Circumscribed abscess of bone : a paper read before the Harveian Medical Society at the first meeting of the session 1867-68 / by T. Carr Jackson.

CIRCUMSCRIBED ABSCESS OF BONE.

A PAPER READ BEFORE THE HARVEIAN MEDICAL SOCIETY

AT THE FIRST MEETING OF THE SESSION

BY

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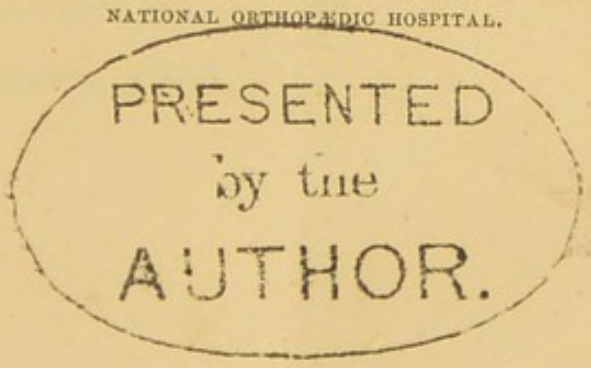

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PREFACE.

THE following pamphlet contains the substance of a Paper read before the Harveian Medical Society, at the first Meeting of the Session, 1867.

The writer has no misgiving about the interest or value of the subject, but much with regard to his mode of dealing with it. Setting his good intention against any shortcomings, he trusts his Cases and remarks may not be deemed unworthy of attention.

3, WEYMOUTH STREET, W.
January, 1868.

CIRCUMSCRIBED ABSCESS OF BONE.

Mr. President and Gentlemen,—

In addressing such an audience as I have now the honour of appearing before, on "Circumscribed Abscess of Bone," it would be mere waste of time, if not a presumption on my part, to preface my Cases and remarks with any detailed observations on the Physiology and Pathology of the osseous tissues. For you all know as well as I do, that the bones, in health and in disease, obey the same physiological and pathological laws as do the soft tissues; that, as in health all these tissues grow and are nourished after a like fashion, so in disease they all exhibit like processes of decay, degradation, and destruction. Therefore, however interesting and tempting it might be, to trace the analogies between the results of inflammation in different tissues, and to notice how these results are essentially the same, though modified, as regards some of the attendant and accidental phenomena, by peculiarities in the organization, function, and physical properties of the texture involved; yet I will not venture to occupy

your time by any such analysis at present. I will content myself with observing, that the Circumscribed Abscess of Bone is a striking illustration of the essential sameness, and the accidental diversity, of the inflammatory process as it affects different tissues. No textures can be more different to the naked eye and to the touch, than are bone and areolar tissue; but inflammation of the one differs from inflammation of the other only in its accidental, not in its essential, features. The inflammatory process is the same in both; yet the attendant phenomena are diverse, owing to the density and resistance of the one tissue, and the loose and yielding character of the other. The results—Abscess, Ulceration, Mortification—are essentially the same. Hence we get differences in rate of progress, in degrees and kinds of pain, in external appearances, and in other symptoms. The reality of these differences, as well as the exaggerated importance attributed to them in former times, is marked by the nomenclature of diseases of the bones: Ulceration becoming, in the osseous tissue, Caries; and Mortification, Necrosis. No mischief can arise, however, out of this difference of nomenclature, so long as it is remembered that the principles of treatment are the same, whether the disease be of the bones or of the soft parts. As Hunter remarks,—"Nor can they (the bones) require a different treatment as regards their vital power, from the soft parts, though they may in the mechanical part; but it will be found that they require a different mechanical treatment only in consequence of their solidity."

Circumscribed Abscess of Bone has not been very long distinctly known to the Profession; the late

Sir Benjamin Brodie having been the first to describe it, and to point out its diagnosis and treatment. It will be well to call to mind the *how* and the *when* of his doing this; for it is a striking and pregnant example of how the true Surgeon, if a brave and honest man, draws good out of evil, and makes a mistake fructify to the advancement of science and art; and of how the alchemy of talent can transmute the loss of an individual into the gain and advantage of mankind.

In his Lectures illustrative of various points in Pathology and Surgery (1846), Brodie tells us that in 1824 he was consulted by a young man, who had a considerable enlargement of the lower end of the tibia, with constant pain, varying in degree, in the part; that he had suffered from it for twelve years; that he had consulted many Surgeons respecting it, and had used a great variety of remedies, but had never derived any benefit from anything that was done. Brodie tried some remedies without any advantage, and at last amputated the limb; the unfortunate patient losing both that and his life. On examination of the amputated tibia, a Circumscribed Abscess was found in the enlarged end of the bone; and Brodie remarks,—"On observing these appearances, I could not help saying that, if we had known the real nature of the disease, the limb might have been saved. A trephine would have made an opening in the tibia, and have let out the matter. It would have been merely applying the treatment here that we adopt in cases of Abscess elsewhere."

Since that time many cases of successful diagnosis and treatment of this disease have been recorded by

Brodie and other Surgeons; and, thanks to him, such a mistake as he made, and honestly recorded, would now be inexcusable.

I purpose, therefore, claiming attention to the narrative of three Cases bearing upon this subject. In the first Case, notwithstanding the typical character of the objective and subjective symptoms being, according to Brodie's description, complete, no Abscess or pus could be found. In the second, some of the more objective symptoms were absent; yet an Abscess existed. In the third was exhibited a more rare form of disease, affecting the shaft of the bone, where, though some of the symptoms usually relied upon as conclusive were wanting, the Abscess was present nevertheless. Lastly, I shall offer you some general observations on the pathology, diagnosis, and treatment of this disease.

(1.) M—— H——, an unmarried female, aged 17, was brought to me for consultation, by Mr. Harris, of Gower Street, Sept. 10, 1860. She had always enjoyed good health as a child; and had begun to menstruate about fourteen months previously, which function had since occurred regularly without intermission. Eight years previously her illness began with an attack of pain in the lower part of the tibia, which was regarded as due to rheumatism, or growing pains; but increasing in severity, she was brought to London, and under the advice of an eminent Surgeon the part was blistered for twenty consecutive weeks. Her suffering was somewhat relieved while the blistered surface re-

mained open, but recurred with increased severity when it healed. Other Surgeons were now consulted, and in turn the various remedies suggested by each had a patient trial :—iodide of potassium, bichloride of mercury, including a variety of local applications, from each and all of which she derived not the slightest benefit. An attack of measles was followed by an unusually severe aggravation of her local complaint, amounting to excruciating agony, coming on daily at 4 P.M., and continuing until 4 A.M., wholly destroying her rest, then subsiding. The effect of which was, that the general health became affected in a marked degree; and the patient, despairing of relief, herself suggested amputation of the limb, if no other expedient could be devised.

On examining the part affected, the greatest intensity of the pain was referred to a spot about an inch above the inner malleolus on its superficial aspect, and described as like toothache, with occasional throbbing. Around this, the lower end of the tibia was much enlarged; the finger passing from the smooth healthy surface of the adjacent bone to a rough irregular induration; the skin covering which was healthy, and moved freely over the enlargement. Considerable swelling, however, of the soft parts occurred during the paroxysm, which subsided on its remission. The ankle-joint was sound.

The above symptoms afforded little room for doubt as to the nature of the malady. Indeed, in respect to its duration (eight years), the intensity and persistency of the pain, its remitting and recurring character, the enlargement of the bone, the futility of

therapeutic measures, and lastly its effect on the patient's health, it might almost be regarded as a typical instance of chronic Abscess of the tibia. Accordingly, I proposed that the bone should be perforated with a trephine, to which the patient willingly assented. But in order to obtain the sanction of authority for this procedure, Mr. Paget's opinion was sought; and that gentleman, having investigated the Case, independently of the opinions that had been formed respecting its exact nature, without any hesitation arrived at the same conclusion, and fully concurred in the absolute necessity of the operation. Therefore, on the 24th Sept., 1860, having, before the patient was chloroformed, marked the spot alleged to be the chief seat of pain, the bone was exposed by a free incision along the greater part of the enlarged surface, through the periosteum, which was found to be greatly thickened, and its texture penetrated with a small trephine to the depth of an inch, but without entering any cavity, or pus appearing. Therefore the neighbouring cancellous texture, which by inflammatory deposit had become very close and dense, was pierced in various directions with a gouge, until a very considerable perforation of its substance had been made. Failing to discover any cavity, the operation was concluded; not, however, without considerable misgivings that the case resembled one alluded to by Sir B. Brodie, where "a very experienced Hospital Surgeon applied the trephine for a supposed Abscess in the head of the tibia. No Abscess however was discovered, and in consequence the limb was amputated. On the parts being examined afterwards, the Abscess was

discovered at a small distance from the perforation made in the operation, and it was plain that the removal of a small portion more of the bone would have preserved the patient's limb."*

The relief, however, from the operation was complete; the wound occupying between three and four months filling up and cicatrizing, and from that time there has not been any recurrence of the pain peculiar to the disease.

Notwithstanding the apparent faulty diagnosis in this case, there are *three* points connected with it which deserve attention.

1st. A remark of Mr. Stanley's, that, failing the detection of matter, it must be recollected that the smallest quantity of purulent fluid confined within a bone has been the source of very severe suffering; and that when mixed with the blood, which in general freely escapes from the inflamed cancellous texture around the Abscess, the purulent fluid might not be distinctly recognised.

2ndly. The curative effect of the operation performed. The Suppuration which necessarily follows, relieves the tension and gets rid of all those products of the inflammatory process which doubtless have much to do with the production of pain. Here also the practical observation of Sir B. Brodie, having especial reference to the foregoing case, may be quoted :— "Now I do not say that in all cases in which the combination of symptoms exist, such as I have described, the Surgeon should at once conclude that there is an Abscess in the interior of the bone, and

* The preparation illustrative of this most interesting case may be seen in the Museum of St. George's Hospital, series ii. 31.

that the trephine should be applied for the purpose of making an opening into it. For the most part there can be no danger in deferring the operation until it has been ascertained whether such remedies as mercury, sarsaparilla, or iodide of potassium, which are well known to have the power of subduing chronic inflammation of bone, will afford the desired relief. But if these methods fail, I cannot doubt that it is the duty of the Surgeon to perforate the bone. Hitherto, in no instance in which I have performed the operation have I failed to discover the Abscess. But even if it should not exist, I can conceive that the perforation of the bone, by relieving the tension and giving exit to serum collected in the cancellous structure, might be productive of benefit; at all events, the operation is simple, easily performed, and cannot itself be regarded as in any degree dangerous."

3rdly. If we compare the account of this case with the first one described by Sir B. Brodie, it is impossible to avoid being struck by the similarity which the two offer, not only in the length of time that the disease had existed, but especially in the leading characters of the pain and enlargement of the bone.

(2.) I—— S——, an unmarried female, aged 16, was admitted into the Great Northern Hospital, under my care, May 16th, 1864.

Menstruation commenced at 14; but this function had never been completely established, and she may be said to have suffered from anemorrhœa, the catamenia having been absent for four months. About ten years previously, as a child, she suffered from disease of the anterior surface of the shaft of the tibia at its

middle, resulting in the separation of a small piece of bone; and subsequently, one winter, the wound re-opened, but healed firmly during the following summer. During seven years she had suffered great pain in the upper part of the tibia and knee joint at varying periods; being worse in the winter, but gradually getting well towards the summer; and this intermission being pretty complete until the recurrence of cold weather. For the six months, and especially during the last month previous to her admission, this pain again increased to such a degree as to deprive her entirely of rest; its access being pretty constantly about four p.m., and lasting until one a.m., when it gradually subsided. She described it as amounting to the most excruciating agony by the time it reached its intensity, commencing with throbbing; and afterwards of a gnawing character, as if the limb was being slowly torn off; and, under all this suffering and deprivation of rest, her health declined perceptibly.

A singular circumstance in the history of this case is, that the girl came up from Sussex, and walked into the Hospital during my admission week, desiring that her leg might be amputated in consequence of the pain, which she referred to the knee joint, and which she said was rendering her life intolerable. The House-Surgeon failing to discover anything amiss with the joint, requested me to examine it. After some delay, and satisfying myself that no disease existed in the knee-joint, I detected a small circumscribed swelling, or rather puffiness, at the inner side of the tibia, on a level with the upper border of its tuberosity, elastic, but not fluctuating, and bearing

manipulation without complaint; until I accidentally touched with the point of the finger a small spot in its centre, when, with a wild scream of terror and agony, the girl fell back on the bed, declaring she could not bear its repetition. There was no enlargement of the bone around this swelling, nor evidence of periosteal thickening beyond the firmness of its boundaries which minute tracing with the finger from the adjoining surface detected. A cicatrix in the middle of the tibia marked the place whence exfoliation had taken place ten years before.

Considering the character of this pain, the long duration of the malady, the evidence of former disease of the bone, and the absence of any disease of the knee-joint, I came to the conclusion that the symptoms were due to an Abscess in the head of the bone. Some of my colleagues were not, however, disposed to concur in this view. It was objected, first, that the absence of general enlargement of the head of the tibia was too marked to render such a diagnosis positive; and secondly, that the pain, as described by the patient, was more diffused than generally occurs where Circumscribed Abscess exists.

The first objection was met by the fact announced by Mr. Paget (Lectures on Pathology, page 405), that "The head of a bone may be scarcely enlarged, while its interior is hollowed out by an Abscess. What remains of the bone may be indurated as by slight and tardy inflammation; but so much of the bone as was where now the Abscess is, must have been inflamed and absorbed."

To the second, an explanation could be readily offered in the want of precision which marks the

narratives of persons in the condition of life of this patient; and I relied, so far as its localization went, on the extreme commotion excited when in the course of examination I chanced to touch this tender spot before alluded to, and which no persuasion could induce the patient to allow me to repeat.

They offered, however, no objection to my proposal to perforate the bone with a trephine. Accordingly, having the patient under chloroform, I freely exposed the bone by cutting through the centre of the swelling; the middle of the incision corresponding to the aforesaid spot. Having perforated the bone with a trephine to the depth of an inch, without entering any cavity, I laid that instrument aside, and with a gouge proceeded to work out the piece of bone which the former instrument had cut through. Suddenly, when removing the last fragments, resistance ceased, and the gouge entered a cavity with a jerk, and immediately there welled up from the opening thick pus of a healthy yellow colour, estimated at two or three drachms. The accuracy of the diagnosis was therefore established, and my operation concluded by freely enlarging the base of the opening with the gouge. No marked amount of periosteal thickening was encountered, but the bone was very dense, and the cancellous texture between the surface and the cavity obliterated. The cavity was considered to be about the size of a small walnut. The patient had no pain that night, and declared it was the first night's sleep she had enjoyed for months. Neither was there any recurrence of the pain; her cure being complete in about four months, when she left the Hospital with the wound all but cicatrised. I have seen this

patient within the past few months. The cicatrix is firm and adherent to the subjacent bone, her health good, and she never suffers pain in the slightest degree.

(3.) An unmarried lady, aged 23, a patient of Mr. Smellie, of the Euston Road, consulted me in the month of June, 1864, concerning a pain in her leg; which she alleged caused her such intolerable suffering and misery, that, failing relief from other measures, she would readily submit to amputation of the limb. Her history of the case was singularly clear. When between three and four years of age, she was allowed to sit upon damp grass, and took a violent cold, which settled in her knee. Her leg was drawn up for some months, and from that time (nineteen years ago) the pain in it had been more or less severe. While yet quite a child she had a carbuncle at the inner side of the knee, as far as she could remember, during the time she had the pain. She could not recollect the sort of pain she then suffered; but when ten or eleven, it was acute and shooting, coming on daily at dinner time during the week (two o'clock), but, singularly enough, on Sundays, when she dined an hour later, it did not trouble her until she was seated at table. The accession of the pain was generally in July, the day of, or the day following, her return from the sea side, continuing two or three months, sometimes almost until the winter, ere it remitted. It was then treated as Rheumatism, and hot poultices and fomentations applied to it. For six years, from thirteen to nineteen, she was comparatively free from it, being so trifling that little notice was taken of it. In 1860

she was slightly troubled with it; but in February, 1861, it attacked her more violently than ever, extending from the ankle to the thigh, and lasted until the end of June. Blisters and iodine were applied, and it again remitted until the following year; when it returned, but not so violently, and lasted only five weeks. In the third week of May, 1864, it came on suddenly during the night, confined at first to the knee, but within three weeks gradually extending down the leg, through the calf to the ankle, varying in character, being like cramp in the calf, shooting and gnawing elsewhere, obliging her to keep constantly in motion, quietude intensifying it, and causing the limb to quiver with pain. During the paroxysm the leg swelled, and was very tender to the touch. From the very first it interfered with her rest; the warmth of the bed increasing it, so that she never slept before half-past six or seven in the morning.

The knee was very weak, and any attempt to lean upon it caused great pain and a bending inwards. Until this time (1864) she had not noticed the puffiness or thickening of the enlargement on the inner side of the leg. She began to menstruate at thirteen and a-half, and continued to do so regularly, and throughout the periods of pain. On examination, the pain was referred, without much precision, to the inner side of the leg; but noticing a circumscribed swelling, or rather puffiness, on the superficial aspect of the tibia, about four inches below its head, I directed my attention closely to its characters. The integuments covering it were healthy, but slightly discoloured from the recent application of iodine. It

was evident that the periosteum beneath was thickened from the firmness and elasticity of its margins; otherwise there was no marked sign of enlargement of the bone, which in every other part was smooth, painless, and free from disease, as were the knee and ankle joints. One small spot, however, existed in the centre of this swelling, unknown to the patient until minute manipulation detected it, pressure upon which caused the most acute suffering; and although not so exaggerated in degree as in the last Case, was sufficiently so to render it an important feature. Accordingly I came to the conclusion that inflammation had from time to time occupied the medullary canal, marked by the epochs of suffering before alluded to, and that it had now localized itself at the spot indicated as a suppurative result,—in a word, that a chronic Abscess of the tibia existed,—and I proposed the application of the trephine. Before consenting to this, her friends were desirous of obtaining the opinion of Mr. Paget, who, concurring with me that there had been inflammation more or less in the bone, would not undertake to say positively that the symptoms were conclusive of the existence of pus. He however thought that relief might be obtained by my proposal; and so, on the 29th of June, the patient being chloroformed by Dr., now Sir Duncan Gibb, Bart., and having the valuable assistance of my colleague Mr. Allingham, I laid the tibia bare by an incision through the swelling; and having perforated the tibia in the exact situation of the most tender point, I had the satisfaction of entering the Abscess, after boring through some very close, dense, and vascular bone. A greenish yellow pus issued therefrom, to the amount of two or

three drachms. The periosteum was considerably thickened; more so than its examination previous to incision would have indicated. The opening into the cavity having been enlarged with a gouge, the operation was completed. A good night's rest was the first marked result of its success, and her recovery was uninterrupted; the wound took some months to fill up, consolidate, and cicatrize, but it was ultimately complete. She has since married, and become a mother, and is at the present moment in the enjoyment of good health.

The opportunities for studying this lesion are rare, as may be inferred from the fact that, in conversation with Hospital Surgeons, I find many who have not seen the disease, and more still who have not themselves treated a case.

A great authority in Surgery, Professor Syme, writing in the year 1848, states that he had for many years been looking for this disease without success; and, though not at all disposed to question the reality of its occurrence, felt entitled to regard its absence from the field of observation submitted to him as a proof that it must be a rare event in the practice of Surgery. Whereupon he proceeds to enter his protest against what he terms the licence to practise an unnecessary and, as he believes experience would show, dangerous operation; these remarks having especial reference to the proposal of Sir B. Brodie to perforate the tibia for Chronic Abscess. Further, in 1863, ("Principles of Surgery") he enforces the principle that "the operation proposed by Sir B. Brodie must not be resorted to without the greatest caution,

since chronic periostitis is extremely apt to simulate the condition requiring its performance, and has misled practitioners even of the most extensive experience to trepan unnecessarily, with the effect not less disastrous than even the death of the patient."

Beyond illustrating the unquestioned fact of the rarity of the disease, these commentaries of a great authority in Surgery do not seem to have any great value; as he had no experience of the disease in question, except in so far as they enforce the very important rule, "Diagnose a disease before you treat it."

The museums of London are singularly deficient in specimens illustrating this disease, even in the cancellous texture of the extremities of bones; while those showing Circumscribed Abscess of the medullary cavity are still more rare. Mr. Kirby of Dublin believes that there exists but one example of this latter form in the immense collection of diseased bones in the Museum of the Irish College of Surgeons. I find no *typical* example in the Museum of the College of Surgeons of England beyond a dried specimen (Hunterian), in which there is a large cavity in the head of the tibia, formed by expansion and growth of its walls, in consequence of a collection of matter in its cancellous tissue; the walls are thus partly bone, partly membrane; the cavity itself measuring six inches from above downwards and four inches across, having several large apertures. St. Bartholomew's Hospital contains a few valuable illustrative specimens; and especially one (Series I. No. 82), showing an Abscess occupying the substance of the inner malleolus, of the size of a hen's egg, the cavity of which is lined by a soft vascular

membrane. The Museum of St. George's Hospital contains, as might be anticipated, some fine examples, including the original preparation from which Sir B. Brodie derived his first experience of this disease.

Sex. With regard to the sex and age of the patients attacked with this disease, nothing certain can be deduced, inasmuch as the recorded Cases have been indiscriminately male and female, and of ages varying from 13 to 50. The period of early adult life, however, seems to be the one in which the greatest number of instances have occurred.

Situation of the Disease. Abscess may form in any bone, or in any part of a bone; but it is much more common in the articular extremities of the cylindrical bones than in their shafts, as may be inferred from the following list of the parts most usually affected:—1. Lower end of tibia. 2. Upper end of tibia. 3. Medullary cavity of tibia. 4. Lower end of humerus.

Beyond this it is impossible to state with any precision the varieties which may be met with. I recollect to have seen somewhere an account of a case in which Mr. Arnott successfully diagnosed and trephined a *femur* for this disease.

Size of Cavity. The size of the cavity will also vary according to the duration of the disease, and the amount of expansion or hollowing out the bone has undergone from the quantity of pus contained within it.*

Swelling and Induration.—The swelling and induration externally will also vary, as my Cases

* Paget, Lectures on Pathology, p. 405.

sufficiently prove; being abundantly manifest where the periostitis has been excessive, and may be but little marked if the disease is one of Abscess purely. The *induration*, where it exists, is due both to the bone and periosteum; the cancellous structure of the former being dense and obliterated by infiltration, and the latter thickened and irregular from the imperfect deposition of bone beneath it, which results from inflammation of its structure. It is obvious, therefore, that the distinctive characters of the two diseases, Chronic Abscess of bone, and Chronic Periostitis, may be lost by merging in each other.

Duration of Disease. The duration of the disease is very variable. It is generally of some years' standing; and nothing short of a complete continuity of the symptoms during a long period, especially as regards the pain, being very marked and persistent during its latter stage, would justify us in coming to a definite conclusion with reference to the existence of the disease.

Causes. No conclusions can be drawn from recorded Cases with regard to the influence of hereditary taint or mechanical injury in assisting to produce the abscess. Mr. Stanley states that it is probable that in some cases a deposit of tubercle has preceded the Circumscribed Abscess in bone; a doctrine which has obtained pathological currency by the advocacy of Delpech, Guillot, Nelaton, Nichet, and others. The more recent investigations, however, of Gurlt, Bilroth, and especially Virchow, are such as to render the existence of tubercle in bone almost problematical. Virchow emphatically asserts that he has

never seen the so called tubercular cell; and that, in the material hitherto pronounced tubercular, he has failed to recognize anything specific outside the casual results of the inflammatory process. The greyish substance found in bone so invaded, being a soft fatty material with an exuberance of connective tissue and fat globules, with or without pus corpuscles, evidently the result of endostitis, of which the attributes are presented in the surrounding bony tissue. Gurlt gives a graphic description of suppuration in bone, diffused and circumscribed. If the matter collect in a circumscribed cavity, the osseous tissue forming the wall of the Abscess becomes dense (Sclerosis). A fine lining membrane may be discerned. Gurlt is of opinion that the consistence of pus is induced by absorption of its serum, and the centre, being the farthest from the lining membrane, remains soft for a longer period, affording a ready explanation of the relief which occasionally follows the administration of remedies which have the power of promoting the absorption of the more fluid parts of the abscess.*

Diagnosis. The diagnosis of this disease had its origin in the well known case of Sir B. Brodie (1824). The symptons of the Abscess, as described by that gentleman, are—enlargement towards one extremity of the bone; *pain* more or less severe, and usually remitting and recurring with increased intensity at variable intervals; induration and adhesion of the integument to the periosteum; tenderness under pressure at particular points; in short, as he remarks with regard to one of his cases, all the symptoms

* Bauer, Lectures on Orthopædic Surgery. Philadelphia. 1864.

of chronic *periostitis.* But it is evident that the symptoms just enumerated vary so remarkably in different cases that each of them demands a careful consideration and a separate study. I am inclined to place most reliance on the *pain*, which is usually the first in the order of occurrence, and also the most marked characteristic of all the Cases. It may be doubted whether it is ever absent during the whole progress of any Case, notwithstanding its remissions and apparent fluctuations, which would *appear* to amount to complete intermissions. The *character* of the pain is peculiar. In the earliest stage of the disease it is generally referred to rheumatism or growing pains, gradually becoming intensified into a throbbing and gnawing pain, marking the expansion of the osseous tissue by the formation of fluid within it, and utterly destructive of the rest and comfort of the sufferer.*

The *access* of the paroxysm is also a characteristic. In a large majority of cases it comes on sometime during the afternoon or evening, and remains during the subsequent twelve hours, at the close of which it gradually subsides and disappears. In some instances, however, it is more or less constant. The *situation* of the pain forms another of its characteristics; the place of its greatest intensity being one small spot, which marks the situation of the Abscess—a point of great practical importance to remember in the operative treatment of this disease, and well illustrated in both my Cases where the Abscess existed.

* It is scarcely necessary to urge that those maladies which may mimic the real disease,—viz. neuralgia, and hysterical pain of bone, —require the most attentive consideration in a diagnostic point of view.

The *termination* of Abscess of the bone is a very disastrous affair, if we refer to those Cases where evidence of its progress is unquestioned. Mr. Kirby relates a case where there resulted complete fusion of parts about the joint, sinuses leading to the articulation from an abscess discovered in the malleolus and complete destruction of the joint, necessitating amputation of the limb. And Sir B. Brodie, in the narrative of one of his Cases, furnishes conclusive evidence of the tendency of this disease to advance towards the joint, and of the swelling and filling of the joint with synovia whenever the patient was allowed to take exercise after prolonged recumbency; showing manifestly the disposition of this disease to implicate the neighbouring joint. Abscess of bone, however, *may* make its way externally, and discharge its contents with complete relief to the more urgent symptoms. In a patient whom I saw in Preston some years ago with my friend Dr. Broughton, this had unquestionably happened; the patient, an unmarried female, had undergone great suffering from enlargement of the middle of the tibia, the soft parts covering which were also implicated in the swelling. An Abscess had formed in its centre, and burst, the opening remaining fistulous; a probe passed through this traversed a corresponding fistulous tract in the bone direct into the medullary cavity of the tibia, leaving no doubt that suppuration had occurred therein. There were no signs of any other part of the shaft being implicated. My friend Mr. Savory has kindly favoured me with the following particulars of a Case he treated in St. Bartholomew's Hospital. An Irishwoman, aged 50, had all the

symptoms enumerated as distinctive of this disease, especially pain in the head of the tibia, with some effusion into the joint. After some weeks of severe suffering, the integuments over the inner surface of the tibia inflamed, suppurated and gave way; a probe passed through the aperture, led directly into a cavity in the substance of the tibia. The escape of pus was followed by the relief of all the urgent symptoms, but a fetid discharge continued. The bone was exposed, the fistulous aperture enlarged by a gouge, and a cavity, with carious walls, which would hold a walnut, laid open. This was thoroughly scooped out, and the patient entirely recovered.

The test of the necessity for Surgical interference will be the utter inefficiency of all remedial measures employed for the relief of this most painful malady. The treatment is therefore perfectly simple in principle; the difficulty lies in arriving at an accurate diagnosis—the existence of an Abscess; and practically will differ from the treatment of Abscess in soft parts in one essential particular only, the nature of the mechanical aid required to perforate the bone. It is not, therefore, necessary for me to occupy your time, which has already exceeded the limits fixed by the Society, with anything more than an outline of the proceedings which will be necessary.

1st. As all operations on bone are prolonged and exceedingly painful, it is essential that the patient should be subjected to the full influence of chloroform. The most painful spot, or any marked physical characteristic indicative of the locality of the Abscess should be noted previous to the operation,

and this should be selected as the point for perforation of the bone. For this purpose various contrivances are in use. The trephine, centre-bit, gouge, chisel, rose-head, &c., all, under different circumstances, adapted to effect the required object. Of these the most simple and efficient is the trephine, having a diameter of three-eighths to half an inch, and having no shoulder or projecting rim to offer impediment to its entry deeply into the substance of bone when depth of penetration is required. The gouge is also indispensable as an accessory instrument. With it the ring or plug of bone, cut by the trephine, can be raised, and the walls of the opening pierced in search of pus, should the first perforation fail to detect it. In such cases as that narrated (No. 2), where the disease evidently existed in the immediate neighbourhood of the joint, it will be necessary to apply the trephine or gouge with great care, to avoid injury to the articulation; and conversely, a very free use of it will be necessary and justifiable in cases similar to No. 1, to avoid the mischance of leaving the abscess unopened, yet but "a small distance from the perforation."

The abscess having been opened, little further treatment is necessary. Under simple water-dressing or bread poultice the cavity suppurates for an indefinite period, and at length fills up and cicatrizes. The relief is immediate and permanent, and in no instance is the success of an operation more satisfactorily exemplified.

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