

SURGERY FOR DENTAL STUDENTS

SIR MICHAEL WOODRUFF

HEDLEY E. BERRY

FOURTH EDITION

SURGERY FOR DENTAL STUDENTS

SIR MICHAEL WOODRUFF

DSc, MD, MS (Melb.), FRCS, FRCS(Ed), FRACS,
FACS (Hon.), FRCPE (Hon.), FRS

*Emeritus Professor of Surgery, University of Edinburgh
Formerly Consultant Surgeon, Edinburgh Royal Infirmary
Sometime Examiner in Surgery to the Universities of London,
Cambridge, Edinburgh, Aberdeen, St. Andrews and Glasgow,
and to the Royal College of Surgeons of Edinburgh Hunterian Professor and
Lister Medallist, Royal College of Surgeons of England*

HEDLEY E. BERRY

MB, BS (Lond.), FRCS

*Consultant Surgeon, Kings College Hospital
Tutor in Surgery, Kings College Hospital Dental School
Sometime Examiner in Surgery in the University of London
Member of Board of Examiners in Dental Surgery (General
Surgery), Royal College of Surgeons of England*

FOURTH EDITION

馆藏专用章

BLACKWELL SCIENTIFIC PUBLICATIONS

OXFORD • LONDON • EDINBURGH
BOSTON • PALO ALTO • MELBOURNE

PREFACE TO THE FOURTH EDITION

This edition follows the same general plan as previous editions but the text has been thoroughly revised and, in places, rearranged. This revision has been undertaken in collaboration by the original author and Mr Hedley Berry, FRCS, who appears for the first time as co-author.

To help the student preparing for his final examination, a new chapter has been added in which sections on disorders of the lips, tongue, buccal cavity and salivary glands, which were previously scattered throughout the book, have been collected together.

As in previous editions, the authors have been concerned primarily to meet the needs of undergraduate dental students, but it is hoped that the book will prove useful also to postgraduates studying for the Fellowship in Dental Surgery of the various Royal Colleges.

We are indebted to many colleagues for helpful suggestions, and especially to Professor J. Sowray, Dr L. Davis and Professor W. Duncan for detailed, constructive criticism of the sections on jaw fractures, blood grouping and radiotherapy, respectively. We thank Professor Sowray also for Figure 44. We also thank Dr Karin Woodruff for her invaluable assistance with the preparation of the Index.

We thank once again the many colleagues who made suggestions and provided illustrations which were acknowledged in detail in previous editions. The remarkable success of the book has been due, in no small degree, to their help, and to the expertise and cooperation of Mr Per Saugman and his colleagues in Blackwell Scientific Publications. Finally, we thank our wives for help with the preparation of the manuscript, and with the onerous task of proof reading.

INTRODUCTION

A course in general surgery is often regarded by the dental student as an unnecessary addition to a heavily loaded curriculum. It is nothing of the sort.

In the first place, dental surgery is a specialized branch of surgery, and no surgeon can practise his art properly unless he has had a thorough grounding in general surgical principles.

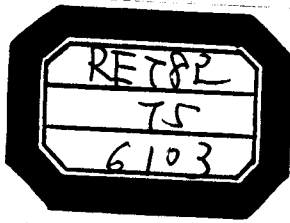
Secondly, cases occur in dental practice in which the differential diagnosis between a dental condition and a surgical condition (in the narrow sense of the word) has to be made. For example, the pain of trigeminal neuralgia may have to be distinguished from pain due to dental sepsis; and the trismus of tetanus from that associated with an impacted molar tooth. When doubt exists a dental surgeon should consult a surgical colleague, but it is obvious that he can do this only if he is aware of the problem.

Thirdly, a dental surgeon who has some knowledge of the regional surgery of the head and neck may, in the course of his examination of a patient, observe some purely surgical lesion, such as an early epithelioma of the lip or septic tonsils, and be able to refer the patient to a surgeon for treatment without delay.

Finally, there are patients who require the services of both a surgeon and a dentist. In some cases, for example patients with fractures of the jaw, both may participate in treatment of the primary condition; in others, dental treatment may be a necessary preliminary to treatment of a non-dental condition, and some of these patients may pose special problems for the dentist.

We believe that the first of these reasons is the most important. If this is correct the primary object of a course in surgery for dental students should be to teach surgical principles. It follows that the usual plan of presenting the dental student with an elementary treatise on the regional surgery of the head and neck, hoping that he will perceive the underlying general principles for himself, is mistaken. What is needed is an account of the basic principles of surgical diagnosis and treatment, and the clinical and pathological features of surgical conditions which are not limited to one particular region of the body, illustrated wherever possible by reference to the common surgical disorders of the head and neck.

The present book is intended to meet this need. At the same time attention has been paid to examination requirements and it has been found possible to include in the examples virtually all the regional surgery specified in the syllabus for the Licentiate in Dental Surgery of the Royal College of Surgeons of England. The student who has read the book in conjunction with a proper course of clinical instruction should therefore find no difficulty with the surgical part of this examination or of the qualifying examination for a university degree in dental surgery.



CONTENTS

Preface to the Fourth Edition	vii
Introduction	ix
1 Surgical diagnosis	1
2 The principles of surgical treatment	22
3 Congenital disorders	44
4 Inflammation and infection	59
5 Pyogenic bacterial infection	80
6 Specific infectious diseases	99
7 Injuries due to mechanical violence	125
8 Fractures and joint injuries	131
9 Injuries of the head and face	147
10 Haemorrhage and shock	168
11 Injuries due to thermal and chemical agents	183
12 Tumours and cysts	190
13 Ulceration, gangrene, sinuses and fistulae	212
14 Disorders of blood vessels	222
15 Diseases of the lymphatic system	234

16 Diseases of bone	244
17 Diseases of joints	267
18 Some surgical disorders of the nervous system. Facial pain	280
19 Disorders of endocrine glands	295
20 Obstructive lesions. Respiratory obstruction. Dysphagia	306
21 Diseases of the lips, mouth, tongue and salivary glands	318
Index	339

Chapter 1

SURGICAL DIAGNOSIS

Almost every patient who consults a surgeon has some definite complaint; for example, pain, bleeding, a localized swelling, an ulcer, retention of urine, limitation of movement of a joint and so on. In seeking professional advice he has two main objects: first, and most important, he wants *treatment*; secondly, he wants a *prognosis*, that is, advice as to the probable consequences of his disorder.

It is the task of the surgeon to satisfy, as far as he can, both these requirements, and to achieve this he must first of all make an accurate *diagnosis*. This includes not only diagnosis of the condition which brought the patient to seek surgical advice but also of any other conditions which may affect his fitness to receive a general anaesthetic or undergo a surgical operation.

In making a diagnosis reliance is placed mainly on the patient's history and the results of clinical examination, but when these are insufficient, various special investigations must be undertaken. The art of taking a reliable history and making an accurate physical examination can be acquired only by practice, but attention may usefully be drawn to certain points which are of special importance.

The history

Some patients have no abnormal physical signs at the time they present and the correct line of investigation and an accurate diagnosis rests entirely on taking a full history. Skill in history taking is especially important for the dental student, who may lack some of the skills required for a full clinical examination. Appreciation of the significance of a patient's symptoms enables patients at added risk to be identified, and may modify the approach to treatment or lead to more expert opinion being sought.

Note first the name, age, sex, marital state and occupation of the patient. Find out the nature of his complaint and its duration, recording the patient's story as far as possible in his own words. His account of his

symptoms should suggest further questions for you to put to him. Record past illnesses, operations and accidents, and ask specifically about heart troubles and allergies. Include questions about the family history when relevant. Be tactful but persistent, and try to avoid asking leading questions. It may be necessary to talk to a relative or friend accompanying a patient when he himself does not give clear answers.

Pain is often a presenting symptom and deserves special attention. Record the site, severity, time and mode of onset of the pain. Ask whether it is colicky, burning or throbbing, and whether it radiates from the site of onset, since the answers to these questions may point to the cause. Remember that referred pain may be felt at a site remote from the site of origin. Pain originating in the diaphragm, for example, may be felt at the tip of the shoulder because the nervous system is unable to distinguish the source. Finally, ask about factors which exacerbate or relieve the pain. The pain of a duodenal ulcer, for example, is typically relieved by taking food or antacids, whereas other types of abdominal pain may be made worse by food.

Systematic enquiry

The systematic enquiry is designed to reveal evidence of disorders which the patient is unaware of, has forgotten, or regards as irrelevant. It should follow a definite plan, so that important questions are not omitted.

Cardiovascular system

Breathlessness (dyspnoea) on exertion often precedes all other symptoms of heart failure. How far can the patient walk? How many stairs can he climb? Is he breathless at rest? *Orthopnoea* (shortness of breath on lying down) and *paroxysmal nocturnal dyspnoea* (sudden attacks of breathlessness at night) are associated with the pulmonary congestion of severe heart failure. Swelling of the ankles (*oedema*) may also be a presenting symptom of heart failure. Cardiac pain (*angina*) is usually felt behind the sternum and can radiate into the neck or down the arms. It may be brought on by exertion or, when narrowing of the coronary arteries is severe, it may occur at rest, perhaps precipitated by anxiety. Patients describing anginal pain merit full assessment by a physician before undergoing any surgical procedure, as do patients who give a history of having had a heart attack. Patients who have had a heart attack during the previous six months are at a considerably increased risk when undergoing an operation.

Respiratory System

Dyspnoea may occur because of obstruction of the upper respiratory passages, for example by an enlarged thyroid gland compressing the trachea or a foreign body obstructing the larynx. It may also result from impaired function of the lung alveoli, as may occur in collapse of the lung, pneumonia, bronchitis and emphysema. The severity of the breathlessness may depend upon how rapidly lung function is lost. A young man who suddenly collapses a whole lung (pneumothorax) may be very short of breath, but an elderly man with severe emphysema may not complain of dyspnoea at rest though he has very little normal, functioning lung tissue and little reserve to cope with any exertion or an anaesthetic.

Cough. How long has the cough persisted? Is it continuous or does it come in paroxysms, as is often the case in bronchitis. Is it a dry cough or a loose cough producing sputum? Enquire if the sputum is clear mucous, or yellow-green mucous suggesting the presence of infection which requires active treatment before the patient can be given an anaesthetic. Blood in the sputum (*haemoptysis*) always demands further investigation because it may be the presenting symptom of bronchial carcinoma or pulmonary tuberculosis. It may also occur in severe heart disease or follow a pulmonary embolism. Determine whether the patient has had true haemoptysis, producing blood-stained sputum which is frothy due to admixture with air, or whether he has spat up blood from some local cause in the mouth or pharynx.

Nervous system

Note should be made of the patient's *mental state*. A history of psychiatric illness may significantly alter the approach to the patient. Undue anxiety may mean that some form of premedication is necessary to calm the patient before performing an operation.

A history of *fits* or *convulsions* is of great importance. Speak to a relative or friend who has observed an attack. Convulsions may be localized to one group of muscles, e.g. an arm or a leg, and not be accompanied by unconsciousness. This would indicate a lesion localized to one part of the brain (possibly a primary or secondary tumour). Generalized convulsions (*epilepsy*) accompanied by unconsciousness may have no obvious underlying pathology (idiopathic epilepsy) or it may be the result of ischaemia of the brain or a systemic upset, e.g. uraemia. *Weakness* or *paralysis* of an arm or a leg may follow a stroke and indicates some degree of cerebrovascular disease.

Urological system

There are three main urological symptoms with which a patient may present: pain, haematuria and frequency.

Pain. Many serious medical conditions of the kidney, e.g. nephritis, are entirely painless.

Renal pain. This is due to obstruction to the flow of urine or to irritation of the kidney pelvis by infection or a stone. It is usually felt as a dull ache in the loin.

Ureteric colic. A violent pain due to obstruction of the ureter by blood, debris or a stone is felt in the loin and often radiates to the abdomen, groin or scrotum.

Bladder pain. This may be a mild suprapubic discomfort or agonizing pain such as that experienced in acute retention of urine. *Pain in the urethra* is usually described as a scalding or burning pain during the passage of urine.

Haematuria must always be thoroughly investigated. The list of possible causes is long but it is headed by the possible diagnosis of a tumour in the kidney or bladder.

Frequency occurs if the bladder is irritated by the presence of a stone or infection. It may also result from incomplete emptying of the bladder, as in prostatism, and from diuresis. The possibility of diabetes mellitus must therefore always be considered because this is an important cause of diuresis.

Endocrine system

The diagnosis of endocrine disorders is often delayed because the onset may be insidious, and the initial symptoms may suggest disorders of other systems. *Thyrotoxicosis*, for example (Chapter 19), may present with cardiac, psychiatric, neurological or alimentary symptoms. Enquire about any family history of endocrine disorders, and specifically about *diabetes mellitus*. Ask if the patient has been receiving steroids or other hormone therapy.

Blood

Ask if the patient has ever been treated for anaemia.

If anaemia is suspected, ask the patient about possible sources of chronic blood loss, such as haemorrhoids, heavy periods or digestive symptoms suggesting peptic ulceration. Make a specific enquiry about anticoagulant therapy if the patient gives a history of having had a heart attack, heart surgery or venous thrombosis. Ask about bleeding tendencies which may have caused problems at previous operations.

Gastrointestinal system

Dyspepsia. Symptoms such as epigastric discomfort, nausea, flatulence and distension after meals are very common. In the majority of patients the symptoms are due to over-indulgence in food, smoking, alcohol, drugs such as aspirin, or anxiety. The difficulty lies in distinguishing those patients in whom the dyspeptic symptoms herald the onset of serious pathology which requires immediate attention. Direct questioning may reveal a pattern to the patient's symptoms which suggests a specific diagnosis and the lines along which investigation should proceed.

Abdominal pain. Note the mode of onset, nature, localization, radiation, precipitating and relieving factors.

Epigastric pain relieved by taking food and antacids suggests the patient may have a duodenal ulcer. Intolerance of fatty foods is often associated with the presence of gallstones. Pain accompanied by heartburn may be due to the oesophagitis associated with a hiatus hernia. Pancreatic pain is frequently referred to the lumbar region of the back; gallbladder pain may radiate to the back in the region of the right scapula.

Vomiting. Ask how often and when the patient has vomited, and about the amount and appearance of the vomitus. Vomitus which contains recognizable food from a meal taken some hours earlier suggests that the patient has pyloric stenosis. The presence of blood always demands further investigation.

Appetite. If the patient is not eating properly ask whether this is because of a lack of desire to eat or the fear of pain precipitated by food. A patient suffering from gastric ulceration may be afraid to eat because a meal is followed quickly by epigastric pain.

Defaecation. Enquire into the frequency and consistency of the patient's stools to establish the pattern of bowel habit, avoiding if possible the words 'diarrhoea' and 'constipation' which mean different things to different

patients. The pattern may vary considerably from patient to patient and the important point to clarify is whether there has been any recent change in bowel habit. Ask if the stools contain blood. Any recent change in bowel habit and bleeding must be investigated if an early diagnosis of carcinoma of the large bowel is not to be missed.

Drugs

It is most important when taking a history to include all medication which the patient is taking or has taken in the recent past. This often provides a valuable clue about the past medical history which the patient may have omitted to mention and also ensures that important medication is not discontinued when treating the current problem. To omit drugs such as insulin, digoxin, antihypertensive drugs, steroids, anticoagulants or β -adrenergic blocking drugs could have disastrous consequences. A list of all medication is beyond the scope of this chapter but certain groups of drugs are perhaps worthy of special mention because of their importance to the patient or because of possible interaction with anaesthetic agents or other drugs.

Anticoagulants Patients may omit to mention that they take anticoagulants, e.g. Warfarin, for heart trouble. It may be unwise to discontinue these completely before an operation, but some modification is usually necessary to avoid excessive bleeding.

Beta-adrenergic blocking drugs are now often prescribed for cardiac problems or hypertension. They may cause vagal over-action, slowing the pulse and seriously modifying the heart's response to the stress of an operation.

Mono-amine oxidase inhibitors which are prescribed for depression may result in the patient being hypersensitive to sympathomimetic drugs, e.g. adrenalin used to infiltrate an operation site, and the patient may also be very sensitive to analgesic drugs such as opiates or pethidine. Mono-amine oxidase inhibiting drugs must be stopped at least two weeks before a planned operation.

Steroids (prednisone, cortisone etc.) cause depression of the patient's adrenal glands which may therefore not be able to respond to the stress of an operation or trauma. It is usually necessary to 'boost' the dose of steroids to cover such an eventuality.

Contraceptive pills may increase the patient's susceptibility to thromboembolism. If an operative procedure which may confine the patient to bed for some time is planned, it is often wise to discontinue the contraceptive pill for one month before operation. If this is not practicable, it may be necessary to take other precautions to prevent deep vein thrombosis (Chapter 2).

Cytotoxic drugs are now taken by many patients for the treatment of malignant disease. Bear in mind that their depressant effect on the bone marrow may reduce the patient's resistance to infection and cause him to bleed excessively.

Alcohol consumption must be noted. The chronic alcoholic may have impaired liver function resulting in altered drug requirements. The alcoholic patient may be very sensitive to opiates and yet show increased tolerance to other sedatives.

The clinical examination

The clinical examination should proceed according to a definite plan. In surgical practice it is often best to begin with a preliminary general examination of the patient and then examine the local lesion thoroughly. Finally complete the general examination in as much detail as the circumstances require.

In this chapter, however, the full general examination is described first with particular emphasis on what can be learned from examination of the fully clothed patient who presents for dental treatment. Then the examination of one important type of local lesion is described, namely, a localized swelling. The examination of ulcers (Chapter 13) and other localized lesions, and of particular parts of the body, is described in later chapters.

General assessment

The student must become practised in making general observations when he first meets the patient and while the history is being taken. Note his demeanour, general state of health and posture. The gait, abnormal movements or a tremor may indicate a neurological or locomotor disturbance. The facial expression may provide a guide to physical or psychiatric disorders. Pain, fear or unnatural anxiety can be recognized

from the face. Observe the patient's complexion, changes in which are often first noticed by his friends or relations. Jaundice may not have been noticed by the patient himself. Pallor may suggest anaemia. A plethoric complexion may be seen in some forms of heart disease, Cushing's syndrome or chronic alcoholism. Note any cyanosis which may indicate severe cardiac or respiratory disorder. Note the rate and rhythm of his respiration and any wheezing or stridor. A recent loss of weight may be apparent and point to a serious underlying disorder. If the patient is in hospital examine the temperature chart hanging above his bed.

Examination of the hands

The dental student should make a point of examining a patient's hands because from the hands much can be learnt about a patient's past, his occupation, his habits and his general health. Routine examination of the hands reveals conditions peculiar to the hands, but more important, it will often reveal physical signs of a generalized disorder.

Note the rate and rhythm of the *pulse* at the wrist, the *temperature* of the hand and the amount of *sweating*. Excessive sweating may mean only that the patient is extremely nervous, but it should alert you to the possibility of an overactive thyroid gland. Cold hands may indicate a circulatory disorder such as Raynaud's phenomenon which may be associated with systemic disease. Sometimes, longstanding arterial insufficiency is severe enough to cause wasting of the pulp of the fingers.

The *shape* of the hand may be modified in some diseases. Notably, in acromegaly, the broad hands and thickened fingers may support the diagnosis which was suspected from the facies. In severe myxoedema the fingers may be thickened.

Observe the outstretched hands for any abnormal *tremor* such as the fine shake of thyrotoxicosis or the coarser flapping tremor of liver failure. The pill-rolling tremor of Parkinson's disease is easily recognized.

Look carefully at the *nails*, noting their shape and colour. Loss of the normal pale pink colour of the nail bed may indicate anaemia, as may pallor of the palmar skin creases. Chronic anaemia may also be manifest by spoon shaped nails (koilonychia) in which the normal transverse and longitudinal convexity of the nail is lost. Transverse fissuring of the nails can be a sign of general debility and pitting of the nails occurs in skin disease (psoriasis). Whitening of the whole nail sometimes occurs in chronic liver disease.

Clubbing of the nails and fingers may be a sign of chronic pulmonary or heart disease. When clubbed, the ends of the fingers become bulbous, and when viewed from the side there is loss of the normal angle between the skin covering the nail bed and the nail itself.

Cyanosis, a red-blue discolouration of the fingers and nail bed, may be present in severe cardio-respiratory disorders. Fingers which are warm and cyanosed indicate that the arterial oxygen saturation is lowered, suggesting a severe lung disorder. In heart failure when the fingers are cyanosed they are often cold.

Examination of a localized swelling

In every case a twofold diagnosis—anatomical and pathological—has to be made. There are thus two questions to be answered:

First, *where* is the lesion, or more precisely, in what anatomical structure or tissue does it arise?

Secondly, *what* is the nature of the underlying pathological change?

Students are apt to neglect the anatomical diagnosis but it is of great importance and, as we shall see presently, often provides a valuable clue to the pathological diagnosis.

The methods used are primarily *inspection* and *palpation*, assisted when necessary by *percussion*, *auscultation*, *transillumination* and *measurement*.

With all these methods the *principle of comparison* is used whenever possible; that is to say, a diseased part, such as a limb, eye or breast, is compared with the corresponding healthy member on the opposite side.

Inspection

Inspection is of great importance. It causes the least possible discomfort to the patient, and often yields information which cannot be obtained in any other way. Signs such as pigmentation, dilatation of superficial veins and dimpling of the skin, for example, may be of great diagnostic significance and can be recognized only by inspection. Moreover, some swellings are more easily seen than felt and may be missed completely if inspection is omitted.

Palpation

Palpation is defined as examination with the hands. The term means much more than simply passing one's hands over the swelling; it implies a deliberate attempt to elicit physical signs, and includes the performance of certain special tests. Palpation helps to confirm the results of inspection and provides additional information which cannot be obtained by the eye alone.

In palpating a swelling proceed as follows:

Determine first the size, shape and consistence of the swelling. Note if it is

tender, if it pulsates, if there is any local change in temperature and if crepitus is present. Finally, test for fluctuation, pitting on pressure, and fixity of the swelling to the skin and to deeper structures.

It is necessary to explain some of these terms and describe how the various tests are performed.

Pulsation. Pulsation is of two kinds, *transmitted* and *expansile*. In the former case the whole swelling moves *en masse* as a result of pulsation in some nearby structure, usually a large artery. In the latter case the swelling itself expands and contracts synchronously with the heart beat. This implies either that the swelling is an aneurysm or that it is extremely vascular, as, for example, some thyroid swellings.

The distinction between the two types of pulsation can usually be made by careful palpation.

Local changes in temperature. A local increase in temperature is characteristic of acute inflammation (Chapter 5).

Local coldness is unlikely to be confined to a swelling but may affect some part of the body such as a finger, hand, foot or limb. The significance of this sign is discussed in Chapter 14.

Local changes in temperature may be estimated by palpation, preferably with the back of the hand. If an accurate determination is required the skin temperature must be measured with a thermistor.

Crepitus. Crepitus is a peculiar grating or purring sensation which may be felt on simple palpation or when a nearby joint is moved. Crepitus may signify:

- 1 The presence of gas in the tissues. This condition is termed *surgical emphysema* and may be due to gas gangrene (Chapter 6) or to injury, especially of the lung or larynx.
- 2 Arthritis (Chapter 17).
- 3 Inflammation in a tendon sheath.
- 4 A fracture (Chapter 8).

Fluctuation. Fluctuation is characteristic of cystic swellings; that is, swellings which contain fluid (Chapter 12). The test for fluctuation may be carried out with the two index fingers, or with the index and middle fingers of one hand and the index of the other. In the latter case the procedure is as follows:

Place the index and middle fingers of one hand (the 'watching fingers') midway between the centre of the swelling and the periphery, and apply pressure to the centre of the swelling with the opposite index finger (Fig. 1). If the swelling is mobile it must be fixed; this can usually be done with the