

# The art and science of diagnosis in endodontics

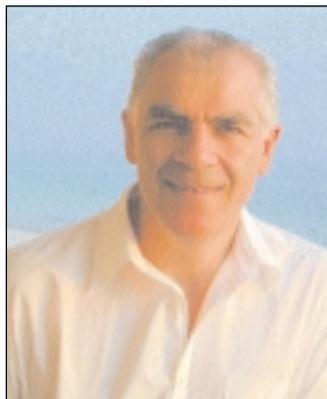
Dr Raphael Bellamy confronts current diagnostic terminology in endodontics and introduces Dr Schilder's simple classification of pulpal disease

In my article last month on the biological objectives of endodontic treatment laid down by Schilder, I wrote briefly about the concept of having a real commitment to excellence in endodontics based upon our knowledge, skill and desire.

Excellence in endodontics is a decision and this degree of commitment starts from the moment the patient presents for treatment. Diagnosis is treatment.

This month's article comments on the terminology used in the art and science of diagnosis in endodontics.

Certainly the area of diagnosis in endodontics is fraught with misapprehension. I feel this is due to the slow evolutionary process of understanding the endodontic



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disease process. A liberal sprinkling of histological terms and other language based upon the presenting condition does nothing, in my view, to help improve our ability in decision making of when to treat and not to treat a tooth endodontically.

First and foremost we are clinicians, not histologists. They have their domain behind microscopes of a different sort and they are essential in the field of medicine and dental medicine. Their ability to identify subtle differences in histopathology on a cellular level is important for the classification of diseases.

However, I see these descriptions as little help for the clinician at the 'rock face'.

To this end I set before you the classification used by Dr Herbert Schilder, a superb wet-gloved clinician in his day who during his practising career wrote over 100 scientific articles, contributed chapters to many textbooks on endodontics, and lectured at major dental meetings in more than 25 countries on every continent. Put simply:

#### • Normal

A normal tooth gives a moderate response to pulp tests (EPT) and this response will subside when the stimulus is removed. The tooth is free of spontaneous pain. Radiographs will show an absence of pulp calcification, internal resorption and an intact lamina dura.

#### • Hyperaemia

This is the first stage where the pulp is symptomatic. There is a sharp hypersensitive response to the cold test, but the pain

subsidises as soon as the stimulus is removed. There is also pain reported when the tooth is in contact with acidic, basic substances or sweetness.

Patients may describe symptoms of fleeting pain and will often not be able to locate the source of the pain. This stage can last for months or years. An investigation of the symptoms may reveal a carious lesion, recent restorative procedures, defective restorations or cervical erosion. Confirmation is obtained with a positive cold test that will not produce any lasting pain and a positive electrical pulp test (EPT). No endodontic treatment is needed for this condition. Usually a sedative-type dressing will suffice, followed by a permanent restoration when the symptoms have completely subsided.

The above are reversible.

Those below are irreversible:

#### • Pulpitis

It is characterised by intermittent or continuous episodes of spontaneous pain. Sudden temperature changes will produce prolonged episodes of pain. A heat test will confirm the symptoms and will produce a delayed or paroxysmal response. Often the patient cannot localise the pain, only say whether it is the right side or the left. These episodes of pain can last for hours, or even days, and will almost certainly be exacerbated by flight. Pain can also be reported on changes in posture, exertion or exercise.

Radiographs are helpful in certain cases to detect a suspect

tooth (deep carious lesion, extensive restoration). An EPT will produce a positive test. This condition of the pulp is irreversible and requires endodontic therapy. Usually the application of ice or cold will reverse the symptoms of a pulpitis produced by heat.

#### • Necrosis gangrene

Conditions following the untreated pulpitis or, for example, trauma causing disruption of the blood supply may lead to necrosis and gangrene.

The pulpal tissue is dead and if the condition is not treated, the noxious materials, infected or not, leaking from the pulp system will lead to a lesion of endodontic origin (LEO) even in the absence of bacterial infection.

It is usually an asymptomatic condition that will not give any response to the EPT. To confirm the condition two tests should be conducted, preferably the heat test and the electrical test. If no response is elicited, then endodontic treatment is required.

#### • Acute alveolar abscess (AAA)

The patient will complain of throbbing, pulsing and pounding pain. In this case the offending tooth is easily identifiable and the pain localised to a specific area. Very often the subject will describe the tooth as being in hyperocclusion. There is an increased degree of mobility.

The operator should rely on the EPT and heat test, with no response expected of either. One additional helpful indication is the extreme

sensitivity to percussion and palpation. Radiographically the periapical tissues may appear normal as a result of the acuteness of the stage.

**The importance of simplifying the process**

There is no doubt that the five listed classifications laid down by Schilder are an over-simplification of an extremely complex disease process. The A B C D of cardiovascular resuscitation are too. But in the heat of battle this is what we need. It is a complex disease process in that there is a continuum. A start of the disease process coronally, several important stages along the journey south and then to final Armageddon. The end usually results in loss of the tooth due to complete failure of the support apparatus. But to overcomplicate clinical diagnosis unnecessarily for the practising clinician is undesirable and certainly does the patient no favours.

Schilder's classifications	Commonly used classifications
Normal	Normal
Hyperaemia	Reversible pulpitis
The above are reversible	Irreversible pulpitis
	Symptomatic irreversible pulpitis
Those below are irreversible	Asymptomatic irreversible pulpitis
Pulpitis	Necrosis
Necrosis gangrene	Acute apical periodontitis
Acute alveolar abscess	Acute apical abscess
	Chronic apical periodontitis
	Phoenix abscess
	And there may be more by now!

One can imagine easily the scenario of the dolorous patient being informed that root canal therapy is not required because a diagnosis of reversible pulpitis has been made, and within hours a root canal is required as the condition relentlessly worsens to irreversible pulpitis. Not a great reflection on our learned profession.

In the final analysis, the

pulp is either healthy or not, and must either be removed or not. The capacity of the mature pulp to repair following traumatic, chemical, thermal, mechanical or bacterial assault is extremely poor. The reasons for this are myriad and beyond the scope of this short article.

Well-trained, experienced prosthodontists, quite rightly, do not hesitate to rid 60-year-

old, multi-filled teeth of their sclerotic, sluggish pulps prior to full coverage or bridge prostheses.

Well-performed endodontic therapy is a highly predictable, successful means of eliminating pulpal disease and its sequelae. It also retains the tooth, the periodontium and the surrounding bone.

Harping back to my previous article of belief in endodontic therapy, I say to you that if you really believe in the predictability of endodontics, as I do, then get on and get that pulp out so the tooth can be predictably restored for a long and useful future. 📧

**References**

Cohen S (1994) Diagnostic Procedures. In: *Pathways of the Pulp*. 6th Edition, chapter 1

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