Pathways in Surgical Management

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Preface

The arrangement of this book is unorthodox. Its relationship to a conventional textbook of surgery is comparable with that of a thesaurus to a dictionary.

A dictionary lists words, many of which have more than one meaning, and defines these various meanings. A thesaurus, on the other hand, starts with an idea and then lists all the words and phrases which in general express that idea, although with wide differences in emphasis and specialization.

Similarly, a conventional textbook of surgery lists surgical diseases and describes the symptoms and signs to which they might give rise: most of these symptoms and signs may occur in more than one disease. On the other hand, this volume starts with some common combinations of symptoms and signs such as the surgeon is likely to meet every day, and works backwards to show how one can identify which of several possible diseases produced that clinical picture.

Since the aim of surgical teaching is to make the student competent to deal with patients, and since these present with clinical pictures rather than with diseases, the author hopes that this book may prove helpful both to students of surgery and to their teachers.

M.H.

Acknowledgements

The text has been read and criticized by several surgical and medical colleagues, mainly at The Middlesex Hospital. While I am grateful to them for their help, the responsibility for the views I have expressed is entirely mine.

Most of the photographs were prepared by the Department of Medical Illustration at The Middlesex Hospital. Most of the x-rays came from the Departments of Radiodiagnosis at that Hospital or at Acton Hospital, but I am indebted to Dr R. Dick of The Royal Free Hospital for Fig. 10.1. The original drawings were prepared by the publisher's artist. Copyright material in the illustrations is acknowledged in the appropriate captions.

I am grateful to my daughter Alison, and to my successive secretaries Miss Sheila Tucker and Miss Margaret Sweet, who have made light of the labours of preparing the typescript; and to the publishers for their forbearance with me over the slowness of my writing and for the unfailing courtesy and efficiency of their help at every stage.

M.H.

Contents

Flow-charts

Introduction

Problem-solving in medical education

The traditional approach to teaching medicine depends upon the following view of the scientific basis of medicine.

A patient presents to a doctor with certain complaints. The doctor takes the history of the illness, examines the patient for abnormal physical signs, and does appropriate special tests which he has reason to believe may influence his management. This combination of symptoms, physical signs and special tests constitutes the clinical presentation. The doctor then attaches to this presentation a label called a diagnosis, and gives the patient treatment which should do him good, if previous experience or logical argument are to be trusted. If the doctor cannot attach a precise label to the presentation, because the clinical features will fit more than one diagnosis, he makes a differential diagnosis which consists of all the possible diseases that might produce the observed presentation and then does further tests designed to discriminate between them. When he has eliminated all but one possible diagnosis, or has decided on positive grounds that one diagnosis only is correct, he can proceed to rational therapy.

In the light of this approach there are three distinct facets of medical education:

1. The development of the skills involved in gathering information about a particular patient — basically, history taking, clinical examination and special investigations.
2. The acquisition of 'knowledge', the corpus of established facts about disease and their management.
3. Learning to select the correct diagnostic label from one's store of knowledge.

In most medical schools, the emphasis is on items 1 and 2. With regard to item 3, the usual advice given is to construct the differential diagnosis and then narrow down the possibilities. Yet when the medical student qualifies as a doctor he finds that there are problems with the approach via differential diagnosis.

Firstly, a complete list of all possible diagnoses would usually be very long: rarely does even the most deliberate and conscientious of doctors draw up such a list. Secondly, no matter how many possibilities the doctor enumerates, it usually transpires that he has forgotten some, of which one may be the correct diagnosis. Thirdly, the concept of the differential diagnosis is only useful if the doctor, having constructed his list, can then afford to sit back and wait for the results of any investigations that he has ordered for their discriminatory value — in other words, if none of the possible diagnoses requires urgent treatment. The immediate and pressing problem posed by the patient is, what must the doctor do, or advise, at that instant?

In place of the *differential diagnosis*, the writer offers the concept of the *working diagnosis*. There is a clear-cut distinction between these concepts. Instead of a list of all the possible diagnostic labels in terms of disease, the working diagnosis presents the key to the management of a clinical situation in terms of the action that the doctor should take. Not often is this diagnosis expressed in the form of exact aetiology or pathology: instead it is the most accurate description of the patient's problem available to the doctor at that moment, and as such it decides the doctor's immediate management. This book describes the management of surgical patients in terms of the concept of the working diagnosis. While it contains much detail, it is primarily a book about ideas and therefore it is aimed at everyone who is interested in surgery —

students, practitioners, and surgeons whether in training or fully qualified.

The difference in attitude produced by a working diagnosis compared with a differential diagnosis can be illustrated by considering one of the commonest problems in general surgery — the patient complaining of a lump in the breast. The differential diagnosis of such a lump includes a wide range of conditions, and most of these cannot be diagnosed with certainty on clinical grounds. The doctor seeing the patient in the out-patient surgical clinic has to decide, not so much the exact pathological diagnosis but rather his course of action: should he put a needle into the lump and try to aspirate fluid from it; ask the patient to come into hospital for an urgent operation; put the patient on a non-urgent waiting list for admission; or deliver reassurance that there is nothing seriously wrong and that no treatment is required? A dominant feature of the concept of the working diagnosis is that the principle of 'fail-safe' must be applied: that is, the most serious of the possible diagnoses must be adopted as the working diagnosis. For example, a lump in the breast may have no particular features suggestive of malignancy, but this fact does not exclude the possibility that it is a carcinoma. Unless, therefore, there is unequivocal evidence that the lump is something else such as a cyst or gynaecomastia that needs different handling, it must be assumed to be a carcinoma and urgent steps taken to get a histological diagnosis. The differential diagnosis *includes* carcinoma, but the working diagnosis *is* carcinoma and this decides the immediate management of the patient. Another example concerns the surgeon's attitude to the patient complaining of acute pain in the right lower quadrant of the abdomen. This problem is discussed in detail on page 315, but the surgeon should say, not 'Is there sufficient evidence to justify a diagnosis of acute appendicitis and therefore the performance of an operation?' but 'Am I so sure that this patient has not got acute appendicitis that I am prepared *not* to advise operation?' For practical purposes, a differential diagnosis including acute appendicitis is tantamount to a working diagnosis of 'pain in the right lower quadrant, possibly appendicitis' and results in the advice of an immediate operation.

It is true that in certain clinical situations the doctor follows the same course of action whether he thinks in terms of working diagnosis or differential diagnosis. If the various conditions in the list of differential diagnoses are of approximately the same urgency and do not require any immediate active management, then it is reasonable to ask for investigations designed to discriminate between these possibilities and await the results. However, even here the working diagnosis helps clarity of thought. Consider, for example, another very common problem — the patient complaining of chronic epigastric pain. Most such patients have no abnormal physical signs, nor can an accurate pathological diagnosis be made from the history. The four commonest conditions responsible for this clinical picture are peptic ulcer, gallstones, hiatus hernia and carcinoma of the stomach, and a doctor working by differential diagnosis probably makes these four conditions his list. The doctor using working diagnosis thinks of the same four conditions but his working diagnosis is chronic epigastric pain requiring special investigations. In each case, the doctor's action is the same: he requests such investigations as a barium meal and cholecystogram. If the investigations show that one of the four diagnoses is correct, then the differential diagnosis has performed as well as the working diagnosis. However, all the investigations may be negative. The approach by differential diagnosis seems to suggest only two possible explanations: either serious organic disease has been excluded, or the list of differential diagnoses must be extended. In terms of the working diagnosis, the problem is different: the patient has chronic epigastric pain which has not been diagnosed by the first-line investigations: should he be reassured that nothing serious is amiss; should the investigations be repeated in a few weeks; or should other more elaborate (and probably more uncomfortable and possibly more dangerous) investigations be ordered? The decision is really, how certain is the clinician that the patient has a serious disease? This decision does not depend on the nature of that disease, and is therefore a consideration which the mere differential diagnosis cannot take into account, yet it is the guiding factor in the management of the patient.

The previous example has illustrated another important feature of a working diagnosis: that it is not meant to be a fixed and unchanging label. The working diagnosis is decided at a certain point in time by the relevant clinical data available up to that moment. A line of management is embarked upon, appropriate to the working diagnosis. As a result of, or perhaps despite, this management, the patient's illness develops in a certain way or more clinical data are collected: the working diagnosis has to be modified, and in turn so is the management. In other words, most of the time there may be no such thing as *the* diagnosis of the patient: simply the working diagnosis in the out-patient

department, the one in the ward after the results of the special investigations have been received, the modification in the operating theatre, the histological diagnosis, and maybe (and only then, finally) the post-mortem diagnosis. At each stage the new working diagnosis produces a fresh shift in the emphasis or the direction of the scheme of management.

The purpose of this book is to provide schemes of management for some of the commoner clinical presentations in general surgery. Each chapter begins with a discussion of the features which define the particular presentation, whether it be a relatively simple problem such as a lump in a particular anatomical location or a complex disturbance of function such as shock. A scheme is proposed to group the patients into separate treatment categories in the first instance, and then as a result of doing something else — making a further clinical observation, applying a special test, or sometimes just waiting — each category is further subdivided. As each logical YES/NO decision is made, the patient's problem is more clearly and narrowly defined, but the strict pathological diagnosis may not be made until treatment has been completed. At the end of the section or chapter there are one or more pages in which the scheme of management is set out as a flow-diagram or algorithm. These flow-diagrams represent one way (not necessarily the best!) of tackling each presentation, and are an attempt to indicate specifically the methods of diagnosis and treatment followed by experienced surgeons. This is the way surgeons work, this is the way that they should teach.

The author must emphasize a point made in the previous paragraph — that his recommended scheme of management is not necessarily the best solution to every problem discussed. However, this book describes the particular solutions that he has found to work best in his hands. In certain areas where there are important alternative solutions, these are also described. The reader can then make up his mind which solution he prefers, or perhaps decide to do a controlled trial to decide between them.

The discussion of the management of common surgical situations in the following pages starts from the assumption that a complete and accurate history has been taken and a complete and accurate examination made. Special tests are brought into the picture when their results may have a direct effect on the decision-making in the flow-pathway, and it is assumed that their results are also perfectly reliable. These assumptions are necessary if any useful discussion of management is to follow, but in practice they are not always justified. Ideally, the probability of the accuracy of any special investigation should be known, and its result weighted accordingly in the decision-making. The doctor should never forget that his decisions on management can only be as accurate as the data upon which they are based. However, the data themselves are not enough: the present book demonstrates how to make the best use of the data.

The problem-solving discussed is how to proceed to manage the patient's problem using symptoms, signs and special tests, and a logical method. These processes are usually summarized in the phrase 'clinical acumen', and clinicians usually argue that acumen cannot be taught but that it is a quality which gradually improves as a result of experience and in its highest degree is vouchsafed only to a fortunate, gifted few. The writer does not accept this thesis: he believes that the algorithmic approach of action resulting step by step from a series of logical YES/NO decisions can put the surgical tyro on a par with his teacher.

This book aims to teach so-called 'clinical acumen' to anyone who has, or may be about to have, the surgical care of patients. I apologize in advance for my presumptuousness in attempting such a task.

About this book

The moment a student is qualified as a doctor, he is expected to have some skill in diagnosis and treatment. It is hoped that this book will therefore be useful to medical students, and to all those younger doctors whose clinical experience is not yet so great that they can construct comprehensive schemes of management for themselves, especially in the stress of having to find the right answer in an urgent clinical situation. Postgraduate students preparing for higher surgical examinations may also find that this approach to common surgical problems helps them to arrange their thoughts in a logical and orderly fashion. Most medical students become general practitioners, and so the text

includes guidance as to when the practitioner should refer the patient for a consultant surgical opinion or for immediate admission to hospital.

The book is arranged in two parts. Part I contains a description of nineteen common non-emergency surgical situations. It must be confessed that certain subjects cannot be easily divided into acute and chronic aspects. When this is the case, the subject has been arbitrarily assigned to one or the other part. Thus intestinal obstruction is in Part II, although the appropriate chapter also discusses chronic intestinal obstruction. Despite such difficulties, the main subdivision into acute and chronic situations has been retained in order to emphasize that the surgeon naturally reacts differently to the two different sorts of situation. The leisurely sifting of detailed information obtained by complicated investigations is acceptable in the out-patient clinic, but not in the casualty department. These non-emergency situations are described first because they are usually simpler than emergency situations.

Part II includes the common emergency surgical situations which the general surgeon might meet. The great importance of trauma is acknowledged by devoting the first chapter to a general analysis of the problem presented by the seriously injured patient. The effects of trauma may be so widespread, and involve so many systems, that certain aspects of trauma considered in later chapters entail a considerable overlap. Most of the rest of Part II is concerned with acute abdominal emergencies.

The suggestions for further reading at the end of each chapter are either classical articles introducing stimulating ideas or recent reviews with valuable lists of references. The number of illustrations has been deliberately restricted: those used have been chosen to emphasize features that are either novel, or of crucial importance, or difficult to describe in words. Several books are available which concentrate on illustrations of surgical diseases.*

This book should be used in conjunction with other sources of knowledge, and these will vary according to the category of person reading the book. The medical student will need again his textbook of pathology and one on clinical signs,* while the surgeon in training will require a textbook of operative surgery and an acquaintance with some of the articles in the lists for further reading.

Finally, the author suggests with great respect that the experienced surgeon may find the book stimulating as a challenge to justify his own (different) approach to these surgical situations, while the teacher of surgery may wish to consider whether his teaching techniques require modifying!

*For example, Browse, N. (1978). *An Introduction to the Symptoms and Signs of Surgical Disease.* London, Edward Arnold.

Part I

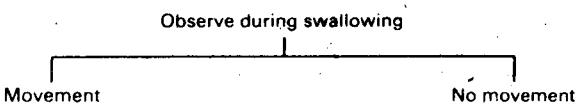
Non-emergencies

Chapter 1

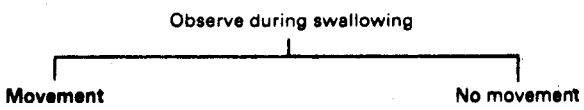
Swellings in the Neck

Although the presentations discussed in this first section of the book usually come in chronic form, it is important to consider first the possibility that occasionally they arrive in urgent circumstances. There is no more urgent situation in surgery than a lump in the neck that is a haematoma, resulting from reactionary haemorrhage following thyroidectomy and producing hypoxia by obstruction to the airway (p. 267). Similarly urgent situations arise when spontaneous bleeding occurs into a goitre, especially into a solitary nodule, or when respiratory airways obstruction arises in the postoperative period after elective surgery in a patient with a goitre. The factors producing the obstruction are not always clear-cut in the latter group: they may include that the goitre is asymmetric, and hence tending to buckle the trachea towards the opposite side, that ventilation may be depressed by the lingering effects of anaesthesia upon the respiratory centre, that the cough reflex is similarly depressed, and that there may be oedema of the vocal cords as a result of intubation by the anaesthetist at the recent operation.

The essence of management is that, in the case of recent thyroidectomy, the wound is reopened immediately to allow blood clot to extrude, and that if this procedure does not result in the immediate improvement of the patient's clinical condition, or if there has been no recent thyroidectomy, an immediate peroral endotracheal intubation or tracheostomy is performed. Once the airway has been re-established, further investigation and treatment of the cause can be carried out as indicated. Thus post-thyroidectomy bleeding requires a check on haemoglobin concentration after the bleed in case transfusion is indicated, and it may be considered worth while to check the normalcy of the haemostatic mechanism; the management of any goitre that seems to have precipitated the obstruction does not differ from the management of other patients with a goitre as discussed in Chapter 2.



When a cervical swelling presents in chronic fashion, the first step in management is to determine whether or not the swelling moves vertically upwards during the act of swallowing, returning to the resting position as the act is completed. This test should always be applied, even if the lump appears to be far from the anterior mid-line of the neck.



Movement on swallowing

Movement on swallowing indicates that the lump either is in the thyroid gland, or is attached to the thyroid gland by direct continuity of tissue, or is pressed against the gland so tightly by the pretracheal fascia that it cannot help but move with the gland. There is no clinical method of distinguishing between the first and third possibilities: for example, a nodule of abnormal thyroid tissue in

the isthmus of the gland is indistinguishable from an enlarged lymph node of the isthmus, although special tests may help to prove the former possibility. The only example of the second possibility that can sometimes be diagnosed on clinical grounds is the thyroglossal cyst.

Movement on swallowing

Moves with tongue — Does not move with tongue

Thyroglossal cyst

If the lump lies in or near the anterior mid-line of the neck, above the level of the thyroid isthmus (i.e. at or above the level of the second ring of the trachea), and distinctly moves vertically upwards when the patient protrudes his tongue, the lump is probably a thyroglossal cyst. Should the lesion clearly manifest the sign of fluctuance, the diagnosis is not in doubt; should there be a possibility that the lump is solid, it is wise to ask for a scan of the thyroid region after a dose of radioactive iodine. Very rarely, a solid lump with the characteristics quoted is an ectopic thyroid gland which has not completed its embryological journey from the tuberculum impar at the root of the tongue to the usual postnatal position, and removal of the swelling by the surgeon unaware of this possibility results in myxoedema and a life-long dependence on exogenous thyroxine.

The thyroglossal cyst is a remnant of the embryological track (Fig. 1.1) and when the cyst presents itself as a cervical swelling it lies anywhere in the mid-line, or near it usually slightly on the left. When removing the cyst, it is important to excise with it all remnants of the track or the cyst may recur. The track consists of a well defined band of fibrous tissue that can be followed for a variable distance upwards and (less often) downwards from the cyst: only very rarely can it be traced between the mylohyoid muscles right up to the tongue. It appears that a very persistent part of the track is usually present in immediate relationship to the back of the centre of the hyoid cartilage, so it is essential to excise this central segment of the cartilage as part of the operation.

Despite the clinical suggestion of movement with the tongue, the author finds that the histological report on a lump removed as a thyroglossal cyst occasionally proves it to be a median (inclusion) dermoid (p. 16).

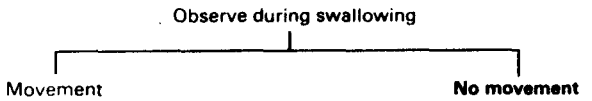
Movement on swallowing

Moves with tongue — **Does not move with tongue**

Thyroid and pseudo-thyroid swellings

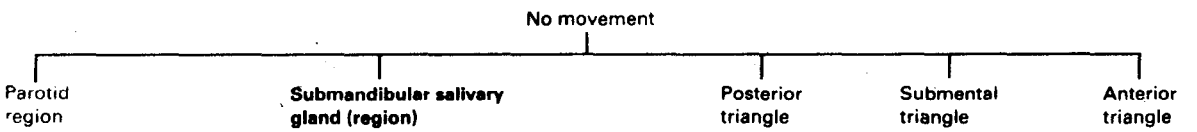
These are discussed in Chapter 2.

Fig. 1.1 Thyroglossal fistula. When the thyroglossal tract remains patent at its lower end, presenting with an external opening in the skin of the lower part of the neck in the mid-line, there is usually no cystic lesion (thyroglossal cyst). In the case of the young man shown, the tract extended upwards behind the hyoid bone, but there was no extension to the base of the tongue.



No movement on swallowing

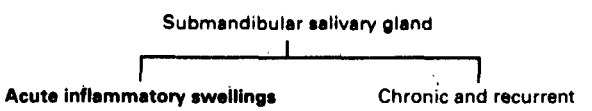
Having excluded a thyroid origin by observation, the next step is to define lumps occurring in easily definable regions so that they can be further subdivided. The most accurately definable of these regions is the parotid, and swellings in the parotid region are described in Chapter 13. The remaining definable regions are the submandibular salivary gland, the anterior triangles, the posterior triangles, and the submental triangles. Finally, there remain lesions which cannot be classified easily according to their presentation in one of these regions.



Submandibular salivary gland region

A word of explanation is necessary about the definition of this region. A strict anatomical definition of the submandibular region is impossible. However, the normal submandibular salivary gland is a palpable structure and the implication of our classification is that the presenting lump is clearly an enlargement of the submandibular salivary gland or a swelling which at least partly encroaches on the region of the normal gland. Even when the presence of the swelling has greatly distorted the region, and nothing of the normal gland can be felt, the presence of a normal salivary gland on the opposite side helps greatly in orientation.

A swelling in the submandibular salivary gland region may present with or without the signs of acute inflammation.



Acute inflammatory swellings

Bilateral

Bilateral presentation of acute pain, tenderness and swelling of the submandibular salivary gland regions is unusual, but practically pathognomonic of mumps since other causes of acute inflammation are most unlikely to be bilateral. Other features of mumps may also be present — parotitis, pancreatitis, orchitis; or there may be circumstantial evidence such as a history of contact or the prevalence of an epidemic.

Unilateral

Unilateral acute inflammatory symptoms and signs may also be due to mumps, but they are much more likely to be due to some other cause and are best treated as a non-specific inflammation. A cause for the condition is sought: a stone in the submandibular duct may be visible and palpable as a hard swelling in the floor of the mouth, lying along the course of the duct, but a stone in the gland itself is unlikely to be palpable during the acute inflammatory state, while inflammation of the submandibular lymph nodes may be secondary to an infective lesion of tongue, floor of mouth, mandible, cheek or neighbouring skin. Any inflammatory lesion found is treated on its merits. The submandibular swelling itself is treated by antibiotics and local anti-inflammatory measures, but the removal of a stone in the duct is probably best not undertaken at this stage.

Usually the inflammation subsides, and further investigation and treatment can then be undertaken as considered below for chronic swellings. However, should fluctuation develop, incision to release the pus is necessary. The course of the mandibular branch of the facial nerve renders it liable to damage during this procedure.

Submandibular salivary gland

Acute inflammatory swellings | Chronic and recurrent

Acute inflammatory swellings

Bilateral

Bilateral chronic or recurrent enlargement may be part of Sjögren's syndrome or of sarcoidosis. Sjögren's syndrome is described in Chapter 3, but it must be emphasized here that submandibular sialography does not give the typical appearance of punctate sialectasis as seen in the parotids: there is often irregular distortion, enlargement and narrowing of the duct system. The diagnosis of chronic or recurrent bilateral enlargement is probably best made by operative removal of the whole of one submandibular salivary gland. The treatment of Sjögren's syndrome and of sarcoidosis is unsatisfactory: corticosteroid drugs are sometimes effective, but the decision to use them depends very much on how bad the symptoms are.

Occasionally, the histological report indicates some other disease such as tuberculosis, reticulosis, etc., and any specific treatment available for the particular disease is then indicated.

Unilateral

An *associated cause* may be demonstrable. Usually this is a *stone in the submandibular duct.* The typical history is that the patient develops pain and swelling in one submandibular region on eating, and the symptoms subside in a variable length of time after the meal, to recur with the next meal. Occasionally, a history of such recurrent minor symptoms is complicated by an acute attack of sustained pain and swelling for several days, possibly with a constitutional disturbance, and the immediate management of this ascending infection is as described in the section on acute inflammatory swellings. Plain x-rays (Fig. 1.2) and sialography are useful in diagnosis and management.

In a period of chronicity, the stone is removed. If the stone is readily palpable in the anterior 2 cm of the submandibular duct in the floor of the mouth, it can readily be removed through the mouth. However, if the stone is further back in the hilum of the gland, it is usually not palpable in the floor of the mouth and there is always a great risk of operative damage to the lingual nerve if one operates through the mouth: the whole gland and a portion of the proximal duct containing the stone are removed via an incision in the upper cervical skin crease. Even if the stone is readily accessible in the floor of the mouth, a history of much trouble with severe attacks due to ascending infection suggests that the gland is chronically infected and therefore likely to continue to give trouble after the stone has been removed, probably with fresh stone formation. In these circumstances, also, it is wise to remove the whole gland.

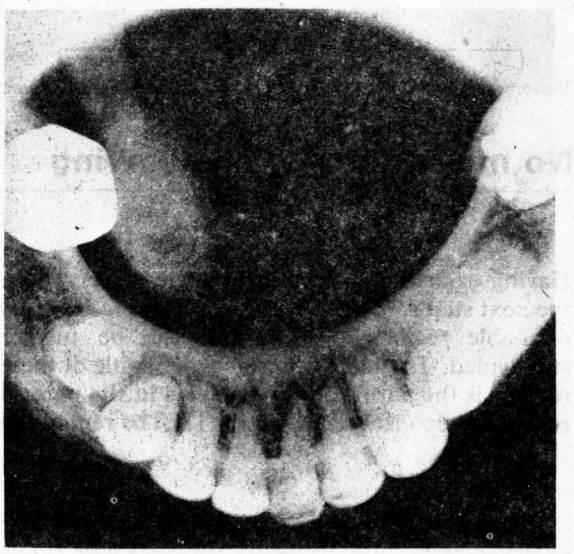


Fig. 1.2 Plain x-ray of the floor of the mouth, showing a large submandibular calculus lying in the submandibular duct near its termination. It would appear likely that the distal oval structure was the primary calculus which, by obstructing the duct, favoured the formation of the tail of secondary calculus which extends proximally.

Another possible *associated cause* in the floor of the mouth is *ranula.* The possibility of this diagnosis is suggested by the cervical swelling being cystic and transilluminable, and in such cases particular care should be taken in the examination of the floor of the mouth. The oral lesion may be inconspicuous by comparison with the cervical swelling: it consists of a bluish discoloration and dome-shaped swelling of the mucosa in part of the floor of the mouth, and pressure upwards on the