

Clinical Radiology of the Œsophagus

Marcel Brombart

Translated by

Sheila Kenny

M.A., M.D. (Dubl.)

JOHN WRIGHT & SONS LIMITED · BRISTOL

CLINICAL RADIOLOGY OF THE ŒSOPHAGUS

By

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BRISTOL: JOHN WRIGHT & SONS LTD.

1961

English Translation:

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The original text in French was published in 1956 by
MASSON ET CIE, PARIS

Distribution by Sole Agents:

United States of America: The Williams & Wilkins Company, Baltimore
Canada: The Macmillan Company of Canada Ltd., Toronto

PRINTED IN GREAT BRITAIN BY JOHN WRIGHT & SONS LTD.
AT THE STONEBRIDGE PRESS, BRISTOL

To Professor Charles Auguste, whose scientific integrity and methodical mind have constantly guided our work, and who has graciously agreed to write the foreword to this book, we here express our deep gratitude.

M. B.

To Professor Lucien Deloyers, whose researches on the physiopathology and surgery of the stomach and œsophagus have frequently enlightened and inspired us, and who has been willing to write the introduction to our book, we offer our sincere thanks.

M. B.

PREFACE TO THE ENGLISH TRANSLATION

“ . . . it will not lie where it concerns,
Unless it have a false interpreter.”

Two Gentlemen of Verona, Act I, Scene ii.

WHILE still dazzled by the splendour of Professor Brombart's masterpiece, and eager to share this new treasure with less brash English-speaking fellow radiologists, I presumed to undertake a translation from the French into English of *La Radiologie clinique de l'œsophage*. I hope that the end-result does not suggest that a dazed state persisted during the translation of too many of the passages, when the meaning thereof fades away from the bright lucidity of the original.

Had Professor Brombart known into what clumsy hands his classic was to fall he must have refused his permission for the translation to proceed. Very graciously he agreed to my doing the translation. If the example of perfection in technique and sustained attention given to the investigation required in radiology of the œsophagus, each demonstrated again and again throughout the book, helps just a few other radiologists as much as it has fortified me, then the deficiencies in the translation may be partly compensated and, I hope, forgiven.

Early in my novitiate as a radiologist (Professor Brombart's book has startled me into awareness that that novitiate is still far from finished) I was especially fortunate to see some of the achievements of Mr. Norman Tanner on pathological and congenitally malformed œsophagi, when I learned that radiology of the œsophagus may be one of the most vital examinations a radiologist can carry out. Thus—though after a very long interval—I acknowledge the heavy debt I still owe to Mr. Tanner for the encouragement that, characteristically, he offers to all those privileged to play any role, minor or vital, in his great performances in surgery. In Professor Brombart's book I have found a vade-mecum of cues essential to the role of the radiologist, whenever the never-palling drama, “Query a lesion of the œsophagus”, is to be re-enacted.

Were it not for Dr. Thomas Lodge this translation could never have been undertaken, or completed. There can be to-day few radiologists, ‘Anglo-Saxon’ or otherwise, unacquainted with this dynamic person's capacity for leading his juniors on to what seem formidable tasks, but which under his easy but steady guidance somehow become “*efforts accomplis*”.

To Dr. Lodge and Mr. Ronald G. Grainger I owe a further debt for their help and suggestions with the proofs at an early, and so a difficult, stage.

Mr. L. G. Owens, Director of Messrs. John Wright & Sons Ltd., must be the most forbearing of publishers, and I am deeply grateful to him for all his assistance during the preparation of this translation, and for the high standard of reproduction of the original illustrations and diagrams. Especially I have to acknowledge the considerable work carried out in the preparation of a new index for the translation.

S. K., 1961

PREFACE

THIS book is addressed to radiologists, gastro-enterologists, otorhinolaryngologists, thoracic surgeons, and, need I say, to physicians.

Its main object is to show, with the many other enthusiastic partisans of modern radiology, that amidst all the methods of investigation of the normal or diseased œsophagus, it is radiological investigation which occupies the most important place, and that it is to it that the clinician should make his first appeal.

In effect, when one proceeds to critical analysis of the different methods at the clinician's disposal for the study of the œsophagus, this is what is ascertained:—

The subjective signs which draw attention to the œsophagus have not, as a general rule, anything pathognomonic about them. Further, they do not necessarily even prove any lesion of this organ; a sensation of the arrest of food can have very different origins, such as an intermittent spasm, an inflammatory stenosis, or an obstruction by neoplasm; a sensation of retrosternal burning can be caused by peptic ulceration of the œsophagus, by œsophagitis due to gastro-œsophageal reflux, or, quite simply, by gall-stones without any accompanying œsophagitis.

On account of its position in the posterior mediastinum the œsophagus is completely beyond palpation and percussion. Likewise, examination of it with the stethoscope is of negligible help.

Without in any way wishing to minimize the value of œsophagoscopy, so valuable on account of direct visual information and the biopsies it permits to be made in situ, it must still be admitted that it is sometimes a disagreeable examination for the patient and liable to lead to complications, fortunately rare; on the other hand, the contra-indications are comparatively common. Moreover, œsophagoscopy is an incomplete method of examination; it is halted by stenosis, it does not give the whole picture, and tells nothing of the dynamics of the œsophagus.

In contrast, if one is prepared to recognize the inevitable limitations of radiology, and if one is willing to put into action all the possibilities it offers us, it must be admitted that radiological examination is the ideal method of examining the œsophagus, both normal and pathological, as much for the amazing wealth of information which it can provide as for its almost complete innocuity. It provides, moreover, an excellent method of estimating the state of the mediastinal organs. As Fleischner says, the examination of the œsophagus is the touchstone of all investigations involving the mediastinum.

The literature devoted to the study of the œsophagus has undergone a very appreciable increase during the last fifteen years, although still obviously inadequate in relation to that which has been devoted to other parts of the digestive tract. And yet, despite this increase in the literature, and despite the great favour that the radiological method of examination enjoys amongst the methods of diagnosis for diseases of the œsophagus, one is left with the clear impression that, after the small

intestine, it is the œsophagus which is the least known of the digestive organs, because it is the least adequately examined during routine radiological examinations of the digestive tract.

The famous phrase of the late Belinoff: "The œsophagus, this essentially misunderstood organ", quoted by Terracol in the preface to the last edition of his book on diseases of the œsophagus, is, in our opinion, still true.

The reasons for this lack of recognition are multiple and varied; they can, however, be classified into three major groups.

1. Reasons of a Clinical Nature.—Many lesions and diseases of the œsophagus are symptomless, either for a considerable time or always, or they may advertise themselves by symptoms which draw attention to other organs. As examples, let us quote cancer of the œsophagus, for which patients only consult the doctor at a very advanced stage of development; 'traction' diverticula, nearly always symptomless; and gastric herniation through the œsophageal hiatus, often silent or simulating the most varied diseases, from angina to cholecystitis.

2. Reasons of an Anatomical Nature.—Covered by skeletal parts and the thoracic viscera, the œsophagus is inaccessible to ordinary clinical examination; radiotranslucent, it is not visible either on the screen or on radiographs without some contrast medium.

3. Psychological Reasons.—Radiological examination is not easy. It demands of the radiologist not only a complete knowledge of the applied anatomy and pathology of the thoracic and mediastinal organs, but it requires time, patience, and the building up of a rational technique making free use of fluoroscopic observation of the œsophagus after it has been rendered opaque, both at rest and during the different phases of peristalsis. Also, fluid barium, as used in examination of the stomach, passes through the œsophagus too rapidly and the pictures are very fleeting and difficult to record.

Consequently, during the routine examination of the digestive tract, the radiologist does not linger at the œsophagus, passing quickly to the examination of the stomach, which is more easily accessible and palpable.

The inevitable consequence of the reasons listed here is that a whole series of diseases and functional troubles of the œsophagus and its neighbouring organs too often go unnoticed.

It is in seeking remedies for this situation for ourselves that we have been led, step by step, to approach all the problems which arise during the radiological study of the œsophagus.

The present work is the fruit of this experience which, while relying on the important existing bibliographical material, is based primarily on careful radiological examination of several thousands of normal and pathological œsophagi.

In publishing it, we hope to make a useful contribution to the study of this organ, still too little understood despite the ever-increasing achievements of thoracic surgery.

The completion of this work has been made possible thanks to the professional and scientific collaboration, sound, constant, and profitable, of my assistants in the Radio-diagnostic Department at the César de Paepe Clinic—Drs. Yves Laurent,

Roger van Lerberghe, Robert Zalcman, and Marc Meuris, to whom I offer my grateful thanks.

Amongst the numerous colleagues who have constantly enlightened and encouraged me, Dr. Jean Schuermans stands out as the pioneer. An enthusiast, always on the alert, always demanding the maximum, he was the first and principal promoter of my efforts in radiology of the hypopharynx and œsophagus. On this account I owe him my boundless gratitude.

In a more specialized section, the study of the œsophagus in cardiology, Dr. Marcel Segers, thanks to his perspicacity and perseverance, has guided me into the most exclusive confines of the relationship between the œsophagus and congenital and acquired affections of the heart, the aorta, and the great vessels. To him, too, I owe my profound thanks.

Equally I wish to thank the Medical Director of the César de Paepe Clinic, Dr. Jules Messine, for the interest he has always shown in my work in the field of radiology.

Finally, I wholeheartedly thank the publishers, Masson et Cie, for their customary impeccable presentation of this work.

M. B., 1954

FOREWORD

RADIOLOGY can justifiably claim to have made the greatest contribution to the knowledge of the physiology and pathology of the œsophagus acquired during the last thirty years.

At the beginning of this century our forefathers still had at their disposal for diagnosing diseases of the œsophagus only the functional symptoms, exploratory catheterization, and auscultation of the sounds of deglutition. The first applied use of electricity brought them two methods especially valuable for the examination of an organ which, until that time, could only be studied in the cadaver: œsophagoscopy and X rays.

At first, œsophagoscopy made the more rapid progress. In the hands of masters as wise as they were efficient there was no delay in perfecting the technique and in finding the answer to all the diagnostic or therapeutic problems which it was capable of solving. A few years sufficed for it to reach, in an initial effort, the limits of its field, and to become a method of clinical diagnosis rather than a means of scientific research.

Radiology of the œsophagus, which had to overcome considerable technical difficulties, developed in a very different way, progressing stage by stage. During the first stage, when the poor quality of the pictures practically prohibited radiography, the fleeting images which appeared on the fluorescent screen inspired less confidence than the lesions discovered on endoscopy.

A second stage was completed when technical progress permitted the selection and instant fixation of the fluoroscopic images on a radiograph. It was not long before the incomparable advantages of radiological examination, its convenience, and the precision of the evidence it allowed to be collected, were recognized by all, and the endoscopists themselves refused to explore the œsophagus which had not been previously radiographed. Œsophagoscopy is now used only to check the condition of the mucosa, or to confirm by biopsy the nature of the lesions disclosed by X rays. Radiology occupies a predominant part in the majority of publications devoted to the œsophagus, and has become the foundation for the diagnosis of œsophageal lesions.

We do not yet know what to expect from the third stage which is in progress, thanks to screen intensifiers, nor what will be the contribution of ciné-radiography. Teaching and research cannot fail to profit from the analysis in slow motion, in all their complexity, of the incessant movements by which the simultaneous play of deglutition, respiration, and cardiac systoles animate the œsophagus. But it seems doubtful whether this accomplishment will be employed by clinicians, who will probably choose to be satisfied with fluoroscopy and radiography.

These resources, in the existing method of technique, are sufficient to make radiological examination the ideal method of exploring the œsophagus, which Dr. Brombart praises in the introduction to his book, in words which should go

right to the hearts of radiologists, and which will not find disfavour with any of those physicians, surgeons, or endoscopists who may amicably dispute with the radiologists the possession of the precious pictures, which often tell far more than the text describing them.

Reliable as these pictures are, the experienced know that they are not always easy to interpret, and to fathom all their secrets it is essential to examine them by an approved method, to have a sound knowledge of pathology and radiology, and to profit from long experience. These are three conditions, the combination of which will assure the success of this treatise of *Clinical Radiology*, which has arrived most opportunely to fill an important gap in the literature devoted to the œsophagus.

The physician in me willingly acknowledges in detail all that this book by a radiologist has taught me of a physiology and pathology which I had thought to know better. And I sincerely regret that the limitations of a foreword force me to be content with drawing the attention of the reader to those chapters which I have especially enjoyed.

The anatomico-radioclinical description of the individual segments is an excellent introduction to a study of the œsophagus, remarkable for its originality and its didactic value. The study of the functional symptoms of the pharynx will teach physicians a radiological symptomatology as yet known only to certain specialists. The chapter on extrinsic deformities happily emphasizes the importance of the information which exploration of the œsophagus can supply about the condition of neighbouring organs.

The relationship between radiology and pathogenesis, still in dispute for certain œsophageal lesions, is given full weight throughout those especially welcome chapters devoted to Zenker's diverticulum, tiered spasms, cardiospasm, and gastro-œsophageal reflux, where the author expresses his personal opinion with a frankness which will find him a sympathetic understanding, even from those who may not eventually agree with him.

With these latter in mind, I will end by recounting the beginning of the friendship which has led me to accept the honour of writing this foreword. During one of those meetings of the *Société belge de gastro-entérologie*, which the Northern French so eagerly attend to improve their knowledge, I found myself one day in complete disagreement with a colleague—who until then I had had few occasions of meeting—on the subject of a gas bubble trapped in an œsophagus. The discussion ended without our having found a point of agreement and I feared I had been a little harsh in my reply. I was agreeably surprised to receive without delay a charming note informing me that my contradictor was troubled by the same scruple. I hastened to reply and to meet him again, and we have now become friends.

PROFESSOR CH. AUGUSTE

Lille, December, 1955

INTRODUCTION

Clinical Radiology of the Œsophagus presented by Dr. Brombart is the work of an expert in radiology reinforced by that of a clinician. This much the title announces: reading the book leaves no doubt of it.

Certain fortunate qualities have allowed one man to integrate closely at this Clinic the interpretation of a considerable and detailed iconography.

This book is more than a personal contribution alive with present-day facts and ending with them. It is a classic.

It is a classic on account of its scope, which, with the exception of congenital malformations in the newborn, includes every aspect of pathology of the organ considered. It is a classic on account of the volume of its information backed up by a full bibliography.

The author has not forgotten to envisage the physiological consideration of this vector canal, the rapid movements, the true significance of which is little known, the play of the cardia, whether functional or morphological, of which even the normal behaviour eludes us, and pathological changes which create surgical problems involving the intolerance of the œsophageal mucosa when it is exposed to the gastric juice.

Seen from this angle, radiology is no longer the science of description which it has long remained, but a powerful instrument for investigation of physiology, to lead, as certain of its recent technical advances will shortly show, to remarkable discoveries.

This book, the expression of sustained and intelligent work, is a classic also on account of its equilibrium.

The different chapters are harmoniously balanced, and at no time does the author allow himself to develop his dearest or personal opinions until they become cumbersome.

The anatomy is restricted to the essential requirements of a foundation which is a necessity.

The chapter on the modifications of the diameter of the œsophagus due to extrinsic factors, in our opinion, develops in accord with those too often misunderstood phenomena on which Dr. Brombart, in collaboration with Dr. Segers, had already laid stress in a preceding work, *The Œsophagus in Cardiology*, which appeared in 1953 from the same publisher.

The illustrations are remarkably good. Consequently they draw from the author a full and inspired interpretation on the clinical and physiological considerations, so that they, too, justify the title of this work. The text appears vivid and clear, and if it provides a useful reference book for the physician and the surgeon, it also represents a source of information to which students, too, should have recourse.

The greatest tribute I can pay is that Dr. Brombart's book makes me regret that I am not an immediate fellow-worker of its author, and so am not able to rely upon his enlightened experience.

But everyone can borrow from *Clinical Radiology of the Œsophagus* something which will guide him safely in a world still new and of which the future is full of promise.

I thank Dr. Brombart for having submitted his manuscript to me and for having allowed me to say here how highly I think of a work the equal of which does not at present exist amidst French medical publications, and which, with such a claim, must find a very large audience in the ranks of physicians, surgeons, and students.

PROFESSOR L. DELOYERS

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December, 1955

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CHAPTER I

EXAMINATION TECHNIQUE

This chapter deals with equipment, contrast media, and the process of examination.

A. EQUIPMENT

It is true that a knowledge of the anatomy, physiology, and pathology of the œsophagus and its neighbouring organs, together with the use of an intelligent method of examination, are the essential foundations upon which the radio-diagnosis of œsophageal lesions rests. Yet it must be conceded also that the equipment at the clinical radiologist's disposal plays an important part in the carrying out of the investigation and the rapid acquisition of radiological evidence which must comply with the following main requirements: the radiographs must be adequate in number, various views must be obtained, and photographically they must be perfect.

In order to achieve this end, the equipment must be sufficiently powerful and must include certain accessories which are now accepted as an inseparable part of modern radiology.

Since the œsophagus is an organ which, its own motility apart, is affected by cardiorespiratory movements, it is essential to be able to use very short exposure times for taking films, about 0.1 second or less.

This means using a generator capable of working at 70 kV. and giving an output of 400–500 mA.

The swift transit via the œsophagus in the erect patient, the ceaseless variation in the pictures caused by peristalsis, respiration, and air swallowing, together with the fleeting nature of certain pathological appearances, necessitate the use of a serial film holder permitting the instantaneous taking of suitable pictures, which are selected by means of very careful screening.

The selector has become for most radiologists the precious tool of perfection and is too well known to need praise and detailed description. We should remember that for perfection we need a fluorescent screen of perfect quality, which can be moved effortlessly in all directions and can be fixed by powerful brakes; it must have a moving grid to reduce scatter, and be provided with a cassette holder for films at least 30 cm. wide; finally, a last but important point, there must be facilities for the taking of serial films.

The selector, fixed to the X-ray tube, is attached to a tilting X-ray table fitted with an electric motor, so that the Trendelenburg position may be used.

B. CONTRAST MEDIUM

The contrast medium universally used for the radiological investigation of the gastro-intestinal tract is a watery suspension of barium sulphate to which is usually added a vegetable gum to make it more adherent to the mucosa.