

# Cracked Teeth

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## Description:

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### # Cracked Teeth

A cracked tooth is one of the most diagnostically challenging problems in dentistry. Symptoms can be intermittent, bizarre, and frustratingly difficult to localise — patients frequently present having already seen several practitioners without a clear answer. Specialist endodontists are uniquely positioned to diagnose and manage cracked teeth, combining high-magnification visualisation with a systematic clinical approach to achieve certainty where others may not.

#### ## What Is a Cracked Tooth?

Cracked tooth syndrome (CTS) describes a spectrum of presentations caused by an incomplete fracture of a vital posterior tooth that has not separated into two distinct fragments. Cracks can range from superficial crazes confined to enamel through to deep fractures extending below the gumline or into the root — the latter often carrying a guarded or poor prognosis regardless of treatment.

The **cracked tooth fracture classification** used in specialist practice describes five distinct entities:

1. **Craze lines** — superficial enamel cracks with no structural significance; no treatment required
2. **Fractured cusp** — a cusp separates, often with little or no pulpal involvement; managed restoratively
3. **Cracked tooth** — an incomplete fracture extending from the crown towards the root; the central challenge of CTS
4. **Split tooth** — a complete fracture that has divided the tooth into two separable segments; prognosis for retention is poor
5. **Vertical root fracture** — a fracture originating within the root, often in previously root-treated teeth; typically extraction is required

The majority of clinically significant cracked teeth fall into the third category — incomplete cracks that have not yet propagated to the root — where the prognosis is meaningful and timely intervention makes a genuine difference.

#### ## When Might You Need Assessment for a Cracked Tooth?

Cracked teeth most commonly produce a characteristic symptom pattern, though not every case follows the textbook presentation:

- **Sharp pain on biting** — particularly on release of biting pressure ("rebound pain"). This is the hallmark symptom and distinguishes cracked tooth pain from most other dental pain
- **Inconsistent pain** — the pain may come and go, vary with different foods, and be impossible to reproduce reliably,

which often leads patients to believe the problem has resolved - **Temperature sensitivity** — prolonged sensitivity to cold, or in advanced cases, sensitivity to heat - **Difficulty pinpointing the pain** — patients often cannot identify which tooth, or even which side, is responsible - **Pain on specific foods** — biting on ice, crusty bread, or hard foods is common; softer foods typically cause less discomfort - **History of bruxism (tooth grinding)** — patients who grind or clench their teeth are at substantially elevated risk - **Large restorations or heavy biting forces** — heavily restored teeth and those subjected to parafunctional loading are disproportionately affected - **Referred or poorly localised toothache** — particularly in patients who have already had unproductive dental assessments

In advanced cases where the pulp has become involved, symptoms may progress to spontaneous pain or abscess, at which point root canal treatment is required before any restorative management.

## ## What to Expect: Diagnosis and Management

Diagnosing a cracked tooth requires systematic clinical investigation. There is no single test that confirms or excludes a crack in every case — the diagnosis is reached by assembling a coherent picture from multiple sources of evidence.

**Clinical history and symptom mapping** Your specialist will take a detailed history of when and how pain occurs. The specific quality, timing, and triggers of the pain provide the single most important diagnostic information.

**Clinical examination under high magnification** The **Carl Zeiss OPMI PROergo surgical microscope** enables direct visualisation of the tooth surface at up to 20× magnification, often with transillumination (directing light through the tooth to reveal cracks that are invisible to the naked eye). In many cases, the crack can be directly identified and its extent assessed.

**Crack detection aids** Staining with disclosing dyes can highlight crack lines that are not visible otherwise. Transillumination with a fibre-optic light source reveals the extent of fracture propagation within the tooth structure.

**Selective bite testing** The specialist uses a tooth sleuth (bite stick) to isolate individual cusps, reproducing the specific bite that triggers the patient's pain. This allows localisation of the crack to a specific cusp or region of the tooth, which guides both diagnosis and treatment planning.

**Radiographic assessment** Standard periapical radiographs provide important baseline information about bone levels, periapical health, and root anatomy. Vertical root fractures may occasionally be visible on X-ray, though CBCT imaging offers superior diagnostic sensitivity in ambiguous cases.

**Pulp vitality testing** The status of the dental pulp — vital and healthy, reversibly inflamed, irreversibly inflamed, or necrotic — directly determines which treatment pathway is appropriate.

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## ### Treatment Options

The appropriate treatment for a cracked tooth depends entirely on the depth and direction of the fracture, the condition of the pulp, and the position of the crack relative to the gum and bone. Your specialist will discuss the likely prognosis at each stage.

**Cusp coverage or full crown (no pulp involvement)** When the pulp remains healthy and the crack does not extend below the gumline, a well-fitting onlay or full-coverage crown that splints the affected cusps can arrest fracture propagation and resolve symptoms in many cases. This is provided by our specialist prosthodontists and should be placed promptly — ongoing unprotected loading accelerates fracture extension.

**Root canal treatment followed by crown** When the pulp is irreversibly inflamed or has become necrotic as a result of the crack, root canal treatment is required before crown placement. The

endodontist treats the pulp first; the prosthodontist then provides definitive restoration. This coordinated approach is facilitated at CSSC by the proximity of both specialist teams on Level 8 of the Manchester Unity Building.

**\*\*Extraction\*\*** When a crack extends below the gumline or through the root, the tooth cannot be reliably saved. In these cases, the specialist will discuss extraction and replacement options — which may include implant-supported prosthetics provided by our periodontics and prosthodontics teams.

### ## Recovery and Aftercare

Recovery following crown placement or endodontic treatment for a cracked tooth generally mirrors recovery from those respective procedures. Specific points:

- Biting pain typically resolves promptly once the tooth is protected under a crown, though in some cases mild sensitivity may persist for several weeks as pulpal inflammation settles - Where root canal treatment was required, soreness around the tooth is expected for a few days - Avoid biting hard or sticky foods on the treated tooth until the permanent restoration is in place - Follow up radiographic review confirms that the periapical tissues are healing as expected

It is worth being direct: not every cracked tooth achieves a pain-free outcome. In a small proportion of cases, despite ideal treatment, symptoms persist — this reflects the variability of individual healing responses and the unpredictable nature of fracture propagation. Your specialist will discuss realistic expectations based on the specific findings in your case.

### ## Why See a Specialist Endodontist?

Cracked tooth syndrome is widely regarded as the most diagnostically challenging condition in clinical dentistry. Its intermittent, poorly localised symptoms mimic a range of other conditions, and the cracks themselves are often invisible on standard X-rays and to the naked eye.

Specialist endodontists are specifically trained in the diagnosis and management of pulpal and periapical disease — including the complex presentations that cracked teeth produce. Access to surgical-grade microscopy at CSSC transforms what would otherwise be a process of educated guessing into one of genuine visualisation.

Incorrect diagnosis of a cracked tooth can lead to unnecessary treatment — or, equally damaging, no treatment at all while the fracture extends deeper. Confident, accurate diagnosis by a registered specialist using appropriate technology benefits patients directly.

All CSSC endodontists hold specialist registration recognised by the Dental Board of Australia, which can be verified through AHPRA.

### ## Our Specialists

**\*\*Dr Gregory Tilley\*\*** BSc (Melb), LDS (Vic), FRACDS, MRACDS (Endo) More than 35 years of specialist endodontic experience, with extensive expertise in diagnostic endodontics and cracked tooth management. Honorary Senior Fellow, University of Melbourne.

**\*\*Prof Chankhrit Sathorn\*\*** DDS, Grad.Dip.Dent, DCLinDent, PhD, MRACDS (Endo) Adjunct Professor, La Trobe University. Prof Sathorn's evidence-based clinical approach is particularly valuable in diagnostically ambiguous cases where symptom interpretation and appropriate imaging selection are critical.

**\*\*Dr Aovana Timmerman\*\*** BSc (Melb), FRACDS, DCD (Melb), GCertClinTeach, MRACDS (Endo) Clinical demonstrator and examiner, University of Melbourne. Experienced in the full diagnostic workup for cracked tooth presentations. Fluent in Mandarin.

**Dr Areti Vrochari** DDS, DrMedDent (Endo) Background in dental biomaterials and restorative dentistry brings additional perspective to the cracked tooth-restoration interface — an area where endodontic and prosthodontic considerations intersect directly.

### ## Related Treatments

- **Root Canal Treatment** (/endodontics/root-canal-treatment/) — Often required when a crack has involved the dental pulp or led to pulp necrosis. - **Dental Crowns** (/prosthodontics/dental-crowns/) — The definitive treatment for protecting a cracked tooth after endodontic management, provided by our specialist prosthodontists. - **Root Canal Retreatment** (/endodontics/root-canal-retreatment/) — Vertical root fractures in previously treated teeth require specialist assessment to distinguish from other causes of retreatment failure.

No referral is required to be seen at the Collins Street Specialist Centre. Contact us on (03) 9650 2726, or ask your dentist to refer you to our endodontic team at Level 8, Manchester Unity Building, 220 Collins Street, Melbourne CBD.