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CLINICAL LECTURE ON INJURIES OF THE ABDOMEN.

BY

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GENTLEMEN,—At our last meeting we were engaged in discussing the subject of idiopathic peritonitis; on the present occasion I wish to call your attention to a class of accidents which very frequently give rise to, and become complicated with, peritoneal inflammation; I allude to injuries of the abdomen; however, before entering into a minute examination of the individual cases of this description which have been admitted into the hospital within a limited period, I deem it necessary to make some general observations on wounds of this region.

Wounds of the abdomen are usually divided, in reference to the parts interested, into those which affect the parietes, those which penetrate, and those which not only enter the cavity, but injure its contents. Adopting this view of the subject, let us, in the first instance, inquire if there be any thing peculiar in the composition of the abdominal parietes, which renders their wounds more intricate than injuries of the same extent in other parts of the body. The only anatomical peculiarity worthy of recollection, is the great quantity of tendinous or aponeurotic structure, employed in forming the anterior and lateral walls, and the respective situations of the epigastric and mammary arteries. Tendinous structure not being highly endowed with vitality is, when injured, rather slow in taking on inflammatory action, but when inflammation once becomes established, its effects are often very serious. In accordance with this doctrine, should you be called on to attend

a person who had received a punctured wound of the abdomen, which had merely penetrated the sheath of the rectus muscles, you are not to view it in the light of a trifling accident, for it may so happen that inflammation will set in some days after the infliction of the injury: such being the case, you must perceive the necessity of being guarded in your prognosis; and vigilant in your attention. In a case of this kind, the wound having been regularly dressed in the first instance, the patient should be kept perfectly quiet in bed for some time, and in the event of his complaining of pain or tenderness in the part affected, in addition to the usual constitutional antiphlogistic remedies, leeches should be applied in great numbers, with a view to prevent the occurrence of suppuration, if possible; should you fail in your efforts to accomplish this object, warm fomentations and poultices are the most agreeable, and, I believe, the best applications you can employ. Here I wish to remind you, that when an abscess forms beneath a fibrous membrane, the constitutional symptoms do not suddenly subside as in other cases, nor will the matter arrive at the surface as soon as if it were otherwise circumstanced. The difference does not appear to me to depend so much on the mechanical resistance afforded by the fibrous texture, as on the scanty supply of absorbents which it receives; be this as it may, it is sufficient for our present purpose to recollect the important fact; and in practice we ought to assist nature in bringing the matter to the surface by making a free incision into the tumour, as soon as we are satisfied that suppuration has taken place. In forming an opinion on this subject, you should be guided by the length of time the patient has been ill, the œdematous feel of the tumour, and the occurrence of rigors, which in all probability will have taken place, should suppuration be established. In the event of an abscess having formed within the sheath of the rectus muscle, you have something more to apprehend than the mere irritation resulting from the confinement of matter; for, inasmuch as

the sheath is deficient posteriorly at its inferior third, it is quite possible that the matter, being firmly resisted in other directions, may gradually work its way downwards until it shall have arrived at the peritoneum, and there by its presence produce inflammation of this delicate membrane.

Your knowledge of anatomy, the situation of the injury, and the symptoms of hemorrhage, will be sufficient to guide you in forming an opinion as to whether the epigastric or mammary arteries have suffered, or otherwise, in a case of abdominal wound. I recollect having heard Doctor COLLES relate a very interesting case of this description, which fell under his observation some years back, as well as I can at present call to mind. The leading circumstances of the case were as follow:—A carpenter, whilst walking, stumbled, and fell upon the edge of a chisel which he had imprudently thrust into his breeches pocket; he was brought to Madam Steven's Hospital immediately after the accident, and on examination, a wound corresponding in size with the sharp extremity of the chisel was discovered in the lower part of the abdomen. The patient, who was pale and exhausted to a certain extent on his arrival at the hospital, gradually became weaker, cold, and pulseless, and in the course of a few hours after admission expired. On opening the body some time after death, the cavity of the peritoneum was found distended with blood, and the epigastric artery completely divided. Thus, then, gentlemen, you perceive from what I have stated, that wounds of the abdomen, although comparatively superficial, may be productive of the worst results. Dr. COLLES's patient might, in my opinion, have died of hemorrhage, although the chisel had never interfered with the peritoneum.

Let us now inquire what are the bad consequences to be apprehended from a wounding instrument having entered the cavity of the abdomen, without injuring either the viscera, or any important blood-vessel. Here I wish you to bear constantly in mind that the term "*cavity*," as applied by anatomists to the natural state of the head, thorax, and abdomen, is not in the ordinary acceptation of the word critically correct, inasmuch as the containing and the contained parts bear a strict proportion to each other; consequently, there can be no vacuum in the living body. Hence it is that we frequently find wounds in those regions, giving rise to visceral protrusion, such as *hernia cerebri*, *hernia pulmonalis*, *hernia intestinalis*, &c. &c. In the case of the

tween its walls and contents is not of a passive nature; on the contrary, during respiration, the floating viscera must be kept in a state of constant motion by the alternate action of the abdominal and levatores-ani muscles on the one hand, and the diaphragm on the other. Such being the case, we can readily understand why it is that penetrating wounds are usually complicated with protrusions of the omentum and intestines; the natural lubricity of their serous surfaces supplies an additional explanation of this well-known fact. Let us now suppose a case in which a penetrating wound of the abdomen has been inflicted, and that a portion of intestine and mesentery protrudes, and inquire what the surgeon ought to do when called on. He should, in the first instance, ascertain by a careful examination whether the protruded intestine had been wounded or not, and when satisfied in the negative, he should at once proceed to return it into the abdomen. For the accomplishment of this object the patient should be placed on his back, with his knees drawn up, and his head and chest somewhat elevated and supported by pillows. By this posture the abdominal muscles will become relaxed, and the prominence of the lumbar vertebræ diminished, consequently the abdominal space increased as far as possible for the reception of the viscera. This preliminary step having been taken the surgeon should now take hold of the displaced parts, and draw out a little more of the intestine, with a view to break down any adhesions which may have formed between it and the margins of the wound; however, if he were called on immediately after the accident and consequently before inflammation or adhesion could be established, this mode of proceeding will be quite unnecessary, and he may at once commence the work of reduction. This object is best accomplished by pushing in first the part which came out last with the index-finger of one hand, which should not be withdrawn until replaced by the corresponding finger of the other. In this way the practitioner ought to persevere with the utmost patience and coolness, returning portion after portion, until the entire volume shall disappear. Gentlemen, when you meet with a case of this description, if you be not very circumspect, you may commit a great mistake by supposing that you are returning the protruded parts into the abdomen, when in reality they are passing either into the sheath of the rectus muscle, or into what is still a more probable, although not a less dangerous receptacle, and that is between the posterior surface of the abdominal muscles and

their peritoneal lining. Here I wish to remind you of a patient of mine who was admitted into this hospital under the following circumstances. The man's name was Salmon, a butcher by trade; whilst engaged in an altercation with his wife, she stabbed him in the abdomen with rather a narrow knife with which he had been killing a calf; he was conveyed to the hospital immediately after the infliction of the wound, and Mr. O'Reilly and I saw him soon after admission. We found him suffering from anxiety and apprehension, with about nine inches of small intestine hanging from the wound, which was not more than three-fourths of an inch in length; we at once set about returning the protruded bowel, and after much trouble and forty minutes' perseverance we succeeded in putting it out of sight. The lips of the wound in the integuments were now brought together, and retained in this position by adhesive plaster, compress, and bandage. This man died of peritoneal inflammation forty-eight hours after the accident, and on examining the body I found a great portion of the intestine which had been protruded placed between the abdominal muscles and the peritoneum. Here a question suggests itself as to whether the intestine might not have been, in the first instance, fairly introduced into the cavity of the peritoneum, and subsequently forced out through the wound in this membrane; the wound in the integuments being closed, it might insinuate itself into the situation in which it was found. In support of this view of the case, I must state that there was no appearance of strangulation whatever exhibited by the incarcerated intestine. On the other hand I don't think it probable that the action of the muscles of respiration would be sufficient to separate the peritoneum from its attachment to the abdominal muscles, I am, therefore, inclined to the opinion that the protruded parts were never completely reduced, and that the detaching of the peritoneum, and the consequent formation of the unnatural recess which contained the intestine, was the result of our efforts to effect this object.

When the protruding viscera have been safely lodged in their natural residence, some surgeons are very partial to the employment of sutures in keeping the lips of the wound firmly together in order to prevent a recurrence of the protrusion: although I am ready to admit the force of this argument in favour of the use of sutures when the wound is so extensive that it cannot otherwise be effectually closed, yet I am convinced we should have recourse to them as seldom as possible. It

is a fact well known to surgeons of experience, that sutures, when introduced into tendinous parts, are apt to excite a bad description of inflammation; and if inserted into muscular structure, spasm and convulsion are the usual consequences.

Let us now suppose the wound to be properly dressed. What are the dangerous effects which the practitioner is to apprehend, and the best method both of averting their occurrence, or of treating them should they unfortunately take place? He should calculate upon the supervention of peritoneal inflammation, as the ordinary consequence of such an injury as we have been supposing to exist: accordingly, the antiphlogistic plan of treatment, in the fullest sense of the term, should be adopted as soon as the patient shall have recovered from the shock of the accident, with a view to prevent, if possible, the establishment of this formidable symptom. You may remember, that at our last meeting I mentioned to you that next to blood-letting, calomel and opium were deemed the best remedies for peritonitis.

When penetrating wounds of the abdomen affect the viscera or large bloodvessels, there is much reason to apprehend extravasations of some kind into the cavity of the peritoneum, such as blood, bile, urine, or the contents of the alimentary canal. Effusions of blood are more likely to result from wounds of the solid than those of the hollow viscera; for this obvious reason, that the former are more abundantly supplied with bloodvessels than the latter. The circumstances which ought to be taken into consideration, and guide our judgment in forming an opinion as to whether blood had been extravasated or not, in a case of abdominal wound, are, the history of the accident, the particular situation in which it occurred, and the concomitant symptoms. For instance, if a man received a stab of a sword in the region of the liver, or spleen, and the usual symptoms of internal hemorrhage, such as prostration of strength, palidity of countenance, coldness of the skin, and feeble pulse, together with an unnatural degree of fulness in the neighbourhood of the injury, quickly followed the infliction of the wound, there could be little doubt that extravasation of blood to a considerable amount had taken place. What should the surgeon do in such an embarrassing case as this? The practice recommended now-a-days, is to open a vein in the arm at once, with a view to produce syncope as speedily as possible, and in this way interrupt the hemorrhage and afford time for the coagulation of the blood already effused. The patient should be kept perfectly quiet and cool, and closely

watched, lest in the event of reaction taking place it might be necessary to have recourse to the lancet a second or even a third time. Should a recovery be effected in a case of this description, the following pathological phenomena must have occurred in the neighbourhood of the wound. The effused blood having first coagulated, afforded a sort of barrier, which was sufficient, under the circumstances, to resist the feeble impulse of the heart's action, and in this way arrest the bleeding in the first instance: in the course of a few hours inflammation set in, and the effusion of lymph at the mouths of the wounded vessels superseded, in some degree, the necessity of the blood's presence; accordingly the absorbents began to effect its removal, whilst the wounded vessels were being closed up by the adhesive inflammation. I have been thus particular in detailing the various changes which take place during the curative process, in order to show you the erroneous nature of the practice adopted by the old surgeons in such cases as I have been describing. They recommended in all cases of internal hemorrhage, caused by wounds, whether the extravasation had taken place into the thorax or abdomen, a free incision to be made into the part involved, with a view to effect its removal; and in some instances they even went so far as to advise the washing out of the cavity, in order that a single particle of blood might not be left behind. It is scarcely necessary to point out to you the mischievous tendency of such absurd advice; you must perceive from what I have already stated, that the effused blood is useful in arresting the hemorrhage, consequently whatever tends to displace it, will be favourable to the continuance or renewal of the bleeding; and, again, the pernicious practice of injecting fluids into serous cavities for the purpose of washing out blood, which is comparatively speaking a mild substance, and removeable by the action of the absorbents, is so opposed to the laws of the animal economy, the principles of surgery, and common sense, that it would be an idle waste of time to enter into a formal refutation of a doctrine which has long since become obsolete.

Extravasations of bile, urine, feces, or chyle, into the cavity of the peritoneum, are usually productive of fatal consequences: the two former, from their fluidity and acrimonious qualities, are much more likely to become diffused and excite peritoneal inflammation than the latter: however, it is a fact well known, that the hollow viscera may be extensively wounded and no escape whatever of their contents take place: in proof of the truth of this statement I could relate to you many cases as

reported in the works of military surgeons, but this I deem unnecessary, as the point in question is generally admitted. I recollect one very interesting case myself, which occurred some years back a few miles from Dublin, in which there was good reason to suppose the intestines were wounded in several places, and yet no extravasation of their contents occurred: it was that of an unfortunate man who attempted to commit suicide by throwing himself on the point of a small sword: the instrument entered the abdomen near the umbilicus, and passed directly backwards through the cavity, and ultimately projected some inches beyond the integuments in the neighbourhood of the spine. The late Mr. Thomas Roney, whose apprentice I was at the time, was immediately sent for; and on his arrival the friends of the patient stated to him that they removed the sword with a good deal of difficulty, as it was so firmly fixed in his body. Mr. R. thinking that deception or misrepresentation was possible, inquired and examined into the circumstances of the case with all the address, discernment, and ability, which he was known to possess to an eminent degree. He found the sword stained with blood from one end to the other, the anterior and posterior wounds in the integuments to correspond; and after the fullest investigation, he was convinced of the truth of the original statement. The case was treated in the usual way, and, strange to relate, the patient recovered in a few days without having had any bad symptom whatever.

Let us now ask why the contents of the intestines do not always escape when their parietes have been completely divided. For a satisfactory explanation of this important fact, the profession are much indebted to Mr. Travers of London, whose able work "on Injuries of the Intestines" I beg to recommend for your attentive perusal. According to this gentleman's experiments and observations, the following are the chief steps taken by nature to prevent extravasation in cases of this description. On the removal of the wounding instrument, the lips of the wound become everted by the action of the muscular fibres, so that the thick mucous membrane assists in filling up the breach. At the same moment that this is being accomplished, the neighbouring convolution of intestine is forced by the action of the muscles of respiration into the situation previously occupied by the wounding instrument, and in this way co-operates with the everted membrane in preventing immediate effusion. In the course of a few hours, inflammation will be established, and lymph shed from the serous surface around the wound;

this lymph quickly becomes organized, and the aperture in the intestine permanently closed by the adhesion of the adjoining convolution. Thus, then, you may perceive that the lips of the wound never become united *directly* with each other, as in cases of simple incised wounds of the integuments and elsewhere; but that it is through the medium of the peritoneal coat of its neighbour that the wounded intestine is rendered capable of performing its wonted functions.

When the hollow viscera become ruptured from falls or blows on the abdomen, or the passing of a heavy body, such as a cart or carriage, over the trunk, extravasation is much more likely to occur than in the case of a wound; for this obvious reason, that the violence is continued after the rupture has taken place, and forces the contents of the injured viscus out through the opening.

Severe injuries of the abdomen are usually succeeded by sickness of stomach, prostration of strength, paleness of countenance, feeble pulse, and, in some instances, a discharge of blood, either from the stomach or bowels. When this last symptom exists, there is much reason to suppose that lesion of the alimentary canal has taken place; acting under this supposition, the practitioner should not prescribe cathartic medicines, lest by their operation they might produce an extravasation of feculent matter, which, under opposite circumstances, would not perhaps have occurred. Let us now suppose a case of penetrating wound of the abdomen, in which a portion of intestine, cut completely across to the mesentery, presents itself externally, and inquire what the surgeon ought to do under such circumstances. Gentlemen, you will meet with much discrepancy of opinion when you come to read the various works which treat of this subject, as to what is the best line of practice to pursue in such a case as I now submit for consideration. Some of the old surgeons, amongst whom RAMDOHR stands foremost, recommend that the superior portion of the divided intestine should be introduced some distance into the inferior, and retained there by means of sutures. The objections to this mode of proceeding are manifest and incontrovertible; in fact the practice in question was conceived in crude notions of mechanism, and in ignorance of the principles of pathology. It would be utterly impossible to introduce one portion of intestine within the other, unless a separation between the mesentery and the former were first effected; this could not be accomplished without destroying some of the mesenteric arteries,

and thereby causing a serious hemorrhage. Again, the difficulty of sewing, or otherwise securing, in a satisfactory manner, the invaginated portion, must be very great; but, above all, the expectation that a serous and a mucous membrane would become incorporated, by the ordinary process of adhesion, is an idea not entertained by any well-informed surgeon of the present day. Mr. JOHN BELL would connect the detached pieces by a point or two of interrupted suture. Sir ASTLEY COOPER and Dr. THOMPSON would employ numerous points, in order to prevent effusion; whilst Mr. TRAVERS, for the same reason, recommends that the lips of the intestinal wound should be carefully brought together with a sewing needle and a thread of silk. This being done, the thread is to be cut short, and the intestine returned into the abdomen, and the external wound dressed in the manner I have already described. You may naturally ask what ultimately becomes of that portion of the ligature which remains connected with the wounded intestine. According to the experiments and observations of Dr. THOMPSON, Mr. TRAVERS, and others, the ligature is disposed of in the following manner:—some hours after the replacement of the injured bowel, inflammation becomes established, and lymph is thrown out in the neighbourhood of the wound in sufficient quantity to cover the ligature externally, and at the same time to connect the contiguous portions of sound intestine to the injured one. In the course of some time ulceration will take place under the ligature, and proceed from the serous towards the mucous membrane, until it will make its way into the cavity of the intestine, and finally pass out of the system with the ordinary contents of the bowels. You are not to suppose that the lips of the wound in the intestine ever become directly united with each other, so as to have the continuity of the canal re-established, as it originally existed. Such is not the fact, the reunion of the divided portions is effected by the connexion formed between them and the surrounding parts, through the medium of adhesive inflammation. The opinions entertained, and the practice recommended, by the writers I have just named, are, I believe, those generally approved of and adopted by the surgeons of the present day. Gentlemen, I find that I have already occupied much of your valuable time with general observations, and must, therefore, postpone the discussion of the individual cases which I intended submitting for your consideration to-day, until our next meeting.