

GASTRO- ENTEROLOGY

AN INTEGRATED COURSE



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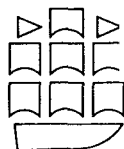
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PREFACE

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.

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CONTENTS

<i>Chapter</i>	<i>Page</i>
I The Mouth, Tongue and Salivary Glands	1
II The Pharynx and the Oesophagus	12
III The Stomach	33
IV The Malabsorption Syndrome	72
V The Biliary System and the Pancreas	103
VI The Liver	127
VII The Acute Abdomen (including intestinal obstruction)	158
VIII Intestinal Infections	174
IX Crohn's Disease	192
X Ulcerative Colitis	198
XI Tumours of the Intestine	209
XII Diverticular Disease of the Colon	229
XIII The Anal Canal and Anus	239
Index	263

I

THE MOUTH, TONGUE AND SALIVARY GLANDS

D. K. MASON and T. GIBSON

SOME disorders are confined to the mouth. Also certain systemic diseases have oral manifestations and early clinical signs or symptoms may occur in the oral cavity, e.g. the furred tongue of dyspepsia, the smooth tongue in iron deficiency or pernicious anaemia, the oral pigmentation in Addison's disease or the Peutz-Jegher syndrome and the dry mouth in Sjögren's syndrome.

DENTAL DISEASES

Dental caries, periodontal diseases and malocclusion are the three main 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 starts at localized areas on the outer surface of the enamel (Fig. 1, 1). It progresses inwards to the dentine and if untreated

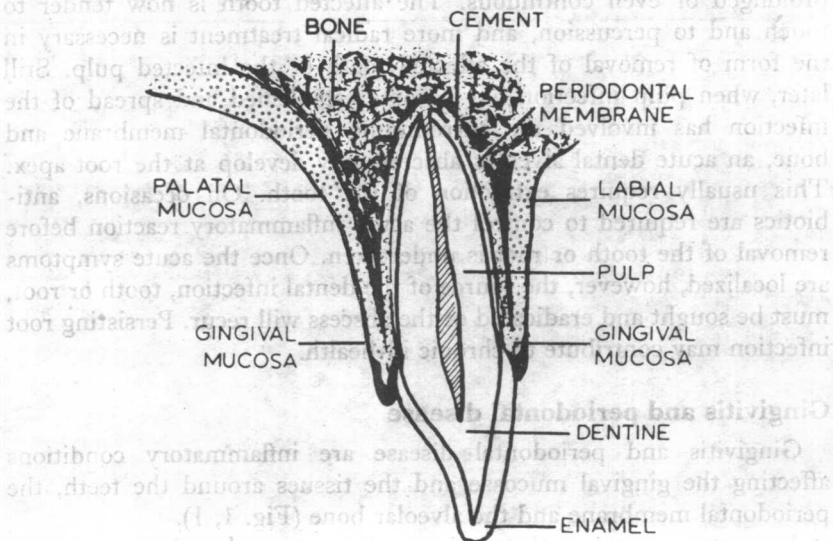


Figure 1, 1. Sagittal section of maxillary incisor tooth and surrounding tissues.

will reach the neurovascular soft tissue within the tooth, the dental pulp. The richly innervated pulp tissue is enclosed in the rigid calcified 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 concentrated in deposits attached to the tooth surface have the ability to convert sugar to acid which in turn results in demineralization of the tooth surface. Bacteria must be present; the feeding of a cariogenic diet containing sticky refined carbohydrate alone will not cause caries. Prevention and partial control of caries are achieved by reducing the intake of refined carbohydrate sweets and avoiding snacks between meals, and by increasing the resistance of the enamel surface by the use of fluoride, preferably in drinking-water, alternatively by topical application. The protective action of fluoride is not fully understood, but enamel treated in this way is more resistant to decalcification by acid.

SEQUELAE

Once caries begins, cavity formation usually progresses to involve both the enamel and the dentine; the decay can be removed at this stage and the tooth filled by the dental surgeon before the patient experiences pain. If a cavity remains untreated, sharp pain may be brought on by changes in temperature. This is at first relieved when the thermal stimulus is removed, but eventually the pain may become more prolonged or even continuous. The affected tooth is now tender to touch and to percussion, and more radical treatment is necessary in the form of removal of the affected tooth or the infected pulp. Still later, when pulp infection has become established and spread of the infection has involved the surrounding periodontal membrane and bone, an acute dental alveolar abscess may develop at the root apex. This usually requires extraction of the tooth. On occasions, antibiotics are required to control the acute inflammatory reaction before removal of the tooth or root is undertaken. Once the acute symptoms are localized, however, the source of the dental infection, tooth or root, must be sought and eradicated or the abscess will recur. Persisting root infection may contribute to chronic ill-health.

Gingivitis and periodontal disease

Gingivitis and periodontal disease are inflammatory conditions affecting the gingival mucosae and the tissues around the teeth, the periodontal membrane and the alveolar bone (Fig. 1, 1).

At least as many teeth require to be extracted owing to chronic gingivitis and periodontal disease as to dental caries.

Gingivitis is usually due to inadequate tooth cleansing allowing the development of dental plaque, i.e. the bacterial deposits which accumulate around teeth and gums. Later inflammatory changes and progressive damage to the supporting tissues (chronic periodontitis) lead ultimately to loosening and loss of the teeth; more teeth are lost in adults from this cause than from any other.

The essential treatment of both chronic gingivitis and periodontitis is to keep the gingival sulcus free from infection by removal of dental plaque and calculus (tartar) and excision of any pockets which have formed around the teeth. Where gross destruction of gingival and periodontal tissues including bone has occurred, extraction of the tooth is necessary.

The commonest and most important form of acute gingivitis is Vincent's infection, in which ulceration of the gingivae with bleeding, pain and halitosis occur. In addition there may be cervical lymphadenopathy and a mild or moderate constitutional disturbance. The aetiology of Vincent's infection is still obscure. Ulcer smears may reveal increased numbers of *Borrelia vincenti* and *Bacillus fusiformis*. It has not been possible, however, to transmit the disease to a normal individual or animal and a general or local lowering of resistance may be a predisposing factor.

Vincent's infection responds to mechanical cleansing of the mouth and improved oral hygiene with the removal of areas where food stagnation occurs. Occasionally these measures are insufficient and systemic penicillin or metronidazole is necessary. Without long-term oral cleanliness, recurrence is almost certain.

Malocclusion

About 40 to 50 per cent of the school children in Britain suffer from some form of malposition or malocclusion of the teeth. Orthodontic correction is desirable, not only from aesthetic and functional points of view but also to prevent dental caries and periodontal disease which are more likely to occur when some types of malocclusion exist.

Developmental disturbances affecting the teeth

Growth anomalies affecting the teeth may occur during the phases of tooth initiation, morphodifferentiation or during formation of the hard dental tissues and the eruption of the teeth themselves. These disturbances manifest themselves in abnormalities of the number of teeth and of their form and structure.

Hypoplasia and hypocalcification of the teeth may arise from severe disturbances of metabolism during childhood fevers and rickets. The

usual defects are horizontally arranged hypoplastic pits or grooves across the crowns of the affected teeth. Rather surprisingly, these teeth are not more prone to dental caries and only aesthetic treatment is usually considered.

Prenatal syphilis can cause structural deformities in which the incisor teeth show a characteristic notching of the incisor edge. This appearance is, however, by no means diagnostic and can also occur as a result of chronic pressure.

Abnormal pigments circulating in the blood during tooth formation, e.g. in neonatal jaundice or congenital porphyria, may give rise to tooth discoloration. Tetracycline given during pregnancy or to a child during dental development may also cause permanent yellow discoloration of the teeth. Tetracycline should therefore be avoided during childhood up to the end of the sixth year while the crowns of the permanent anterior teeth are calcifying.

ORAL MUCOSA AND TONGUE

Local and generalized lesions occur, the latter frequently being termed 'stomatitis'. In addition to lesions specific to the mouth, the oral mucosa is affected in diseases which are primarily dermatological.

LOCALIZED LESIONS

Trauma

Mucosal injury occurs quite commonly in relation to sharp edges of natural or artificial teeth, or rough food, and may cause ulceration, a granulomatous reaction or hyperkeratosis of the epithelium.

Treatment consists basically of removal of the cause, but if the lesion persists excisional biopsy is desirable. It is most important to regard as a possible neoplastic condition any oral ulcer which does not heal after traumatic factors have been eliminated.

Recurrent aphthae

These common oral ulcers are painful and shallow and some 2 to 4 mm in diameter. They may appear in crops of three to eight and last for about seven to 20 days. They heal without scarring but often recur at fairly regular intervals. There is no known cause; although the lesions may resemble those of herpes simplex, no virus has been found associated with them. Trauma may play some part in determining the sites in which ulcers occur, but can only be a localizing rather than a causal factor. Treatment is empirical; topical steroids (e.g. triamcinolone 1 per cent) appear to accelerate healing in about 50 per cent of patients.

Epulis

An epulis is an inflammatory hyperplasia affecting the soft tissues adjacent to the teeth; some are fibrous in nature while others are more vascular; some contain giant cells. All are benign and treated by local excision. One variety is associated with pregnancy, the lesion appearing about the third month; in many instances regression occurs spontaneously after the birth of the child, only to recur during a subsequent pregnancy. If excessive bleeding occurs, excision may be necessary during pregnancy.

Sore tongue and glossitis

Pain or unpleasant sensations of burning or itching in the tongue may be caused by many factors, e.g. nutritional deficiencies, anaemias, sideropenia, dryness of the mouth, poisoning with heavy metals and local trauma. All patients with such symptoms referable to the tongue should be fully investigated even in the absence of obvious local abnormality.

Geographic tongue is a benign condition characterized by the recurrent appearance and disappearance of atrophic areas. The cause is unknown, and although there is no effective treatment, the patient should be reassured of the benign nature of the condition.

Infective granulomata**TUBERCULOUS ULCERATION**

This is a rare complication of pulmonary tuberculosis, the sputum containing the causal organisms. The tongue is the commonest site in the mouth and the ulcer may show considerable chronicity and induration. Demonstration of acid- and alcohol-fast bacilli from the ulcer establishes the diagnosis. No local treatment is required, the ulcers healing when the systemic disease has been treated.

ISOLATED SYPHILITIC LESIONS

These lesions of the oral mucosa may occur at any stage of the disease. A primary chancre presents as a firm nodule which ulcerates; the diagnosis is made by dark-ground illumination of material from the lesion to demonstrate the spirochaetes. 'Snail track' or 'mucous patches' occur during the secondary stage, while gummata, leukoplakia, or atrophic glossitis may present in tertiary syphilis. The palate and tongue are particularly common sites for gummata. Treatment at all stages should be supervised by a venereologist.

Leukoplakia

'Leukoplakia' is a descriptive term for a white plaque or patch on the oral mucosa which cannot be removed by scraping (Plate I). It occurs most frequently in people over 40 years of age and since approximately 5 to 15 per cent undergo malignant changes, it is best regarded as a pre-malignant condition. Although external stimuli such as trauma or pipe smoking may be associated with the disorder in some patients, the cause in many is not known. Careful investigation and follow-up are essential. Any irritants should be removed and a biopsy should be made of any white patch. The majority show keratinization, hyperkeratosis or dyskeratosis, while some show frank malignancy and require excision. The advice of a competent pathologist is essential. All patients with leukoplakia should have repeated biopsies, particularly when any visible change is noted in an established lesion. Leukoplakia occurring in a patient with tertiary syphilis is particularly liable to become malignant.

Neoplasia

True benign tumours are rare in the oral cavity although fibro-epithelial polyps or denture granulomata occur as a result of local trauma or irritation. The commonest benign neoplasm is the papilloma appearing as a warty swelling on the mucosa. It is treated by excision.

Squamous cell carcinoma is the commonest malignant tumour of the mouth (Plate II). It occurs predominantly in men aged 50 or more, and the areas most commonly affected are the lateral borders of the tongue, the lower lip, the floor of the mouth and the lower alveolus. In some patients the tumour is related to chronic irritation from the sharp edge of a tooth, an ill-fitting denture or smoking, especially clay-pipe smoking; in some areas of India chewing the betel leaf is a predisposing factor. There appears to be an increased risk of this tumour in patients with tertiary syphilis. Oral cancer has become less common in Britain during the past 50 years and this has been related to such factors as changes in smoking habits from pipes to cigarettes, improved dental care and early diagnosis and treatment of syphilis. In many cases, however, there is no obvious predisposing factor.

Squamous cell carcinoma presents as an indurated swelling which may be ulcerated. Pain is not a feature in the early stages. Histological examination reveals a variety of appearances from invasive, well-differentiated, squamous epithelium with cell nest formation to the more undifferentiated types. Treatment depends to some extent on the site. Carcinoma of the lip may be successfully treated by excision or by radiotherapy; it seldom metastasizes and has a good prognosis. Carcinoma of the tongue may also be treated by radiotherapy or

excision; metastases to the regional lymph nodes on either side of the neck are common, however, and block dissection of the nodes may be required. Carcinoma of the floor of the mouth metastasizes so frequently that it is best excised in continuity with the regional nodes on the same side. Wide excisions of mandible and maxilla may be required when the tumour is adherent to or involving bone. Techniques of reconstruction have improved to such an extent that it is possible to repair as a primary procedure even quite major facial deformities. Patients need never be left drooling uncontrollably through defects left after cancer ablation.

Tumours arising in the small salivary glands may appear on the palate, the tongue or the cheek mucosa. The histological pattern varies as described on page 11, but all have a marked tendency to recur unless excised very widely in the first instance. They are not radiosensitive.

STOMATITIS

Stomatitis may result from infection, the side effects of drugs or as part of a generalized dermatological condition.

Herpes simplex

Herpes simplex is the commonest cause of stomatitis in infants and young children but may occasionally occur in adults. Vesicular lesions occur over the hard palate, the dorsal surface of the tongue, or on the lips. The gingival margins may become red and swollen and the cervical lymph glands enlarged. There is often a mild constitutional upset with pyrexia, and the infection runs its course for about one week. No treatment is usually required but in severe cases tetracycline in the form of a mouthwash, or idoxuridine 0.1 per cent applied to the lesions may shorten the course of the disease. Systemic administration of tetracycline is contraindicated in infants, young children and pregnant mothers because of the danger of tetracycline pigmentation (p. 4). Once a herpetic infection has occurred in the lip there is a tendency for the lesion to be reactivated throughout the subject's life. There is a well-established clinical association between herpes of the lip and respiratory infection.

Herpes zoster

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

Acute specific fevers

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

Secondary syphilis

The secondary stage of syphilis develops one to four months after infection and stomatitis may occur at this time in association with the papular skin rash, enlarged lymph glands and constitutional disturbances. The disease at this stage is especially transmittable and caution is necessary in handling affected patients.

Thrush and other *Candida* infections

Oral infections with *Candida albicans*, a yeast-like fungus, are being increasingly recognized. *Candida albicans* is present as a commensal in 30 to 40 per cent of normal mouths. It becomes pathogenic only when there are additional circumstances favouring growth of the fungus. Infection also occurs when the oral flora are disturbed during prolonged antibiotic therapy. When pathogenic in the tissues, the mycelial form of the yeast cell predominates.

Thrush is characterized by creamy, white patches surrounded by erythematous areas on the mucosa of the cheeks and/or the soft palate. The white patches consist of clumps of *Candida albicans* which can be easily rubbed off the erythematous base and may be identified by microscopic examination of smears. Occult systemic disease should always be excluded by a thorough clinical examination. The condition responds to nystatin locally in the form of lozenges or a suspension.

Chronic oral candidiasis may be responsible for sore gums beneath dentures, especially the upper; angular cheilitis (fissuring at the corners of the mouth) and a lesion simulating leukoplakia, in which the mycelial form of *Candida* may be present deep in the tissues. Treatment is by nystatin lozenges 500,000 units t.i.d. orally for at least 14 days.

Drugs

Occasionally, patients with toothache hold aspirins or other analgesics containing aspirin against the oral mucosa in the region of the painful tooth; a chemical burn may result and appear as a white area of necrosed tissue on a red base. Agranulocytosis due to bone marrow depressants such as chloramphenicol, phenothiazines and cytotoxic drugs can cause secondary infective oral ulceration. A bullous reaction of the

mucous membrane and skin in the Stevens-Johnson syndrome is associated with sensitivity to barbiturates or sulphonamides.

DISEASES AFFECTING SALIVARY GLANDS

OBSTRUCTIVE CONDITIONS

Mucocoeles

Mucocoeles are mucus-containing cysts which occur superficially in the oral mucosa. They arise as a result of duct obstruction with retention of secretion. Treatment is by surgical excision or marsupialization. Although small mucous glands are present in all regions of the oral cavity, except the anterior aspect of the hard palate, by far the most common site for these cystic lesions is the lower lip, and it is thought that they may be initiated by trauma. The term ranula is used to describe the large mucous cyst which occurs in the floor of the mouth.

Calculi

Calculi occur most commonly in the submandibular gland or duct. Small stones cause occasional pain and transient swelling over the submandibular gland area during or just after eating. When they have been present for some time, infection supervenes causing permanent enlargement of the gland. When the calculus is in the duct simple surgical removal of the calculus is sufficient. When it is in the gland, excision of the gland plus the calculus is necessary. If acute sialoadenitis is present this should be controlled by antibiotic therapy before operation is performed.

INFECTION AND INFLAMMATION

Epidemic parotitis

Epidemic parotitis or mumps is the commonest inflammatory condition affecting the salivary glands. It is caused by a virus spread by droplet infection and affects mainly children and young adults. Glandular tissues are principally involved, the commonest being the parotid glands, but occasionally the submandibular salivary gland, the testicle, the pancreas or the ovary may be affected. The incubation period of mumps is about 18 days. Usually parotid swelling alone is the first feature, although the disease may begin with a constitutional disturbance for several days followed by swelling of the parotid glands.

The diagnosis is made from the history and clinical presentation. A complement fixation test, which is usually positive one week after the

onset of symptoms, may assist in making the diagnosis in atypical cases.

The treatment is symptomatic. Mouthwashes should be prescribed as the mouth may be very dry on account of reduced salivary flow from the affected glands. Patients should be isolated until all glands are symptom-free and no enlargement is present.

Acute sialoadenitis

This condition most frequently involves the parotid glands. Acute parotitis tends to develop during severe febrile illnesses and after major surgical operations, especially if adequate attention is not given to the prevention of dehydration, elimination of infection and careful oral hygiene. Infection may reach the gland either ascending from the oral cavity or via the bloodstream during bacteraemia or septicaemia. This is a serious condition and requires prompt treatment with the appropriate antibiotics; surgical drainage is necessary when abscess formation has occurred within the gland capsule.

Chronic sialoadenitis

This may occur as a residual infection after acute parotitis but is often a complication of obstructive lesions of the submandibular gland or duct. Infection reaches the glands along the ducts, the commonest organisms being *Streptococcus viridans* and *Staphylococcus aureus*. Treatment is by appropriate antibiotic therapy after bacteriological examination of saliva from the duct orifice. Where calculi are present, surgical excision of the gland is indicated.

DEGENERATIVE CONDITIONS

Sjögren's syndrome

The features of this syndrome are dryness of the mouth, dryness of the eyes combined with rheumatoid arthritis or other connective tissue disease. To substantiate the diagnosis of Sjögren's syndrome, two out of these three criteria must be present. The condition is most frequently found in female patients over 40 years of age. Characteristic histopathological changes occur in the salivary and lacrimal glands. Glandular tissue is replaced by massive infiltration of lymphocytes and plasma cells with the resultant clinical signs of dryness of mouth and eyes. Diagnosis is made from the history and clinical examination, and there may be typical serological changes associated with connective tissue disorders. Treatment is symptomatic; glycerine mouthwashes help to relieve the dryness of the mouth.

Post-irradiation damage

Damage may follow irradiation of tumours in the upper alimentary or respiratory tracts. The salivary glands are particularly sensitive to radiation and the reduced salivary flow may be temporary or permanent. Glycerine mouthwashes or pastilles may give symptomatic relief.

TUMOURS

The neoplasm most commonly involving the salivary glands is the pleomorphic salivary adenoma. This tumour may occur in major or minor salivary glands, and common sites are the parotid and palatal glands. The pleomorphic adenoma has a characteristic histological pattern with duct-like structures and a matrix which often consists of a structureless mucoid substance thought to arise from altered secretion of the glandular tissue.

As it grows, the surrounding tissue is compressed into a pseudocapsule of the tumour, from which it can readily be enucleated. This should never be done since the tumour cells are invariably present in the capsule and recurrence is inevitable. Although often regarded as benign since it does not metastasize, such a tumour is locally invasive and can cause great morbidity for many years unless radically excised in the first instance. In the parotid gland, excision is complicated by the presence of the facial nerve which requires careful dissection.

Every gradation in histological appearance can be found from the almost benign pleomorphic adenoma to the frankly malignant adenocarcinoma and such terms as cylindroma, adenocystic carcinoma and mucoepidermoid carcinoma are applied to specific types. All require radical excision to prevent recurrence. It is imperative to avoid cutting into the tumour at operation to prevent seeding in the wound.

It must be emphasized that any painless swelling developing slowly in the parotid gland or on the hard or soft palate is to be regarded as a salivary adenoma or one of its histological variants and widely resected. Tumours recurring after inadequate primary excision can rarely be totally eradicated without massive tissue ablation.