Current Practice

PRACTICAL PROBLEMS

Emergency Dentistry for the General Practitioner—I. Pain from Dental Disease

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The dental diseases which cause pain are:

- (a) *Pulp damage and its sequelae.*
- (b) *Gingivitis.*
- (c) *Periodontal abscess.*
- (d) *Pericoronitis.*
- (e) *Post-operative infection.*

Pulp Damage and its Sequelae

The pulp of a tooth may be injured by invasion of organisms from a carious cavity or by their entry through a developmental defect. It may be damaged by trauma to the tooth, which results either in a fracture of the tooth with exposure of the pulp or in a violent movement of the tooth which tears the apical blood-vessels supplying the pulp. On occasions the pulp may be damaged during filling of the tooth—for example, as a result of accidental overheating by rotary cutting instruments.

Damage to the pulp results in pulpitis, which may be symptomless but often causes pain—which, characteristically, is brought on by or made worse by thermal stimulation. In the early stages cold usually makes the pain worse and warmth makes it better, but in the later stages the reverse applies. It is of considerable importance whether the pain comes on only as a result of thermal stimulation or stimulation by sweet foods, or whether it comes on spontaneously; and also whether the pain lasts for a minute or two or for ten minutes or longer. Rapidly fading pain produced only by stimulation is associated with a reversible degree of inflammation of the pulp, whereas longer lasting pain, which at times comes on spontaneously, is associated with an irreversible pulpitis.

Even if the pulp damage results in aseptic necrosis, infection of the necrotic pulp eventually follows, with spread to the periapical tissues. During episodes of acute periapical inflammation the periodontal membrane is oedematous, producing slight extrusion of the tooth and a slight increase in mobility. The patient experiences a dull or throbbing pain, and the affected tooth is tender to percussion.

If pus from a periapical lesion burrows towards the surface, one form of alveolar abscess is produced. If the abscess points towards the mouth it presents high in the sulcus in adults, but relatively close to the gingival margin in children. In adults the point of presentation distinguishes an apical alveolar abscess from a periodontal abscess, which normally points either in the gingival crevice or in the gingival third of the gum (Fig. 1). The lack of difference in the manner of pointing of apical and periodontal abscesses in children is less important than at first appears, because in children periodontal abscesses are very rare, and almost all alveolar abscesses associated with the primary

dentition are apical. Less commonly, apical abscesses will point on the skin of the face or neck, or into the maxillary sinus or nose.

As an acute periapical lesion develops, the overlying soft tissues become swollen. At first, while the pus is still within the bone, soft puffy collateral oedema develops: this is not

FIG. 1.—Diagrams illustrating the use of an enamel chisel to open up a carious cavity. Certain anatomical features referred to in the paper are shown: A=interdental papilla, B=gingival margin, C=gingival crevice, D=pulp, E=neck of tooth, F=gingival or cervical 1/3rd of alveolar process, G=apical 1/3rd of alveolar process.

of great importance, although the swelling in a child can be sizable. Later, as pus escapes from the bone, the swelling becomes more indurated, and vasodilatation is seen in the overlying skin or mucous membrane. Should the infection spread in the tissue planes of face, neck, or floor of mouth as a cellulitis, the induration becomes intense and brawny, finally producing localized pitting oedema with dusky redness and a point of maximum tenderness, as pus forms in the tissue spaces. Constitutional signs and symptoms depend on the extent of the infection. Lymph-node involvement secondary to apical infection is common; but fortunately in these days haematogenous spread, particularly to the cranial cavity, is very rare.

Gingivitis

Non-specific marginal gingivitis results in soreness of the gums, but this is rarely severe enough for a patient to seek emergency treatment. In this respect the two most important gingival inflammations are acute herpes-simplex gingivostomatitis and Vincent's gingivitis.

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Acute herpetic gingivo-stomatitis is most common in infants and children, though it also affects adolescents and adults. It represents the initial infection with herpes-simplex virus, and it is associated with considerable enlargement of the regional lymph nodes and quite severe constitutional symptoms. A multitude of small vesicles appear on the gingivae, on the mucous membrane of the cheeks, palate, and tongue, and on the margins of the lips. The vesicles soon rupture, to produce shallow painful ulcers with a yellowish floor and a bright red margin: some become confluent to produce larger ulcers. The clues to diagnosis lie in the appearance of the ulcers and their random distribution in relation to the gingival margin, and in the finding of a few intact vesicles or of yellow crusted lesions on the red margin of the lips or around the external nares.

Vincent's gingivitis is virtually unknown in healthy children in European countries, but it affects teenagers and adults. The initial complaint is of marked soreness or dull pain affecting one or more quadrants of the mouth, or often the whole mouth. If, despite the soreness, the patient brushes the teeth, the gums will bleed freely. Sometimes bleeding appears spontaneously. The ulceration characteristically destroys the interdental papillae; only in advanced cases does it spread to the rest of the gingival margin (see Fig. 1 for terminology). A thick felted greenish-grey slough is formed, with a characteristic fetor. There is malaise and the regional lymph nodes are enlarged.

Periodontal Abscess

In periodontal disease there is destruction of the periodontal attachment of the tooth, so that a probe introduced into the gingival crevice will pass into an abnormal interval between the root of the tooth and gum. This interval is the periodontal pocket. Periodontal disease is normally painless; the only symptoms are bleeding of the gums during eating or tooth brushing, with fetor oris and mobility of the teeth in the later stages.

If organisms from the periodontal pocket penetrate the adjacent tissues and set up an acute inflammation, however, a periodontal abscess is formed. Under these circumstances the patient may present with pain. The pain is continuous—dull or throbbing—and largely unaffected by heat or cold. Unlike the pain of pulpitis or acute apical alveolar abscess, it is not worse in the evening and at night. Whereas an apical abscess points in the apical third of the alveolar process, a periodontal abscess points either in the gingival crevice or in the cervical third of the alveolar process (Fig. 1). The affected tooth becomes more mobile at an earlier stage than with an apical abscess; and, because the periodontal membrane is involved from the beginning, the tooth is tender to percussion.

Rapidly progressive periodontal disease or a succession of periodontal abscesses are occasionally presenting complaints in diabetics.

Pericoronitis

Pericoronitis is infection of the soft tissues around the crown of a partially erupted tooth. Since wisdom teeth are most frequently impacted and partially erupted, pericoronitis is most commonly associated with them.

Once a communication exists between the crown of a tooth and the mouth, a pericoronal space is formed in which food and epithelial debris accumulate. This becomes infected, and from time to time organisms invade the surrounding soft tissues. Often the invasion is triggered off by the upper third molar

biting on to and damaging the flap of gum over the lower third molar. The infection can be either non-specific and suppurative or ulcerative, or it may be a specific infection with Vincent's organisms. Thus on occasions pericoronitis is the site of origin of a Vincent's gingivitis.

If a young adult complains of pain suggestive of gingivitis or periodontal abscess and has a swelling of the lower cheek, then pericoronitis of a lower third molar is a likely diagnosis, particularly if the pain is referred to the ear. There will be a variable amount of limitation of mouth opening. The third molar gum-flap will be red, swollen, and tender to gentle pressure; pus may exude from under it, and the upper surface may have an indentation from the cusps of the upper third molar.

The danger of pericoronitis lies in the many directions in which the infection can spread into the soft tissues.

Post-operative Infection

In dental surgery the commonest site of post-operative infection is in the tooth socket. The essential feature is disintegration of the blood-clot by oral organisms before sufficient granulation tissue has invaded it to line the bony walls of the socket and protect them. The organisms are therefore able to infect the bone of the socket wall. Fortunately, this infection almost always remains localized to the thin layer of bone immediately adjacent to the socket lumen. The pain ranges from a dull ache to that controlled only by powerful analgesics like pethidine or methadone. In the early stages the only indications of trouble are redness of the mouth of the socket and foaming of the clot, with loss of its normal firm adhesion to the walls of the socket. A day or two later the socket is empty of clot, and a variable amount of bare bone is exposed.

Osteomyelitis is uncommon as a complication of tooth extraction; it is more likely to complicate a neglected dental infection, affecting the mandible rather than the maxilla. If, during the course of a mandible infection, the pressure from inflammatory oedema rises sufficiently to interfere with conduction in the inferior dental nerve, it will also interfere with the blood-flow in the inferior dental vessels. This reduction in blood supply can tip the balance in favour of spread of the infection within the bone. Thus the onset of numbness of the lower lip is a serious sign, indicating that the conditions for osteomyelitis exist.

Considering the very large number of local anaesthetic injections which are given, needle-track infections are very infrequent. In a large hospital dental department with nearly 100,000 patient-attendances a year, serving a densely populated area with many dental surgeons, not more than two or three needle-track infections are seen each year. Inferior dental or posterior-superior dental nerve-block injections are usually involved. Many such infections clear up rapidly, but some are outstanding for their idleness and for the considerable limitation of opening they provoke in the absence of much readily detectable swelling. The site of injection within the mouth is tender.

(This article will be continued next week.)

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