

# Retreatment in Endodontics: What Happens When Your Root Canal Is Redone Under a Microscope

*By Root Canal Foundation, Chennai*

A root canal is meant to be a permanent solution. But sometimes, months or even years later, the same tooth starts hurting again, or an X-ray taken for another reason reveals a lingering infection nobody noticed. This is called a failed root canal treatment (RCT), and the good news is that it can very often be fixed — through a specialised procedure called endodontic retreatment.

At Root Canal Foundation, retreatment is one of the areas we see most often, precisely because we are known for handling cases that other clinics have found difficult to resolve. This blog walks you through what retreatment actually involves, why a microscope changes the outcome, and answers the questions patients ask us most.

## Why Do Root Canals Fail in the First Place?

A root canal can fail for several reasons: a canal inside the tooth that was too narrow, curved, or hidden to be treated the first time round; a crack in the tooth; a crown or filling that let bacteria leak back in; or an infection that had already spread beyond the root tip before treatment began. Whatever the cause, the fix is rarely to simply “redo” the same procedure — it requires figuring out precisely what went wrong and correcting it, which is why retreatment is considered a more advanced skill than a first-time root canal.

This is where the dental operating microscope changes everything.

## Tracing Missed Canals

Teeth do not read textbooks. Many teeth — particularly molars — have extra canals that are extremely narrow, curved, or calcified, and easy to miss without magnification. A missed canal left untreated continues to harbour infection no matter how well the other canals were cleaned, and it is one of the single most common reasons a root canal fails.

Under the microscope, magnified up to 20 times with strong, focused illumination, these hidden canals become visible: subtle colour changes in the floor of the tooth, fine grooves leading to extra openings, and calcified canals that would otherwise be invisible to the naked eye. Locating and treating these canals is often the single most important step in a successful retreatment.

## Removing Instruments Left Behind

Occasionally, a small fragment of a root canal instrument separates and remains lodged inside the canal during a previous treatment. This can block proper cleaning and sealing of the canal and is a well-documented cause of persistent infection.

Removing a separated instrument is a delicate task — done without magnification, it is easy to weaken or perforate the tooth in the process. Under the microscope, using fine ultrasonic tips, the fragment can usually be loosened and retrieved with the surrounding tooth structure

carefully preserved. Where a fragment cannot be safely removed, it can often still be bypassed or sealed in, so that the infection is controlled and the tooth is saved.

## Apical Surgery Using Piezo Units and the Microscope

Not every failed root canal can be resolved by reopening and recleaning it from above (non-surgical retreatment). Sometimes the infection persists at the very tip of the root, or the tooth has a crown, post, or restoration that would need to be destroyed to attempt non-surgical retreatment. In these cases, a minor surgical procedure called an apicoectomy (apical surgery) is recommended.

This involves gently accessing the root tip through the gum, removing the infected tissue, and sealing the end of the root from below. Two things have transformed how predictable this surgery is:

- The microscope, which allows the surgeon to identify hairline fractures, extra canals at the root tip, and confirm a complete, clean seal — all under high magnification.
- Piezoelectric (piezo) ultrasonic units, which cut bone with fine, precise vibrations rather than a rotating drill. This allows the surgeon to shape a small bony window very conservatively, protect nearby nerves and sinus structures, and control bleeding better — resulting in less trauma, a more comfortable recovery, and higher healing rates than older surgical techniques.

Together, microscope-guided technique and piezo instrumentation have raised the success of apical surgery from roughly the 60% range seen with older methods to well above 90% in modern microsurgical practice.

## Treating Large Lesions — Surgically and Non-Surgically

A long-standing infection at the root tip can grow into a cyst or lesion that shows up as a dark, well-defined area on an X-ray or 3D (CBCT) scan. Many patients assume a large lesion automatically means surgery or extraction — but that is not always the case.

- Non-surgical management: In many cases, thoroughly cleaning, disinfecting, and sealing the canal system — sometimes with the aid of medicated dressings between visits — allows even sizeable lesions to heal gradually over months, as the body resorbs the infected tissue. This is always attempted first when the tooth's anatomy allows it.
- Surgical management: When the lesion persists despite proper non-surgical treatment, or the canal cannot be adequately accessed from above, microscope-guided apical surgery is used to directly remove the diseased tissue and seal the root end, giving the lesion the best environment to heal.

3D imaging (CBCT) plays an important role here, giving a true three-dimensional picture of the size and extent of the lesion before deciding on the right approach — something a standard 2D X-ray cannot always show accurately.

## Why Experience Matters in Retreatments

Retreatment is not a routine procedure — it is one of the most technically demanding areas of endodontics, and outcomes depend heavily on the clinician's experience and equipment. Dr V

Gopi Krishna, founder of Root Canal Foundation, brings 24 years of specialist clinical experience in endodontics, with more than 25,000 endodontic cases performed, including a substantial share of complex retreatments and microsurgeries referred to him by other dentists.

He was among the first in India to bring the dental operating microscope into everyday clinical use, installing the country's first clinical microscope in 2007. He is the author-editor of leading endodontic textbooks, including Grossman's Endodontic Practice, read by more than 30,000 dental students across Asia each year, and holds the FDS RCS ad hominem — the highest honorary fellowship of the Royal College of Surgeons, Edinburgh — awarded to very few endodontists worldwide.

Root Canal Foundation, established in Chennai in 2004, has grown into one of India's most reputed root canal centres, with ten in-house dental operating microscopes, in-house CBCT 3D imaging, and a track record of treating referred and second-opinion cases from across India and more than 30 countries.

## Frequently Asked Questions on Retreatment (In Plain Language)

### **1. My tooth had a root canal years ago and it's hurting again. Does that mean the treatment failed?**

Not always — sometimes it's a new cavity, a cracked filling, or gum-related pain. But pain, swelling, or an X-ray showing a dark spot near the root usually means the infection has come back and needs to be looked at by a specialist.

### **2. Can a failed root canal always be saved, or will I need the tooth removed?**

Most failed root canals can be saved with retreatment, especially when there is enough healthy tooth structure and bone support left. Extraction is usually only recommended when the root is severely cracked, the tooth cannot be restored afterward, or repeated attempts have not resolved the infection.

### **3. Is retreatment more painful than a first-time root canal?**

No. It is done under the same local anaesthesia as a regular root canal, and most patients describe it as no different in comfort. Some mild soreness for a day or two afterward is normal, just as with any root canal.

### **4. What is a dental microscope, and why does it matter for my treatment?**

It's a specialised microscope, similar in idea to what eye surgeons use, that lets the dentist see inside your tooth magnified up to 20 times with very bright, focused light. It allows hidden canals, cracks, and infection to be spotted and treated far more precisely than with the naked eye.

### **5. What does “removing a broken instrument” mean, and is it dangerous?**

Sometimes a tiny fragment of a dental instrument from an earlier treatment gets stuck inside the canal. Under a microscope, this can usually be safely removed using very fine ultrasonic tips without harming the tooth. If it can't be removed, it can often be safely sealed inside without affecting the outcome.

### **6. What is “apical surgery” or “apicoectomy”? Will I need stitches?**

It's a minor surgical procedure to clean out infection at the very tip of the root, done through the gum, without removing the tooth or your crown. It typically takes under an hour, needs a few dissolvable or removable stitches, and healing is usually quick and comfortable, especially with the gentler bone-cutting instruments (piezo units) we use.

#### **7. I have a large cyst near my tooth root. Do I need surgery straight away?**

Not necessarily. Many large lesions heal on their own once the canal is properly cleaned and sealed non-surgically — it just takes a few months to see full healing on follow-up X-rays. Surgery is considered only if the lesion doesn't respond to this first.

#### **8. How long does retreatment take, and how many visits will I need?**

This depends on the complexity of the case, but many retreatments are completed in one to two visits. More complex cases — such as those involving instrument removal or surgery — may need an additional visit or two, which we will explain clearly before starting.

#### **9. How do I know if I need a specialist for this, rather than my regular dentist?**

If you've already had a root canal on the tooth and it's still causing problems, that is precisely the situation a root canal specialist (endodontist) is trained for. A second opinion — with a fresh 3D scan — is always a reasonable first step.

#### **10. Why should I choose Root Canal Foundation for retreatment?**

Retreatment is our area of particular strength. With 24 years of dedicated clinical experience, ten in-house dental microscopes, in-house 3D (CBCT) imaging, and thousands of complex and referred cases treated, we are recognised as one of India's most experienced root canal retreatment centres — and we welcome second opinions.

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*If a previously treated tooth is troubling you, don't assume it has to be extracted. Book a consultation with Root Canal Foundation, Chennai, for a thorough evaluation under 3D imaging and microscope, and an honest opinion on saving your natural tooth.*

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