Endodontic success: '100% – X'

Raphael Bellamy discusses homeostasis and why Dr Herbert Schilder had the right ideas about endodontics

The challenge of endodontic success is clear to the conscientious clinician of general dentistry and to the endodontist who is entirely committed to excellence in root canal therapy.

However, the human body is an extraordinary organism in that its ability to continue to function under adverse biological conditions is remarkable and a major reason why we have dominated this planet of ours while other organisms have not.

This capacity to adapt, tolerate and even mend in the presence of biological adversity, whether normal or pathological, is a phenomenon based upon biological systems that want to work properly by design. This is termed homeostasis.

BLESSING AND A CURSE

Homeostasis describes the tendency of such a system, especially the physiological system of higher animals, to maintain internal stability, owing to the coordinated response of its parts to any situation or stimulus that disturb its normal condition or function.

This can be both a blessing and a curse to the clinician. Why? A curse, because it allows us to fall short of our goals for whatever reason, be it difficult anatomy, difficult access, lack of patient compliance, lack of suitable technology or simply that we didn't try hard enough and we can get away with it because the patient appears to be fine or even better. A blessing, because sometimes we must do extreme things to teeth in order to secure tooth survival. They heal remarkably well in spite of what we do.

I have written before on this subject but those who have not been exposed to my writings may wish to know that Schilder, the world's greatest endodontist, stated that in endodontics there are three critical factors that drive the clinician to excellence and they are knowledge, skill and desire.

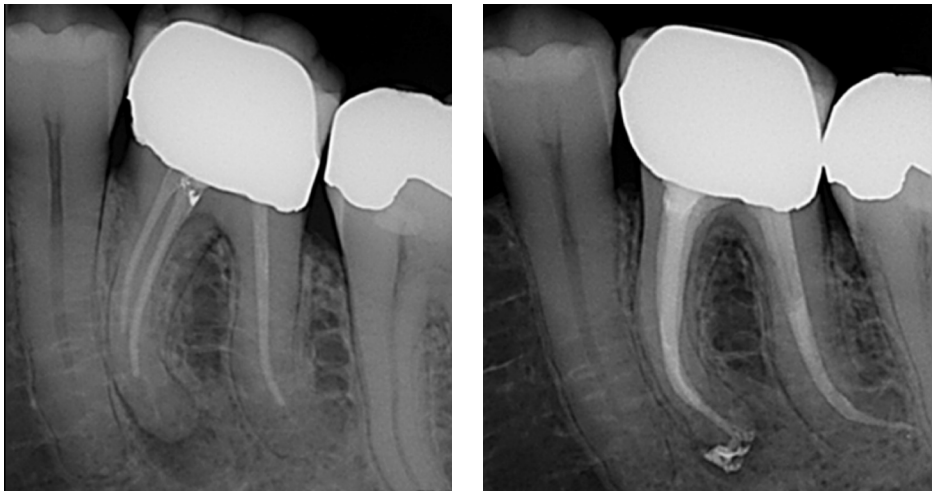

Figure 1: Poor endodontics retreated

Much like the organism described earlier, these three factors are interdependent. Knowledge in the absence of skill and desire is futile in endodontics. Skill in the absence of knowledge and desire is futile. Desire in the absence of skill and knowledge is futile, but where desire differs is that it drives us to gain skills and attain the knowledge that allows us to carry out successful endodontics. Therefore, if we acknowledge that endodontics works then successful endodontics is plain and simply a decision. That brings me to the title of this article: '100% – X'.

CAPACITY TO HEAL

In 1962 Dr Herbert Schilder turned the endodontic world on its head when he announced: 'The capacity of lesions of endodontic origin to heal is 100% – X.' At the time, others in the field of endodontics said such a statement was nonsense. For example, Dr Seltzer's study of teeth that he had treated endodontically (note I did not use the words clean and shape) revealed that all the teeth still contained necrotic tissue after such treatment; the recognised cause of failure based upon the 'hollow tube theory' of Rickert and Dixon (1931).

Seltzer stated that 'it can't be done'. Everybody accepts now that it can be done. The more complete the cleaning, shaping and obturation of the root canal system then the higher the success rate in endodontics. Put simply: if extraction works, then well performed endodontics works. It is a *sine qua non*.

Schilder was right, of course. This unpalatable truth is as unsavoury today as it was then. It strikes right at the heart of the clinician; it centres the spotlight on knowledge, skill and desire; it asks questions of us. Are we really as conscientious as we say we are? Are we committed to excellence like we say we are? I don't think so (Figure 1).

POOR ENDODONTICS RETREATED

Schilder indoctrinated all of his students about the 1962 study – I know because I am one. It is a basic tenet of the Schilder philosophy and it is what every Schilder-trained endodontist believes in. If you carried out root canal therapy and it failed to heal then you failed to deal with the root canal system. This is a heavy burden indeed for a clinician to carry.

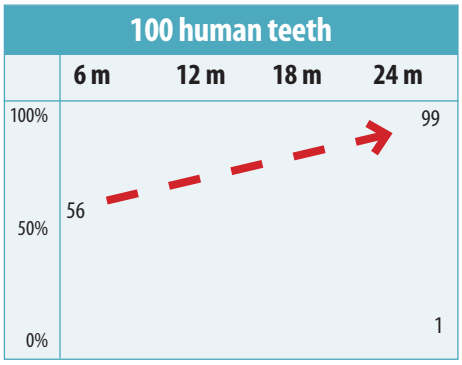

Figure 2: The results of Schilder's orthograde root canal therapy using warm vertical compaction technique on 100 necrotic anterior teeth. At six-month recall, 56% showed an intact periodontium. At 24-month recall, 99% had an intact periodontium. The one tooth that did not respond favourably was subsequently treated and then healed

Schilder didn't teach self-righteousness; he taught us to be guilty of failure and persist for our best effort. Clinicians will always choose to blame something or somebody for their failures but Schilder asked us to look at ourselves in the mirror as clinicians, human beings and articulate the words slowly: 'I failed... I failed' and then try harder next time.

Often it occurs to me that both general dentists and maybe even endodontists don't really believe that with the correct technique we have the ability to predictably save teeth by restoring the periodontal apparatus to health and function. The real power of this study comes from its simplicity. Let us examine it more closely.

SCHILDER'S STUDY

Schilder carried out orthograde root canal therapy utilising his warm vertical compaction technique on 100 necrotic, anterior teeth of healthy subjects. The teeth possessed lesions of endodontic origin (LEOs) that varied in size from 8mm to 35mm. The treated subjects were recalled over a minimum of 24 months at six-month intervals and radiographs taken of the treated teeth.

Within six months, 56% of the treated teeth showed an intact periodontium. Within 24 months, 99% of the treated teeth showed an intact periodontium. One subject, an elderly female, had a lateral incisor that did not respond favourably after the 24-month period. Dr Schilder treated this tooth once more using a surgical approach. Access to the apical extent of the tooth revealed the presence of two distinct root tips, one filled but the other unfilled. The unfilled palatal canal remained hidden on X-ray behind the treated, more buccally placed canal. The apicoectomy, with a retrograde amalgam filling placed, removed this anomaly and the contaminated root tip.

Can you guess what happened? It healed, bringing the success rate to 100% with 100 successfully treated teeth. What comes after this graphic demonstration is all down to us and the way we deal with the root canal system. When we fail in endodontics, we fail to deal with the root canal system.

X MARKS THE SPOT

'What is X?' you may ask. The value of X as it is used in the context of '100% – X' is the variable for any given endodontic case and, of course, it needs to be as small as possible in order to secure the most favourable outcome for treatment.

If you are in the 'blame game', as I call it, X for you could represent a multitude of things that do not allow you to satisfy the absolute criteria for the healing of the periodontal apparatus. It could be a clinician's limited knowledge of endodontics, the anatomy, the smear layer, the bacteria involved, the biofilm, the necessary irrigants to kill the pathogens responsible, the inability to gain patency, to shape the system, to clean the system, to obturate the system, the interappointment medicament, or the temporary dressing.

X also represents the more tangible aspects that can influence our behaviour and therefore the outcome, like the time we allocate a patient in the schedule for the procedure, whether they have one visit or two visits, whether we like the patient, whether we charge enough, whether we feel valued by the patient, whether we care enough. The list is without end and contains every other thing that you can visualise that will compromise the outcome of the case by increasing the value of X. If you are in the 'blame game' you will find plenty of reasons indeed.

TRUE PROFESSIONALS

Based upon some research, the 'average' endodontic treatment doesn't seem to last a very long time – at least if we want to secure the prevention or healing of apical periodontitis. If we only focus on tooth survival, much as the implant promoters do for such fixtures, then the tooth survival for endodontically treated teeth would be phenomenal indeed. In many dental articles comparing the efficacy of implants versus retention of the natural tooth, the authors rarely compare like with like.

If we are to aspire, as we should if we are true professionals, to reach 100% success in endodontics, then the profession's attitude needs to change and follow Schilder. Wouldn't it be a disgrace for the profession if we accepted implants as a solution for badly performed endodontics, knowing that the potential of endodontic treatment is much higher than what the profession actually gets out of it?

NOT ALWAYS EASY

Fifty years after Dr Schilder made it glaringly obvious to clinicians as to how to achieve clinical success, we have embraced all the technological developments that dentistry has to offer like children in a sweet shop, yet consistently we fall short of the goals that he set for us.

I believe the trouble lies within our own behaviour as a profession. We have bought into the idea that root canal therapy is easy when it is not. It never was and never will be. I have experience, deliver excellent anaesthesia, rubber dam, a microscope, digital radiography, apex locator, nickel titanium rotary files, sophisticated delivery systems, irrigation systems, disinfection systems and obturation systems, yet I spend more time, not less time, on my cases than ever before in an effort to secure success.

If you believe the dental industry, then you believe that anybody can do endodontics because it's easy and getting easier. Well, let me tell you that it is not. Every easy case is a hard case. Every case is a hard case. Schilder said many times that 'the technology will never save you'. He was right. **ID**

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