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COURSE

OF

LECTURES ON PHYSIOLOGY AND SURGERY,

DELIVERED AT ST. GEORGE'S HOSPITAL,

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(From the Manuscript of Dr. Thomas Shute.)

LECTURE X.

FISTULA. DISEASES OF BONE.

THIS term is very inadequate to what it is meant to express, for the fistula is only a symptom of the disease. It is necessary to have a general idea of the cause of fistulæ. They are intended for the passage of some fluid or extraneous substance, or for some secretion, as in fistula in perineo, or for some natural discharge, as from the parotid, or in abdominal fistula, for the discharge of fæces, making artificial anus. Among the fistulæ which are to supply the defect of an obstruction of a natural passage, is that of the lachrymal sac. The tendency to heal in fistula differs according to different circumstances. Of this, there are two principal causes; an unfavourable opening, and the seat of the part being diseased.

When parts are deep-seated, granulation is retarded, and the opening being so situated that the matter does not readily escape, prevents granulation, which is sometimes the case in large abscesses of the breast; when these break above, the weight of the matter prevents granulation, and is not sufficient to produce ulceration. The second cause may arise from a part which is naturally indolent becoming diseased, as tendon, ligament, bone, &c.; or from a disproportion in the disposition for healing in the external and internal parts. Parts which are deep-seated, have not so strong a disposition for healing as those which are superficial, therefore in lumbar abscesses the parts do not heal, and the external opening heals to a small orifice, and then remains in that state.

The reason why fistulæ do not heal, is usually said to be the discharge of matter continually passing through the opening; but this does not appear to be the cause, for if a more favourable opening is made for the matter, and none discharges by that orifice, it will remain open, which we frequently see in fistula in perineo, where the opening through the urethra is perfectly free. This backwardness to heal seems to arise from a sympathy or intelligence between the deep-seated and superficial parts, for as long as the seat of the disease continues unsound, the opening will not take on the healing disposition.

A fistula in ano begins two or three inches up, on the side of the rectum, perhaps on the external coat of the gut, or from its being diseased; the
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matter descends, making an external opening through the integuments, but usually does not penetrate the gut. If there is a stone in the bladder, and a wound is made into it, the wound will not heal while the stone remains there; or if the bladder is much diseased and an opening is made, the external orifice will not heal, although those parts are perfectly sound, which must arise from sympathy between the external and internal parts. The external opening is called fistula, but when there are a number of other small canals branching from it, and leading to different unsound parts, these are called sinuses.

In the cure of fistula we are first to consider the cause. If it arise from the obstruction of a natural opening, as in fistula lachrymalis, then that must be removed, or a new one made.

If it be caused by a collection of matter it is easiest cured, therefore fistula in ano generally yields to treatment more readily than any other. If the cause arises from an unfavourable opening for the discharge, then we should make one which is favourable.

If the fistula continue open from the bottom being unsound, then openings should be made to expose it as much as possible; but if the part will not admit of this, either from its situation, or being seated in a vital part, then we must be content with keeping it open, for the discharge of matter. In lumbar abscesses, we cannot expose the bottom of the cavity, and sinuses formed in joints will not admit of exposure.

Fistula Lachrymalis.

Fistula lachrymalis is caused by an obstruction of the duct: this often happens after the small-pox. This disease is often produced in venereal cases. Sometimes there is an adhesion between the septum and that side of the nose, which may be felt by carrying a probe up the nostril. Contraction of the duct may, perhaps, sometimes produce it, as in the urethra. When the duct is obstructed, the lachrymal sac becomes distended; this produces inflammation, and then the tears will increase it by their stimulus, owing to the salt which they contain. The tears will not cause inflammation, but they will increase it. The sac then suppurates, and we have matter mixed with the tears; it afterwards ulcerates, and gradually makes its way to the skin. To cure it, the obstruction of the duct must be removed, and if it cannot be removed, then a new passage must be made. It is not always possible to do this, for sometimes there is an entire adhesion of the septum on that side with the nose, obliterating totally the cavity of the nostril. Pressure alone in these cases could not probably occasion much inflammation, for we see the tunica vaginalis considerably distended in hydrocele without occasioning it, but if a stimulus was added to the fluid similar to the tears, then it would inflame.

Fistula in Ano.

A fistula in ano generally begins two or three inches up on the side of the rectum, perhaps from an inflammation of its external coat, or from some disease of the rectum at that part. It always points externally at the integuments on the side of the rectum; a free opening in this part is not sufficient to heal it; the rectum must be divided too. It must be treated just as an abscess, considering the inside of the rectum as an internal surface, and opening to the origin of the disease.

Diseases of the Bones.

Bones, in anatomical lectures, are always considered separately, as a very distinct and different part of the body, both in their structure and growth; therefore we have lectures particularly treating of their formation, when nothing is said of the growth of a tendon, or a muscle, &c. In books of surgery the diseases of the bones are treated of distinctly from other parts, since they are not considered as subject to the same laws under disease. Bones may be regarded as composed of two parts, an animal matter and calcareous earth.

They partake of all the diseases of other parts, being equally affected by them, therefore we have the venereal virus in bones; cancer, and scrofula, &c. The effects are sometimes different, which arises from the difference in structure. Where there is such difference only, the disease will be spoken of, it being unnecessary to speak of each disease. These parts are more tedious in their operations towards a cure than others, which may arise from the calcareous earth they are combined with.

It is very difficult to know the extent of a disease in a bone, therefore difficult to know how to treat it. In soft parts it is generally very easy to discover how far the disease has extended by the inflammation. The hardest bones are generally easiest of cure, but this usually depends on exfoliation; they exfoliate sooner than those which are less compact. When they are inflamed considerably, they generally die. They may, perhaps, be readily deprived of their animal part, that is, ulcerate easily, but cease to be connected with the body. When a bone is exposed, it generally exfoliates, that is, if it is deprived of its periosteum, it exfoliates as far as it is exposed; but if a muscle projects in the same manner, it will not slough. Soft bones retain their living principle much longer than those which are compact; therefore they are less apt to exfoliate. This may arise from their being more vascular.

The cure in a soft bone is more lasting than in those which are hard. Bad formation of the bones produces bad health; a badly-formed skull may hurt the intellectual faculties, and a badly-formed trunk produces bad health, which is generally the case with crooked people; it is very seldom that they are fat. Thus, a disease of the bones may affect the constitution mechanically.

Many accidents produce much worse consequences in bones, than the same violence would do in soft parts; this is owing to their resistance not receding from the injury. If a heavy piece of iron was suspended by a cord and forcibly struck with a hammer, it would make a dent; but if a small

piece was suspended and struck in the same manner, it would produce no injury, from the parts receding from the blow. Thus it is with bones; the same degree of injury which would fracture it, would produce no effect on a muscle; and when soft parts are injured, it is generally owing to the resistance caused by the bones underneath. If a blow is given on the shin, it produces injury from the resistance of the tibia; if the same blow was given on the abdomen, it might produce no effect at all.

Bones and joints easily take on any scrofulous tendency which is in the habit. Children who get any blow on a bone or strain of a joint, are very apt to put on the scrofulous appearance, if there is the least tendency to it in the habit. When a bone has been once diseased, it is very apt to become so again; the part always being very weak afterwards. Bones which are commonly called carious are not always rotten, for it is common to say that a bone is carious, if it can be felt with a probe bare; though it is no proof that the life is lost. We should not declare that a tendon was in a sloughing state from being able to feel it distinctly, and yet it is as reasonable to suppose so. Caries is a term which gives no idea of the disease. An ulcer of the bone is properly meant by it.

Ulcerations in bone partake of the same varieties as other ulcers. Caries in books is generally divided into dry and moist: this division arises entirely from ignorance of the disease. The dry is said to exfoliate easily, the moist with difficulty; therefore, the cautery is ordered to be applied to produce dryness, that the bone may exfoliate sooner. The truth is, the moist bone is not dead, for as long as it discharges anything, it must be alive; the cautery, by causing death, promotes exfoliation.

Bones go through the three stages of inflammation as other parts: the adhesive, suppurative, and ulcerative. The first stage of inflammation in bone, I would call the ossific, because in this, new bony matter is added; in this respect it differs from inflammation in other parts. The simple adhesive process in bone would be insufficient; it produces a proper texture to unite soft parts, but would be inadequate in bone. Suppuration is the same as in other parts; when matter forms in a bone, or between it and the periosteum, we have the bone ulcerated, but it is much less frequent in bone than in other parts. Ulceration also is similar to that in other parts; but in this it often removes complete portions without causing any suppuration.

Every disease requires a peculiar treatment, and each part likewise; for although Nature is very regular and uniform in her operations, yet she deviates in different parts, but in these deviations she is constantly regular. Therefore the treatment must be regulated according to the operations of that part. Each part has a disposition to form itself, and the part always forms a similar substance; therefore we have skin forming skin, muscle, muscle, cartilage, cartilage, bone, bone, &c. However, in some instances, Nature seems to deviate from herself, as in the formation of bone; where we see her, first forming cartilage, and afterwards removing this cartilage, and putting bone in its place; in the skull she first forms a membrane, and then bone; in this seeming deviation, however, she is equally regular, for after-

wards, if any of these parts are removed, she replaces them in the same manner; in the extremities first forming a cartilage, then bone; in the skull membrane, afterwards bone.

Bones when inflamed swell, as other parts do; this is attended with a heavy pain, which precedes the swelling some time, from which it seems that the process is slow, and performed with difficulty, for in soft parts the inflammation and swelling begin nearly at the same time. The time of swelling will vary according to the nature of the bone; in those which are spongy, it will be sooner than in those that are compact. It is very difficult to conceive how the swelling of a bone is effected, or that it can arise from extravasation of fluids. However, the swelling is very evident, and occurs without any appearance of additional matter being laid on the surface, but is regular throughout, as may be seen in the femur. I confess that I have no perfect idea how it is effected. It may possibly arise from a deposit of calcareous earth, and therefore when bones have been inflamed, we frequently see their internal reticular part entirely filled up. The constitution is considerably harassed in cases of this kind, from the continuance of the heavy depressing pain, but it is not easy to say whether the pain arises from pressure on the nerves, or from a peculiar disposition of the nerves to become painful at that time. The use of this inflammation is the same as the adhesive in soft parts.

Anchylolysis.

Inflammation of bone frequently produces anchylolysis, of which there are five species, four produced from this cause; the fifth, from another, which will be explained hereafter.

The first species is where the parts situated between two bones take on the ossific inflammation, and thus form a bony connexion, the parts between becoming ossified; by this means we have one rib united with another; one metacarpal bone with another; the tibia with the fibula. The second species is the union of joints, where there is no capsular ligament, as in the bodies of the vertebræ; these are united by cartilage.

Here is a specimen of a thorax, in which all the bones are anchylosed, so that the person must have breathed entirely by the diaphragm.

The third species is where the capsular ligament takes on the ossific disposition, and forms a bony connexion by the ligament becoming ossified, as you see in this specimen of the shoulder of a lion. This must be much more difficult where the joint has an extensive motion in every direction, than where it is more confined, as in the bones of the pelvis; but when the capsular ligament is short, it is much more frequent, as between the head of the fibula and tibia.

The fourth species occurs when the articular cartilages inflame, become soft and vascular, filling the cavity with extravasated fluids, and thus forming a soft anchylolysis, these parts afterwards ossifying, and the two bones becoming one. The cartilage in this case loses its disposition to re-produce cartilage, and the joint becomes in the same state as a simple fracture. Indeed, the union of simple fractures takes place on the same principle; it is produced by the extravasated blood becoming vascular. The ends of the bones inflame and ulcerate, the ossific matter being removed; they then become more vascular, like a

growing bone, and shoot their vessels into the coagulum; thus the ends of the bones become soft, to unite with soft parts.

The quantity of callus is in proportion to the mischief done to the surrounding soft parts; the more they are torn, the larger is the cavity for the reception of extravasated blood, which afterwards becomes bone; it will likewise depend on the degree of inflammation, for the surrounding parts taking on the ossific inflammation will become ossified, and by that means increase the size of the callus. The disposition for the formation of callus is very different in subjects of the same age. It is generally stronger in the young. Inflammation beginning in a part near a bone will sometimes be communicated to it, when the bone will give the ossific disposition to the soft parts; therefore we may have this specific kind of inflammation in a soft part, and without its beginning in a bone.

The third species of anchylolysis seldom occurs, the motion of the joint preventing it, especially in those joints which have extensive motion; another cause is, the distance of attachment between the two ends of the ligament; the length of the ligament being so much, that the ossific inflammation communicated to it from the bone seldom extends along half the length of the ligament to meet the inflammation on the other side.

The fourth species, where the surfaces of the bones are united by the cavity of the joint being filled by ossific matter, may be caused by the articular cartilage being absorbed, which sometimes happens, or from the cartilage changing its disposition, becoming soft and vascular, throwing out fluids which fill the cavity of the joint, and afterwards become bony. All this will arise from an inflammation surrounding the joint, and communicating itself to the articulation.

I examined the elbow-joint of a lady who had abscess near the joint; the latter was anchylosed in the manner last described, forming a soft bond of union, but she did not survive long enough for it to become ossified. This inflammation does not always proceed so far as to produce ossification; the ligament only becomes thickened. If we could by any remedy prevent ossification from taking place in these cases, it would be a great point gained; for by keeping them in the soft state, the parts might be absorbed, or at least there would be some motion in the joint. Callus of a simple fracture is more lasting than that of a compound fracture. Although it is mechanically stronger than original bone, yet its living powers are weaker, and it is not able to resist disease so much.

The callus of a simple fracture will not be absorbed so soon from a weakness of the constitution, as that of a compound fracture, which shows that the living powers of the former are strongest.

Ossific inflammation of bones.

The union between two broken bones must be ossific, for any other would be of little effect.

Simple fracture unites commonly in a fortnight, in some constitutions motion may be perceived at the end of twenty days; it is in most cases cured within a month. After a month has passed, or the natural time of the healing process, it is impossible to say when the union will take place, perhaps never; when the opportunity passes, nature often never renews her action.

This union does not always take place, for we sometimes have a fracture remaining in the same state as the soft ankylosis before described (or the thickened ligament) for years, remaining moveable, and forming something similar to a joint. This deficiency in the formation of callus is in general attributed to a bad constitution, or to the part being much moved; but it does not appear to arise from either of these causes; for if the fracture is made compound, which has been done, the wound will heal well, and form a good callus; this then is a proof that the constitution was good. Motion does not appear to prevent it, for a dog that breaks his leg, and runs about with it loose and dangling in the streets, will have the bones as firmly united as if it was kept ever so quiet. In all the processes performed by nature, there are certain leading principles, which are followed by other operations in regular succession; if the first principle of action is stopped, or any other succeeding operation, it generally puts a stop to all which were to follow, there being a regular chain or connexion between the processes of nature to perform some work; and if one of these is prevented, it generally stops all which were to follow, each depending on the other. This may be explained in what takes place in the descent of the testis. The descent of the testis is a natural operation of the animal economy at a certain period; when this process takes place, and the testis has descended, then commences the period for the closing of the tunica vaginalis; if by any accident the tunic is prevented from closing (as from a bit of intestine or omentum slipping into it) at the stated period, it then loses its disposition to perform such operation, and it remains ever after open. Thus it is in the different operations of nature, and this may perhaps be the cause of simple fractures not uniting sometimes; by some accident the leading operations may be destroyed or stopped, as, for instance, if the extravasated blood, which forms the beginning of callus, should lose its living principle, then by becoming extraneous it would give the stimulus for absorption. The extravasated blood may be absorbed as in an ecchymosis: it evidently loses its living principle in some cases. By losing its life it may not coagulate, but give the stimulus for absorption; when absorbed, the other processes would not go on to unite the bones, but a new stimulus would be given, which would be to make a joint. I have lately met with a fractured thigh, in which the blood had been absorbed; on examining it I found a kind of granulation, shooting everywhere from the surface of the bone, which would, I think, have taken on the ossific disposition, and have performed the union. These were not attended with pus; therefore this is only necessary where the granulations are exposed, and perhaps intended as a covering. The extremities of the bones becoming enlarged, and the projecting parts of the bone rubbing against each other, give the stimulus for absorbing those parts, by which means the extremities of the bones become smooth, and covered with something similar to cartilage. The extremities of the bones are not ground by friction, for then we should find the matter which was ground.

The formation of a joint between the two ends of a fractured bone seldom happens; it is much more frequent for them to be united by soft ankylosis, that is, by a cartilaginous or membranous sub-

stance, which will admit of some motion; and therefore, it is to be wished for in those cases where joints ankylose, but we know of no power to prevent ossification. The constitution, by being very much weakened, will prevent ossification, and even cause its absorption, but to bring it to such a state, perhaps, would not be prudent. These cases may be cured by making the fracture compound, when they are situated so as to admit of it; the exposing the extremities of the bones will give a stimulus, causing inflammation and granulation, when the callus will form in the granulations as in compound fractures, or become ankylosed, as in the exposure of joints. It may, perhaps, be necessary to saw off the ends of the bones to produce a greater inflammation.

A similar disposition take place in dislocations, as in cases where bones do not unite; the bones not being able to recover their situation, nature sets about making a new joint; if the head of the bone is situated against a bone, then the pressure causes an absorption, and makes a cavity to adapt itself to the head of the bone; a substance like a ligament is formed, and connects the bones together, secreting synovia and making a joint.

In this case two operations take place at the same time; the bone in contact ulcerates and the surrounding bone inflames, which causes it to thicken and raise itself round the head of the bone, forming an articulatory cavity. If the head of the bone is situated in soft parts, these adapt themselves to it in the same manner, making an articulatory cavity.

CASE OF SHORTSIGHTEDNESS

CURED BY OPERATION.

TO THE EDITORS OF THE PROVINCIAL MEDICAL AND SURGICAL JOURNAL.

GENTLEMEN,—The arduous and laborious pursuits of my profession have alone prevented me from contributing to your excellent Journal an earlier or a better production than the following, which, if you should think it worthy of insertion in your columns, is at your service.

Your obedient servant,

JAMES ADAMS.

27, New Broad Street, Sept. 1841.

7 Henry Stevens, æt. 17, a healthy-looking lad, marked by the small-pox, has light hair and gray irides, with rather more than usually dilated pupils. Association unusual; if the right eyelid be closed, the left eye remains in its natural central position; but if the right eyelid be suddenly raised, the right cornea will be found much inverted: if the right eyelid be left open, the right cornea is seen to move, gradually, to its natural central position, in order to correspond with the left; if the left eyelid be closed, a similar result does not take place, the association being perfectly natural.

Position of both eyes perfectly natural. If an object be held close to the root of the nose, and the patient be desired to look at it, both corneæ are, at first, slightly and equally converged; but, as the effort to view the object with both eyes is