LECTURES

ON THE

PRINCIPLES OF SURGICAL DIAGNOSIS:

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

By F. LE GROS CLARK, F.R.C.S.,

Hunterian Professor of Surgery and Pathology in the College; Surgeon to
St. Thomas's Hospital; and Examiner in Surgery at the
University of London.

LECTURE III.—LESIONS OF THE NECK AND THROAT.

(Concluded.)

Penetrating Wounds.—Cut Throat.—Shock.—Contusion of the Larynx.—Scalded Throat.—Foreign Bodies in the Larynx and Trachea.—Tracheotomy.—Foreign Bodies in the Pharynx and Œsophagus.—Wounds of the Heart.—Parallel between Injuries of the Brain and Lungs.

I HAVE remarked that the *pharynx* is occasionally involved in wounds laying open the larynx and extending to the back part of the former tube, without necessarily implicating the larger vessels or other important parts in the neck. Such injury does not entail any serious consequence in itself, although the determined nature of the self-inflicted injury implies such an amount of lesion as is likely to prove mortal. The same remark may be made respecting other accidental wounds of the pharynx from the intrusion of foreign bodies which may penetrate or lacerate the back of the throat, such as fish-bones or a tobacco-pipe; but it should be remembered that these lesions may be complicated by the wound of neighbouring textures of importance. Thus fatal bleeding may result from puncture of a large vessel; or deep-seated suppuration may follow, and entail secondary hæmorrhage.

I recollect, when I was a hospital apprentice, a singular instance of attempted suicide, occurring during my week of "taking in". A woman had recourse to the curious expedient of forcing a large door-key into her throat. Happily, it was held fast in the pharynx, within reach of a pair of forceps, and was extracted without much difficulty, and without producing any worse result than a sore throat for a few days. This specimen (1077) from our College Museum is identified with a similar case; it is the handle of a punch-ladle, which was taken from the throat of a maniac who proposed to commit suicide by swallowing it. He experienced no subsequent inconvenience from this eccentric use of his punch-ladle.

The accidental blocking of the pharynx by the lodgment of food within it has proved fatal by suffocation. The accompanying preparation from the Museum of St. Thomas's Hospital exemplifies this fact. The patient, a man who was engaged in taking a meal at an eating-house, was seen to be suddenly seized with convulsion, as if struggling for breath, and was, of course, supposed to be in a fit. He died speedily; and, when examined after death, a large morsel of un-masticated meat was found to have been wedged in the pharynx, and to have thus arrested respiration.

Of accidental wounds of the *œsophagus* I have never seen an instance, except in association with division of the trachea in attempted suicide; and this, in my experience, is an infrequent occurrence. An incautious penetration of the trachea in tracheotomy might cause, and I believe has produced, a similar result. Egress of food or drink, or the symptoms consequent on their introduction into the air-tubes, would indicate the probable nature of the injury; though, as I have already remarked, these results may be due to the imperfect closure of the glottis when respiration is performed through an artificial opening below the rima. Not infrequently, surgeons are consulted respecting the supposed lodgment of foreign bodies in the *œsophagus*. I think there is no doubt that occasionally abrasion of this tube perpetuates the uneasy sensation, which the patient interprets as a proof of the presence of some extraneous body; and, if deglutition can be completed without difficulty, it is unwise to interfere. The cautious passage of a probang may, if required, satisfy the importunity of the sufferer. Again, this impression may be the first indication of some commencing serious organic disease, such as cancer. If deglutition be really obstructed, of course this sign, together with the history of the case, may indicate the reality of the patient's suspicion, and demand decided interference to afford relief. I remember an interesting exemplification of this state

which occurred to me a few years back in St. Thomas's Hospital. A young man applied at the surgery, stating that, in eating some soup a few days previously, he had inadvertently swallowed an irregular fragment of bone. He pointed to the exact position where he believed it had lodged, adding that he was starving, as he was incapable of swallowing even liquid food. The pain he suffered, which was not acute, was aggravated by the effort at deglutition; and he added, that he was conscious of the bone passing into the throat, but too late to arrest it; and his subsequent efforts to return it were fruitless. There did not appear to be any marked change of position after the first day. I tested the accuracy of his statement by giving him some milk to drink, and he complied with my request to make the attempt. A certain quantity was imbibed, and then the whole, apparently, was regurgitated. Under these circumstances, I did not hesitate to pass a probang; and at the spot indicated by him—viz., about the middle of the mediastinum—its further progress was arrested by firm resistance. I was now so persuaded of the correctness of his representation, that I did not hesitate to press the instrument onwards, and soon had the satisfaction of feeling the obstruction give way; and the probang passed on into the stomach. On its removal, I requested the patient again to make an attempt to swallow some milk. He was sceptical of the utility of repeating this experiment, as he felt sure, from his sensations, that the bone was still lodged in the *œsophagus*. His gratification at finding that he was indeed relieved was proportionate to his previous despondency; and, as I did not again see him, I presume he had no further trouble, beyond the soreness which I told him to expect for a short time.

The following is a remarkable instance of permanent relief following the simple operation of passing the *œsophagus*-tube. A servant of middle age, residing in my family, had been the subject of dysphagia for eighteen years. It was with difficulty that she could swallow any solid food during this entire period; and latterly her fellow-servants were so alarmed by her rapid loss of strength and almost entire abstinence, that the subject was mentioned to me. There was no serious obstruction to the passage of an ordinary stomach-pump tube; and the relief was immediate, complete, and permanent. I cannot explain the *modus operandi* of the remedy. I believe the case to be entirely genuine, and free from the suspicion even of hysteria; and I quote it for what it is worth.

Not long since, I noticed in print a case in which a half-crown had been swallowed, and remained lodged in the *œsophagus* for some months, when death resulted from ulceration extending into the aorta. The story of the man, who was, if I remember right, a criminal, was not credited, and no attempt was made to relieve him.

The following interesting case, communicated to me by Dr. George Johnson of King's College, exemplifies the value of the laryngoscope in the diagnosis of the class to which it belongs. A child, aged twenty months, had, according to the account of his parents, swallowed a penny. At first, he was nearly suffocated; but, when seen by Dr. Johnson two days afterwards, he breathed freely; but the respiration was accompanied with a moist rattling noise in the throat. He could swallow only liquids; and that was difficult, and excited cough. The mucus discharged was occasionally tinged with blood. These symptoms and the general distress of the child satisfied Dr. Johnson that the coin was impacted in the throat. The laryngoscope revealed its position in the upper part of the *œsophagus*—the surfaces directed forwards and backwards, and the upper margin just below the opening of the larynx. It was readily removed with a pair of long slender forceps. The early signs of suffocation in this case no doubt corresponded with the passage of the coin over the base of the tongue and epiglottis.

The removal of foreign bodies impacted in the *œsophagus* is not often called for; and, when required, the surgeon would usually be guided by the prominence of the object upon which he is cutting. Our senior Vice-President, Mr. Cock, has twice successfully performed this operation, and has given an interesting record of the cases in the *Guy's Hospital Reports*.

Traumatic stricture of the *œsophagus* is occasionally met with, as the result of textural lesion from the contact of some irritating matter swallowed accidentally or intentionally; but such obstructions are not characterised by any peculiarities, and are recognised by the diagnostic signs common to all strictures in this tube. I have a record of two cases in which the patients had fallen into a vat of soap-lees. In one, I had the opportunity of witnessing the early escharotic effect of this solution—the mucous membrane of the lips, tongue, and fauces being destroyed in patches; and dysphagia being the most distressing consequence of the accident. The other case came under my care six weeks after a similar accident; and he applied at the hospital in consequence of the difficulty he experienced in deglutition. He was relieved by the use of a bougie.

The remarks which I made in reference to the infrequency of traumatic lesions of the thoracic viscera, in civil practice, apply with special force to the *heart* and the *great vessels* immediately connected with it. The relations of these parts, and the protection thereby afforded to them, preserve them from injury in any of the ordinary casualties which come under the notice of the hospital surgeon; and, when such injuries do occur, they are usually so immediately fatal, that there is no opportunity of associating with them the particular diagnostic signs or symptoms by which they may be identified. Indeed, the survival of the patient, under circumstances which might be supposed to implicate this vital organ, may be generally accepted as proof that it has escaped injury; yet many remarkable instances have been recorded, in which even serious wound of the heart has not proved immediately fatal; nay, in which the patient has so far recovered as to live for a considerable period, and the real nature of the lesion has not been verified until after death. One such instance I alluded to in my last lecture as having come under my own observation many years since. A patient was admitted into the hospital with fractured ribs, and survived the accident several hours. At the *post mortem* examination, one of the fractured bones was found to have transixed the pericardium, and penetrated into the left ventricle of the heart. As this very rare accident was not suspected, unfortunately no special record of the symptoms during life was preserved.

The presence of such a wound may be conjectured from the direction taken by the penetrating weapon or missile; but the attendant symptoms, being dependent chiefly on loss of blood and embarrassment of the heart's action, are necessarily equivocal, as they are equally indicative of other and less serious injuries; and information derived from the stethoscope is scarcely more certain. External violence, such as sudden and forcible compression of the chest, may rupture the heart or one of its large vessels, as occurred in a case which came to my knowledge, in which the aorta was lacerated by the fall of a heavy cask on a man's chest.

In such instances, no doubt, the force acts either by compression of the column of blood within, or by excessive displacement and longitudinal extension of the artery; perhaps by both combined. Survival even for a limited period after these wounds must be due to the obliquity of the opening, or to the sudden syncope which ensues, and the consequent closure, by clot or otherwise, of the laceration or opening. More limited injuries may, for a time, be unattended by symptoms to create alarm, or even to excite suspicion of their existence, as is illustrated in the following instance, which occurred about two years since in St. Thomas's Hospital.

James C., aged 7, was brought to the hospital about mid-day, with the history of having had a fall three hours previously. He was examined by the dresser on duty, who fancied that he detected a fractured rib, and applied a flannel bandage. The child looked pale, and his respiration was somewhat embarrassed, but he did not complain of pain. He was taken home, and seems to have been tolerably comfortable during the afternoon and evening, his condition not exciting any alarm in the minds of his parents. About midnight, he began to complain of some uneasiness about the chest; and at two A.M., fifteen hours after the infliction of the injury, he rose up to pass urine, but fell back fainting, and almost immediately expired. At the *post mortem* examination, it was discovered that a needle had passed through the cartilage of the fifth rib. About an inch of the pointed end had been broken off, and was found free in the pericardium, where it had rested, and lacerated the apex of the heart; and from the wound thus caused hæmorrhage had taken place into the pericardium, to the extent of six or seven ounces. A second part of the needle was imbedded in the cartilage of the rib, not projecting on the pericardial aspect, but slightly on the cutaneous. The third part of the needle, including the eye, was not found. A most careful examination of the skin failed to detect the aperture by which the needle had entered. The body was pale and anæmic, but otherwise healthy. The cause of death was evident; viz., embarrassment of the heart's action from the presence of blood in the pericardium: its suddenness was due, apparently, to the abrupt change of position, acting directly on the heart, and indirectly on the brain.

The following very interesting case of a similar injury, but in which recovery took place, has been forwarded to me by my friend and former pupil, Mr. Morton of Guildford, in whose practice it occurred about a year and a half since: the record of the symptoms is an interesting contribution to the diagnosis of these injuries.

M. M., aged 17, a schoolboy, of phlegmatic temperament, was accidentally stabbed with a penknife by another boy, whilst at play. On receiving the wound, he felt scarcely any pain; only a little catch when he drew a full breath. There was scarcely any bleeding from the external opening. Immediately after the accident, he went into school, and remained an hour, feeling, as he expressed it, "all right", but hoping he should not be "put on." At the expiration of an hour, feel-

ing faint, he went out, and then vomited and fainted. Upon recovering he returned into school, but was soon obliged again to leave, in consequence of a return of the nausea and faintness.

At seven o'clock in the evening, three hours after the injury was received, he was seen by Mr. Morton, having confessed the cause of his illness. When Mr. Morton entered the room, he immediately rose and walked to meet him. His face was deadly pale, his lips bloodless, his skin cold and clammy, and pulse almost imperceptible. He had been vomiting frequently since his first attack of faintness. The heart was acting very feebly, with a scarcely perceptible impulse: the sounds were muffled, but there was no bruit, nor was there any increased cardiac dullness to be detected on percussion. The wound was a puncture, three-eighths of an inch wide, made by an ordinary penknife an inch and three-quarters long from point to handle. The situation of the wound was between the third and fourth ribs, an inch and a half from the centre of the sternum, and two inches to the right, and an inch and a half above, the left nipple: the edge of the knife was turned downwards.

There was no hæmorrhage from the external wound, which was at once closed with collodion. He was placed in bed, and, there being no attempt at reaction, hot bottles were placed in contact with the feet and body, and ice was given him to suck, in the hope that it might allay the distressing sickness. He complained of no pain except on deep inspiration, and even then he did not seem to suffer much. There was no cough nor spitting of blood.

At one o'clock on the following morning reaction commenced, and the vomiting was less frequent. Four hours later he had slept a little, and his skin and feet were warm. At nine o'clock, fourteen hours after the accident, the pulse was more distinct, and 120 in the minute. The heart's action was still feeble, and irregular in the force of its beat, but not intermittent. At the close of twenty-four hours, reaction was complete, without fever. On the fourth day, the pulse had fallen to 90. He had no dyspnoea, but the respiration was still quick, and he complained of slight pain in the chest.

A fortnight later, the report states that he had been gaining strength, though the heart's action was still very feeble, and much quickened by any excitement or exertion. There had not been any abnormal sounds or precordial rubbing up to this date, when his pulse ran up suddenly from 84 to 96, and a loud bruit became audible over a limited area, having the seat of the puncture at its loudest point. It was not heard over the apex of the heart, nor in the carotid arteries, but was apparently superficial, and yet difficult to separate from the first sound of the heart; and it was not a to and fro sound.

At this period the boy was removed home, and thus passed from Mr. Morton's observation: but he appears to have had no further serious symptoms, although, at the expiration of three months, his medical attendant reported that he could not satisfy himself that the heart was quite free from impediment in its action. The only stethoscopic signs then present were, indistinctness of the first sound and undue clearness of the second, the interval of repose being lengthened. After the lapse of seven months, all traces of the accident had disappeared.

From the position and depth of the wound, and from the symptoms, which are such as we should look for under such circumstances, there can be little doubt that the pericardium was penetrated in this case, and probably the heart itself punctured. The early faintness, pallor, depressed circulation, and sickness, were those of shock, and of too profound and protracted a character to admit of explanation, considering the nature of the violence inflicted, except on the supposition that some vital organ was injured. The position of the wound indicated the organ; and hæmorrhage to an extent sufficient alone to account for this condition would have been fatal, from the embarrassment of the heart's action which would have been inevitably entailed. The bleeding into the pericardium must have been limited. Reaction was unaccompanied by any striking change in the heart; and more than a fortnight elapsed before pericarditis was manifested by the pain, abnormal sound, and constitutional disturbance. Whether this was followed by any adhesion of the adjoining surfaces of the serous membrane is doubtful; but the negative evidence is opposed to such a conclusion.

By the great kindness of the owner of this preparation, I am enabled to show a remarkable exemplification of the possible protraction of life after the receipt of an injury usually regarded as immediately fatal. The interest associated with the specimen is enhanced by the fact that the heart was taken from a soldier who fought at Corunna, and that the veteran surgeon, Mr. Fuge, of Plymouth, who has kindly permitted me to exhibit it, was the attendant on the wounded man when he was landed at Plymouth just sixty years ago. His story was this. He was struck down by a ball which entered his chest, the wound being to the left of the sternum, between the second and third ribs. He thought he might have been insensible for half an hour. One of his companions, who helped to remove him from the field, said that the loss of blood

did not appear to have been copious at the time. He was carried on board a line-of-battle ship, crowded with wounded soldiers, and sent to England, receiving, on his voyage, no surgical attention beyond the application of a piece of plaster. Mr. Fuge found the external wound healthy-looking and suppurating. A probe was introduced nearly its length without meeting with any resistance. His countenance was pale; respiration frequent and laboured; pulse 120, feeble but regular; temperature nearly natural; distressing restlessness; inability to sleep, and a craving for opium. He complained occasionally of an obtuse pain, but was unable to point to any particular part of the chest as its site. He had also colliquative diarrhoea. He remained in the same condition for two days, and then his intellect became confused, and he was less tractable. He got out of bed for some purpose and nearly fainted. His restlessness increased, and he expired on the following morning, nearly fourteen days after the receipt of the wound, and on the third day after landing.

On examination of the chest, the left pleura was found to contain two quarts of sero-sanguineous fluid, its costal surface exhibiting evidences of acute inflammation, and the lung, shrunk to a small solid mass, was adherent to the spine. The thickened and distended pericardium contained half a pint of the same sort of fluid, and the surface of the heart was covered with a thin layer of adhering lymph, a small clot of blood being attached to its apex. The right ventricle presented a transverse opening about an inch in length, which penetrated to its interior, near the origin of the pulmonary artery. On removing the heart, by cutting through the great vessels, the ball was sought for, and found lying loose in the pericardium. By tracing its course, it became evident that it must have remained in the right auricle, as the tricuspid valve had a circular, lacerated opening in it, near its attachment to the ventricle. The right pleura and lung were healthy.*

The singular problem to solve in this case is, that the hæmorrhage did not immediately destroy life, and that the ventricle could continue to contract on its contents without discharging the blood into the pericardium: perhaps this result was hindered by the laceration of the valve, which allowed the partial regurgitation of the blood into the auricle; and the action of the ventricle would tend rather to contract than to expand the opening. If the coronary artery had been wounded, death must have been instantaneous.

This case is not singular, as regards the nature of the wound; but it is very remarkable, if not unique, in the fact that the patient so long survived so rare an injury.

There is a closer analogy in the condition and consequences of lesions of the brain and lungs than might be supposed, from the contrast in structure and function existing between these organs. Partial fracture may occur in either case without involving the contained viscus; contusion is represented in each instance by apoplectic extravasation—if I may be permitted this generic but questionable use of the word—on the surface, or in the interior of either organ. Even concussion of the nerve-centre would seem to have its parallel in those functional disturbances which result from mechanical violence offered to the lung, without organic lesion; as exemplified in the effects of blows and of compression. Hæmorrhage with one or other viscus may be fatal from interference

with function; and the consequences of mechanical injury correspond, inflammation endangering the integrity of the organ and the life of the patient in either case, though usually fatal in injuries of the head, and rarely so in injuries of the chest. Lastly, the pleura, as the arachnoid, is obnoxious to the usual consequences of inflammation; and in each instance life may be jeopardised by encroachment of its products on the contained viscus.

The vicarious performance of function, dependent on the duality of each organ, is more effective in preserving life in lesions of the lung than in those of the brain; but the relative mortality in either instance is due rather to the facility with which the disintegrated tissue and the products of inflammation are discharged from the chest than from the skull. I may observe also, in following out this parallel, that there seems to be a greater tendency, in lung-injury, to limitation of inflammation to the proximity of the injured part; whereas, in brain-lesion, the fatal issue from secondary causes is almost invariably the effect of extension of inflammation, and consequent disorganisation of texture, involving some immediately vital part of the encephalon.

The mutual relations and interdependence in function of these important organs is brought out into bolder relief by the lesions to which they are subject. As the respiratory effort fails under privation of nerve-force, so do the functions of the brain languish when it is starved of its due supply of oxygenated blood, at once its stimulant and its food. Each organ is invoked at times to perform extra duty, under the coercive influence of necessity; and each has its intervals of comparative repose. The unremitting activity of the lungs is more apparent, though scarcely more real, than that of the brain. In both, their voluntary functions have rest in sleep. Each has its own peculiar susceptibilities; but it is rarely that these are rudely aroused in the one without the sympathy of the other being awakened. Shock is experienced when either is seriously hurt; but this appears to be incidental rather to the general concussion caused by the violence, than to the appeal made directly to the organ—though certainly more apparent, the degree of violence sustained being taken into account, in injury of the lung than in that of the brain.

That lesions of the heart are attended by profound collapse, and are more certainly and speedily mortal than those of either brain or lungs, is readily intelligible, when we consider its larger supply of ganglionic nerves, and the immediate importance of its uniform function to the vitality of every other organ. Its irregularity or intermittent action is alarming; and even the brief suspension of its rhythmic beat is death.

OBSTETRIC MEMORANDA.

[UNDER this head, we shall, from time to time, as materials come to hand from correspondents, publish records of cases remarkable in themselves, or illustrating points of interest in obstetric practice, therapeutic or manipulative. We shall probably in this way preserve from oblivion the notes of very many useful and instructive occurrences in private practice; for the great obstetric experience is that—for the most part hitherto unwritten—of the great body of general practitioners throughout Great Britain. We will only ask those who may forward cases for record, to relate them with the utmost brevity, and equally to condense any appended remarks.]

THE USE OF OBSTETRIC INSTRUMENTS.

By JOHN D. SCURRAH, M.D.(Lond.), Birmingham.

I GLADLY confirm by my experience the remarks of Dr. Savage in the JOURNAL on the more frequent use of the forceps. Next to the use of anaesthetics, the timely use of the forceps seems to me one of the most valuable means for alleviating pain and preserving life which our profession possesses. Anyone who has seen much midwifery practice, especially in large towns, will recognise how frequent are the cases, "especially in primiparæ," as Dr. Savage so well puts it, "where much pain, anxiety and exhaustion are spared" by the use of the forceps. By this practice, I am satisfied the lives of many infants are preserved which would otherwise be lost.

For a long time, I adhered to the old orthodox objection to the use of the forceps. But I find their more frequent use to be so beneficial and preservative, and so few, if any, injurious results or valid objections, that I think I should not be justified in limiting their use to one in five hundred or one thousand cases, as is done by some authorities.

In my last five hundred cases, I have used the forceps thirty-eight times, or about one in thirteen. Not a single maternal death occurred, and generally the mothers recovered very rapidly. There were only four children stillborn, and of these, two had been dead some little time. So that properly there were only two; and in these two cases the cord was round the neck, and I waited some hours before using the forceps.

* This case is reported in the *Edinburgh Medical Journal*, vol. xiv.