

# YOUR PRACTICE BUILDER

A QUARTERLY PUBLICATION OF HEALTH CARE TRUST FOR GENERAL DENTAL PRACTITIONERS

## From the Editor's Desk

The 13th Federation of Operative dentistry and 6th Indian Endodontic Society's conference was held at Mumbai from 4-6 Dec.98. I listened to some thought provoking lectures by eminent International speakers. I learned that as in India, abroad also majority of root canal cases are being managed by general dentists. Though single sitting root canal treatments have always had a place in Endodontics, with improved instruments and techniques, more and more practitioners are resorting to that.

The trend of aggressive instrumentation to enlarge the canal is showing a slight shift. The question seems- if we can devoid the root canal of the bacterial flora with the use of sodium hypochlorite in appropriate concentration, can't the root canal be obturated with minimal enlargement?

Ultrasonics have occupied a firm place in Endodontics. Starting from root canal instrumentation, to gutta purcha condensation to retrieval of broken instruments, without the use of ultrasonics, you can't take endodontics to the next millenium.

From the ENT surgeon's operation theatre, microscopes are finding way to the endodontist's clinic. After years of "blind operations" during RCT, it will be a real pleasure to work with endodontic microscopes, though its high cost will be a serious limiting factor to allow widespread use.

With the third generation apex locators, working

length determination has become an easier and faster step with reliable results.

Could you ever imagine that teeth sensitivity may be a manifestation of temporomandibular disorder? A lot of research is going on TMD and its management. The latest information on TMD is outlined in this issue.

Oral cancers, the most common and 40% of all cancers in India, is a devastating condition. Dentists are in a unique position to detect oral cancers at a very early stage, which will profoundly influence the prognosis. A simple and step by step method of examination which will safeguard against missing out on any early lesion has been described. With 94% sensitivity of Ora Screen test, you should be able to refer the cases to a specialist in time.

**Dr. Beena Rani Goel, M.D.S.**

<b>INSIDE</b>	
<b>1</b>	<b>EDITORIAL</b>
<b>2</b>	<b>ENDO SERIES- 5: APEX LOCATORS</b>
<b>3</b>	<b>TEMPOROMANDIBULAR DISORDERS</b>
<b>4</b>	<b>ORAL CANCER</b>
<b>5</b>	<b>SUBSCRIPTION INFO</b>
<b>6</b>	<b>CARIES VACCINE</b>
<b>7</b>	<b>NEW LIFE MEMBERS</b>

## Endo Series-5

## Electronic canal length measurement

**E**lectronic root canal measuring devices were developed as a clinical aid in endodontics to reduce the radiation exposure and to improve the accuracy of measurement. It also reduced the time taken in root length measurement.

The most desired apical extent of the root canal obturation is the 'cementodentinal' junction (CDJ) which is also the apical constriction. The blood vessels are thinnest at this part and produce the least injury during pulp extirpation. The tissue present in the greater diameter of the apical foramen (apical to the cementodentinal' junction) is periodontal membrane. Injury to periodontal membrane can interfere with apical healing. This narrow waist provides a matrix to condense the root canal filling against.

Direct current measurement of electrical resistance between the mucous membrane and the periodontium was presented in 1962. This resistance is consistent in any portion of the periodontium, regardless of age or tooth type. The electrical resistance of the periodontal ligament, which can be measured by passing a root canal file through the root canal, will be equal to the electrical resistance of the mucous membrane which can be measured directly. The **first generation** of apex locators, resistance -type instruments were developed in 1969. Mark IV is the third upgrade of the original product. The Endodontic Meter was an alternating current device.

The **second generation** was based on the principle of impedance e.g. Endocater. Impedance systems are based on the theory that the root canal, a long hollow tube, develops an electrical impedance, caused by transparent dentin deposition which exhibits a sharp decrease at the cemento-dentinal junction. This sudden drop can be measured electronically. Since the transparent dentin develops in late teen years, these devices work poorly in young patients.

The **third generation** is the frequency dependent machines. The **Apit** method calculates the difference between two potentials of the root canals using current sources from two different frequencies. This device can be accurate in the presence of strong electrolyte, but it must be calibrated in each canal. It is unable to measure in dry canal.

The basis for frequency dependent locators lies in the fact that sites in the canal give differences in impedance between high (8kHz) and low (400 Hz) frequencies. After calibration, with the lip clip, the coronal portion of the canal gives minimal difference between these two frequencies. As the file goes deeper into the canal, the difference in the frequencies increases and is greatest at the CDJ.

The "ratio method" has been commercialized as the Root ZX® (1991), which expresses the quotient of two impedance in terms of the electrode position within the canal. No calibration is required.

Various authors have reported accuracy of apex locators varying from 80-93%. I have been using Root ZX for all my cases since four years and will consider its accuracy in the upper limit.

Each instrument works differently even among the same generation of locators. Instructions should be read carefully and understood clearly before using the machines.

Main **advantages** of Apex locators are that these measure the root canal length to apical foramen, **not** to the radiographic apex. Easy and fast to operate, giving good

accuracy. Artificial perforations can be recognized and radiation to the patient can be reduced.

The **disadvantages** include difficulty in teeth with wide-open apex and inconsistent results in cases of vital pulp. High cost is another factor.

Cervical leakage of current is the greatest cause of inaccurate measurements; leakage might be due to metal restorations, decay, and/or irrigants. Low readings (long working length) occur with very dry canals, and high readings have occurred in long-rooted teeth, when conventional devices were used. Large lateral canals can cause early indication of the apex. The electronic method is impossible for the wide-open case.

Device improvements are being researched. The Root ZX® has been adapted for application with an ultrasonic unit, as the Solfy ZX®. **Contd. on page 7..**

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## Temporomandibular Disorders (TMD)

### What is Temporomandibular Disorder?

TMD describes a variety of conditions that affect jaw muscles, temporomandibular joints, and nerves associated with chronic facial pain. Symptoms may occur on one or both sides of the face, head or jaw, or develop after an injury. TMD affects more than twice as many women than men and is the most common non-dental related chronic orofacial pain.

### What causes TMD

Normal function for this muscle group includes chewing, swallowing, speech and communication. Most experts agree that certain tasks, either mental or physical, cause or aggravate TMD, such as strenuous physical tasks or stressful situations. Most discomfort is caused from over use of the muscles, specifically clenching or grinding teeth (bruxism).

These excessive habits tire the jaw muscles and lead to discomfort, such as headaches or neck pain.

Additionally, abnormal function can lead to worn or sensitive teeth, traumatized soft tissues, muscle soreness, jaw discomfort when eating, and temporal (side) headaches.

### What are Common TMD Symptoms?

- An earache without an infection.
- Jaw pain or soreness that is more prevalent in the morning or late afternoon.
- Jaw pain when you chew, bite or yawn.
- Clicking when opening and closing your mouth.
- Difficulty in opening and closing your mouth.
- Locked or stiff jaw when you talk, yawn or eat.
- Sensitive teeth when no dental problems can be found.

The majority of cases can be treated by unloading (resting) the joint, taking a non-aspirin pain reliever and practicing stress management and relaxation techniques. It is important to break bad habits to ease the symptoms. Most treatment for TMD is simple. For example, control clenching or grinding during the day by sticking your tongue between your teeth. Occlusal splints are also very

useful. More severe cases may be treated with physical therapy, ice and hot packs, posture training and orthopedic appliance therapy (splint). Eating soft foods and avoiding chewing gum also help relax the muscles.

The condition is often cyclical and may recur during times of stress, good or bad.

**Most experts agree that certain tasks, either mental or physical, cause or aggravate TMD, such as strenuous physical tasks or stressful situations. Most discomfort is caused from over use of the muscles, specifically clenching or grinding teeth.**

Advanced diagnostic techniques like tomograms and MRI (magnetic resonance imaging) are also used to understand the exact nature of joint derangement.

**INTERVENTION** in the management of TMJ Dysfunction is directed towards 2 distinct strategies of treatment:

1 - **Early Treatment** strategies are applied during the earlier stages of the condition at which no permanent disability has as yet occurred; and are directed towards reversing the condition back to normalcy.

2 - **Limitation of Disability** strategies are applied during the later stages of the condition when permanent disability has already occurred; and are directed towards

containing the condition and preventing its further progression.

### EARLY TREATMENT

Symptomatic treatment is recommended as a first line of treatment regardless of specific diagnosis. A two week regimen is recommended.

### Soft diet:

Consisting of a mechanically soft diet, recommending the avoidance of tough meats, hard bread crusts, bagels and raw vegetables. Chewing gum should be totally avoided.

### Nonsteroidal anti-inflammatories(NSAID) for pain:

Generally prescribed on a dosage schedule to allow the maintenance of appropriate blood levels of the drug. Over the counter drugs on as needed basis may be sufficient.

### Moist heat or ice:

A warm washcloth applied to the painful area for 15-20 minutes at a time can be used. Wrapping the washcloth in handtowels and heating in a microwave

will maintain the heat over the longest period of time. Ice may also be used alternating with heat or on its own depending on which provides the most relief. A small bag of ice with a towel wrapped around it, or an ice cube kept in motion over the skin may feel beneficial.

#### **Self guided jaw relaxation:**

The patient should be counselled on keeping a slight space between the teeth at all times other than eating or swallowing. This can be taught by having the patient say the letter "N", which will provide a small freeway space.

Diurnal parafunctional activity such as clenching, grinding the teeth, biting the nails, and posturing the jaw should be avoided.

#### **OCCLUSAL APPLIANCES in EARLY TREATMENT PHASE**

Full coverage splint: Recommended in cases which demonstrate nocturnal bruxism either by nocturnal monitoring by EMG, or as reported by patient of symptoms of pain or jaw stiffness in the morning upon awakening.

A maxillary or mandibular splint can be fabricated out of hard acrylic. The appliance should cover all teeth to prevent iatrogenic tooth movement. The appliance should be adjusted to have stable simultaneous occlusal contacts on all opposing teeth.

Generally the splint should be constructed to occlude in a position of comfortable mandibular closure.

#### **LIMITATION OF DISABILITY**

This is potentially an irreversible form of treatment which may require prosthodontic restoration or orthodontic treatment to restore stable occlusion.

A splint is made to correspond to the occlusal distance necessary to recapture the articular disk. The splint is worn 24 hours a day including during meals. If symptoms resolve, the patient is "weaned off" the splint. If this can not be done without the return of symptoms, the teeth may need to be moved or restored into the newly acquired position. This rearrangement of teeth is carried out by fixed orthodontic appliances.

#### **TREATMENT ADJUNCTS**

##### 1 - Behavioral Therapy:

Relaxation Therapy can be applied as part of the Early Treatment phase

Biofeedback can be applied as part of Limitation of Disability

##### 2 - Physical Therapy:

Exercise Therapy can form part of the Early Treatment phase. Trigger point injections, Ultrasound and physiotherapy, are useful in Limitation of Disability.

##### 3 - Surgical Therapy

Arthroscopy can be applied as part of Limitation of Disability. Accupuncture also has been tried in TMD with success.

*Health Care Trust wishes all the readers of "Your Practice Builder"*



*A very prosperous and Happy New Year*



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## ORAL CANCER

Since 90-95% of all oral malignancies are squamous cell carcinomas, the term oral cancer is used to imply **squamous cell carcinoma**.

Globally, oral cancer is one of the most common cancers. Though it may be detected at an early stage, due to lack of symptoms especially pain, medical attention is usually sought only in the advanced stage. Prognosis is poor at this stage. All dentists should equip themselves with the knowledge to detect oral cancer at the earliest possible stage.

In India, oral cancers are the commonest, constituting upto 40% of all cancers. When oral cancer is detected early, the five year survival rate is anticipated to be 80%. Within the mouth, factors which influence survival are :

1. Site (the further back the location of cancer in mouth, poorer the prognosis).
2. Size of the lesion at the time of diagnosis.
3. Degree of differentiation.
4. The involvement of regional lymph nodes and
5. Whether distant metastases are present or not.

Since we know the major risk factors for oral cancer, preventive approach is important. Tobacco is by far the most important risk factor for oral cancers, and excessive consumption of alcohol is the second most important risk factor. They act synergistically and the combined damage is more than multiplied.

1. **Primary prevention** of oral cancer is aimed at avoidance of the use of tobacco, encouragement of a healthy diet with adequate fresh fruits and vegetables.
2. **Secondary prevention** aims to detect the disease at an early stage, when intervention is likely to lead to cure, or minimise morbidity, and reduce eventual mortality.
3. **Tertiary Prevention** refers to the prevention of a new cancer development after treatment, or to minimise morbidity arising from treatment.

Since individuals with oral cancer are more prone to the development of other primary cancers of the oesophagus, larynx and lungs, detection of an asymptomatic oral cancer identifies individuals at high risk for development of other malignancies of the respiratory system and the upper aerodigestive tract.

Oral cancer occurs twice in men compared to women. It is most frequent in those over 40 years of age. People who are at high risk include:

- Smokers and other tobacco users
- Heavy alcoholic beverage users

Those who have had oral, lung or throat cancer before and

Those who are immuno-compromised (HIV)

The chances of developing oral cancer increase with the frequency and duration of the use of tobacco and alcohol, and with combined use of both.

### Oral Sites at Higher Risk

The floor of the mouth, the ventrolateral tongue, the soft palate, lingual aspect of the retromolar area, and the anterior tonsillar pillar are the areas of highest risk. Oral cancer more often affects mucosa of an edentulous ridge, though it may occur in the dentate part of the alveolar ridge.

The buccal mucosa, pharyngeal wall and base of the tongue may also be affected. Hard palate and alveolar ridge are less commonly involved.

Cancers of the tongue are often located at the borders, and cancer of the floor of the mouth is mainly found in the anterior part.

### Onset of Symptoms

Almost all of the malignant oral tumors are squamous cell carcinomas. Majority of them grow rather slowly, though sometimes they behave in a very aggressive way.

The average duration of symptoms is around 4-5 months, ranging from a few weeks upto one year.

Relatively small carcinomas measuring less than 1 cm, may be completely asymptomatic.

In carcinomas (CA) of the tongue, pain is often the first symptom, which may be localized or referred (eg. to ear).

Reduced mobility of tongue may be another symptom. In CA of floor of the mouth, majority of patients may present with discomfort or irritation at the site of tumor. There may be a reddish change, swelling or an ulcer. In CA of the oral mucosa, the most common presentation is an indurated area of ulceration, which in some cases may be surrounded by leukoplakic or erythematous changes. The manifestation may also be as an exophytic, papillary or verrucous growth.

Oral cancer is generally recognized by dentists as ulcers that fail to heal, as tumors, or as changes in long standing red or white plaque.

**Routine examination of the Oral Mucosa:-**

Use gloved fingers, and two mouth mirrors to retract the tissue.

Visual inspection should be supplemented by palpation of any suspicious area .

**Extra Oral Examination:-**

Observe the face for asymmetry, swellings, skin blemishes, moles and pigmentation. Examine the vermilion border of the lips and corner of the mouth, note any changes in color or texture.

**Intra Oral examination:-**

With the patient's mouth half open, examine the labial mucosa and sulcus.

With the mouth open wide retract the cheek on one side and examine the color and texture of buccal mucosa.

Then with the mouth half open observe the maxillary and mandibular sulci

Repeat sequence for the other side of the mouth.

Inspect the tongue at rest and protruded, look for any aberrations in the color, texture, distribution of papillae, asymmetry or mobility.

Now, to facilitate inspection of the lateral borders, hold the tip of the tongue with a gauze square and move it to one side, while retracting the cheek. Repeat for the other side.

Ask the patient to raise the tip of the tongue to the palate, and examine the floor of the mouth and ventral surface of the tongue.

Depress the tongue and inspect the hard and soft palate, then request the patient to say 'Ah' and examine the pillars of the fauces, tonsils, uvula, and oropharynx.

**The early detection of Oral cancer with Toluidine Blue:-**

The use of pharmaceutical grade Toluidine Blue (also called Tolonium chloride) as found in a proprietary product such as Ora Screen will eliminate any potential toxicity or uneven staining which would occur through the use of unrefined Toluidine Blue from laboratory.

Toluidine Blue must be used only after a visual and manual inspection of the oral cavity and neck and before any instrumentation of the oral soft tissue.

**Indications** for Toluidine Blue rinse or application

1. To examine the mouths of patients at risk for oral cancer.
2. To highlight early stage asymptomatic lesion and to confirm the presence of suspicious lesion.

3. To screen for other oral cancers in a patient with an already identified upper aerodigestive tract cancer, even after treatment of the initial lesion.

**Ora Screen Test**

This test involves four stages:

1. The mouth is cleansed by rinsing with the Ora Screen 1% acetic acid solution.
2. Rinsing with Ora Screen Toluidine Blue 1% disclosing solution stains abnormal tissue royal blue.
3. Rinsing with the Ora Screen 1% acetic acid solution to remove excess stain.
4. Visual examination by dentist.

The Ora Screen procedure can be completed in less than 5 minutes.

To reduce the rate of false positives (which is lower than 8%), after detecting a positively stained lesion during the first examination, repeat the test after 10-14 days.

A second positive staining indicates that a biopsy is mandatory.

The sensitivity of Ora Screen rinse protocol averages 94%. The patient with a screen detected lesion should be referred to a specialist.

Researchers at John Hopkins university have developed a test that may be used to regularly and quickly check for early tumors in patients at risk of developing cancer or as a post surgical test for residual cancer cells.

This test temporarily slows DNA production in cancer cells causing some elements of DNA to accumulate in the blood. When these materials are excreted in large amounts in urine, they indicate the presence of cancer.

Baseline urine samples are taken from the patients and they take one allopurinol pill. This drug is ordinarily used to treat gout but it temporarily interferes with the production of DNA element called pyrimidines. Urine samples during the next 24 hours will show surprisingly higher levels of orotidine and orotic acid (components used to build pyrimidines) in cancer patients.

**Dentist's role in prevention-** To be cont. in next issue

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**CARIES VACCINE**

**B**ritish scientists say they've developed a vaccine to prevent tooth decay by eliminating bacteria from the mouth, according to reports from CNN.

The American Dental Association's (ADA) Division of Science believes that the initial research results appear promising in the ongoing fight against tooth decay. The American Dental Association is looking forward to additional **long-term studies** that give more data to validate the results as reported.

The new vaccine is a **plant-based** substance that is painted on teeth and allegedly produces antibodies that prevent harmful bacteria (*streptococcus mutans*) from sticking to teeth and causing cavities. The vaccine was developed by California-based Planet Biotechnology and tested at Guy's Hospital in London.

The tasteless, colorless vaccine was **tested on people** during a four-month trial. Volunteers received the vaccine twice a week for three weeks for a total of six applications.

A mouth rinse was first used to reduce the levels of bacteria in the volunteers to zero. Then they applied a control (placebo) solution to some patients and the vaccine to others. Within two months, the bacteria

returned to the mouths of the control group while those who received the vaccine were reportedly protected for up to four months. Dr. Julian Ma and Professor Tom Lehner led the team of researchers at Guys Hospital dental school where the testing took place. The scientific trials are reported in the May issue of *Nature Medicine*.

A variety of research endeavors have been underway to explore the possibility of developing a caries vaccine for more than 20 years. We may expect that a safe, effective vaccine will be developed for the public. The company is hoping to have the vaccine available for consumers in 2001 or 2002.

**Welcome!! New life members**

- |                         |                    |
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**Contd. from page 2..**

Recently, application of the Root ZX® to an engine-driven, nickel titanium file system was developed. It allows file tip monitoring during all instrumentation procedures.

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<b>Apex Locator Type</b>	<b>Disadvantages</b>	
<b>Resistance Type</b> e.g. Foramatron IV (Parkell, USA) Odontometer A/S L, (Goofs)	Requires dry condition Needs calibration Requires lip clip	Ea Di Au Us
<b>Impedance Type</b> Endocater (Hygienic)	Difficult to operate Requires coated probes	Op Nc An
<b>Frequency Type</b> Endex (Osada) Root ZX (J. Morita)	May be short-circuited Requires lip clip	Op Us An Au Re