

Oral Diagnosis

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ORAL DIAGNOSIS

BY

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Preface and Acknowledgements

THIS book is written in an attempt to bring together the diagnostic techniques which may be used to investigate clinical problems in dentistry. It is not a textbook of pathology, and pathological detail is included only when necessary to explain the diagnostic procedures. Trauma is not included, nor is malocclusion. The arrangement of some of the material may appear somewhat illogical—for instance, the placing of pemphigus amongst dystrophic lesions of the mucosa—but an attempt has been made to group the conditions in a clinically significant manner. Similarly the classification of periodontal diseases may cause disagreement in some readers. Here the material has been presented as far as possible using the most widely accepted terminology.

No short book dealing with so wide a subject can be absolutely comprehensive, but it is hoped that the basic diagnostic techniques have been indicated for most of the conditions likely to arise in either the general or hospital practice of dentistry. Further detail may be found in the literature cited in the suggestions for further reading.

Mr. F. Taylor-Monks has kindly given permission for the free use of the records of patients treated by him and many of the radiographs and illustrations derive from this source. Professor E. D. Farmer has allowed both the use of the facilities of his department and the reproduction of several illustrations. Mr. Peter Bird has provided several radiographs.

Many thanks are due to Mr. J. S. Bailie and Miss Julie Homer for their photographic work and to Mrs. Nancy Carruthers who has typed the manuscript. Finally, the writer's gratitude must be expressed to the editor, Mr. D. H. Goose, for his help and advice.

Contents

| | |
|--|-----|
| PREFACE AND ACKNOWLEDGEMENTS | vii |
| CHAPTER I. <i>Examination of the Patient</i> | 1 |
| CHAPTER II. <i>Laboratory Investigations</i> | 10 |
| CHAPTER III. <i>Biopsy and Bacteriology</i> | 29 |
| CHAPTER IV. <i>Facial Pain</i> | 38 |
| CHAPTER V. <i>Lesions of the Teeth and Periapical Tissues</i> | 46 |
| CHAPTER VI. <i>Lesions of the Oral Mucosa and Periodontium</i> | 79 |
| CHAPTER VII. <i>Lesions of Bone</i> | 111 |
| CHAPTER VIII. <i>The Temporomandibular Joint</i> | 133 |
| CHAPTER IX. <i>Common Facial Swellings</i> | 141 |
| APPENDIX | 151 |
| ADDITIONAL READING | 156 |
| INDEX | 159 |

Examination of the Patient

THE first step in the investigation of any patient should be a review of all available notes, correspondence and other similar documents. This background information is best acquired before the patient is actually seen, the lead given being invaluable in planning the approach to the patient as well as being essential for the subsequent diagnosis.

When the examination of the patient is being carried out, all significant facts should at once be added to the records. The necessity of making full notes at the time of examination cannot be overstressed. Memory for details of one patient amongst many may be very short and it is essential that full information should be available to any subsequent colleague who may attend the patient. Quite apart from the invaluable nature of full notes from a dental or medical viewpoint, their importance in any matter involving legal proceedings is clear.

It is a personal view that complex charts for the recording of results of an oral examination are unnecessary and that relevant facts are better recorded in words, rather than as a mark against a previously determined entry in a diagnostic chart. The value of such aids, however, is that there is a clearly laid down routine which must be followed in every case. Without a set chart it is important that a routine form of procedure should be adopted and adhered to for the examination of all patients. With an established routine, the likelihood of significant omissions grows less and the task of recording the examination is simplified.

The first phase of the examination occurs as the patient enters the room and during any conversation preliminary to the case-history taking. It is not suggested that the dentist should act as a "spot diagnostician" of medical or psychiatric complaints, but the recognition of sick, frightened or mentally disturbed patients may help greatly in determining the line of investigation. The powers of observation which enable the expert diagnostician to recognize these factors may be aided to a certain degree by personal flair, and to a great extent by experience, but are based firmly on a sound knowledge of the relevant pathology.

The Case History

The history taking should begin with the personal details of the patient's name, address, age, marital status and occupation, if these have not been already entered in the notes. If they have been previously obtained, these details should be read before the examination proceeds. The outlook of varying types of patient differs vastly in relation to such matters as aesthetics, degree of reaction to pain, tolerance of discomfort and so on, and it is well worth while to have the patient's personal details in mind when attempting to assess certain conditions.

The patient should be asked first of all the nature of his complaint. It may well differ in a quite startling manner from the details given in previous notes or correspondence. This may be simply due to the different emphasis the patient may be expected to place on his symptoms, but may also imply a change in the condition or the onset of a secondary condition. The order in which symptoms have occurred should be carefully determined—often a much more difficult task than at first imagined.

It is worth spending a little time in sorting out the confused details of a history which may be told in reverse order—not unnaturally so, since more recent and possibly more urgent symptoms will be uppermost in the patient's mind.

Details of the relevant medical and dental histories should next be taken. So far as the medical details are concerned, it is often necessary to ask directly whether there have been past illnesses, whether the patient is at present receiving medical treatment and for what, and whether he is at present taking any drugs. Patients are often reluctant to volunteer information on what they may consider to be irrelevant past conditions and direct questioning must be used. The significance of the questions regarding the taking of drugs is obvious in view of the increasing numbers of patients maintained on anticoagulant, steroid and other long-term therapies.

When developmental anomalies are present or suspected, as in the case of anodontia, defects of tooth structure, facial dystrophies and so on, the family history takes on considerable importance. The family photograph album may be of great use in detecting the degree of involvement of other members of the family, including those deceased. In the same way, a series of photographs, however simple or technically faulty, can be assembled by most patients in order to show their facial characteristics over the years, and these may prove very useful in the assessment of slowly increasing facial deformity.

In the giving of a dental history, the patient may often find great

difficulty in placing chronologically the treatment that has been carried out and considerable patience is often needed to assemble facts in the correct order. Although the patient's description of past treatment may appear somewhat exaggerated, it is rarely advisable to dismiss too lightly stories of difficult extractions, post-operative haemorrhage and similar incidents which may be all too easily repeated in the most inconvenient circumstances.

The examination. After taking the history the examination of the mouth may be carried out, taking in order teeth, soft tissues, bone structures and extraoral structures. It is advisable to maintain a routine procedure for all cases and to examine, for example, the teeth in a fixed order—say, from left to right in the mandibular teeth, followed by the same order in the maxillary teeth. If a routine of this nature is not maintained, then omissions may occur.

When examining the patient, a comfortable position for both patient and operator is a help in reducing strains, both physical and mental. Adequate illumination is absolutely essential, and it is a great help if the light can be focused on the mouth alone when that is required; many patients are apprehensive when undergoing examination and a dazzling light in the eyes does much to increase the patient's discomfort. Similarly the adoption of an easy chair-side manner and the use of a vocabulary adapted to the patient's comprehension will be repaid with increased relaxation of the patient, and a consequently better history.

The teeth. The teeth must first be charted, those absent being noted. It must be remembered that teeth missing from the arch may be unerupted, congenitally absent or have been extracted and it is often quite impossible to differentiate between these possibilities without radiographic evidence. Each tooth must be systematically viewed and explored on all surfaces by means of sharp probes for the presence of caries. To aid in the visual examination the teeth should be dry and, if there is much saliva, drying either by an air syringe or with cotton wool is essential for a satisfactory view. The probes used must be sharp, and usually a sickle type and a double-ended Briault type probe are all that are necessary.

As each tooth is viewed any colour change is noted, together with any evidence of hypoplasia, erosion, attrition or abrasion. Testing for sensitivity to percussion is carried out gently with the reversed end of a mirror handle. If the vitality of any tooth is suspect, then pulp testing should be carried out. The methods adopted and the significance of their results are discussed in Chapter V.

Occlusion. The teeth, having been viewed individually, must next be examined as a functional whole, malocclusions of all kinds being recorded. If treatment of malocclusion or traumatic occlusion is contemplated, then study impressions of the initial state are essential to aid in a considered diagnosis.

Periodontal structures. These should next be investigated. The presence of supra- or subgingival calculus is noted, the latter by passing a probe gently and atraumatically to the depth of the gingival crevice. The presence of materia alba and the state of oral hygiene are also noted. The gingival soft tissues are carefully visualized, noting any change of contour, colour or surface texture. Any recession of the gingival margin, and consequent exposure of cementum, is noted, and loss of attachment of the teeth estimated by gently testing for mobility. Where minimal changes in a tooth are suspected, the test for mobility is best done by placing the finger over the buccal surface of the tooth and the adjacent teeth and allowing the patient to come into occlusion. Small movements are then easily detected by the examining finger. More gross forms of mobility are tested for by gently applying pressure to the suspect tooth in a linguo-buccal direction. Instruments should be used for this, not fingers, which hide the tooth and themselves deform and may convey inaccurate sensations of movement. Any exudate from the gingival margin after gentle pressure must also be noted.

The oral mucosa. The whole surface of the oral mucosa must be visualized and examined for any abnormality. In order to retract the lips and cheeks sufficiently to expose fully the sulci, a dental mirror used as a retractor is invaluable. For examination of the tongue, it should be held between fingers and thumb, using a gauze napkin, and traction gently applied both forward and laterally; in this way the best view of the lateral margin of the tongue and the floor of the mouth is given.

Palpation is used to assess the texture of any lesion and to detect induration. Swellings in the substance of the soft tissues are best examined by bimanual palpation, the examining fingers lying on each side of the tissue mass. Palpation of structures within the floor of the mouth is made easier by a gentle upward pressure in the submandibular area by which the tissues are lifted and well defined.

Fluid-filled lesions in the soft tissues are detected by observing the "fluid thrill" passed through the lesion between examining fingers placed on each side of it. It may be difficult to differentiate between a deeply seated fluid-filled lesion and a very soft, solid tissue mass. Aspiration biopsy (Chapter III) will assist the diagnosis in these cases.

The facial skeleton. The facial contours are viewed from the front. Any asymmetry is noted, remembering that virtually all faces are to some extent asymmetrical. Swellings may be confirmed by gentle palpation of the facial skeleton, always palpating bilaterally to compare with the unaffected side. If a swelling of the upper third of the face is noted it is better seen by viewing downwards from over the head of the patient.

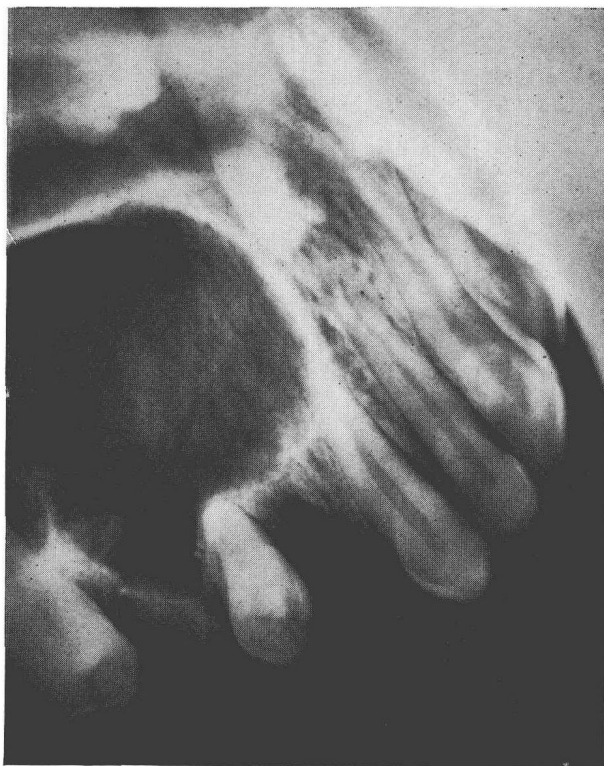


FIG. 1. Radiograph of large maxillary antrum resembling a cyst.

Intraorally the skeleton may again be palpated bilaterally, the fingers passing lingually and buccally over the mucosa covering the mandible, and up the ascending ramus. In the maxilla the exploring finger passes buccally and palatally over the alveolar process and should be carried posteriorly to palpate the tuberosities distal to any standing teeth.

Gentle pressure should be brought to bear on any swelling found. Its texture, sensitivity and tendency to spring or produce the crackling characteristic of thin plates of bone should be noted.

The temporomandibular joints. The temporomandibular joint is palpated by a single finger placed slightly anterior and below the external auditory meatus, whilst standing in front of the patient. When maintaining this position, the patient is asked to open and close the mouth and to perform protrusive and lateral movements. Undue movements of the

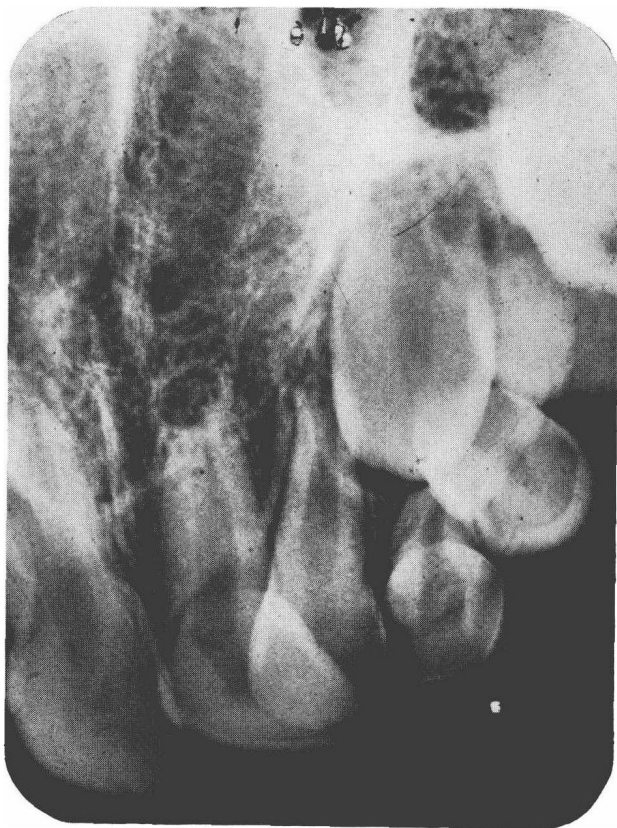


FIG. 2. Superimposed incisive foramen resembling apical granuloma on radiograph.

condyle head and clicking of the joint can be felt quite plainly, whilst in cases of joint dysfunction, the patient may complain of pain on the slightest pressure from the palpating finger when the mouth is opened. Further joint sounds are well heard by the use of a stethoscope placed over the condyle head.

Standing centrally in front of the patient, any deviation in opening and closing the mouth may be noted, together with any abnormal



FIG. 3. Superimposed mental foramen resembling apical granuloma on radiograph.



FIG. 4. Calcified buccal lymph node seen on lateral oblique radiograph.

cuspal guidance. It is often in the last few millimetres of closure that some abnormal lateral movement occurs, and this must be carefully looked for.

The neck. Finally, the soft tissues of the face and neck must be palpated and for this the best position is behind the patient. Bilateral palpation of the face, parotid and submandibular salivary glands and neck is carried out, followed by careful search for prominent lymph nodes in the neck. For this examination the patient must relax the neck muscles by bending the head slightly forwards and to the respective side whilst the regions of the submandibular, submental, auricular and cervical nodes are palpated on each side in turn.



FIG. 5. Calcified node as in Fig. 4 seen in occlusal view.

Other associated structures. Examination of the eyes, skin, ears and sinuses must of necessity be confined to a simple inspection. Further clinical examination is best left to a colleague in the appropriate speciality, as is the treatment of most conditions not specifically oral or dental in nature. The degree of overlap of specialities is probably greatest in the case of patients with conditions affecting the maxillary antrum. Many cases of antral disease may be seen in the dental surgery and it is clear that some degree of competence in the diagnosis of these lesions is necessary for an oral diagnostician. This does not necessarily imply, however, that the dental surgeon is the person best qualified to deal with

the subsequent treatment. Indeed, the greatest value of a careful examination of the extra-oral structures may well be the opportunity for prompt reference of the patient to the appropriate specialist.

Radiography

When the examination has been completed, it may then be decided to obtain appropriate radiographs. Although the indiscriminate use of these is obviously to be deprecated, the risk of radiation damage from dental radiography is absolutely minimal (with the adoption of simple safety precautions), and there is rarely any excuse for not obtaining them if they are necessary for diagnosis.

Even in relatively routine diagnostic problems there is everything to be gained by obtaining adequate well-positioned radiographs. For a complete assessment of the dental condition full mouth periapical films, properly positioned to include the apices of the teeth, are mandatory. For a simple screening test for gross pathology, probably most information from fewest films is obtained from a pair of lateral oblique films of the mandible, the positioning being such as to include a view of the maxilla. The use of radiographs in the diagnosis of caries is discussed in Chapter V.

The dental surgeon being for the most part his own diagnostic radiologist, care must always be taken in the recognition of anatomical landmarks which may be mistaken for pathological conditions, the antrum and the mental foramen being foremost amongst the readily mistaken structures (Figs. 1, 2 and 3). Similarly, the superimposition of structures must always be kept in mind and, if necessary, any possible errors obviated by the taking of additional films differently angulated (Figs. 4 and 5).

The use of contrast media may, very occasionally, be of use in the demonstration of patent ducts or sinuses or to demark clearly a vague osteolytic lesion. The major use of contrast media in oral diagnosis, however, is in the injection of the salivary ducts to produce sialographs, and to gain information regarding the condition of the salivary glands. The technique of this is described in Chapter IX.

CHAPTER II

Laboratory Investigations

THE clinical and radiographic examination of the patient having been completed, it must be decided whether further investigations are needed. These may be either to confirm a suspected disorder, or to obtain more information before the diagnosis is provisionally or finally made. Many of these investigations require laboratory facilities and some of these are described below. There are many other haematological and biochemical tests which might occasionally be needed in the diagnosis of oral conditions. The ones specified here are, however, generally adequate for a full investigation of the vast majority of conditions which are likely to be encountered in dentistry.

Blood

Examination of a sample of the patient's blood is valuable in three situations: as a screening procedure to aid the diagnosis of an unknown condition; to help confirm a tentative diagnosis; and to investigate a suspected disorder of the blood clotting mechanism.

Collection

For most tests, blood is taken either from a vein or from capillaries. To obtain venous blood, the patient should be seated or lying (fairly frequently a patient faints, although a well-performed venepuncture is quite painless). A tourniquet is placed firmly round the upper arm, or, if assistance is available, the upper arm can be tightly encircled and gripped by two hands. The skin over the cubital fossa is cleaned with alcohol and the skin and vein are punctured by the collecting needle (about 21 gauge) used with the bevel upwards, attached to a sterile syringe of about 10 to 25 ml capacity. After aspiration shows a small amount of blood, indicating that the needle is in the vein, the tourniquet is released, a few seconds allowed for the establishment of normal flow,

and the required amount of blood collected. The needle is then withdrawn and pressure is applied to the puncture with a sterile swab for a few moments to prevent further bleeding. A small dressing may be used to cover the puncture site for a day or so, although this is not strictly necessary.

For most examinations not involving the clotting properties of the blood, it should be emptied from the collecting syringe into bottles containing an anticoagulant. This may be heparin, added at a concentration of 0·5 mg per 5 ml of blood, although a more commonly used anticoagulant is a mixture of ammonium oxalate and potassium oxalate; this is used in a concentration of 6 mg ammonium oxalate and 4 mg potassium oxalate per 5 ml of blood. These small amounts of anticoagulants are easily obtained by the evaporation of measured amounts of stock solutions in the collecting bottles. It is obvious that blood so treated cannot be used for the estimation of nitrogen or of potassium, and in these cases a single oxalate salt is used.

Small amounts of capillary blood, which are required for many tests, may be obtained by puncturing the lobe of the ear or the finger to a depth of 2 mm or so with a sharp lancet or needle. There are many patterns of blood lancet available, some with depth guards and some with a spring action. In the absence of one of these special instruments, however, a lancet improvised from a guarded scalpel blade of the fine cutting point type is perfectly satisfactory. Needless to say, whatever instrument is utilized must, like all equipment used on patients for blood collection, be adequately sterilized. The first drop or two of blood should be discarded, and only the further drops used in the examination. The puncture should not be squeezed as this may express tissue serum and dilute the blood. No further action is necessary to protect the puncture when bleeding has stopped, which it normally does in a very short time.

Routine Blood Examination

For the routine screening procedure as an aid to diagnosis it is sufficient to carry out only three examinations. These are a haemoglobin estimation, a total white cell count and a survey of a stained film for abnormal cell forms. If any abnormality in these is found, then further tests may be utilized. This simple screening procedure is sufficient to give some indication of most blood disorders and to indicate the lines of further tests. Deficiencies or abnormalities of the clotting system will not, however, be shown up by this procedure, except occasionally by the presence of a secondary anaemia.

Haemoglobin Estimation

The estimation of haemoglobin is not carried out by direct chemical methods but by colour comparison with standards which vary in the differing types of apparatus; all give reasonably comparable results. An apparatus developed by the Medical Research Council is the grey wedge photometer (Fig. 6) in which the blood, diluted 200 times in a 0.1 per cent solution of sodium carbonate, is viewed through a compensating colour filter and directly compared with the colour density of a calibrated grey wedge. This calibration is direct and values for the haemoglobin content can be read off at once. There are various other instruments of this type, including some for the direct colour comparison of undiluted blood, either in glass cells or when absorbed on filter

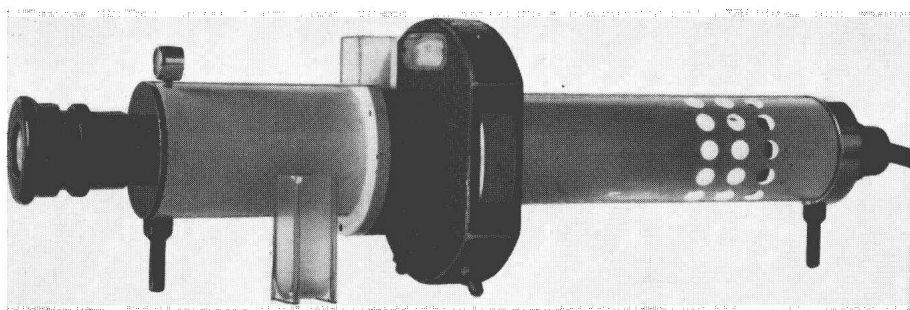


FIG. 6. Grey wedge photometer.

paper; however, these methods are difficult to use and inaccurate compared to dilution methods.

The results of haemoglobin estimation can be given in two ways. The best and most accurate way is to express the result in grams of haemoglobin per 100 ml. The second method, still much employed, is to express the haemoglobin of the blood under examination as a percentage of the "normal" value taken as standard. The inaccuracy in this type of result lies in the difficulty in defining a normal value, since this latter varies with age and between the sexes. Frequently the haemoglobin may be reported in both ways (e.g. Hb = 90 per cent = 13.3 g/100 ml).

Normal values for the adult male can be taken as varying from 14 to 18 g/100 ml and for the adult female 12 to 16 g/100 ml. With mean values taken as 16 g/100 ml for males and 14 g/100 ml for females this corresponds to an approximate percentage range of from 85 to 115 per