical to remove the entire lesion. For example, if the lesion is too large to remove easily, the clinician might want to perform multiple small incisional biopsies of the lesion. Once the oral pathologist makes the diagnosis, the decision can be made whether the entire lesion must be removed.

Some lesions may present with multiple sites in the oral cavity, and the clinician may choose to sample a few of the lesions before deciding on removal of all of the lesions. Figure 1 illustrates a 57-year-old female who presented to the office for a periodic examination and prophylaxis. Clinical examination revealed multiple diffuse white lesions throughout the attached gingiva in all four quadrants of her mouth. The patient denied use of tobacco or alcohol. Because the lesions were large and widespread, the decision was made to perform multiple incisional biopsies to obtain a definitive diagnosis. Anesthesia was obtained with lidocaine with epinephrine 1:100,000. The lesions were then biopsied with the use of a carbon dioxide laser and #15 scalpel blade (specific biopsy technique will be discussed in Part 2 of this article).

Figure 2 illustrates the wound healing 1 week post-biopsy. Note that there is still lesion present mesial and distal to the biopsy wound. Figure 3 illustrates complete wound healing 1 month postbiopsy. The oral pathologist diagnosed these lesions as hyperparakeratosis, and the decision was made to observe the lesions periodically, rather than perform extensive surgical removal.

Figure 4 illustrates a 67-year-old female who presented to the office for a periodic examination and prophylaxis. Clinical examination revealed a

## Everything you want... nothing you don't!



The Ceralas D15®  
980nm Diode Laser

### YOU WANT

- High absorption that cuts and coagulates optically without Oreo-cookie effect.
- Sterile bloodless environment without thermal charring.
- Predictable and highly controllable depth regulation.
- No recession to gingiva (non-contact ablative gingival troughing so you can take immediate post-op impressions).
- Post operative tissue is pink and non-necrotic. (Patient can eat and brush teeth immediately afterwards) Cosmetic appearance is beautiful.
- Often painless, little or no blocker needed, greatly reduced postoperative discomfort.
- Complete portability. The Ceralas D15® weighs only 14 lbs. and comes with a beautiful and durable hard case.
- Lowest replacement parts cost on market, (replacement fibers under \$175 each. Good for 100 uses).
- 100% solid state construction; free of moving parts or adjustable lenses.
- No service contract to sign or pay for, (saves you up to \$4500 in extended costs over some other brands).
- We guarantee a "free" loaner by 8:30am the following day, should anything ever happen to your laser. Your complete customer satisfaction is our greatest concern.

### YOU DON'T WANT

- Thermal cutting/coagulation via carbonized optical fiber to temperature of 750°F.
- Pain and swelling caused by thermal effect.
- Bleeding, necrotic tissue blanching and/or charring (Oreo-cookie effect).
- Tissue recession from thermal shock (risky to do impressions as necrotic tissue will slough).
- Uncontrollable depth penetration.
- Heat included coagulation (similar to electrocautery).
- Jackhammer effect (may crack teeth when navigated near hard tissue).
- Post operative patient discomfort.
- Expensive hard tissue laser to perform procedures that can be done equally well with air abrasion or fissurotomy at a fraction of the cost.
- Non-portable unit. Some lasers weigh several hundred pounds and require water cooling—once installed, they can't be easily moved.
- High fiber/glass tube replacement costs (brand costs range from \$300-\$2,500 depending on whether they're 840nm, Nd:YAG 1064, Erbium YAG or CO<sub>2</sub> units).
- Limited guarantee (many only offer one year).
- Expensive service agreement (most laser manufacturers recommend these for units that require tune-ups, service adjustments, and flash lamps needing replacements every 500-100 hours). Plus, you must wait for the service agent to come to you.

**This laser will pay for itself! Start doing laser dentistry now!!!**



**Ceramoptec**

For in office demos or questions call 1-800-934-2377 • 1-877-CERALAS • 413-525-0600  
Fax 413-525-0611 • Visit our web site at <http://www.ceramoptec.com>

**FREE FACTS, circle 38 on card**



freely movable nodule at the tip of her tongue. The patient related that it had been there for "a few months," did not change in size, was not painful, and may have originally been related to trauma (biting the tongue). The patient did complain, however, that the lesion occasionally interfered with her speech and chewing. Anesthesia was obtained with lidocaine with epinephrine 1:100,000. The lesion was then totally excised with the use of a #15 scalpel blade and carbon dioxide laser. Figure 5 shows the tongue immediately post-biopsy.

#### INSTRUMENTATION

Many different instruments may be used to perform incisional and excisional biopsies. Included in this list are liquid nitrogen (cryosurgical biopsy), electro-surgical instruments, lasers, tissue punches, and scalpels. Though each technique has its advantages and disadvantages, this paper will deal with a simple #15 scalpel blade as the instrument of choice. The armamentarium (Figure 6) includes:

- Gauze
- Cotton rolls
- Suture material of choice (silk, gut, etc)
- Needle holder
- Scissors
- Mouth mirror
- Suction tip
- #15 scalpel blade and handle
- Biopsy bottle with 10% formalin
- Tissue pickups.

The last two items on the list may not be standard equipment in every dental office. The oral pathology laboratory that will perform the processing of the biopsy specimen provides the specimen bottle free of charge. This will be examined in more detail in the discussion of the oral pathology laboratory's role in diagnosis of the specimen. College pliers may be utilized to hold the specimen during the biopsy procedure; however, this author prefers Adson forceps to hold the tissue. Many different types of tissue pickups are available

in dental supply catalogs.

#### REASONS FOR BIOPSY

The clinician needs to know the diagnosis of a lesion in order to provide proper treatment. A biopsy with histological evaluation

will yield this information. A biopsy will tell the clinician if a lesion is related to an inflammatory response, is associated with a systemic disease, or is a neoplasm. It will reveal if the neoplasm is

benign or malignant. In the case of malignancy, a biopsy will enable the oncologist to type, grade, or stage the lesion, and determine a treatment plan and ultimately a prognosis.

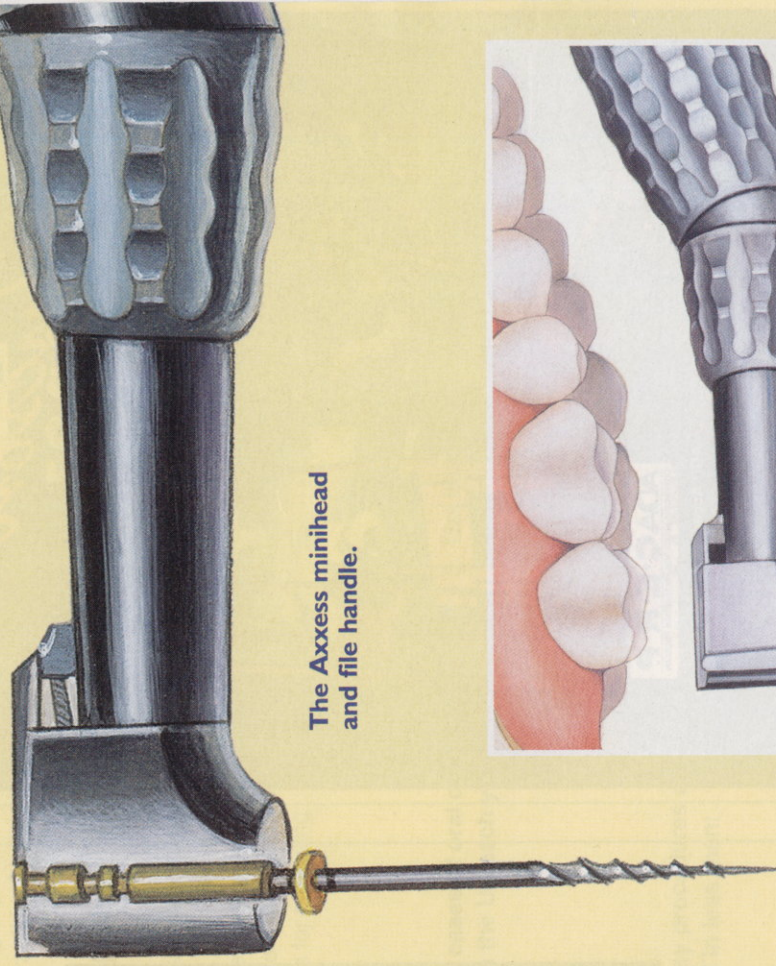
A biopsy is usually not performed immediately after discovering a lesion. First, the lesion is examined and a differential

*continued on page 48*

## Less Is More.



A competitor's rotary file in a standard handpiece.



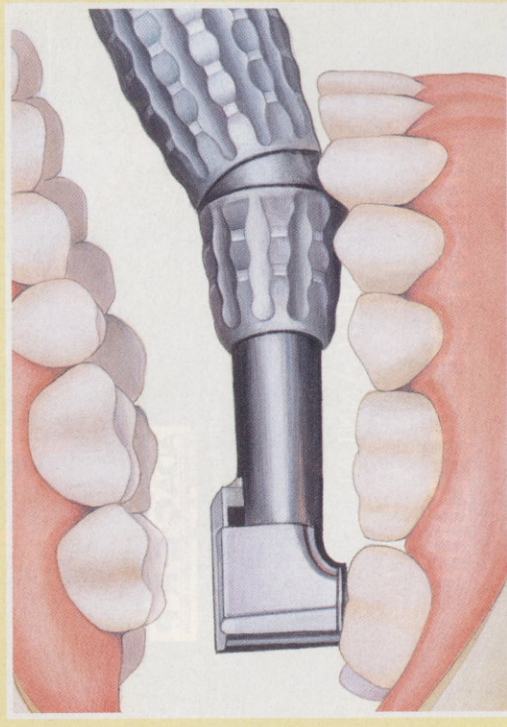
The Axxess minihead and file handle.



With the new **Axxess Handle** from **Analytic**, you really do get more with less.

The **Axxess Handle** – available on all our rotary NiTi **Quantec** files, including the .08, .10 and .12 tapered **Flare** series – is 30% shorter than that of a conventional rotary file. Combine it with the new **Axxess** minihead contra angle handpiece, and you've got an additional 5mm of clearance. That's ideal for those hard-to-reach posterior regions.

Bring it all together with the **QEM** Motor and you've got the most innovative NiTi rotary file system on the market today. Call us at **800-346-ENDO** and find out how much more less really is.



Axxess handle shown in dental model; rubber dam removed for illustrative purposes.



The **QEM** Electric Motor.

**Analytic**  
SYBRON DENTAL SPECIALTIES

**FREE FACTS, circle 39 on card**

www.Analytic-Endodontics.com



### Soft Tissue Biopsy Technique..

*continued from page 47*

diagnosis is made. Next, the etiology is considered. The next step will likely be to decide on a course of treatment. As an example, a clinician may choose to

initially treat a lesion with antibiotics or anti-inflammatory medications. Or, the lesion may be treated with an operative technique. For example, if an ulcerated lesion is present on the buccal mucosa opposite a broken cusp tip, initial treatment of the lesion

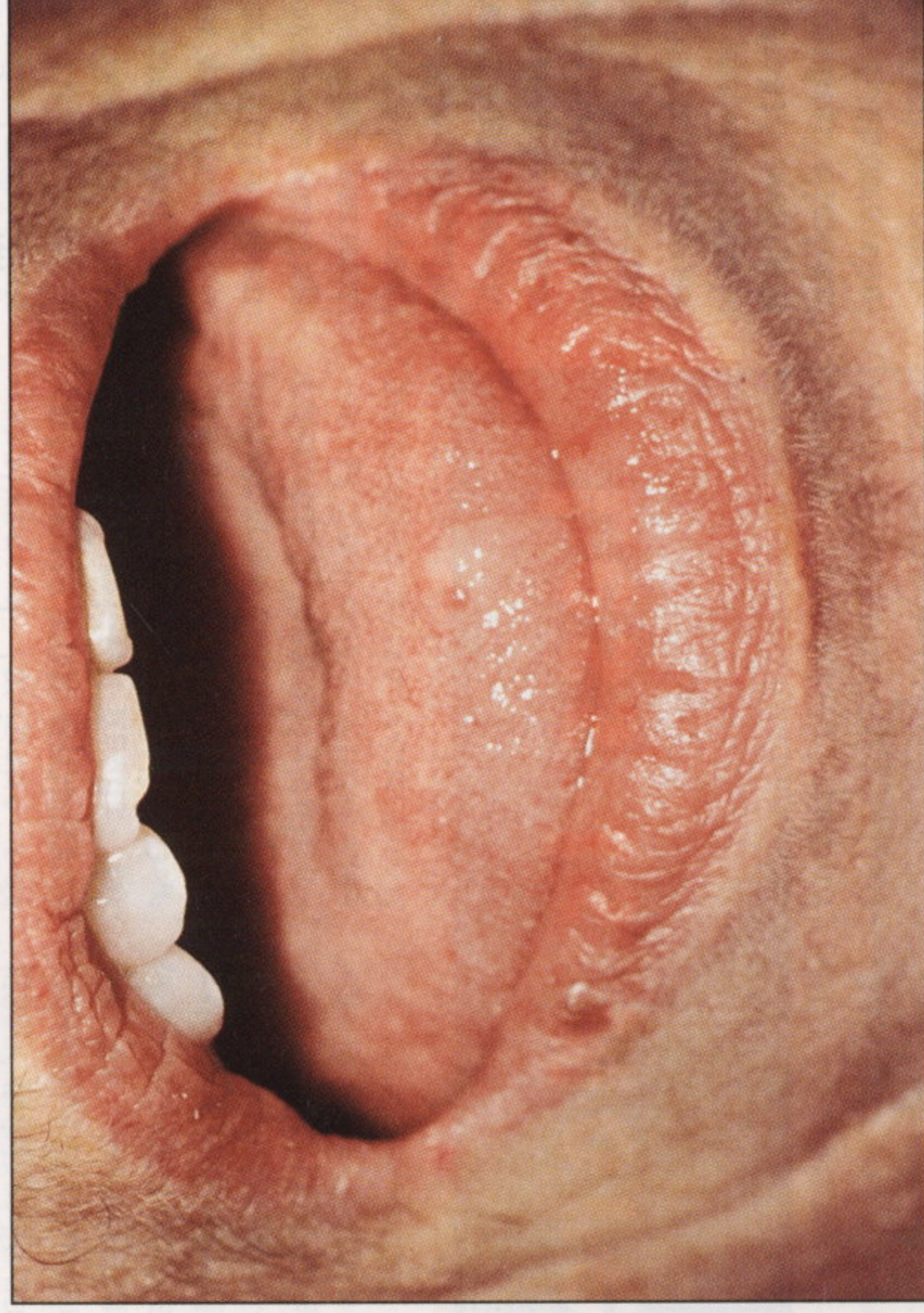


Figure 4. 67 year-old white female with freely movable lesion on the tip of her tongue.



Figure 5. Tongue immediately postbiopsy.



Figure 6. Tray set-up for simple soft tissue biopsy procedure.

## ACADEMY OF LASER DENTISTRY

Dedicated To The Advancement Of Lasers In Dentistry



**ADACER.P**  
CONTINUING EDUCATION RECOGNITION PROGRAM  
AGD Accepted National Sponsor  
FAGD/MIAGD Credit

EIGHTH ANNUAL  
ALD CONFERENCE AND EXHIBITION  
**March 21-24, 2001**

Tucson, Arizona  
SHERATON EL CONQUISTADOR RESORT

*Come for the Education, STAY FOR THE FUN!*

- SCIENTIFIC AND CLINICAL PRESENTATIONS
- CERTIFICATION PROGRAMS
- HANDS-ON LASER & HIGH TECH WORKSHOPS
- LUNCHEON FOR LEARNING
- ALL MAJOR LASER WAVELENGTHS REPRESENTED
- MANUFACTURERS' EXHIBITS



P.O. Box 8667 • CORAL SPRINGS, FLORIDA 33075 USA  
954-346-3776 • FAX 954-757-2598  
WWW.LASERDENTISTRY.ORG

**FREE FACTS, circle 40 on card**



will consist of smoothing down the broken cusp tip or restoring the tooth. The patient is then recalled after a sufficient period of time (usually 10-14 days) for the area to heal. If the lesion has not responded to the conservative treatment, and there is no other apparent etiologic factor, a biopsy is warranted.

A clinical history is essential. If the patient presents with multiple oral ulcers and systemic symptoms (fever, malaise), the clinician may ask if blisters preceded the ulcers. If so, a viral (herpetic) etiology is suggested. In this case, as with the previous case, a biopsy will not be performed immediately. A sufficient period of time will elapse for the viral infection to run its course before the patient is recalled for a re-evaluation.

Concerning where dentists should biopsy, they should biopsy anywhere within the confines of the oral cavity from the vermilion border of the lips to the palatopharyngeal arch, and everywhere in between. Depending on comfort level and experience, dentists can biopsy the gingiva, buccal mucosa, alveolar mucosa, tongue, soft and hard palate, and lips.

Concerning what lesions should be biopsied, any lesion that looks suspicious, different, or abnormal should be considered for biopsy. These include lesions that have no apparent etiology; lesions that are deviations from normal anatomy and are unilateral; lesions that are a different color from the surrounding tissue for no apparent reason, including red, white, and hyperkeratotic lesions; and lesions that present as unusual surface morphologies, such as papillary projections, craters, and ulcerations.

Inherent in the use of any biopsy procedure is familiarity with lesion appearance. Excellent texts<sup>13</sup> and atlases<sup>14</sup> are available for review of oral pathology. ♦

Part 2 of this article will discuss patient selection and a step-by-step soft

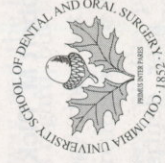
tissue biopsy technique.

#### References

1. Cancer Statistics, 2000 *J Clin Ca*. 2000;50(1):12-13.
2. Jacobs J. Oral cancer examination guide. *The Dental Assistant*. 1997;66(2): 30-31.
3. Woodcock T. Detecting oral cancer: a guide for healthcare professionals. *J Pract Hygiene*. 2000;9(3):67-68.
4. Oral cancer fact sheet. *AGD Impact*. 2000;28(1):18.
5. Engelman M, SJ Schackner, et al. *Oral Cancer Examination Procedure*. Poughkeepsie, NY: Oral Cancer Prevention and Detection Center; 1966.
6. American Dental Association. *1995 Survey of Current Issues in Dentistry: Oral Cancer Detection in the Dental Office*. Chicago, Ill:American Dental Association; 1996.
7. American Dental Association. *1990 Survey of Dental Services Rendered*. Chicago, Ill:American Dental Association; 1994.
8. Shafer W, Hine MK, Levy, BM. *A Textbook of Oral Pathology*. 3rd ed. Philadelphia, Pa:WB Saunders; 1974.
9. *Taber's Cyclopedic Medical Dictionary*, F.A. Davis Company, Philadelphia, Pa: 1977.
10. Folsom TC, White CP, Bromer L, et al. Oral exfoliative study: review of the literature and report of a three-year study. *Oral Surg Oral Med Oral Pathol*. 1972;33:61-74.
11. Sciubba J et al. Improving detection of precancerous and cancerous oral lesions: computer assisted analysis of the oral brush biopsy. *JADA*. 1999;130:1445-1457.
12. *Clinical Research Associates Newsletter*. 2000;2 (7):1.
13. Regezi J, Sciubba, J. *Oral Pathology Clinical-Pathologic Correlations*. WB Saunders; Philadelphia, Pa: 1989.
14. Regezi J, Sciubba J, Pogrel, A. *Atlas of Oral and Maxillofacial Pathology*. WB Saunders; Philadelphia, Pa: 1999.

**Dr. Convissar** is a pioneer in the field of laser dentistry. He was one of the first dentists in the nation to incorporate lasers into a general practice. Dr. Convissar received fellowships in the Academy of General Dentistry and the American Society of Laser Medicine and Surgery, and mastership in the Academy of Laser Dentistry. The author of numerous peer-reviewed publications in the dental literature, Dr. Convissar served as guest editor of the *Dental Clinics of North America* issue on Lasers and Light Amplification in Dentistry, to be published in October, 2000. Dr. Convissar maintains a private practice of laser, cosmetic, and rehabilitative dentistry in New York City and serves as Director of Laser Dentistry at New York Hospital-Medical Center of Queens. He can be reached at 212-255-5730, or via E-mail at: LASERBOBDDS@MSN.COM.

# Continuing Education Exercise No. 9.1



To submit Continuing Education answers, use the answer sheet on page 159. On the answer sheet, identify the article (this one is Test 9.1), place an X in the box corresponding to the answer you believe is correct, detach the answer sheet from the magazine and mail to Dentistry Today Department of Continuing Education.

The following eight questions were derived from the article *Soft Tissue Biopsy Techniques for the General Practitioner, Part 1*. By Robert A. Convissar, DDS, FAGD, MALD, pages 44 through 49.

#### Learning Objectives

After reading this article, the reader will learn:

- 1) the types of biopsy techniques.
- 2) instrumentation needed to perform a biopsy.
- 3) reasons for biopsying.

#### 1. How many cases of oral cancer are reported in the US each year?

- a. 10,000.
- b. 30,000.
- c. 50,000.
- d. 65,000.

#### 5. The biopsy technique that removes the entire lesion is called:

- a. incisional biopsy.
- b. aspiration biopsy.
- c. excisional biopsy.
- d. brush biopsy.

#### 2. Most biopsy procedures can be performed in less than:

- a. 5 minutes.
- b. 10 minutes.
- c. 20 minutes.
- d. 45 minutes.

- #### 6. A biopsy is usually performed:
- a. immediately after discovering a lesion.
  - b. before any treatment is started.
  - c. only on patients older than 18 years.
  - d. after a lesion has had a chance to heal.

#### 3. What percentage of biopsies are performed by general dentists?

- a. 17.6%.
- b. 26%.
- c. 32.5%.
- d. 55%.

#### 7. Dentists should limit their biopsies to:

- a. gingiva and buccal mucosa.
- b. gingiva, buccal mucosa, and tongue.
- c. gingiva, buccal mucosa, tongue, and hard palate.
- d. anywhere within the confines of the oral cavity.

#### 4. Oral cytology has been shown to have a false-negative rate of:

- a. 8%.
- b. 18%.
- c. 31%.
- d. 42%.

#### 8. The type of biopsy that is usually used for radiolucent lesions of the jaw is:

- a. incisional biopsy.
- b. excisional biopsy.
- c. aspiration biopsy.
- d. oral cytology.