

# Clinical Lecture

ON

## OSTEO-MYELITIS AND ACUTE PERIOSTITIS.

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GENTLEMEN,—I shall direct your attention to-day, first, to the subject of osteo-myelitis, or inflammation of the contents of the medullary and Haversian canals, including the spaces in the spongy portion of the long bones; and, secondly, briefly consider the effects produced by this form of disease as compared with that caused by periostitis.

Osteo-myelitis may be either acute or chronic in its course, but, unless as a complication following operations or injuries of the long bones, the acute form of the disease is not often met with in this country. On the other hand, chronic inflammation of the contents of the spongy portions of various bones is a fertile source of mischief, not only to the osseous tissue, but also to joints situated in the proximity of the disease, because, as I shall subsequently explain to you, a cavity of this kind affords the easiest exit to the products of the inflamed structures. You are aware that in the soft tissues of the body the materials arising from the process of inflammation are, as a rule, prevented from entering the blood, not only by the contraction and plugging of the vessels surrounding the inflamed area, but also in consequence of the new cell-formation which occurs in the part effectually closing the capillaries, and probably preventing the absorption of putrid material into the circulation through the radicles of the lymphatic system. And there can be no doubt that in instances of chronic osteitis the surrounding Haversian canals and medullary spaces become occluded; nevertheless, the formation of the vascular system in bone is eminently adapted for the absorption into the circulation of putrid matter formed in it, and hence we find in practice that over and above the death of the bone resulting from acute osteo-myelitis the patient runs a very great risk from pyæmia. Professor Longmore has noticed that, after trivial gunshot injuries involving the periosteum, acute inflammation of the contents of the medullary canal sometimes occurred, followed by the death of the patient from septicæmia. But Sir J. Fayrer has without doubt done more to elucidate the circumstances of osteo-myelitis than any other living authority, a large portion of his experience, like my own, having been acquired in the tropics, where osteo-myelitis and pyæmia are more frequently met with than in this country. In fact, some ten years ago it was rather the exception than otherwise not to have osteo-myelitis among our hospital patients in Calcutta after amputations or compound fractures of the extremities. It is true that, stricter attention having been given to the sanitary condition of these institutions, and in my own practice, after the introduction of the antiseptic system of dressing, we lost fewer cases from pyæmia; but I confess that this improvement was partly due to other than atmospheric influences, because cases of osteitis and pyæmia sometimes occur without the admission of air into the inflamed parts—for instance, after injuries to the skull, although no breach of continuity of the scalp has taken place, I have seen the most rapid and deadly septic poisoning supervene,—but, as I said before, the carbolic spray and antiseptic dressing have, I believe, saved the lives of a considerable number of the patients in the hospital I was formerly attached to.

It does not seem to me that there is any great difficulty in diagnosing a case of osteo-myelitis, especially if the disease follows on injury to the bone. The patient under these circumstances may appear to be doing well for the first week or ten days after the operation: the stump or wound, as the case may be, perhaps looks in a satis-

factory condition; there is no deep-seated pain or external signs of inflammation; but the patient's temperature rises suddenly, and he complains of rigors, or it may be only of a chill, followed by perspiration, his tongue becomes dry and brown, the pulse and breathing rapid, and the skin and conjunctiva assume a dull, yellowish appearance; but, above all, the temperature of the patient's body rises and falls suddenly within the course of a few hours. Symptoms such as these indicate pyæmia, and I need hardly remark they are different from those of ordinary surgical fever, which usually supervenes some twelve or sixteen hours after an operation. The patient's eye is bright and glistening, his face and forehead are flushed, the skin feeling healthy to the touch, though hot and dry; in fact, the difference between pyæmia and surgical fever are as distinct as that between any two members of the same family can well be, although it is not always easy to describe their characteristic features in words. The more closely, however, you watch these fevers at the bedside, the clearer will their respective peculiarities dawn upon you, and enable you, without hesitation, to give an opinion as to the form of fever from which your patient is suffering. But the symptoms I have referred to only allow us to arrive at the conclusion that the case is one of septic poisoning; they do not determine the point as to the existence or otherwise of osteo-myelitis. To satisfy ourselves on this matter we must pass a probe down to the medullary canal of the injured bone, and if we find that its cellular lining has been destroyed, and we discover bare bone for some distance along the course of the canal, we should not hesitate to lay open the wound, and accurately ascertain the state of the osseous tissue. It may possibly be that only limited necrosis exists, but in this case it is hardly likely that the pyæmia is the result of the absorption of putrid matter lodged in the osseous structures. In the early stages of osteo-myelitis the contents of the medullary canal may be seen protruding from the end of the bone as a red fungating mass; but this condition soon passes away, the contents of the canal suppurate, and we shall find it empty, its walls denuded of their lining membrane; in fact, necrosis of the bone surrounding the canal will have taken place. Under these circumstances, Sir J. Fayrer insists on the fact that the best chance we have of saving the patient's life is to amputate (or reamputate) the limb at, or above, the joint above the diseased bone; and I quite agree with him as to the necessity of this line of practice, for it is only by the entire removal of the source from which the putrid matter is being absorbed into the blood that we can hope to preserve the patient's life.

But, as I have before remarked, you are not to suppose that acute osteo-myelitis only occurs in cases of direct injury to the osseous tissue; for, as Mr. Savory and other authorities have observed, the exposure of a limb to sudden extremes of heat and cold, such as plunging the legs and feet into ice-cold or very warm water, may set up acute osteitis in the part exposed to treatment of this kind, and the case now under our treatment in St. Luke's ward is an instance in point.

W. S—, aged ten, was admitted into the Westminster Hospital on Feb. 8th. The patient's father and mother are strong and well-to-do country people; there is no suspicion of any marked hereditary disease in this case, and our patient, though slim, has been a very healthy boy up to the present time. He was perfectly well until December 20th, when, on his way home from school, he fell through the ice into a pool of water, and got his feet and legs wet. In this condition he returned to his cottage. The weather was very cold at the time, and in the evening his legs became extremely painful, and his mother, thinking he had rheumatism, applied hot poultices to his limbs. The patient has since been confined to his bed; his legs became much swollen; after some three weeks two abscesses burst in front of the right shin, and subsequently another formed over the ankle-joint, and discharged a small quantity of matter. The skin inflamed over the left foot in a similar manner. The patient was seen in January by Mr. T. Eager, of Woking, and, by his direction, removed as soon as practicable to the hospital. On admission we found that the right leg and foot were pale, swollen, and very œdematous, with three ulcers along the shin and over the ankle-joint; there was no discharge from these sores, but on passing a probe through the upper ones, we came down upon soft

disintegrated bone; the instrument could be thrust deeply into the dead bone. The left foot was affected in the same way. Our patient was much emaciated, with a dull jaundiced eye, dry brown tongue, a small very rapid pulse, and respiration 42 in the minute. His skin felt clammy, and was covered at times by profuse perspiration, the temperature of his body rising and falling rapidly from 101° to 105°. There could be no doubt as to his being under the influence of septic poisoning, arising in all human probability from the absorption of matter about the dead tibia.

I could not obtain permission to remove the limb until the 15th of February, when the leg was amputated at the knee-joint. The patient suffered from diarrhœa after the operation, and it was with some difficulty we managed to control the purging; but, with this exception, he has improved rapidly in health, and is now convalescent.

In passing, let me warn you not to think lightly of diarrhœa in cases of pyæmia, or to foster the notion that purging of this kind is an effort of nature to eliminate the poison from the system. My experience leads me to think that diarrhœa in these cases is an indication of extreme exhaustion, and, unless you can control it by means of opium and astringents, the prognosis must be a very unfavourable one.

But I would draw your attention to the condition of the amputated limb. The tibia I show you was taken from the leg immediately after it had been removed from the body, and it has since undergone no maceration or preparation of any kind, and you observe its cancellated structure and medullary canal are entirely destroyed. It looks just like a bit of old worm-eaten wood. The outer shell of the bone is more healthy than any other part of the tibia. And all this mischief has been the work of less than seven weeks' disease. The patient was suffering from great pain in the knee-joint before the operation, and, although the articular cartilages covering the lower end of the femur were found to be healthy, it was nevertheless a hazardous proceeding amputating as I did through the joint; for you must bear in mind the fact that there is a great tendency for osteomyelitis to extend from the bone affected to contiguous bones, without the intervening joint (if there happen to be one) being affected. In fact, I think that pyæmia commencing from osteomyelitis does not, as a rule, give rise to abscess in the joints; the lungs first, and then the liver, are the most common seats of those isolated spots of necrosed tissue which are generally described as secondary abscesses. If you examine the lower end of the tibia and the astragalus taken from W. S.—'s leg, you will clearly appreciate the bearing of the remark I made regarding amputation through the knee-joint, for you will notice that there is a large isolated cavity in the lower end of the tibia, which was the seat of an abscess. The periosteum covering this portion of the bone, and that over the astragalus, is, as you observe, perfectly healthy. The cartilage lining the osseous surfaces of the ankle-joint is unaffected, but beneath the cartilage of the upper surface of the astragalus you see there is another cavity, the seat of a second abscess; and a similar abscess has formed in the cancellated tissue of the bone, and passing forwards, has burst into the astragalo-scaphoid articulation. But I would call your special attention to this deep red patch of cancellated tissue beneath the cartilage lining the lower surface of the bone; you may notice that it is surrounded by apparently healthy osseous tissue, the patch itself being a spot of highly inflamed bone. I have examined sections of the part under the microscope in the fresh state, and shall describe its condition to you in the next lecture; for the present, I may observe that we have in the inflamed spot an example of the earliest stage of the process which, after continuing for a time, has led to the abscesses above referred to in the astragalus, and which has reduced the tibia to the necrosed condition in which you now see it. But as I said before, this patch of inflamed tissue in the astragalus is separated by healthy bone from surrounding abscesses, and I have so often seen similar instances of acute osteomyelitis leading to this condition that I urge you strongly, in amputating in cases of this kind, to cut beyond the joint next above the site of the disease.

Osteitis, however, is not by any means always the acute affection I have illustrated by the case of S.—, for in the next bed to his there is a patient, H. T.—, whose os calcis I excised some seventeen days since. The bone, as you see, is covered with healthy periosteum, but in its centre there

is a cavity as large as the top of one's little finger, and from this, leading down to the lower surface of the bone, is a passage through which the products of the inflamed tissues found their way, but then meeting with resistance from the dense structures covering the heel, the matter had forced a passage up along the exterior of the bone, and burst through the skin on either side of the foot.

H. T.— was sent up by Dr. Ferris, of Uxbridge, and placed under my care in this hospital on the 2nd of March. He states that four years ago he thought he must have sprained his foot, as he was seized with violent pain in the heel; this lasted for some months, and then abscesses formed on either side of the heel, which burst and relieved the pain, but the wounds have continued to discharge ever since. The boy has enlarged cervical glands, and is doubtless of a strumous diathesis. On passing a probe through the fistulous openings no bare bone could be discovered; the reason of this is now apparent from the course the matter had taken to reach the surface. You will observe that the cavity in this os calcis contains no dead bone, and further that its walls are lined with a compact layer of osseous structure, corresponding to the walls of a chronic abscess of the soft parts of the body. But if in place of opening externally, as the collection of matter in this os calcis has done, the abscess had been so situated that the point of least resistance for the pus to have taken had been into a joint, the result would have been to excite changes in the part resulting in the destruction of the articulation. And this is doubtless the history of some cases of joint disease; or, in other words, chronic osteitis, though by no means always ending in abscess, occurring in the spongy ends of one of the long bones, may terminate in partial disintegration of the bone, and destruction of a neighbouring joint. On the other hand, it is quite possible that inflammation occurring in the cancellated tissue of bone may pass off without leading to further mischief in the part than a certain amount of enlargement and consolidation of the structures implicated in the diseased action.

It is hardly possible for me to draw your attention to more instructive specimens of diseased bone than those I now show you, as contrasted with the shaft of this fibula, which I lately excised from the leg of a little boy in Luke ward. In this instance we have an example of acute periostitis in contradistinction to inflammation, commencing in, and being chiefly confined to, the contents of the medullary and spongy portion of the bone; and you will observe the difference between the shaft of this tibia affected by osteomyelitis, and this fibula in which the periosteum has been destroyed by acute inflammation. In the former specimen we have seen that the whole of the cancellated structure of the bone is necrosed; but in this fibula the external layers only of the bone are implicated, although it is absolutely bare of periosteum from end to end. The superficial layers of the bone are affected in this latter case because the external layers of the long bones grow from and receive their vessels through the periosteum; but, as we learn from a longitudinal section through the bone, the medullary canal and the cancellated tissue are perfectly healthy.

W. C.—, aged six, was admitted into this hospital on Dec. 21st, 1875. He states that his schoolmistress struck him with a cane across the leg. The limb became swollen and very painful. The child's mother has lost the bone of her nose from disease, and the patient is a sickly-looking little fellow. On admission we found the right leg very much swollen, of brawny hardness, and there were all the indications of a deep-seated abscess in the muscles of the calf of the leg. On the 23rd a grooved needle was passed into the inflamed structure, but, as no matter appeared, a deep incision was made down to the bone, and a very considerable quantity of pus escaped from the wound. On the 27th another free cut was made along the lower part of the fibula so as to give free exit to the matter. Bare bone was distinctly felt, but we delayed further proceedings at the time because in some few cases of the kind the periosteum which has been separated from the bone by the products of inflammation, so soon as these have escaped, reunites to the osseous tissue, and considerable superficial necrosis of the shaft of the bone is prevented. But as the discharge in this case became very profuse indeed, and the child's health was rapidly failing, I cut down on the diseased bone, removed the whole of its shaft, leaving the upper and lower epiphyses *in situ*.

In this instance the inflammation of the periosteum followed a blow over the bone, and at first sight the case looked like one of abscess of the calf of the leg, but on passing a grooved needle down into the muscles no pus could be discovered, and we had to cut upon the bone before the matter flowed into the wound. Two free incisions were, therefore, made into the periosteum. The drain of matter from these was subsequently so profuse that it speedily began to tell on the boy's health, so that I had to remove the shaft of the bone, leaving, however, the upper and lower epiphysis, for they were covered with periosteum, and I expected that the greater part, if not the whole, of the bone would re-form from these epiphyses; and such has been the case. You can now distinctly trace the outlines of a new tibia under the cicatrix in the skin; in fact, the shaft of the bone has been partly re-formed. One of the most important practical lessons we may learn from the case is, that in "deep-seated abscesses," especially if they occur in the leg or thigh, pass your finger down through the opening you make to allow the pus to escape, and examine the condition of the bone, for in cases of this description you may discover that the inflammation has commenced in the periosteum, and spread outwards into the soft parts. Acute periostitis is not very frequently followed by pyæmia; at the same time, it occurs generally among debilitated children or in adults in bad health, and the separation of the dead from the living bone is a tedious process attended with profuse discharge, which in time may no less surely destroy the patient than pyæmia would in instances of osteo-myelitis.

In the next lecture I shall give you an account of the pathology of osteo-myelitis, and illustrate the subject by specimens prepared from the bones I have shown you to-day.

## NOTES ON UTERINE PATHOLOGY.

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### II.—DESCRIPTION OF THE VARIOUS ABNORMAL CONDITIONS OF THE UTERINE TISSUES.

It appears to be essential, to anything like an accurate estimation of the relation of the various pathological changes in the uterus one to the other, to examine carefully our present nomenclature and actual knowledge regarding the nature of the tissue-changes in the organ so frequently observed in connexion with distortions and other analogous alterations.

These tissue-changes have been described under various names—chronic inflammation, congestion, hypertrophy, atrophy, areolar hyperplasia (Gaillard Thomas), &c. &c. It need hardly be stated that under these various general designations are included conditions not seldom widely different.

For obvious reasons it will be advisable to limit our inquiries for the moment to the tissue-changes observed in the uterus in the *ante-puerperal* state; for when pregnancy has occurred other peculiar changes result, the consideration of which demands a separate inquiry. Tumours of the uterus are of course excluded.

Medical phrases are of unquestionable utility when they are intended to formulate some known fact or to represent a leading and dominant idea, but when a question is to be seriously debated they are frequently an impediment rather than a help. In attempting, therefore, a clinical description of the tissue-changes in the nulliparous uterus, it will be better as far as possible to avoid them.

The principal physical abnormal changes in the uterine tissues with which we are familiar by clinical observation are—(A) Softness, (B) hardness, (C) enlargement, and (D) diminution in bulk.

(A) *Softness*. By this is to be understood an absence of that degree of firmness and resistance which is natural to the healthy uterus. It is placed first in order because there are reasons, as will be shown, for attaching a high degree of importance to it as a pathological factor. Observation has convinced me that it is a physical change which occurs with great frequency in the early stage of chronic cases

of uterine disease. The os and cervix uteri are readily to be felt, and hence this change is one very readily appreciated. The softness presents itself in all degrees. I have found the cervix so soft that its outline was rendered indistinct and closely—so far as its softness is concerned—resembling the state of the tissues of the os in advanced pregnancy. Naturally, as is well known, the vaginal portion of the cervix is very firm and resistant. This softness of the vaginal portion is generally associated with a like degree of softness of the body of the uterus, but in the case of the body of the uterus the change in texture is not so easily appreciable. The evidence of the existence of softness of the body of the uterus conjointly with softness of the os and cervix is of an inferential character, but it is clinically demonstrable. Existing by itself, undue softness of the uterus is not accompanied by exaltation of sensibility under ordinary circumstances. It is almost invariably accompanied by a more profuse secretion than usual from the mucous surfaces of the uterus. It is probably present to a slight degree during the normal process of menstruation, but in such a case the softening is not of course pathological.

Softness of the uterine tissues implies necessarily another quality—viz., pliability. Naturally this is a quality which the uterus possesses in a certain degree, but when the uterus is in a state of health it is compensated by the rigidity which the firmness and resistance of the healthy uterus offers to any attempt to bend it, and which, moreover, aids it in resuming its proper shape after being bent. The uterus is largely dependent, as I have been for some time accustomed to teach in my lectures, for maintenance in its erect position upon its own tissues, far more, indeed, than upon its outer attachments. Proportionately to the size of the uterine canal the thickness of the uterine walls is considerable, even at the part where the uterus is weakest—namely, at its centre. Deficient firmness in the uterine walls necessarily then implies an increased pliability of the organ, and clinical evidence abundantly shows that exceeding softness of the uterus is very frequently indeed conjoined with an extreme pliability. Not unfrequently the sole discoverable physical change present is this softness combined with undue pliability. There may be no tenderness to the touch, there may be no redness or increased vascularity to be observed by the eye at the os uteri, and there may be no increase in the bulk of the uterus; in fact, it may be even smaller than usual. The cases in which this softness, uncomplicated with other conditions, exists form a very important group, with which I have become acquainted by clinical observation alone, and, so far as I am aware, the bearing of the facts of these cases is a very wide and interesting one in any discussion on the subject of uterine pathology.

The cases in which this peculiar softness of the uterus presents itself in its typical form are those of young women who present other obvious indications of weakness, want of power, debility, and general feebleness. In a subsequent paper it will be shown how frequently such a condition of the uterus is responsible for the inability such patients experience in walking, owing to the circumstance that the uterus is so pliable that the mere assumption of the vertical position suffices to produce a marked degree of flexion, which may be temporary or become subsequently persistent.

My purpose now, however, is to endeavour to arrive at an intelligible explanation of the undue softness.

It is some few years now since Scanzoni published his valuable monograph on "Chronic Metritis." In that work he very forcibly dilates on the circumstance that the so-called chronic inflammatory changes in the uterus would be more correctly looked upon as chronic nutrition disturbances. This view has always strongly commended itself to my mind, and the observations which I have accumulated in the course of some years would seem abundantly to support this conclusion.

Applying these common-sense principles to what may be observed in these cases of undue softness of the uterus, it becomes sufficiently evident that these are really cases of imperfect nutrition—starvation—of the uterus. The organ is imperfectly nourished, very frequently in common with other organs of the body; the natural result is that the tissues are soft, spongy, and non-resistant. The cases in which this malnutrition of the body at large gives rise to