

TOOTH FRACTURE (BROKEN TOOTH)

BASICS

OVERVIEW

- Trauma to the tooth may involve fracture of any part of the tooth
- May involve the crown and root of the affected tooth; the crown of the tooth is the portion of the tooth that is above the gum that is covered by enamel; the root of the tooth is the part of the tooth below the gum line that is covered by cementum to attach the tooth to the bone of the jaw
- Classified as “uncomplicated” if the fracture does not enter the internal part of the tooth containing the blood vessels and nerves (known as the “pulp”) and “complicated” if the fracture enters the pulp

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

Mean Age and Range

- Any age

SIGNS/OBSERVED CHANGES in the ANIMAL

Crown Fractures (involving the portion of the tooth above the gum line)

- Clinical loss of tooth-crown substance; may affect enamel only, or enamel and dentin; the enamel is the hard, shiny white material covering the crown of the tooth; the dentin makes up the bulk of the tooth structure
- Uncomplicated fractures with the fracture line close to the pulp (the internal part of the tooth, containing the blood vessels and nerves)—pale pink pulp is visible through the dentin; gentle exploring will not allow the explorer into the pulp cavity
- The recent or fresh complicated fracture is associated with bleeding from the pulp
- Older fractures may exhibit a dead pulp; clinically the pulp chamber is filled with dark material, and the tooth is often discolored

Root Fractures (involving the portion of the tooth below the gum line)

- May occur at any point along the root surface; often in combination with fracture of the crown, although root fractures can occur without fracture of the crown
- Root segments may remain aligned or may be displaced
- Clinical signs indicating a possible root fracture include pain on closure of the mouth or during open-mouth breathing
- Abnormal horizontal or vertical mobility of a tooth may raise suspicion of a root fracture

CAUSES

- Generally the result of a traumatic incident (such as a road traffic accident, blunt blow to the face, chewing on hard objects)

TREATMENT

HEALTH CARE

Uncomplicated Crown Fractures (involving the portion of the tooth above the gum line without entering the pulp)

- Dental procedure by the veterinarian in which sharp edges are removed with a bur and the exposed dentin tubules are sealed with a suitable liner or restorative material

Complicated Crown Fractures (involving the portion of the tooth above the gum line with entering the pulp)

- Require treatment of the internal part of the tooth containing the blood vessels and nerves, known as the “pulp;” such treatment is known as “endodontic therapy” and includes root canals and pulpotomy—if the tooth is to be maintained; otherwise, extraction is preferable to no treatment at all

Mature Tooth

- Recent fracture in the mature tooth with the pulp still alive (vital)—two options exist, partial pulpectomy and direct pulp capping (vital pulpotomy) followed by restoration or conventional root canal therapy and restoration
- For partial pulpectomy and direct pulp capping to succeed, the procedure should be carried out within hours of the injury; the initial procedure may not be the final treatment—the tooth may require standard root canal treatment later, if the pulp tissue dies
- When the pulp already is inflamed chronically or is dead (known as “necrotic tissue”), standard root canal therapy and restoration are the treatments of choice, if the tooth is periodontally sound

Immature Tooth

- A living (vital) pulp is required for continued root development; as long as the pulp is alive (vital), the treatment of choice is partial pulpectomy and direct pulp capping, followed by restoration
- If the pulp tissue is dead (necrotic), no further root development will occur; necrotic immature teeth need endodontic treatment to be maintained; remove the dead tissue and pack the root canal with calcium hydroxide paste; some continued root development and closure of the apex can be stimulated if this procedure is performed; change the calcium hydroxide every 6 months until the apex is closed at which time a standard root canal is performed
- Immature teeth may be present in the mature animal, if trauma to the developing teeth caused death of the pulp; such teeth should be treated as “immature teeth”

Root Fractures (involving the portion of the tooth below the gum line)

- Treatment of crown and root fractures depends on how far below the gum line the fracture line extends
- If the fracture line does not involve the pulp (the internal part of the tooth, including the blood vessels and nerves) and does not extend more than 4 to 5 mm below the gum, restorative dentistry can be performed; if the fracture extends more than 5 mm below the gum and involves the pulp, the tooth usually should be extracted
- In some cases, the fractured tooth root may heal, if the tooth can be stabilized; in other cases, extraction of the tooth may be necessary

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- A broad-spectrum antibiotic drug for 5 to 7 days may be indicated; for example, when longstanding infection is present

FOLLOW-UP CARE

PATIENT MONITORING

- Check a partial pulpectomy and direct pulp-capping procedure with dental X-rays 6 and 12 months postoperatively, or at intervals determined by clinical signs, to detect death of the internal tissues of the tooth, including the blood vessels and nerves (pulp) and subsequent changes in the bone around the tips of the root, indicating the need for root-canal treatment
- Check the outcome of conventional root canal therapy by dental X-rays 6 to 12 months postoperatively; evidence of changes in the bone around the tips of the root at this time indicates the need for further treatment or extraction of the tooth; further treatment consists of redoing the root canal, often using surgical techniques
- Check root fractures with dental X-rays 6 to 12 months postoperatively
- Check uncomplicated fractures with dental X-rays at 4 to 6 months postoperatively

PREVENTIONS AND AVOIDANCE

- Avoid situations in which teeth are likely to be damaged; keep animal from chewing on hard objects, such as rocks
- To avoid complications, institute treatment within hours of injury

POSSIBLE COMPLICATIONS

- Untreated pulpal exposure invariably leads to inflammation of the pulp (known as “pulpitis”) and eventual death of the pulp tissue and subsequent changes in the bone around the tips of the root
- Immature teeth stop developing

EXPECTED COURSE AND PROGNOSIS

- Vary with vitality of the pulp (the internal structure of the tooth, including the blood vessels and nerves), location of the fracture, and whether the tooth is mature or immature

KEY POINTS

- Trauma to the tooth may involve fracture of any part of the tooth
- May involve the crown and root of the affected tooth; the crown of the tooth is the portion of the tooth that is above the gum that is covered by enamel; the root of the tooth is the part of the tooth below the gum line that is covered by cementum to attach the tooth to the bone of the jaw
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