Cleaning canals

Dr Michael Sultan discusses how sodium hypochlorite is his irrigant of choice

There are now so many systems for better faster and more efficient preparation of root canals that sometimes the real biological focus of treatment is somehow overlooked.

The issue is not how quickly a canal can be prepared using the latest Nickel Titanium (NiTi) systems but whether the canals are actually clean. It is very easy to get seduced by a beautiful shape on a radiograph but if the canal was not fully disinfected first the whole system will fail. The preparation of root canal treatment in a vital tooth is to remove the inflamed tissue and ultimately to seal the canal system. Treatment is more complex in a non-vital tooth where the bacterial control is the key to success.

Pleasing the patient

When patients come to see me with a failing root canal, they are often disappointed and want to know how and why their dentist has failed. I usually show them the excellent program tooth atlas (www.tooth atlas.com). This shows three-dimensional images of teeth gained from micro scanning. It highlights to them that canals are not simply straight tubes going from the crown to the apex but are complicated structures often interlinked with multiple branches. Looking at these images, I am sometimes amazed that the success rates that we quote to patients are so high when these canals are so difficult. I also think that if the patients were forewarned and advised that the prognosis of a tooth was 80 per cent and not 100 per cent a lot of problems could be avoided.

Relying on irrigants

Looking at the shape of canals, it becomes clear that there is no way a stainless steel file can even make a start in preparing it fully. Even the nickel titanium files will be ineffective, so we must rely on our irrigants to really clean canals. They do this by dissolving the organic pulp tissue, killing and removing bacteria and dissolving the inorganic block. The key is to get some room for our irrigants to get in.

The effects of the sodium hypochlorite are best explained using the analogy of our mouth. The bacteria in a canal are like the pocket germs and if flushing will not remove them but are found in biofilms organised plaques of tissue. These biofilms need to be disrupted so we need to actively plane the canal walls with instruments whilst getting in large volumes of irrigants ideally activated by ultrasonic.

Using NiTi instruments

One of the problems of using NiTi instruments is the false sense of security it gives us by so rapidly enlarging canals. Firstly, it doesn’t mean that oval canals are fully prepared as the NiTi instrument tend to be quite centred so much of the canal walls are untouched and secondly the preparation is so fast that our irrigants have not had time to work. Ideally the minimum soaking time with sodium hypochlorite should be 5 minutes to ensure that the tissues have been dissolved from all the nooks and crannies of the tooth and the bacteria killed.

Don’t make mistakes

It must not be forgotten that sodium hypochlorite is a very toxic fluid that if extruded out of a canal can cause serious complications. It is not uncommon following a flare-up to get a phone call from one of the audience in a panic saying that the patient is in severe pain and is having an allergic reaction to the hypochlorite. What has normally happened is the sodium hypochlorite has been forced out of the canal into the surrounding tissues.

The result can be startling and dramatic. The patient might well scream out in pain and there will be a profuse bleed there is a possibility of parapharyngitis and later very marked bleeding. Management is very much to stay calm and to make sure the patient is calm—you may well be the only person in the room doing so. Local anaesthetic has to be top up and in some cases mild sedation may be required. Ideally the canal should be rinsed out with saline and the contents aspirated to dilute the irritants. Antibiotics are seldom required but are recommended if the canal was infected and had been endodontically prepared. The patient should be advised on pain control and the most effective is alternating 400mg Ibuprofen with 500mg Paracetamol. The patient should also expect severe bruising and should be advised the use of ice packs.

Down to poor management

I have known of patients leaving practices due to hypochlorite accidents but most of the problems are due to poor management. The effects of the sodium hypochlorite is self-limiting with return to normality at about two weeks and there are cases studies which detail the effect of when an Inferior Dental block was inadvertently given with bleach rather than with local anaesthetic.

The initial problem occurs when using the high concentrations of hypochlorite 5.25 per cent. This we need for its tissue dissolution affect but it is highly toxic. In addition we know that fluids do not flow very well around a root canal so to get a good flow in the apical area the needle has to be within 2mm of the apex. Some precautions therefore have to be taken.

Firstly, the needle should never bind in the canal but should be kept moving. This prevents wedging and possibly forcing the fluid through the apex. Ideally the needle should be safe ended and exiting to stop apical flow. Leuer locking needles are vital as we have all seen needles fly off syringes under pressure-bleach coming in contact with expensive clothes can be costly at best and at worst bleach in contact with eyes can be very irritating. Knowledge of the needle diameter is also important – 25 gauge is equivalent to a size 60; 27 to a size 40 and 28 to a size 30.

Take it slow

The bleach should always be injected slowly and some advo-