

Gastroenterology

AN INTEGRATED COURSE

Iain E. Gillespie
T.J. Thomson



Churchill Livingstone 

THIRD EDITION

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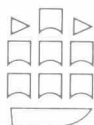
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Preface to the Third Edition

We have been encouraged by the reception of the first two editions to bring out a third, which again is primarily aimed to act as a companion text and guide for undergraduate medical students. Each chapter has undergone critical review, and where felt appropriate, considerable restructuring has been undertaken. We have attempted to give appropriate concise accounts of recent developments only where these have been shown to have proven value in clinical practice.

We are grateful to all the contributors, many of whom participated in the earlier editions, and warmly welcome those who join us for the first time.

It has been a pleasure to have the expert and friendly guidance of Churchill Livingstone who have eased the task of preparing this new edition.

Manchester and Glasgow, 1983

I. E. G.
T. J. T.

Preface to the First Edition

Gastroenterology is one of the most appropriate subjects for an integrated approach. Many patients with gastrointestinal disorders require the help of general practitioners, physicians, radiologists, surgeons, pathologists, and, increasingly, experts from other medical disciplines. There is also a tendency for those with common and important diseases of the alimentary tract to be under the joint simultaneous supervision of physician and surgeon. Good examples are chronic peptic ulcer, haematemesis and melaena, and ulcerative colitis.

In Glasgow, as in many other medical schools, a considerable amount of integration has been introduced into the instruction on clinical subjects to medical students, and this volume is based on the main topics discussed during the gastroenterology section of the fourth year, main integrated clinical instruction course. All the authors have taken part regularly in these courses over the past six years, and have, therefore, experience of the topics which students find difficult to understand. Each has tried to give most emphasis in the text, to the disorders which occur most frequently in clinical practice, or which have a clearly defined aetiology and therapeutic approach. Where, in spite of much indirect evidence and speculation, we have an incomplete understanding of the cause or causes of a disease, the descriptive accounts are purposely brief.

It is hoped that the book will serve as a useful accompaniment to the instruction in an integrated gastroenterology course, to be supplemented by the student's personal additional notes. Blank pages have been inserted for this purpose at the end of the book.

The initiative for this volume came largely from Professor A. D. Roy, now of the University of East Africa at Nairobi, Kenya, and the Editors wish to acknowledge the considerable preliminary work which he did. We are also extremely grateful to our publishers, Churchill Livingstone, for impressive patience and excellent guidance on numerous occasions.

We are also greatly in the debt of Mr G. Donald and his staff of the Department of Medical Illustration at the Western Infirmary, Glasgow, particularly Mrs P. Miles, for the many line diagrams, and of Mrs E. Nimmo for typing the entire text.

Manchester and Glasgow, 1972

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The mouth, tongue and salivary glands

Introduction

Embryologically, the oral mucosa, salivary glands and the enamel of the teeth are derived from an ingrowth of ectoderm, while the dentine, pulp and cement are mesenchymal in origin.

While some disorders are restricted to the mouth, certain systemic diseases have oral manifestations. The mouth constitutes the first part of the alimentary canal and as such may be involved in diseases affecting other parts of the alimentary canal, e.g. Crohn's disease. However, when considering the embryological derivation of the oral mucosa, it is not surprising to find that numerous dermatological conditions extend into the mouth, e.g. pemphigus vulgaris, lichen planus and erythema multiforme.

Early clinical signs or symptoms may also occur in the oral cavity in association with immune disorders, nutritional deficiencies, endocrinopathies and diseases of the haemopoietic system.

DENTAL DISEASES

The structure of tooth and its supporting tissues is illustrated in Fig. 1.1. The external surface of the tooth is covered by enamel, which is non-vital and extremely hard. The underlying dentine is vital, and exposure of this tissue is painful.

Dental caries, periodontal disease and malocclusion are the three most common dental conditions encountered in practice. Although each is largely preventable, it is remarkable that all are increasing in prevalence in our community.

Dental caries

Dental caries, or decay, commences at localized areas on the outer surface of the enamel and progresses inwards to the dentine. The dentine is next destroyed and the carious process continues until it involves the neurovascular soft tissue within the tooth, i.e. the dental pulp. The richly innervated pulp tissue is enclosed in the rigid cal-

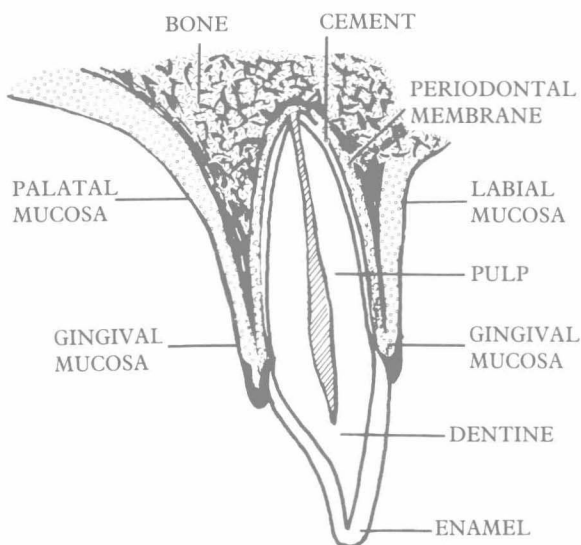


Fig. 1.1 Sagittal section of maxillary incisor tooth and surrounding tissues.

cified dentine; any increase in pressure due to inflammation produces pain.

The most widely accepted theory for the initiation of dental caries is that the oral bacteria, which are concentrated in deposits attached to the tooth surface, have the ability to convert carbohydrates into acid. This acid results in the demineralization of the tooth surface. Prevention of dental caries can be achieved by:

- (a) reducing the intake of refined carbohydrates, particularly as snacks between meals,
- (b) regular tooth brushing after meals along with the use of dental floss for cleaning the areas between teeth,
- (c) increasing the resistance of the enamel to caries by the use of fluoride. Fluoride may be added to the drinking water to give a final concentration to 1 part per million in areas where the water supply does not contain an adequate amount. Such a concentration of fluoride does not cause any known diseases. Alternative measures are to take sodium fluoride tablets or have fluoride applied topically to the teeth.
- (d) plastic sealants applied to the fissures of teeth to prevent any acid formed from coming in contact with the enamel.

Sequelae of dental caries

Once caries begins, cavity formation progresses to involve both the enamel and dentine. The decayed tissue is easily removed at this

early stage and the tooth filled by the dental surgeon before the patient experiences pain. If the cavity remains untreated, sharp pain will be brought on by hot and cold substances as well as by exposure to sugar. It is usually still possible to fill the tooth at this stage.

Without treatment, the tooth may become painful for prolonged periods and be tender to touch or to percussion. A more radical treatment is now necessary in the form of removal of the affected pulp, i.e. root treatment, or extraction of the tooth. Still later, when the pulp infection has become established and spread of the infection has involved the adjacent periodontal membrane and alveolar bone, an acute dental abscess may develop at the apex of the root. This usually requires extraction of the tooth. Antibiotics alone are not sufficient for the treatment of a dental abscess.

Periodontal disease

Periodontal disease (gingivitis) is an inflammatory condition affecting the gingival mucosa initially, and subsequently involving the supporting tissues around the teeth, i.e. the alveolar bone and periodontal membrane (periodontitis).

As much as 99 per cent of the British population has varying degrees of periodontal disease, and at least as many teeth require to be extracted on account of periodontal disease as for dental caries. It is the commonest reason for tooth loss in those over the age of 35 years.

Chronic gingivitis is due to inadequate tooth cleaning, allowing the development of dental plaque; this consists of bacterial deposits which accumulate around the teeth and gums. Therefore, it is entirely a preventable condition. Later inflammatory changes are progressive damage to the supporting alveolar bone and periodontal membrane (chronic periodontitis) which lead ultimately to loosening and loss of the teeth.

The essential treatment of periodontal disease is to keep the gingival sulcus free from infection by removal of dental plaque and calculus (tartar). Minor surgery may also be required either to any pockets which have formed or to modify the bony socket margins.

The commonest form of acute gingivitis is acute ulcerative gingivitis (Vincent's infection), in which extensive ulceration of the gingivae, with bleeding, pain and halitosis, occurs. In addition there may be enlargement of the cervical lymph nodes, together with a mild or moderate constitutional disturbance. The aetiology of acute ulcerative gingivitis is still obscure: although smears taken from ulcers usually reveal increased numbers of *Borrelia vincenti* and *Bacillus fusiformis*, it has not been possible to transmit the disorder

from one individual to another. Possibly a general or local lowering of resistance may be a predisposing factor.

Acute ulcerative gingivitis responds favourably to thorough mechanical cleansing of the teeth and gums, together with improved oral hygiene and removal of areas where food stagnation occurs. Only occasionally are these measures insufficient and systemic metronidazole or penicillin is necessary. Without long-term oral cleanliness, recurrence is almost certain.

Malocclusion

Between 40 and 50 per cent of British school children have some form of malposition or malocclusion of the teeth. Orthodontic correction is desirable not only from the aesthetic point of view, but also to prevent dental caries and periodontal disease occurring in areas of difficult access for cleaning. A further problem which tends to occur in association with certain types of malocclusion is temporomandibular joint pain and even arthritis.

Cleft palate and cleft lip

The embryology of the face is complex. Many different congenital abnormalities may occur; some are bizarre and very rare. The commonest and that with which we are most concerned is a cleft of the palate. This may, or may not, be associated with a cleft lip.

Feeding the neonate with a cleft palate is difficult because of the inability of the baby to develop suction, even though it makes sucking movements. Swallowing should not be affected so that adequate nutrition is possible when milk or soft food is delivered to the posterior part of the oral cavity. An abundance of breast milk may make breast feeding practical; otherwise milk should be given in such a way that suction is not needed. The teat on the milk bottle may have the holes made larger so that the milk will drip freely from an inverted bottle. A plastic bottle which can be squeezed is also useful. It is helpful to hold the infant at about 45° above the horizontal so that the milk will flow to the back of the mouth with minimal regurgitation into the nose. More air than usual is swallowed and feeding will take longer than on average.

Different surgeons close palatal clefts at different times but all are agreed that they should be closed before the child starts to speak. This does mean, however, that an intimate mother/child relationship must be developed early and the mother should be taught the various tricks required to feed the child as soon as possible.

Developmental disturbances affecting the teeth

Developmental anomalies affecting the teeth may occur during the phases of tooth initiation, morphodifferentiation, deposition of the hard calcified dental tissues or during eruption of the teeth themselves. Such disturbances in growth can affect the actual number of teeth as well as their form and structure.

Hypoplasia and hypocalcification of the teeth arise either from a genetic defect or from severe metabolic disturbances during childhood. This latter group includes viral infections and rickets. The usual defects are horizontally arranged hypoplastic pits or grooves across the crowns of the affected teeth. However, these teeth are not more prone to dental caries, and treatment, using plastic sealants, is carried out on aesthetic grounds.

Congenital syphilis produces a characteristic form of enamel hypoplasia with lateral tapering towards the incisal edge of anterior teeth, together with notching of the incisal edge (Hutchinson's teeth). The first molar teeth are also involved with globular masses of enamel replacing the normal cusps (mulberry molars). These appearances of the teeth are not absolutely pathognomonic of syphilis, as similar disturbances can also occur as a result of chronic mechanical pressure. Conversely, not all cases of congenital syphilis have these dental findings.

Tooth discolouration may arise from pigments circulating in the blood during tooth development, e.g. neonatal jaundice and congenital porphyria. Tetracyclines given either to the mother during pregnancy or to the child during the phase of dental development may cause permanent yellow to grey discolouration due to incorporation of the antibiotic into the teeth. Therefore, tetracyclines should be avoided both during pregnancy and up to the end of the sixth year, while the crowns of the permanent anterior dentition are calcifying.

ORAL MUCOSA AND TONGUE

The mouth is lined by stratified squamous epithelium which is keratinized in some areas (hard palate, dorsum of tongue and gingivae) and non-keratinized in others (buccal mucosa, soft palate, labial mucosa and floor of mouth).

Lesions affecting the oral mucosa can be localized or widespread throughout the mouth. If there is extensive mucosal involvement then the term 'stomatitis' is applied; disease of the tongue is 'glossitis', of the gums, 'gingivitis', and of the lips, 'cheilitis'.

Oral manifestations of medical or surgical disease

The oral mucosa may demonstrate signs of systemic disease. A tendency to inflammation and oral ulceration may occur in iron deficiency or pernicious anaemia and in malabsorption syndrome. In leukaemia, where there is decreased host resistance, candidiasis and herpes infections occur as well as bleeding and ulceration. Decreased saliva from reduced salivary function as in Sjögren's syndrome, post-irradiation or due to dehydration, may also contribute to an increased susceptibility to infection. The oral mucosa may be affected early in certain primary dermatological conditions, such as pemphigus where oral bullous lesions occur and in lupus erythematosus white patches or ulceration may be presenting features. The circumoral pigmentation of Peutz-Jeghers syndrome, an inherited condition, should alert the clinician to the possible coexistence of gastrointestinal polyposis, which could result in intestinal obstruction or bleeding. On examination of the mouth and tongue enlarged infected tonsils may be apparent and may be accompanied by cervical lymphadenopathy.

Trauma

The oral mucosa is most commonly injured by the teeth: sharp edges of natural teeth or dentures may catch the mucosa and produce ulceration or a blow to the lips may cause the incisors to penetrate the labial mucosa and lips. In both circumstances the aetiology is fairly obvious and treatment is aimed at removal of a cause of repeated trauma. Should an ulcer persist in the absence of any apparent trauma or irritation, then it must be regarded as potentially neoplastic and a biopsy is desirable.

Recurrent aphthae

Recurrent oral ulcerations, or aphthae, usually occur on the non-keratinized oral mucosa and present as shallow, painful ulcers covered by white slough. The ulcers vary in size from 1 to 5 mm in diameter, and may appear either singly or in crops lasting five to fifteen days.

The aetiology of recurrent aphthae is unknown, although they are thought possibly to be more common in individuals with an atopic diathesis. Twenty per cent of patients presenting with what appears to be typical oral aphthae have an underlying systemic disorder, such as deficiency of iron, vitamin B₁₂ or folic acid. A few women have aphthae which appear between ovulation and menstruation, and in these specific cases therapy with oral contraceptives or oestrogens is usually successful.

Treatment of the remaining cases of recurrent aphthae is empirical. Hydrocortisone pellets, triamcinolone in carboxy-methylcellulose paste, or a 0.2 per cent aqueous chlorhexidine mouthwash may be of benefit.

Glossitis and sore tongue

Simple furring of the tongue may occur in patients with dehydration, acute fevers or dryness of the mouth. It is also seen in heavy smokers.

Many disorders may give rise to a painful or burning sensation in the tongue. Several nutritional deficiencies produce a red, tender tongue, which may in later stages become pale and atrophic. Dryness of the mouth, or xerostomia, can also cause discomfort of the tongue, and not infrequently a superimposed candida infection aggravates the condition.

Geographic tongue, or benign migratory glossitis, is a benign condition which is characterized by the intermittent appearance of round erythematous atrophic areas surrounded by a white margin. The aetiology is unknown and there is no treatment other than to reassure the patient of the benign nature of the condition.

Non-infective granulomata

There are several benign, non-infective, inflammatory, hyperplastic lesions which develop in the tissues adjacent to the teeth. The name epulis was previously applied to all of these lesions, but this term should be discontinued.

A pyogenic granuloma represents an unusually intense hyperplastic inflammatory response in the gingivae. This is a swelling of up to 1 cm, with a deep red surface which tends to bleed easily, and which arises commonly during pregnancy. The treatment for pyogenic granuloma is local excision, together with improved oral hygiene. In the pyogenic granuloma associated with pregnancy, however, the lesion often subsides spontaneously following delivery.

A second type of granuloma occurs adjacent to the teeth, but this variety contains multinucleated giant cells and is termed 'peripheral giant cell granuloma'. Again the lesion is benign, and the treatment is local excision.

Infective granulomata

Syphilis

Oral syphilitic lesions can occur in all stages of the disease. A primary chancre is most commonly found on the lip or tongue, and

presents as a firm nodule which ulcerates and becomes covered with a whitish slough. During the secondary stage 'mucous patches' may appear on the oral mucosa; these are multiple, superficial ulcers. Snail-track ulcers are another feature of secondary syphilis. The gummata of tertiary syphilis may develop intra-orally, being most common on the tongue and palate. Atrophic glossitis and white patches (leukoplakia) on the mucosa are further oral lesions of tertiary syphilis.

Tuberculosis

Tuberculous ulceration of the mouth is now a rare complication of pulmonary tuberculosis. The tongue is the commonest site, and the ulcer is irregular, indurated and painful.

Oral infections

Herpes simplex

Infection with this virus is the commonest cause of stomatitis in infants and young children, although it does occasionally occur in adults. In the primary infection, vesicular lesions develop on the palate, gingivae, dorsum of tongue and lips. The cervical lymph nodes become enlarged and tender. There is usually a mild constitutional upset, with the child becoming febrile and refusing food: this lasts for between a week and ten days. No specific treatment is normally required, but attention should be paid to an adequate fluid intake together with analgesics and sedatives where required, such as elixirs of paracetamol and promethazine.

Further episodes of secondary infections occur in a number of people, but these are nearly always confined to the lip and take the form of a 'cold sore'.

Herpes zoster

'Shingles' may occur in the regions supplied by the trigeminal nerve, giving rise to a rash and stomatitis. The earliest sign of the disease is pain in the area supplied by the affected branch of the nerve, followed soon by a vesicular eruption on mucosa and skin. The pain can be extremely severe and persist long after the skin and mucosal lesions have healed. In intractable cases, section of the nerve roots may be necessary.

Acute specific fevers

The vesicular eruption of the skin present in smallpox and chickenpox may also occur on the oral mucosa. Koplik's spots, like white grains of salt on a bright red base, occur on the buccal mucosa in