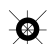
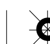


CYAN MAGENTA YELLOW BLACK

Single Visit Endodontics

Dr. Siju Jacob

Dr. Siju Jacob completed his B.D.S From Bangalore Institute of Dental Sciences Bangalore and M.D.S from Saveetha Dental College Chennai. He has a full time private practice limited to Endodontics in Bangalore, India. He can be contacted through his website www.rootcanalclinic.com
This is the first of a three part clinical article on Single Visit Endodontics.

Overview and Case Selection

"Single visit Endodontics versus multiple visit Endodontics". For decades, this topic has triggered many a battle royale pitting practitioners against academicians, juniors against seniors and not to mention Endodontists against Endodontists.

In recent years, with the advent of rotary Ni-Ti, single visit Endodontics has gained increased acceptance as the treatment of choice for most Endodontic cases. In spite of the recent developments, most practitioners are reluctant to do single visit Endodontics. The purpose of these articles is to discuss the various aspects of single visit Endodontics and eventually motivate the practitioner to make single visit Endodontics the rule rather than the exception in one's practice.

Reasons For Not Doing Single Visit Endodontics

We surveyed 50 private practitioners in Bangalore to determine their reasons for not doing single visit Endodontics. A variety of reasons were given. Listed below are some of the most common ones.

1) Fear of post-op pain.
2) Fear of failure.
3) Lack of time.
4) Lack of clinical experience.
5) Lack of equipment.
6) Fear of being "unconventional".
7) Fear of patient not accepting single visit Endodontics.
8) Discomfort to the patient.
9) Not economically viable.

Let's discuss these factors in detail to see whether any of them is actually a hindrance to a practitioner performing single visit Endodontics.

Fear Of Postoperative Pain.

Needless to say, this ranked as the most common reason for practitioners not taking up single visit Endodontics. When one relies on anecdotal evidence or individual testimonies, this may seem true. But if one actually goes through the scientific literature available, one is in for a surprise. Most comparative studies show no difference in postop pain between single and multiple visit Endodontics. Most studies show a 10% incidence of pain after single visit Endodontics which was quite similar to that of pain after multiple visit Endodontics. Considering most studies were done before the invention of rotary Ni-Ti instruments, one can only expect better results after the invention of these instruments. Therefore post obturation pain should never be a reason for not doing single visit Endodontics.

Fear Of Failure

If fear of pain was the first on everyones list, the second most common factor was failure. Can an endodontically treated tooth fail because it was done in one visit? Though anecdotal evidence seems to suggest so, scientific literatures seem to suggest otherwise. Most studies show no difference in success rates between single visit Endodontics and multiple visit Endodontics.

The question that a practitioner needs to ask himself is" Is there any benefit in bringing back a patient for multiple visits?" Could I do better work if I had more time at my disposal? This is where one needs to have the ability to select a case. For example look at the case in Fig.1A. This was a case where the patient had persistent pain after single visit Endodontics. This case if left alone would probably fail. The reason for the pain and failure is the missed third root (Fig.1B).

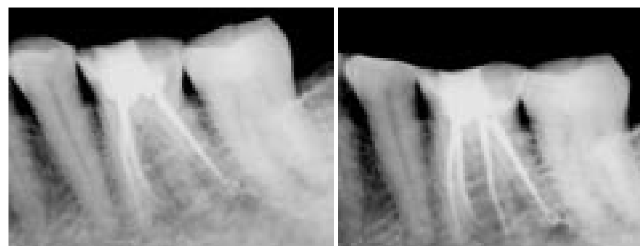
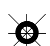
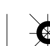
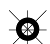
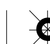


Fig. 1 A. *Fig. 1 B.*

The question to be asked is why this large canal was missed. Was it missed because the clinician rushed through the procedure? If the answer is yes, then this case would probably be better treated in multiple visits. If the clinician did not have the knowledge and the skill to discover this missed canal, this case would fail irrespective of whether the case was done in 1,2 or 5 visits. So the issue here is not the number of visits but what more was done to improve the prognosis of the case in subsequent visits. There are certain objectives which have to be fulfilled when doing Endodontic therapy. (These will be discussed later.) If these objectives can be achieved in one visit, then there is no need to recall the patient for a second time.


CYAN MAGENTA YELLOW BLACK


Lack Of Time

Lack of time in a busy practice is another common excuse for not doing single visit Endodontics. This may be true in case of those emergency patients who drop in without appointments. But what about the majority of patients who are seen only on an appointment basis? Instead of giving the typical 30 minute appointment for access, why not give them 45 minutes more and complete the case? Many a times we see cases which are called for cleaning and shaping being converted to 5 minute "irrigation appointments" because of lack of time. Then begins the ritual of open dressing, closed dressing, interappointment pain, open dressing again and so on. This sort of unplanned Endodontics only harms the patient and the practice.

Most clinicians when asked say they prefer to do access in the first visit, cleaning and shaping in the second visit and obturation in the third. Let's see how much time is spent doing redundant procedures in between each appointment:

Preparing the chair----- 5 minutes: Even with excellent staff, it takes at least 5 minutes to clean and prepare the chair in between patients.

Chit chat -------- 5 minutes: Exchanging pleasantries are part of any practice and probably more in India than elsewhere. This time can increase or decrease depending on the personality of the dentist and the patient.

Anesthesia ------ 10 minutes: Giving anesthesia is not the problem, obtaining it is. Some mandibular molars may require about 20 minutes to get profound anesthesia

Isolation and reentry through temporary ---- 5 minutes: Applying the rubber dam and drilling through the temporary to reach the canals takes at least 5 minutes.

Reorientation ------- 10 minutes: This is a huge time waster. The root canal anatomy which was so familiar during the last visit suddenly appears alien. Files which were snugly fit at the apex during the last visit may be loose. One may need to take additional working length radiographs to re-familiarize.

Drying the canals and putting a temporary filling --- 5 minutes

Post-op instructions ---- 2 minutes.

More chit chat ----- 3 minutes.

When we calculate the total time taken to do repetitive procedures it works out to 45 minutes per visit. What is thought to be a time saver is actually a huge time waster. Single visit Endodontics actually makes sense in a busy practice and can save the clinician hundreds of hours every year. Therefore lack of time should never be an excuse for not doing single visit Endodontics.

Lack Of Clinical Experience

This is certainly a valid point. Single visit Endodontics should never be done by an inexperienced clinician. Single visit Endodontics should be attempted only after one gains proficiency and confidence in multiple visit Endodontics. Very often we see a beginner attempting single visit Endodontics rushing through the procedure and often compromising on the quality of Endodontic therapy. Readers should realize that there are no short cuts to excellence in Endodontics.

While lack of experience can be an excuse for a beginner, one fails to understand clinicians with over 15 years of experience claiming lack of experience as an excuse for not doing single visit Endodontics.

Lack Of Equipment

This is again a valid reason. If a practitioner is attempting to make the transition from multiple visit Endodontics to single visit Endodontics, then he needs to invest in certain equipment. This investment can be done irrespective of whether the practice is in a rural or urban area. We will discuss equipment and profitability at a later section.

Fear Of Being Unconventional

From the time one is in dental school, one is brought up with the notion that multiple visit Endodontics is conventional while single visit Endodontics is "unconventional". However this is purely a mental problem and should easily be overcome. One can use "unconventionality" as a tool to promote one's practice rather than be scared by it.

Fear Of Patient Acceptance

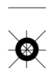
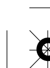
Some practitioners felt there was a possibility of patients who were used to multiple visit Endodontics considering single visit Endodontics as substandard. In our clinical experience, we have found the converse to be true. Patients are actually thrilled at the possibility of finishing the treatment with lesser visits and injections. One can explain the transition from multiple visit to single visit Endodontics due to better instruments and technique. Most patients are mature enough to understand.

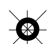
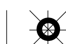
Patient Discomfort

Few practitioners felt it could be uncomfortable for the patient to keep the mouth open for a long period of time. This is again a valid reason. As a rule, single visit Endodontics should be completed in 1 hour. If at the end of 1 hour, one has not reached the master cone stage, it would be prudent to recall the patient for a second visit. With experience, most cases can be completed within 1 hour. Case selection will be discussed later in this article.

Economics

There were also a small group of practitioners who felt it was easier


CYAN MAGENTA YELLOW BLACK


to charge the patient in multiple visit installments, rather than the entire treatment charges in one visit. This again is not true. Our experience shows that patients are in fact willing to pay more for single visit Endodontics. Years ago, when I started using rotary Ni-Ti, I was part of a large practice where multiple Endodontics was the norm. When we made the transition to single visit Endodontics, we let the patient decide. We gave them the option of multiple visit Endodontics using conventional hand instruments at the standard fee and single visit Endodontics using rotary Ni-Ti at a fee that was 20% more. 3 months later, we stopped giving them this option because not a single patient chose multiple visit Endodontics even though it was 20% cheaper. Today in our practice, 95% cases are treated in a single visit. Never underestimate your patients!

Advantages and Disadvantages of single visit Endodontics:

Advantages:

• **Patient comfort:** This is undoubtedly the biggest advantage. Patients are absolutely thrilled with the idea of root canal treatment in a single visit. The major reason for the increased patient acceptance is the reduced number of injections (who wants to take injections?). The other comfort factor is reduced number of visits to the dental clinic. (The dental clinic can hardly be classified under dream destinations).

• **No interappointment pain:** In a study done by Torabinejad, 50% of patients undergoing multiple visit Endodontics required an interappointment visit because of pain or swelling. While this figure may seem exaggerated to a clinician, interappointment pain resulting in an emergency appointment does occur in multiple visit Endodontics. Single visit Endodontics eliminate the flare-ups caused because of leakage of the temporary cement.

• **Saves time:** In today's world, the most precious commodity is time. Single visit Endodontics saves many hours of the patient's time and hundreds of hours of the clinician's time.

• **Minimizes fear and anxiety:** Single visit Endodontics is a boon to the apprehensive patient. For these patients, the psychological trauma starts at the very thought of going to the dentist. Add to that the trauma of going through multiple injections. Single visit Endodontics builds confidence and motivation in such patients.

• **Minimizes incomplete treatment:** Although not very common, some patients do not return to complete the root canal treatment. Single visit Endodontics minimizes the occurrence of these "disappearing" patients.

• **Familiarity of the canal anatomy:** This is the most important factor from a clinician's point of view. Each pulp space has its own intricate anatomical variations and it takes a while for a clinician to become familiar with these. Multiple visits would require re-familiarization leading to loss of time and frustration.

• **Constant working length:** When doing multiple visit Endodontics, most clinicians note down the working length but make no note of what the reference point was. The reference point could be a thin cusp tip which could chip off between appointments. Failure to note down stable reference points could lead to incorrect working length determination and related flare-ups. These mishaps are avoided with single visit Endodontics.

• **Esthetics:** For patients who report to the clinic with fractured anteriors, an esthetic restoration can be placed immediately after single visit Endodontics.

Disadvantages:

A practitioner who is used to single visit Endodontics would see no disadvantages in single visit Endodontics. However, from an impartial view the following could be classified as disadvantages:

• **Tiring for the patient:** The longer single appointment could be tiring for some patients. Some patients with T.M.J problems may not be able to keep their mouth open for a long duration.

• **Inexperienced clinician:** As discussed earlier, an inexperienced clinician may lack the skill to complete the Endodontic therapy in one visit.

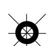
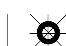
• **Flare-ups:** If a flare-up occurs, it is easier to establish drainage in a tooth which is not obturated.

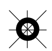
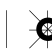
• **Not possible in all cases:** Difficult cases like calcified canals, severe curvatures, weeping canal, etc... may require more time and subsequent visits.

Criteria for single visit Endodontics:

1) Clinical experience: The Endodontic competence of the clinician is the most important factor in performing single visit Endodontics. Single visit Endodontics should never be attempted by inexperienced clinicians. Practitioners should understand that single visit Endodontics is not an excuse to compromise on the basic principles of Endodontic therapy. As a rule, single visit Endodontics should be completed within 1 hour. The clinician should have the ability to treat the case in this limited period of time without compromising on the quality of the treatment. Unforeseen procedural problems may arise and one should have the clinical wisdom to convert a single visit case into a multiple visit one if necessary. This is far more prudent than rushing through. It is foolish to start a case assuming to finish it in one sitting come what may.

2) Patient cooperation: When starting with single visit Endodontics, one should start with cooperative patients. Starting off with uncooperative patients can destroy confidence and can lead to frustration and compromised treatment. Non cooperative patients include children, gaggers, patients with T.M.J disorders, limited mouth opening, etc... Later on, as one gains more experience and thereby more confidence, one can handle uncooperative cases too with ease.

3) Accessibility: One should start performing single visit Endodontics on teeth which have good access and visibility. Anterior teeth are more visible and accessible than posterior teeth. Therefore one should always start with the anteriors. Maxillary anteriors are great teeth to start single visit Endodontics. The confidence that the clinician gains after doing single visit Endodontics on easily accessible teeth will then enable him/her to tackle more "difficult to access" teeth.

4) Anatomic variations: It is wrong to have a preconceived notion about the number of canals a tooth can have. Anatomic variations from the usual "set pattern" can occur in any teeth. A clinician should have a high degree of suspicion for extra canals. Teeth which have anatomic aberrations require more time to treat and are probably not the best candidates when making the transition to single visit Endodontics. The following are teeth which commonly show extra canals and systems.

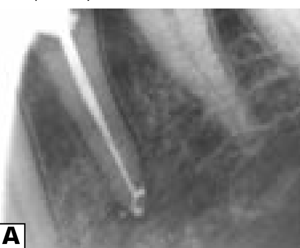
• Mandibular incisors:

Very often, mandibular incisors have two canals which can have two or more portals of exit (Fig.2). The canal that is most often missed is the lingual canal. Access cavities need to be extended more lingually to locate the second canal. The clinician should allocate more time when planning to treat mandibular incisors in a single visit.

Fig2: Mandibular incisor showing two canals and more portals of exit.

• Mandibular premolars:

Mandibular premolars commonly exhibit a single canal but occasionally can bifurcate. When they occur as a single canal system (Fig. 3A), the apical one third frequently exhibits ramifications. Time should be spent to clean out these ramifications. Single canals which bifurcate into two (Fig.3B) can take more time to treat and therefore are not ideal teeth when starting the transition to single visit Endodontics.



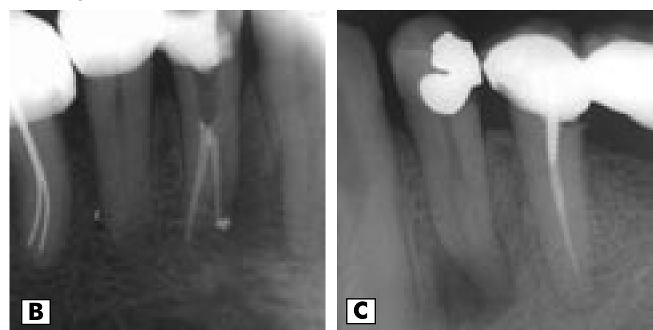
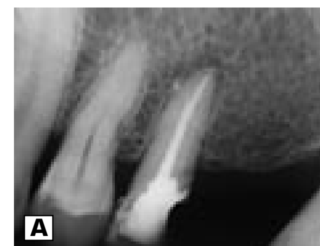


Fig 3: Variations in mandibular premolar anatomy. (A) single canal with ramifications in the apical one third (B) Single canal which bifurcate into two. (C)A good off angled preoperative radiograph helps the clinician to anticipate bifurcated premolars.

A good off angled preoperative radiograph can help the clinician to anticipate bifurcated premolars (Fig. 3C).

• Maxillary premolars:

Maxillary premolars may have one (Fig. 4A), two (Fig. 4B), or three canals (Fig. 4C). Maxillary premolars with three roots or canals are probably best treated in multiple visits.



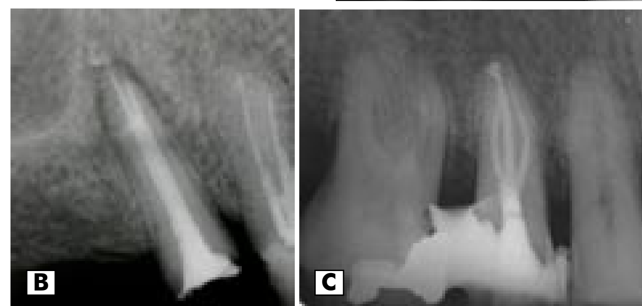


Fig. 4: Variations in maxillary premolars: (A) single canal (B) two canals, (C) three canals.

• Maxillary molars:

A second mesial canal (MB2) (Fig.5) is seen in 60% of maxillary first molars and about 30% maxillary second molars. MB2's are frequently narrow and curved and would require more time to treat. Another variation is an extra palatal root or canal. These teeth have a large incidence of missed canals and therefore one should have the clinical wisdom to decide when an additional sitting would be necessary to satisfactorily treat some teeth.

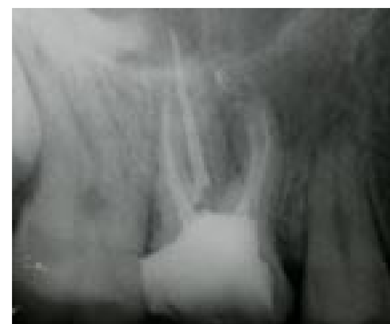


Fig 5: MB2 in maxillary first molar.

• Mandibular molars: Mandibular first molars commonly have, three, four or occassionally 5 canals (Fig. 6A, B). Single canal teeth are also occasionally seen. Often a third mesial canal (middle mesial canal) is present between the mesio buccal and mesiolingual canals.

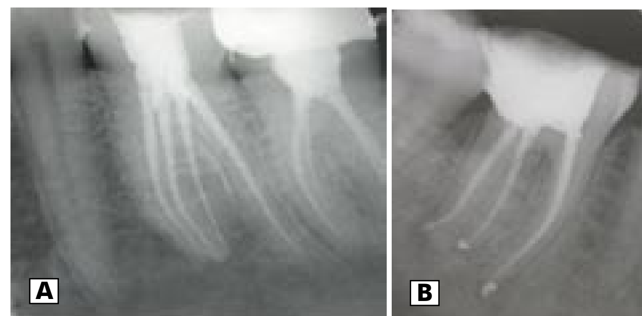
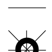
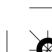
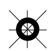
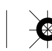


Fig 6: Multiple roots and canals in mandibular first molar.

Mandibular second molars, apart from the above variations can also manifest as two canals which merge into one (Fig. 7A). C shaped canals are also commonly seen in these teeth (Fig. 7B). C shaped canals take more time to clean and fill.

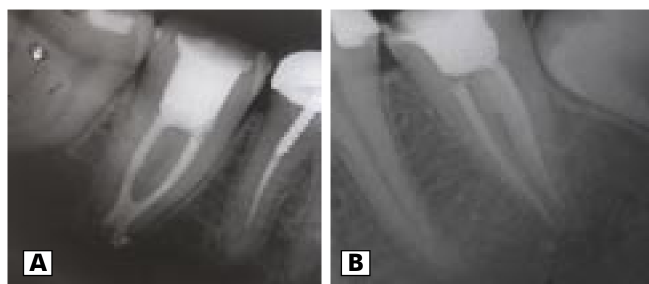


Fig. 7: Anatomical variations in mandibular second molar: (A) two canals merge into one. (B) 'C' shaped canal.

• **Third molars:** These teeth can have as many canals as they please. Both maxillary and mandibular third molars can have a variety of anatomical variations. The clinician must be prepared to treat anywhere between 1 to 5 canals (Fig. 8A, 8B).

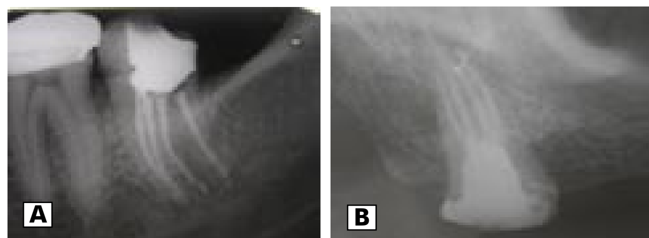


Fig. 8: Extra canals in third molars. (A) Triple rooted mandibular third molar. (B) Four canals in maxillary third molar. This tooth has two palatal canals.

5) Calcified canals: Teeth with calcified chambers and canals take more time to treat and are more prone for iatrogenic errors than those with wide pulp chambers. Some may require multiple visits. A good preoperative radiograph can help the clinician plan treatment of these teeth (Fig. 9A, 9B).

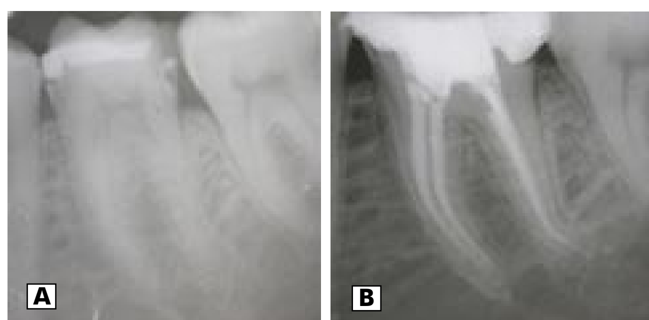


Fig. 9: Calcified chamber and canals. (A) Pre-op radiograph helps prevent iatrogenic errors. (B) Post obturation of same case.

6) Curved canals: Most canals exhibit some degree of curvature. Some are obiviously more curved than usual (Fig.10A, 10B, 10C, 10D). Severely curved and tortuous canals take more time to treat and require patience and skill. These canals are probably best treated in multiple visits if the clinician is not experienced.

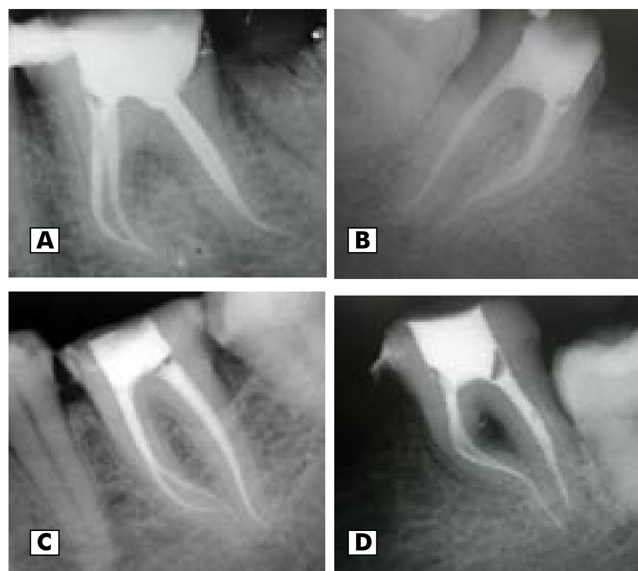


Fig. 10: Curved canals.

7) Pulp status: Vital teeth have fewer post op flareups when compared to non vital teeth. Although an experienced clinician can treat even non vital teeth in a single visit with little or no post op problems, it is a good idea to start with vital teeth when making the transition to single visit endodontics.

8) Apical lesion:

The presence of an apical lesion tells us that the tooth is non vital. A red flag should go up when treating these teeth in a single visit. However the size of the lesion is no indicator of the intensity of the flare up. According to our clinical experience, the smaller the lesion, the more the chances of a flare up is. Teeth with apical lesion which have been left open for a long time are not ideal for single visit Endodontics (Fig.11). An asymptomatic tooth with a lesion has the potential to turn into a phoenix abscess. It would be prudent to treat these teeth under antibiotic coverage.

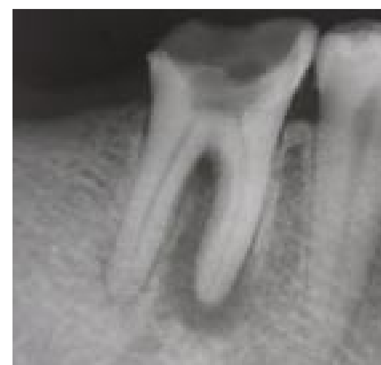
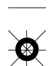
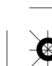
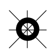
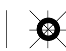


Fig.11: Teeth with apical lesion and left open for too long are not ideal cases for single visit Endodontics.

9) Clinical symptoms: Single visit Endodontics should not be done in acute alveolar abscess cases. Patients with severe pain, tenderness and swelling are better treated in multiple visits. These instances are however the exception rather than the rule.

10) Presence of a sinus tract: Teeth with sinus tracts seldom flare-up and therefore are good cases for single visit Endodontics. The sinus tract acts as a safety valve and prevents the build up of pressure.

CYAN MAGENTA YELLOW BLACK

Indications and contraindications:

As mentioned previously, the clinical Experience and ability of the clinician is the most important factor. A clinician who is experienced in single visit Endodontics can perform the majority of cases in a single visit. For an experienced clinician, the only absolute contraindication is in case of a draining canal. However for a clinician who is starting to make the transition from single visit endodontics to multiple visit endodontics, the following indications and contra indications may prove useful.

Indications for single visit Endodontics:

- Uncomplicated vital teeth.
- Physically compromised patients who have to make an effort to come to the dental clinic.
- Medically compromised patients who require antibiotic prophylaxis and sometimes alteration in the medication they take.
- Fractured anteriors where esthetics is a concern.
- Apprehensive but cooperative patient
- Patients who require sedation or operation room.
- Uncomplicated non vital teeth with sinus tract.

Contra indications for single visit Endodontics:

- Acute alveolar abscess cases with pus discharge.
- Patients who have acute apical periodontitis with severe pain on percussion
- Painful non vital tooth with no sinus tract.
- Asymptomatic teeth with apical lesion and no sinus tract.
- Cases with procedural difficulties like calcified canals, curvatures, extra canals, etc....
- Patients with TMJ disorders and inability to open the mouth.
- Teeth with limited access.
- Non surgical Retreatment cases.

The basis of successful single visit Endodontics is thorough cleaning and shaping. We shall discuss principles and techniques of cleaning and shaping in the next issue.