LECTURES ON THE DISEASES OF THE BONES AND THE JOINTS.

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LECTURE IV.

Manner in which cartilage becomes ulcerated, and how those portions of it are removed which disappear in the ulceration. The terminations of ankylosis. Treatment of ulceration of cartilage, and chronic inflammation and puffy swelling of joints. Tuberculous deposit in the heads of long bones. Disease of the whole of a joint. False symptoms of affections of joints. Caution to be observed before pronouncing the persons complaining to be malingerers.

In consequence of articular cartilage being considered a non-vascular tissue, like epidermis or nail, and properly so, perhaps, in the healthy condition of parts, the subject of ulceration of cartilage in diseased joints has long been involved in mystery. From this supposition, which you will have reason to believe is incorrect as regards joints in a state of disease (and you will have ocular demonstration to the contrary), it has been conjectured that the particles were removed by the action of some neighbouring vessels. Mr. Key maintains that the synovial membrane has a great deal to do with the ulceration of cartilage; and he refers to the supposed absorption of dead bone, in some cases of necrosis, by the action of the vessels in the living shell. We have already seen, when speaking of the separation of sequestra by ulcerative absorption, that the illustration at least is fallacious, and that when bone is once deprived of its vitality it is never again acted on by living tissues so as to cause the slightest alteration in its size or weight. We now come to the proposition itself, and I shall here show you that there are means by which portions of cartilage may be removed without the intervention of the vessels of neighbouring parts.

When you inject a diseased joint in which there is inflammation of cartilage, with fine injection of parchment-size and vermillion, and afterwards make a very thin section of the cartilage, and examine it under the microscope, you will sometimes be able to see, very distinctly, a beautiful arrangement of capillary vessels, which cannot be seen in the healthy state of those parts. If the section be made in a direction perpendicular to the surface of the cartilage these vessels are observed extending upwards, in long loops, from the membrane which lies between the cartilage and the bone. This membrane, in the healthy state of a joint, can with difficulty be demonstrated, but in disease it becomes thicker, and the vessels composing it increase in size, and send offsets into the cartilage. All this is clearly seen in the specimens of injected cartilage on the table, which I shall have much pleasure in showing you, after lecture, by means of the microscope. In one of the specimens capillary vessels ramifying in the cartilage are seen injected with blood. You will observe, also, many branches perforating the cartilage and ramifying in organised lymph on the free surface. The peculiar arrangement of the vessels in these different substances cannot be mistaken by any one who has been engaged in examining them under the microscope. You must then be quite satisfied, I think, that cartilage, when inflamed, contains blood-vessels in tolerable plenty; and if there are vessels carrying blood to nourish the tissue, there must also be vessels to carry back that blood and to convey away effete and useless matter.

I am not aware that this fact has been demonstrated before. Sir B. Brodie argued, very correctly, the probable existence of blood-vessels in cartilage, from the fact that, although exposed to friction and pressure, cartilage does not wear away; that it is subject to inflammation and other diseases; that it is sometimes reproduced; and from other considerations connected with the functions of that tissue. Mr. Mayo, again, has referred to specimens of diseased joints...
which he had injected, in which he says he has clearly shown vessels ramifying in cartilage. I have, however, closely examined these specimens, and although a few vascular fringes are seen creeping up the edges, the appearance is very doubtful and unsatisfactory, and no pains were taken to exhibit the real nature of these little streaks by the aid of a glass, and it is only by the use of a good one that the vessels in inflamed and diseased articular cartilage can be detected.

Now, in what way, let us ask, does ulceration of cartilage take place? It happens after three different fashions, and they are these:

First. It may occur in consequence of a swollen state of the synovial membrane, producing pressure on the cartilage. In these cases the ulceration begins at the edges, and the cavities and crevices left by the process of absorption are accurately filled up by fringes or tufts of membrane. These processes of membrane merely fit in accurately, and do not generally obtain any more intimate connection. They have nothing to do with absorbing the cartilage,—no injection can be made to pass from them to the tissue beneath them, and they are only held in their place by the pressure of the atmosphere, which prevents the occurrence of a vacuum, here as elsewhere. Sometimes, however, adhesions take place and anastomoses with the vessels of the medullary web, and these adhesions may be found of considerable length, stretching across the joint. This, then, is the process of ulceration when the ulceration commences, and goes on from the surface towards the bone, which may itself become the seat of ulceration when the cartilage is perforated entirely.

Secondly. Cartilage may become ulcerated at a distance from the edge and from the fringes before mentioned. Thus it may be eroded from the surface of the patella, or the condyles of the femur, &c. In this case the cartilage becomes swollen and softened; it then puts on a rough and fibrous appearance at one or more points where ulceration commences, and goes on from the surface towards the bone, which may itself become the seat of ulceration when the cartilage is perforated entirely.

Thirdly. The process of ulceration may commence at the attached, and proceed towards the free, surface. I have already spoken to you of a vascular layer, or membrane, which exists between the bone and articular cartilage, which is hardly demonstrable in health, though it becomes very evident in inflammation of joints. In this third form of the ulcerative process the membrane alluded to swells up, and separates the cartilage from the bone to which it was attached. The part of the cartilage that is opposite these points then begins to ulcerate, and gets thinner and thinner, until at last it is altogether removed, and ulceration is formed, or it is separated in the form of a thin flake, which floats loosely in the joint.

These, then, are the three forms in which ulceration of cartilage takes place. It is always, as I have before said, attended with great pain, more particularly when the roughened surfaces are made to rub over one another. In the lower animals we see this so much the case that a slight amount of the affection will ruin an animal altogether, and render him useless. In the well-known "Navicular disease," for example, for which many valuable horses are obliged to be destroyed, the amount of disease found on examination is surprisingly small. This disease consists in ulceration of the cartilage covering a bone which is deeply seated in the hoof, and serves as a kind of pulley for the flexor tendon; and the pain caused by rubbing over the rough surface is so intense that the animal will scarcely put the foot to the ground, and can no longer be put to work. Here is a specimen of the disease which was given me by an excellent veterinary surgeon, the late Mr. Castle, of the 12th Lancers. The horse from which the bone was taken, a very valuable one, having cost something over two hundred guineas, became so lame that his owner had him destroyed by advice of the veterinary faculty, after all means of cure had failed. The ulcerated cavity, you will perceive, is like that in a carious tooth, and will, in fact, barely admit the end of a common dressing-probe. Yet this is the amount of change of structure in the cartilage and bone, which had led to inflammation and tenderness to such an extent in the neighbouring parts as to render the animal a burden to himself and totally useless to his possessor.

When ulceration of cartilage has once been established in the human subject,—when the osseous tissue is exposed, and more especially if any portion of the bone perishes,—a favourable termination of the case is hardly to be expected; that is to say, it is rare, whenever disease has advanced so far, for a patient to recover without losing the diseased parts, either by resection of the joint or amputation beyond it.

Sometimes, however, a sort of natural cure takes place, by ankylosis, as it is called; the ulceration is stopped, new bony matter is thrown out in large quantities from the exposed surfaces, and the articulating ends are, as it were, glued closely to one another. Any one of the joints of the upper and lower extremities may thus become immovably fixed, and so may the vertebrae, as we shall see hereafter. Here, also, is a rare specimen, belonging to the museum of University College, in which ankylosis of the lower jaw to the temporal bones has taken place. In some of these cases the disease may be said to be cured, but in others the stiffness of the joint renders the limb worse than useless.

Now, as to the treatment of the affections we have just considered. Knowing the serious and dangerous changes which may occur when inflammation of a joint is
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allowed to continue long unchecked, you will easily understand how acute synovitis ought to be combated with vigour and decision. In the first place, the part must be kept perfectly still and quiet,—and this applies equally to all these affections of joints,—not by means of splints and bandages (for these would only increase the irritation and swelling), but by supporting the limb on an inclined plane and cushions, the patient being at the same time confined to bed. I say this, "in the first place," because there is no chance for the most active and judicious antiphlogistic measures unless at the same time perfect rest be enjoined and preserved, so as to avoid fresh cause for inflammatory action; and because it is a point which is often overlooked, and to the omission of which we may often attribute want of success in many cases. In the next place our measures must be actively antiphlogistic, so as to make at once a decided impression on the affected joint.

If the inflammatory action be high, and the patient robust and strong, blood may be taken pretty freely by venesection, but if the patient be of a weakly habit or unhealthy constitution this may be dispensed with, and abstraction of blood confined to the neighbourhood of the joint itself.

After having thus, where necessary, diminished the quantity of circulating fluid, and consequently the tendency to inflammation, you should next relieve the congestion of the part itself by cupping, or the application of leeches. These latter should not be applied, as you sometimes see them, by six or eight or ten at a time, to a large joint, but several dozen should be put on at the beginning, and, if necessary, frequently repeated, until the pain is gone and the tenderness very considerably diminished. You will do well to persevere boldly in this plan of treatment, well knowing that if you lose the chance of putting down the inflammation at once, by using half measures, which can be of no real benefit, you run the risk of the formation of pus in the joint, after which there can be little or no hope of preserving all the functions of the joint.

I need hardly say that, with the above line of proceeding in acute synovitis, you should not neglect to purge the patient thoroughly, and keep him on low diet. After the leeches have been applied, also, the joint should be assiduously fomented with flannels, or bags of chamomile flowers, wrung out of hot water. These are more agreeable to the patient, and relax the tissue more than cold applications; and, if necessary, frequently repeated, until it becomes perfectly soft and pliable. It is then applied and kept in apposition with the limb, by means of bandages, until it is perfectly dry. When this is the case the splint is removed, its edges are pared smooth, and it is properly padded and lined with wash-leather, so as to fit comfortably to the patient.

Again, when there is much puffy swelling of the joint, you may, with propriety, imitate, in some measure, the practice of Mr. Scott, of Bromley. I need not detail to you the whole proceeding, a portion of which savours somewhat of quackery, but the principal and most essential part of it is the drawing of strips of lead-plaster pretty firmly round the whole joint, the skin being previously covered with some pieces of lint, spread with soapcerate and camphor. The latter application serves the double purpose of gently stimulating the part, and defending it from friction and excoriation; whilst the former (the lead-plaster) produces its effect by the support and even pressure which it affords to the joint, thereby preventing further effusion, and putting the parts in the most favourable state for the absorption of that already there. If necessary, leather splints may be worn in addition to these plasters.

Whilst these means are being taken the state of the general health should be attended to, and tonic medicines, suitable to the circumstances of the case, should be administered.

When tuberculous deposit takes place in the heads of long bones, little, I fear, can be done. You may, by judicious attention to regimen, &c., improve the patient's constitution and strengthen his frame, and you may flatter yourselves that under these circumstances the deposit will be absorbed. You will, however, generally find yourselves deceived, though the disease may remain long dormant. Where the disease is attended with much pain, and the patient is deprived of sleep, you may be inclined to apply leeches, but in these cases, if they are used at all, it should be very sparingly, and you should then employ counter-irritants, such as blisters of nitrate of silver, or causticwares, eruptions on the skin by tartar-emetic ointment or croton oil; or very strong tincture of iodine, may be painted on the part

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with a camel's-hair brush. These should be applied over part of the joint at a time, and frequently repeated.

I question very much if the employment of deep issues, made by potassa fusa, corrosive sublimate, &c., are attended with much benefit; and I think that, excepting in very severe cases, the employment of the actual cautery, whether by the hot iron or the moxa, is not warrantable. These remedies, on the contrary, often excite a great deal of irritation, and I need not say that if any tendency to inflammatory action remains in the joint, as it will for a long period, they are calculated to cause the greatest mischief. I have a specimen in my museum of a knee-joint which was actually opened by the determined application of these deep issues, one of which, at the inner side of the limb, has ulcerated through the fibrous and synovial capsule, and was the immediate cause of the leg being amputated.

When the whole of the structure of a joint is affected with disease, so that the cartilage is ulcerated, and the bone denuded and rough; when the joint is filled with purulent matter; when there is great laxity of motion, and the bones grate over one another, if moved from side to side; when the patient suffers much pain, and his strength is beginning to be affected by the operation of the local disease on the constitution, nothing can be hoped to be effected without removing the disease altogether.

Sometimes, as you will hereafter learn, this may be done by excision of the joint; but at other times it implies the amputation of the limb above the diseased joint. When we come to surgical operations I shall have to consider the kind of cases in which either operation is desirable.

Before dismissing the general consideration of diseases of joints, I may just mention that severe pains in these parts are often complained of, particularly by weakly children, without any actual disease of the part, and merely from a deranged state of the general health. When the bowels, for example, are deranged by the presence of worms, or sordes, pains are felt in the hip or in the knee, and these may be severe enough to make persons believe that the joints are affected, and treat them accordingly. These symptoms are not, however, got rid of until the source of irritation is removed; and when perhaps, by a brisk purge, some worms are expelled from the intestinal canal, the joint becomes in a little time free from pain, although it has not itself been treated.

Again, in some nervous persons, such as hysterical young women, you may meet with many symptoms of ulceration of cartilage, such as great pain on moving the joint, inability to use the limb, &c., and there may even be, when the knee is complained of, some puffiness about the patella. But on more attentive examination you are able to find out the nature of the case. You find that the patient does not suffer more when the joint is roughly handled than when it is gently and carefully moved; that there is as much tenderness evinced when the skin alone is pinched very gently as when pressure is made directly into the joint; and that though the patient, if asked, complains of constant and severe suffering, the whole will be forgotten when the mind is engaged in conversation or otherwise. Where such a case is clearly made out, of course you would treat it accordingly, attending principally to the re-establishment of the patient's health and cheerfulness, by the use of tonic remedies, changes of scene and occupation, &c., rather than applying any very active measures to the joint itself. In some cases belladonna-plaster may be useful to soothe the part, or any other similar application may be made, for the same purpose, with advantage. Sometimes, also, it is necessary to use stimulating ointments and liniments, and even to employ a considerable extent of counter-irritation, as though there were actually inflammation of the joint. There may, of course, be some chronic disease of the synovial membrane, which is apparently exaggerated in importance by an hysterical and nervous patient, and that should not be overlooked. Indeed, although it is right that you should be aware of the existence of these nervous affections of the joints, yet there is great danger in taking up the idea too strongly and too readily. In military practice, in particular, the suspicion that men are simulating disease in order to escape work which they are obliged to undergo when well, often causes chronic affections of the bones and other parts, to remain long unattended to, or, at all events, not to be treated so attentively as the cases really require. I have in my collection a specimen taken from the body of a soldier, who must have suffered great torture during the latter part of his life, and yet was looked upon as an imposter, or "malingerer"—or one who exaggerated his sufferings unnecessarily. He complained for a long time of pain in the back, rendering his work exceedingly irksome to him, and at last disabling him altogether. For a long time no notice was taken of his complaint; at last he was taken into the hospital, where he died, and after death it was found that extensive disease had taken place in the lumbar vertebrae. You should, therefore, be very careful in your examination, and be cautious how you pronounce a case to be a purely nervous affection, for should it at a future time be ascertained that the joint is really diseased it would be a very awkward circumstance.

In the next lecture we shall commence the consideration of the diseases of particular bones and joints.