

Practised in the art of pulpotomy

Dr Ray Bellamy addresses the treatment of acute pain from a pulpitic tooth

We are not reminded enough in general dentistry that although we operate in a mechanical way, we do so in order to deal with a biological and bacterial problem. The reason I say this is that we can often overlook the biological aspect of what we do. I wrote before of the mechanical and biological objectives of endodontics. When this happens the host defence mechanisms are put into action and, more often than not, deal with any disruption in the normal homeostasis of the human body. Repetition of the same procedures, day in, day out, can lead to complacency. One sure reminder is the pulpitic tooth.

Because the dental pulp blood supply is a terminal supply, its capacity to withstand even moderate trauma is compromised. A dental restoration is such a trauma. Pulpitis usually presents to our offices with a disgruntled patient attached. Disgruntled because



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invariably a recent dental procedure has been carried out under the dentist's recommendation. The prompt and efficient relief of pain in these instances is both welcome and a great practice builder.

To be practised in the art of pulpotomy is vital (no pun intended!) in order to deal with these acute clinical presentations. To be prepared for pulpotomy is also vital. The delivery of a predictable mode of care for the relief of acute dental pain is essential for the smooth running of any busy dental practice.

Diagnosis

Critically, the first priority is to establish a firm diagnosis before embarking on any active treatment. In the case of the pulpitic tooth, the clinical symptoms are classic and have been discussed. Briefly, they constitute acute pain on extremes of temperature, spontaneous pain, and the patient is often woken by pain at night. Remember, if you cannot reproduce these clinical symptoms or make a definitive diagnosis then do not carry out the pulpotomy procedure. If the tooth is non vital, the pulpotomy will not work and this treatment modality is not indicated.

Anaesthesia

After the necessary tests have been made, the symptoms reproduced and a definitive diagnosis made, the first step is to establish anaesthesia. This in itself can be a problem. If the presentation is early then profound anaesthesia can usually be gained and the procedure completed. However, in many instances the subject may choose to 'tough it out' for a period, which allows for the build-up of chemical inflammatory mediators in the pulp space. There are many reasons promulgated as to why

anaesthesia is ineffective or less profound in these cases but the bottom line is that the tooth is difficult to anaesthetise. It is better to get in early rather than late in these cases. Remember, if the diagnosis is pulpitis then the pulp is going to die.

Aids to gaining successful anaesthesia include the use of intraosseous delivery of anaesthesia, supplemental injections to the palate in the maxilla, the lingual in the lower and the use of the Gow-Gates approach to the inferior dental nerve. Direct pulpal anaesthesia should be considered if the chamber is accessed and the patient is still uncomfortable. Finally, if you are unable to gain profound anaesthesia then the discharge of the patient should be considered. The administration of high dose anti-inflammatory medication, e.g. 800mg. Ibuprofen t.i.d. (where appropriate), for a maximum of 48 hours means that a second attempt is usually more successful.

A delay in the delivery of this treatment allows the radicular pulp tissue to become inflamed; the procedure will be less effective and less predictable. We need predictability in this procedure and prompt intervention will deliver this to us. In most cases the patient will have been subjected to, and barely tolerated, the incredible pain of pulpitis. Their levels of tolerance may be at its nadir. A proper and concise explanation of the procedure is important in order to get the patient 'onside'. Explain the rationale for what you are about to do. Yes, they will dismiss it with: 'I don't care... Just do something!' But it will be appreciated nonetheless when all is said and done.

Rubber dam

The third step is the placement of rubber dam. It is a fundamental principle of a pulpotomy/pulpotomy

procedure that sterility is maintained throughout. The inflammation and pain within the tooth may not be bacterial in its origin. The introduction of bacteria would be an added complication. Therefore, rubber dam placement must be considered mandatory – not only for its success but also for the safety and well-being of both the patient and the operator.

Access cavity

Of course the procedure for the anterior tooth, the pulpectomy, is far less complicated in the dentist's eyes because of its proximity to the front of the arch, the less complicated anatomy and often easier anaesthesia. The attention to detail remains the same. At the risk of being condescending, I should state that the access cavity is done in accordance with good endodontic principles.

A good access cavity to the pulp chamber will allow you to remove the tissue in the pulp horns and introduce a barbed broach to extirpate the pulp without interference from the walls. The broach should be chosen to be large enough to engage the pulp firmly without binding the walls. In all cases the broach should never be used deeper than two-thirds of the way into the canal and never into the curved section of a canal. Utilise a single turn of 360° and remove the pulp in its entirety. Avoid the maceration and 'hamburger making' of the tissue, as this is subsequently more difficult to remove and any that remains will be severely damaged and generate inflammatory exudates, resulting in pain. The less manipulation of the tissue the better. The more complete the removal the better. In the mature tooth the complete removal of the radicular pulp is a critical phase of endodontic treatment. It will never be as easy to do again so, wherever possible, the complete removal

of this tissue is desirable.

In the posterior tooth good access is critical. Access to the chamber is to include the pulp horns and will set the operator up for good straight line access when the root treatment is to be completed. The removal of any decay advancing to the chamber is necessary to avoid rapid recontamination. The removal of the complete restoration and all decay is desirable where it would not compromise the strength and function of the temporary restoration.

Access to the chamber through enamel and dentine is made with the hi-speed with copious water spray to avoid overheating of the pulp. A hi-di crown preparation bur with rounded tip is most suitable in both length and shape for this purpose. This avoids the creation of any sharp internal line angles within the access cavity and its length allows the bur to penetrate to a deeper level. This is used until you have prepared a smooth, gradually tapered access and recognise the roof of the chamber, usually by the presence of a pink hue beneath the dentine. At this stage irrigate the chamber with 5.25% NaOCl and dry. A size 6 or 8 sterile round bur should then be utilised at low speed to breach the roof of the chamber. The clinician will sense 'a drop' of the bur as it enters the chamber and the bur is then moved laterally in an effort to unroof the pulp chamber. This is done in all directions to eliminate all the tissue, and upwards and outwards to eliminate the pulp horns. Further irrigation with NaOCl will aid the removal of pulpal tissue. Do not be tempted to handle and contaminate the bur in cleaning debris from it, but utilise isopropyl alcohol and gauze for this purpose.

The pulpitic tooth will bleed profusely and, following the complete removal of the coronal contents of the chamber, the orifices of the canals will be clearly visible as separate bleeding points. Place a sterile cotton pellet (Size #3) dampened with either sodium hypochlorite or hydrogen

peroxide into the chamber and leave for a couple of minutes. Removal of the cotton will reveal the presence of amputated stumps of pulp tissue blanched by the medicament. The placement of one or two sterile cotton pellets firmly and evenly into the chamber will allow the passive exudates to be absorbed and support the temporary filling material. There is no need for the introduction of phenolic agents to the chamber as these will merely exaggerate the inflammatory condition of the pulp.

Closure

Cavit G is a suitable material for this purpose if the patient can be treated promptly, otherwise use a glass ionomer material like Fuji II or Fuji IX. Irrespective of the temporary filling material, it is important to place at least 4mm of filling material to ensure that a strong and adequate seal is attained.

The closure of the chamber in both anterior and posterior is the same. However, the occlusal loads present in the posterior teeth cannot be overlooked. The occlusion should be checked and reduced to avoid excessive loading of the tooth. Concise post-operative instructions should be given to the patient and a clear endorsement that although their pain will subside dramatically they must return for root canal therapy. The patient may choose to take analgesics and if so then powerful anti-inflammatory tablets would be the medication of choice. Absolutely no antibiotics are indicated for this procedure.

Conclusion

The pulpotomy procedure is not to be considered part of the root canal therapy. It is a separate procedure and a separate fee should be charged. If the clinician is to give this procedure the attention it deserves then this is more likely if a suitable fee is raised. Your patients are very appreciative of your skills and your efforts to accommodate them for the prompt relief of pain and suffering. After all, this is what we do. 