LECTURES

ON THE

PRINCIPLES OF SURGICAL DIAGNOSIS:

ESPECIALLY IN RELATION TO SHOCK AND
VISCERAL LESIONS.*Delivered at the Royal College of Surgeons of England.*

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LECTURE II.

Symptoms and Signs.—Antecedent Condition of Patient: his Habits, Temperament, and Occupation.—Exciting Causes of Injury or Disease.—Existing Subjective and Objective Indications.—Signs, Certain, Equivocal, Negative, and Accidental.—Sources of Obscurity and Fallacy.—Functions of Animal and Organic Life.—Intellect, Expression, Colour, Volition, Sensation, Excito-motor Phenomena—Rigor, Specific Sensation.

MR. PRESIDENT AND GENTLEMEN,—An accomplished and eminent physician, when speaking in his lectures of the value of diagnosis in medicine, and of its forming "the indispensable basis of all advances in physic as a practical art," goes on to observe that, "almost all we know concerning the proper treatment of the sick is originally derived from observation, not of the nature of diseases, but of the effects of remedies." This apparent paradox embodies an important truth, as it is employed by its author in application to the practice of physic; because, as I took occasion to remark in my last lecture, the action of medicines can be learned only by experience, such knowledge being, for the most part, purely empirical, but, at the same time, essential in the medicinal treatment of disease. Yet, it is equally certain that the most accurate acquaintance with therapeutics must be unavailing, unless the capability of identifying disease be also possessed; and it is thus alone that empiricism and science combine to make the accomplished physician. In surgery, apart from the medical treatment of our cases, there is, as I remarked, but little scope or justification for empiricism; diagnosis is all-important, and the association between the knowledge of what a disease is and its befitting treatment is, therefore, founded upon a more satisfactory basis. Physiology and pathology have taught us how to manage surgical disease; where to interfere and where to withhold interference. All the great discoveries in practical surgery are due to the advance of our knowledge in these departments of sciences; and our operations are performed with confidence and skill only by the practised anatomist.

I trust it may not be inferred that, in making these remarks, I desire to draw an invidious parallel between medicine and surgery. This is very far from my intention. I am not unaware of the vast strides which the practice of medicine has of late years made, both in acquaintance with disease and in the use of remedies; and a new field has been opened up by the employment of spectrum-analysis in displaying the presence of elements in the animal body, which the most delicate chemical tests have failed to detect; and also in demonstrating with what remarkable rapidity those elements pass into the circulation, and are found even in parts completely external to the circulating system. The discovery by Dr. Bence Jones of the existence, in every texture of man and of some animals, of a fluorescent substance, which has a very close optical and chemical resemblance to quinine, is a singular triumph of investigation in this direction. From this source, and from experimental organic chemistry, we may confidently anticipate that our knowledge in therapeutics will be advanced, and that our accepted empirical conclusions will receive a scientific explanation. But especially has the progress of which I speak been due to the more accurate diagnosis of disease, founded upon morbid anatomy and pathology; and I cannot but recognise in this fact a bond of closer alliance between medicine and surgery; a nearer approximation in our several pursuits, and an identity of interest in the investigations of the several co-labourers in the cause of humanity—an association which should never have been disturbed by jealousy or rivalry, by pharisaical derision of empiricism on one side, and by contempt for handicraft on the other. Much has been accomplished in this welcome change even within my short memory, and much, I may add, is due to the present high educational standard of that class which forms the bulk of our profession, and which, as embodying the scientific cultivators of both medicine and surgery, constitutes the great bond of union between the more exclusive branches of our common calling.

The evidence by which we judge of the nature of a surgical disease or

injury, or, in other words, by which we form our diagnosis, is derived from various sources. Many antecedent circumstances in disease, and many concurrent circumstances in accidents, have to be carefully ascertained and considered, and this inquiry constitutes the *history* of the case. Any deviation from a normal condition, whether functional or organic, is called a symptom or a sign; and it is either by the positive information supplied by the presence of such signs or symptoms, or, it may be, by the negative evidence afforded by their absence, that we judge of the nature of a disease or accident, and of the treatment which should be adopted for its relief.

In the foregoing paragraph, I have employed two words, "symptom" and "sign," as if they were convertible expressions, to which the same meaning is attached; and yet this is not exactly the case. Even the etymology of the two words would seem to justify some distinction between them. The Latin word *signum* (itself of doubtful Greek origin) is more positive and emphatic; it implies the evident manifestation of what it denotes; whereas, the Greek word *συμπτωμα* conveys to the mind the idea of concurrence and accident combined. By this I mean, not the concurrence of various elements by which a diagnosis is formed, but the coincidence of an *accidental* circumstance with, and denoting the presence of, that which is, as opposed to it, *essentially* the disease. And this definition is in strict accordance with that pathology which regards disease as having an existence entirely independent of, though denoted by, symptoms. In other words, the symptoms, in the aggregate, do not constitute the disease, but their concurrent presence denotes its existence. But these distinctions in definition are determined much more by conventional usage than by grammatical rule; and I trust I shall not do violence to either by the interpretation I have been in the habit of attaching to these two words. Symptom seems to me more a medical, and sign more a surgical term; symptom conveys to my mind the idea of something, the communicated or obvious presence of which is indicative of some abnormal condition that is not otherwise or in itself manifest; sign appeals exclusively to the senses, and appears to imply the existence of a palpable token whereby we may recognise the presence or nature of some *material* change in the body. For example, it would, to my apprehension, be as inaccurate to speak of the functional disturbance of organs as signs of fever, as to enumerate deformity, crepitus, etc., as symptoms of fracture. I should prefer that diction in which the word "symptom" is employed in reciting the indications of the presence of cancer in the stomach, and the word "sign" in describing the same disease in the breast. Perhaps I should express myself more accurately if I speak of *symptoms* as denoting functional variations which are subjective, and *signs* sensible changes which are objective, the former being essentially dynamic, and the latter physical or chemical in their nature. Such, at least, is the sense in which I shall employ these expressions in the ensuing lectures; although I am aware that the restrictions I put on the words in question are open to criticism, and are not in accordance with the definition of them which is often given and received.

In the consideration of some of the cases of injury, and even of disease, which come under the care of the surgeon, he is able to dispense with any particular inquiry as to antecedent circumstances; but in the majority of instances the previous history is an important element of information, as bearing upon the treatment, and requires careful investigation, whilst it tests the ability and discretion of the practitioner. Not unfrequently the simple nature of the malady or injury, or the intelligence and good sense of the patient render the task an easy one, but very often the surgeon has to contend with a variety of adverse circumstances in this investigation. The antecedents may, in the patient's estimation, be overrated or underrated; he may attach an undue importance to some, whilst he conceals, either wilfully or ignorantly, others. In some instances, patients are indisposed to answer any inquiry, and in others, all suggestions are acquiesced in with a readiness which negatives the value of every reply. Leading questions may be requisite to elicit information, or they may be fatal by inducing assent, in compliant or fanciful clients, to every inquiry. Thus, both patience and sagacity are taxed in this investigation, and frequently it is only after both are well-nigh exhausted, that a true history of the antecedent condition of the patient is acquired.

The circumstances into which it behoves the surgeon to inquire, may be classed under two heads; viz., those which are associated with the general health, habits, occupation, temperament, and constitution of the patient, and those which more especially pertain to the existing disease or accident, and which constitute predisposing and exciting causes of the malady he has to deal with. There are few surgical cases in which the general antecedent condition of the patient has not an important bearing on the treatment and prognosis; and in many instances likewise a just diagnosis is dependent on an accurate acquaintance with the previous history of the patient. This is especially the case in large cities where life is more artificial, and the over-stimulation of the circulation,

with insufficient exercise, is so common. Thus, it may be predicated with tolerable certainty of the gin-tipping mechanic or of the beer-drinking drayman, that they will bear injuries and operations badly; that their reactive power is feeble, or, if active, faulty, and tending to destructive disorganisation rather than repair. The flagging and faltering steed requires both whip and spur, and the wonted stimulus must be supplied to rouse the sluggish organic energy, or to convert the morbid into a healthy action. I say the *wonted* stimulus, and I may remark that the caprice of the stomach often exacts the most scrupulous attention to its habits, so that even the substitution of one preparation of alcohol for another will not be tolerated—a circumstance which must, I think, be familiar to many of my hearers. In fracture, we frequently meet with cases exemplifying this fact; a tardy union is stimulated by the welcome glass of gin, or the allowance, often not very moderate, of porter, as the case may be; and in one instance, narrated to me by a provincial surgeon of eminence, non-union of a fractured leg was traced to the patient's privation of his evening indulgence in smoking, which was forbidden by the rules of the hospital; but my friend procured a relaxation of this rule in favour of his patient, with the happiest result. The explanation of these circumstances is intelligible, if we trace the connecting links between the cause and effect. Assimilation of the food is essential to reparation, but digestion is dependent on the humour of the stomach, and the disposition of that organ depends on the ingesta and other agents, which influence it more or less directly. Thus, the diagnosis of the phase which disease resulting from lesion assumes, is often materially assisted by a proper appreciation of these circumstances.

The foregoing remarks apply with equal and even greater force where the history of pre-existent disease—*e.g.*, the presence of a poison in the system—affords to the surgeon an explanation of phenomena which would be otherwise perplexing. How long does the poison of malaria linger in the frame, and determine the intermittent type of many accidental disorders. Gout modifies or aggravates the intensity of inflammation and influences its results; but still more potentially does syphilis often mar reparative effort, and predispose to local results which would not occur in a healthy constitution. Under these circumstances, the necessity of treating the constitutional condition in order to cure the local complaint, proves the importance of an accurate diagnosis in such cases.

The temperament of the patient, both physical and moral, has often a material influence in determining the course of action of the surgeon, where the responsibility of a serious operation is thrown upon him; and undoubtedly peculiarities in these respects require due consideration where every element of information may assist in clearing away the obscurity of a doubtful diagnosis. The nervous excitability of one patient, the frigid impassiveness of a second, or the uncomplaining docility of a third, may so far modify the symptoms resulting from the same lesion, as materially to mislead the medical attendant, if unobservant of these peculiarities. No less does physical temperament produce similar qualifying results; and injuries are differently resented by patients belonging to the sanguine, bilious, or nervous type.

The occupation of the mechanic or artisan, which demands the special use of certain muscles, or in which some constrained position is more or less constantly maintained, not unfrequently entails unsymmetrical development, and even a certain amount of deformity which, if overlooked, may mislead the surgeon when treating an injury. In my last lecture, I took occasion to remark upon this fact, which should not be disregarded in cases where the diagnosis is not clear, and may owe its obscurity to this cause. And instances are not wanting in which, even amongst the better class of our patients, a knowledge of their ordinary engagements may throw light of considerable value on the nature and consequences of injuries or diseases of which they are the subjects; and such information may serve to guide the surgeon, not only in his diagnosis, but in his treatment.

The direct or exciting causes of surgical disease or injury are many and various, but may, as regards the latter, be classed chiefly under extremes of temperature and mechanical violence, which produce results differing as widely in their degree as in their nature, according to the intensity of the agent, or the susceptibility of the recipient. A precise acquaintance with the character of the exciting cause and the manner of its infliction is always desirable, and often essential in forming a correct diagnosis; *e.g.*, in penetrating wounds, the form, size, sharpness, and other characteristics of the weapon, enable the surgeon to determine the probable depth of a wound, and to conjecture, if not to positively ascertain, the extent of the injury and the parts that are implicated. Again, the diagnosis of injuries at or near to the ball and socket joints is materially aided by a knowledge of the way in which the accident occurred; direct violence suggests fracture, and force indirectly applied points to dislocation. So uniformly almost is this the case, so rare are the exceptions in the shoulder-joint, that a clear and well defined description of

the manner in which the injury was inflicted is alone sufficient, in nearly all cases, to determine the nature of the lesion, whether it be dislocation or fracture.

Yet, whatever the value of the knowledge acquired by reference to antecedent circumstances, the existing condition of his patient is the chief source of information upon which the surgeon must rely, in forming a diagnosis of the disease or injury he has to treat. The changes which are thus offered to his inquiry may be classed under two heads, *viz.*, subjective and objective, or those which are simply functional, and those which are sensible. Each of these possesses a value in itself, though in general its importance is very much enhanced by association with other indications pointing in the same direction. Many subjective indications or symptoms are to be ascertained only by inquiry of the patient, and especially so those which have reference exclusively to his own feelings, such as the presence, character, and localisation of pain; but others, such as the state of the tongue and of the circulation, are tested by the senses. Objective signs are exclusively sensible, and the aid of all the senses is called into requisition in determining their existence and their nature. Adventitious assistance is frequently of much value in helping the surgeon to a correct diagnosis; as, for example, the microscope in suspected cancer, the stethoscope in aneurism, accurate measurement to test the symmetry of opposite sides of the body, and the exploratory needle in doubtful tumours. To these I may add the ophthalmoscope, the laryngoscope, and an instrument with the more comprehensive title of endoscope, for the use of those who are inquisitive respecting more remote regions in the interior of their patients. Even in subjective symptoms such artificial expedients are often adopted with advantage, and the condition of the secretions, the capacity for developing heat, or the character of the pulse, are ascertained by chemical analysis, the thermometer, or the sphygmograph.

It is not my intention to detain you with a detailed description of *all* the symptoms and signs with which it is the business of the surgeon to familiarise himself, although it is my wish and design to classify and comment briefly on the more important and significant; but I shall venture first to occupy your attention for a few moments with some remarks on the *relative* value of these indications of disease or injury, individually or as noticed in association with each other; and on some sources of obscurity and fallacy to which they are obnoxious.

The importance or worth of a diagnostic sign or symptom depends upon its more or less pronounced character; or, in other words, upon its being certain and unequivocal, or doubtful. In some instances, a solitary sign, such as abnormal mobility in fracture of a long bone, or transparency in a scrotal tumour, or the audible ring of a stone in the bladder, are characteristic or pathognomonic of the injury or disease with which they are allied. But in many more, it is by the association of signs with each other, or with symptoms, that their value becomes apparent. Thus, pulsation alone is insufficient to characterise an aneurism, because other tumours likewise pulsate; but if we find associated with this sign a diminution of the swelling when the supplying artery is obstructed, and an expansive return to its previous dimensions as soon as pressure is removed from the vessel, each sign imparts a significance to the other, which alone it does not possess. In this way an accumulation of evidence may be elicited, amounting to actual demonstration, leaving no room to doubt the nature of the case which is under investigation.

Not unfrequently *negative* evidence has an important bearing on diagnosis. The presence of many symptoms and signs may point to a certain conclusion; but the absence of one particular indication may suffice to counterbalance all its positive evidence. This is occasionally exemplified in the diagnosis of tumours. Again, a tranquil pulse may be the only proof that suspected inflammation is not present,—the diagnostic distinction between cerebral excitement and inflammation.

But the value of diagnostic testimony to the existence of disease or injury varies with the capacity of the observer. The careless inquirer may overlook indications which are readily detected by the observant practitioner; or experience may teach various surgeons to place a different estimate on what they notice. Some have more tact in discriminating what is important, or in eliciting proof of what they are seeking for; in fact, it is in surgery as it is in medicine, that the senses must be well-educated, the judgment well-balanced, the fruits of experience well-stored and readily accessible; and beyond all, there must be, as I have already insisted, such classification of acquired knowledge as shall constitute a sound code of principles on which to rest, where experience is at fault and precedent fails.

Among the many tests to which the tact and judgment of the surgeon are subjected, is that of the *accidental* presence of signs or symptoms, and the relation, if any, which these may have to the subject under consideration. The relative value of concurrent signs I have already referred to; but the present is a separate question, and often one of much

delicacy. It is far from rare to meet with such peculiarities as I allude to. They may be due to circumstances quite independent of the existing malady; or they may be allied with it, but without possessing any intrinsic value in determining the diagnosis in the case. They constitute for the most part the category of what I may term the "remarkable features" in the early cases, and especially the operations, of young surgeons,—features which cease to be remarkable, and which are estimated at their true value as experience ripens. Yet, on the other hand, some of these accidental or occasional concomitants are fraught with a deep and peculiar meaning to those who know how to read them aright; they are as the floating feather, showing the course of the current of air or of the silent stream.

The coexistence of various signs or symptoms suggests the consideration whether they are consistent with each other, and how far they are diagnostic of the injury or disease which is suspected. In this investigation it becomes the duty of the surgeon to unravel the tangled web, and to ascertain the simplicity or complexity of the case before him. The concurrence of dislocation, with fracture near to a joint, may give rise to such a complication; and the diagnosis of such injury is thereby rendered more obscure. Many opportunities will be afforded me of exemplifying this ripe source of difficulty in the diagnosis of visceral lesions. These obscurities are sometimes intensified by the more urgent symptoms assuming such a predominance as, in part or entirely, to mask those of less prominence, though not of inferior importance in arriving at a correct conclusion. The sensations of the patient,—the pain he suffers, or the swelling of an injured part are ripe sources of obscurity in such circumstances, and necessitate delay in acting, on account of the difficulties they entail. Or, again, the surgeon may be misled by deception on the part of the patient; and this source of embarrassment, as I have already observed, is not always wilful. His ignorance of the relative value of this or that indication may induce him to give prominence to one symptom, whilst he conceals another; or he may have some unrevealed motive for misguiding his medical attendant. Hysteria often perverts symptoms, by the substitution of those which are its peculiar attributes; or the acute or chronic effects of intoxicating drink may entirely alter the phase of indications, which would otherwise stand out in bold relief.

Another source of obscurity is the functional derangement consequent on the sympathy of different organs; such, for example, as arrested or excessive secretion, irritability of the stomach or bowels, obstinate constipation, dyspnoea, convulsion, paralysis of the bladder, and a host of other sympathies, some familiar in their interpretation, others unintelligible to us. The influence and effects of prior treatment also often call for the scrutinising attention of the careful practitioner; for in them we find an explanation of modified or qualified symptoms, which would be otherwise a prolific source of fallacy in diagnosis; and which sometimes suggest the wish that the case had been transmitted to us without this additional source of obscurity. The earlier treatment of strangulated hernia, of retention of urine, of misunderstood joint injuries, present us with many and painful proofs of the importance of investigating all that the patient has had done for him by those who have had the earlier management of the case.

These are the chief sources of fallacy or misdirection which occur to me to notice in connection with surgical diagnosis. It would not be difficult to extend this list, or to enlarge upon its details, by further illustrative commentaries on the different subjects to which I have alluded; but this would be inconsistent with the necessarily condensed style of these lectures; and the details of the outline I have sketched may be readily filled in. I shall next proceed to make a few remarks on certain symptoms and signs which have a more special import and significance in surgical diagnosis.

(To be concluded.)

THE PATHOLOGY OF SKIN-DISEASE.

THOSE interested in the cryptogamic diseases of the skin may be interested to know that arrangements have been made for Mr. Tuffen West, F.L.S., to deliver two lectures, in connection with Mr. Hutchinson's course, on Parallel Diseases in Plants. The lectures will be given in the Library of the Hospital for Skin-Diseases, New Bridge Street, Blackfriars, on Friday, July 17th, and Saturday, July 18th (this week), at 8.30 in the evening. Mr. Hutchinson also wishes us to state he has arranged for the attendance of several patients suffering from the curious malady known as Morphœa (Addison's Keloid), on Tuesday next, at half-past three. He will be glad to submit them to the examination of any one interested in the subject. They are supposed to illustrate the important proposition, that the disease has its primary seat in the nervous system, and not in the skin.

AN ADDRESS

ON THE

ANTISEPTIC SYSTEM OF TREATMENT IN SURGERY.*

Delivered before the Medico-Chirurgical Society of Glasgow.

By JOSEPH LISTER, F.R.S.,
Professor of Surgery in the University of Glasgow, etc.

MR. PRESIDENT AND GENTLEMEN,—In order that the antiseptic system of treatment may confer upon mankind all the benefits of which it is capable, three things appear to be indispensably requisite. First, that every surgeon should be convinced of the reality and greatness of those benefits, so that he may be induced to devote to the antiseptic dressing of a case the same kind of thought and pains as he now, if at all worthy of the name of surgeon, bestows upon the planning and execution of an operation; secondly, that these efforts on his part should be directed on sound principles; and thirdly, that, for carrying out these principles, he should have thoroughly trustworthy practical means at his disposal. I venture to hope that the illustrations which I propose to bring before you this evening may promote in some degree each of these essentials.

In speaking of the antiseptic system of treatment, I refer to the systematic employment of some antiseptic substance, so as entirely to prevent the occurrence of putrefaction in the part concerned, as distinguished from the mere use of such an agent as a dressing. The latter has long been practised in many parts of the world. The former originated rather more than three years ago in this city (Glasgow). The material which I have generally used for the purpose is carbolic (or phenic) acid, which, when I first published on the subject, was new to most British surgeons as an external therapeutic agent. This circumstance, while it had the effect of attracting greater notice to the matter than might otherwise have been the case, was perhaps on the whole a misfortune, since it tended to distract attention from the essential principles of the treatment which I advocated, and to lead many in this country to look upon carbolic acid in the light of a specific. On the other hand, continental surgeons visiting our Infirmary, familiar with the use of carbolic acid as an ordinary antiseptic dressing, have invariably formed a just estimate of the advantages derived from its employment upon the system to which I have alluded.

So far from carbolic acid being a specific, it owes its virtues to properties which it possesses in common with various other substances; and results similar in kind to those obtained by its means might be got by disinfectants long familiar to British surgery, provided always that the same principles guided their employment. This statement is not made on theoretical grounds alone. About nine months after I had first treated compound fracture with carbolic acid, Mr. Campbell De Morgan published a paper "On the Use of Chloride of Zinc in Surgical Operations and Injuries," and was kind enough to send me a copy of it. By means of this salt he had obtained highly satisfactory results, though led to employ it with a very different object in view. Mr. De Morgan used chloride of zinc in the first instance in cases of cancer, upon the idea that the frequency of return of the disease after operation might depend on the dissemination of its germs on the cut surface, and he hoped that, by applying a strong solution of the chloride to the wound so as to destroy any cancer-germs that might be scattered over it, he might diminish the chance of recurrence. Having treated cases of cancer in this way, he found that the wounds healed unusually kindly, while there was, at the same time, an absence of "animal odour," and he expressed his surprise at the small amount of "action" in the part. To myself it appeared perfectly natural that, if chloride of zinc prevented animal odour, implying that putrefaction was avoided, the wound, protected from the irritating influence of the products of decomposition, should exhibit little inflammatory disturbance. But it struck me as very remarkable that a single application of chloride of zinc to the raw surface should

* This address does not profess to give a complete account of the antiseptic system, but was based upon some illustrations which happened to be at my disposal. One of these, an experiment in support of the germ-theory of putrefaction, was dwelt upon at considerable length, in accordance with what I believe to be the great practical importance of the subject to which it refers.