THE DIRECT TREATMENT
OF
PSOAS ABSCESS WITH CARIES OF THE
SPINE.

BY
FREDERICK TREVES, F.R.C.S.,
ASSISTANT SURGEON TO, AND LECTURER ON ANATOMY AT, THE
LONDON HOSPITAL.

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AMONG inflammatory affections of bone spinal caries must rank as one of the most serious, yet its gravity depends upon no special virulence of character, upon no unusual activity of progress. The caries that involves the vertebræ is not an isolated and peculiar variety. It is usually of the kind known as strumous, or better, as osteo-myelitis granulosa. It may be of the simple species that follows upon injury, or, in rarer instances, of the form that is dependent upon syphilis. A caries precisely similar to it may be met with in the foot or hand; and yet an amount of disease may prove fatal in the spine that in the os calcis would form but a comparatively insignificant ailment. Its gravity can hardly be said to depend even upon the proximity of the malady to the spinal cord. Bone disease in the upper cervical region is certainly very often fatal by

the mischief it may induce in the medulla spinalis, but elsewhere in the column it must be owned that the fatal issue is comparatively seldom due wholly to a central nerve complication. It cannot even be said that in the vertebræ caries meets with a bone tissue that presents any facilities for its development that are not possessed by many other bones in the body. In actual fact the carpus and tarsus present advantages for the rapid progress of caries that are greatly in excess of any possessed by the spinal column.

It is needless to say that the seriousness of Pott's disease depends mainly upon the depth at which the morbid centre is placed; upon its inaccessibility to methods of treatment that are successful in other forms of caries, and upon the tedious, laborious, and destructive processes that are necessary for the evacuation of its morbid products.

When caries attacks the spine suppuration as a rule results, as it does in carious processes elsewhere. The abscess formed has, however, not attained great size before it finds itself hemmed in on all sides. All ready points of exit for its escape are closed, and to find an issue upon the surface of the body it has to take a long and devious course. When the malady involves the lower segments of the column the pus usually follows the psoas muscle and so makes its way to the thigh. Or it may fall short of the thigh and wander into the pelvis or force its way among the connective tissue planes of the lumbar region. Wherever it goes it leaves behind it a tract of destruction and adds to the original evils of the disease a grave and terrible complication. But even when the products of suppuration have been evacuated the disease is still far from cure. There is an immense abscess cavity that must be closed and a vast amount of dead and dying bone in the depths of the body that must be more or less completely eliminated. Nature's methods of effecting this removal are very slow. The products of the disease are carried away particle by particle and grain

by grain, and it not infrequently happens that the patient dies worn out before the tedious process is completed.

Now take for the sake of comparison a case of caries involving a superficial bone. Suppose, for example, that a patient is attacked with this disease in the vicinity of the wrist. The parts involved can at once be placed at rest. Any pus that may form can be immediately evacuated. Necrotic fragments or portions of disintegrated bone can be readily removed, and the progress of the disease, with more or less success, arrested.

Surgeons having under their care cases of Pott's disease must have been impressed with the good that might accrue if only that malady could be made amenable to such methods of treatment as are usually adopted in the more superficial forms of caries; but I am not aware that this impression has been carried into actual practice.

In the present paper I venture to submit to the notice of this Society an operation for the more direct relief of spinal caries when associated with abscess and when occurring in a certain segment of the column. I might say at once that the procedure is concerned only with the disease when it involves the lumbar and, with some reservation, the twelfth dorsal vertebræ. It consists simply in cutting down upon the bodies of those vertebræ through an incision made in the loin. By means of this incision the diseased area can be more or less directly exposed, suppurative collections can be opened at their point of origin and evacuated by the shortest possible route, portions of necrosed bone can be removed when such exist, and the diseased district subjected to the same methods of treatment that are commonly applied to the more superficial forms of caries.

I am enabled to give an account of three patients upon whom I performed this operation, and from one of whom I removed a large sequestrum involving a great part of the body of the first lumbar vertebra.

The details of the operation as it may be performed on the cadaver are as follows. In the description given I have

presumed that the surgeon intends to cut down upon the second or third lumbar vertebra. If a higher or a lower vertebra require to be exposed some slight and obvious modifications as regards position of incision, &c., would have to be introduced. These, however, need no detailed notice. The patient's loin having been exposed a vertical incision some two and a half inches in length is made through the integuments. The centre of this cut should lie about midway between the crest of the ilium and the last rib, and the cut should be so placed as to correspond to a vertical line parallel with and to the vertebral side of the outer border of the erector spinæ. I find that the average width of the erector spinæ in this situation is, in the adult, from two and three quarters to three inches. The incision, therefore, should be situated about two and a half inches from the lumbar spinous processes. After cutting through the superficial fascia the dense aponeurosis is exposed that covers the posterior surface of the erector spinæ and which is variously known as the superficial layer of the lumbar fascia, as the aponeurosis of the latissimus dorsi and serratus posticus inferior muscles, and as the inferior part of the vertebral aponeurosis. The part of this layer exposed in the lower half of the incision is wholly tendinous, but from that seen in the upper half of the cut arise some of the fibres of the latissimus dorsi. These fibres are thin and pass from below obliquely upwards and outwards. The dense aponeurosis with its attached muscular fibres having been divided in the full length of the incision the erector spinæ is exposed. This muscle is at once recognised by the vertical direction of its fibres. The outer border of the muscle should now be sought for and the whole mass drawn by means of retractors, as far as possible towards the middle line of the back. In this way the anterior part of the sheath of the muscle, known as the middle layer of the fascia lumborum, is readily exposed. Neither in front nor behind has the erector spinæ any direct adhesion to its sheath at this part.

The anterior layer of the sheath, as now exposed, is seen to be made up of dense white glistening fibres which are all more or less transverse in direction. Through this sheath the transverse processes of the lumbar vertebræ should be sought for. The longest and most conspicuous process is that belonging to the third vertebra. It is readily felt. The erector muscle having been drawn as far as possible towards the middle line, the anterior layer of its sheath must be divided vertically as near to the transverse processes as convenient. By this incision the quadratus lumborum muscle is exposed. The muscle as here seen is very thin. It is composed of muscular fibres which run from above obliquely downwards and outwards. Between the fibres are tendinous bundles which spring from the tips of the transverse processes. The muscle should be divided close to the extremity of a transverse process and the incision cautiously enlarged until the muscle is divided to the full extent of the skin wound. It is at this stage that there is danger of wounding the abdominal branches of the lumbar arteries. The inner edge of the quadratus is overlapped by the psoas muscle, so that when the former is divided the latter is exposed. The psoas fibres, as now seen, take about the same direction as the posterior fibres of the quadratus, *i.e.* run downwards and outwards. The interval between the two muscles is marked by a thin but distinct layer of fascia, known as the anterior lamella of the fascia lumborum. Some of the tendinous fibres of the psoas having been divided close to a transverse process the finger is introduced beneath the muscle and gently insinuated along the process until the anterior aspect of the bodies of the vertebræ is reached. The incision in the psoas can be enlarged to any extent.

If the patient were stout or very muscular the length of the skin wound would have to be increased, or a transverse cut might be made into the erector spinæ to allow of its more effectual retraction.

With common care there should be no danger of opening up the subperitoneal connective tissue, much less of

wounding the peritoneum. All risk on this score will be avoided by making the incision in the quadratus as near to the transverse processes as possible.

Great care must be taken not to wound the lumbar arteries. The abdominal branches of these vessels run for the most part behind the quadratus lumborum. That, however, from the first vessel runs in front and not infrequently those from one or two of the lower arteries follow its example. These vessels may be of large size, often as large as the lingual. They may be avoided as well as the trunks from which they arise by keeping close to a transverse process. The main vessel curves around the spine between the transverse processes and between these processes also the division of the artery occurs. If, therefore, the rule be observed of always reaching the spine along a transverse process, the lumbar arteries and their abdominal branches need be exposed to no risk.

In actual practice the operation is much simpler than may appear from this description. The patients are usually young and thin—often very thin. If the disease have lasted for any length of time the muscles about the part are found to be atrophied, and if any moderate deformity exist it serves to render the morbid region more easy of access. The moment, moreover, that the quadratus is incised the psoas is reached, and here will in all probability be found an abscess cavity which will immediately conduct the surgeon's finger to the seat of the disease. As to which loin should be selected—the right or the left—it matters little. The operation can be somewhat more conveniently performed upon the right side, while upon the left it is that the risk of damaging the peritoneum by an accidental slip is reduced to a minimum.

I might now give an account of the three patients already referred to. They came under my care at the London Hospital while doing vacation work for my colleague Mr. Adams, to whom I am indebted for permission to publish them.

The first patient, a young woman, æt. 21, was admitted on July 1st, 1883. Two years before she had received a violent blow over the lumbar spine. Twelve months before she began to experience pain in this part on movement, which pain had continued more or less until she came into the hospital. Two months before admission a swelling appeared over the right iliac crest and since that time walking had been so painful and difficult that she had to take to her bed. Her state on admission was as follows: She was anæmic and very thin. There was tenderness over the first and second lumbar spines, which was much increased by movement; there was great rigidity of this segment of the spine, but no deformity. A small swelling existed over the right iliac crest, and a large dull and fluctuating swelling in the left iliac region. This latter swelling, which was evidently an immense abscess, could be felt on examination by the rectum and vagina to extend into the pelvis.

The patient's condition a month later, *i.e.* early in August, was as follows. The collection in the left iliac region had increased rapidly and had been aspirated three times. After each tapping it refilled speedily, the amount of pus evacuated on the three occasions being respectively 28, 60, and 30 ounces. Thus no less than three quarts of matter had been discharged in about thirty days. The patient was rapidly emaciating; she had severe night sweats, her temperature ranged from 100 to 104, she was extremely feeble and complained of so much pain in the left side as to require the frequent administration of hypodermic injections of morphia; she had occasional rigors and was often sick. It was evident that this enormous amount of suppuration was kept up by some abiding source of irritation, situated probably in the lumbar spine. The parts had been kept at rest by maintaining the recumbent posture and by restraining movements by means of a long Liston's splint. The patient, however, was not able to endure the confined position for long, and the splint was left off. Under the circumstances, therefore, I resolved to perform the operation above described with

the purpose of hitting the abscess near its point of origin and of removing if possible any carious bone that may be perpetuating the mischief. The operation was performed on August 11th. The incision was made in the left loin. The erector spinæ muscle was found to be much atrophied, and before the quadratus lumborum could be well defined a huge abscess was opened that occupied the substance of the psoas muscle.

Introducing the finger into the abscess cavity the bodies of the lumbar vertebræ were soon reached, and in the substance, or rather in the place, of the first vertebra a large sequestrum was found. This was readily removed. It was situated in a cavity apparently lined by granulations, and after its removal no more dead or exposed bone of any kind could be detected. The operation was conducted under antiseptic precautions, and from the abscess cavity some forty ounces of pus were evacuated. It was evident that the abscess extended far down into the pelvis. A large drainage tube was introduced so as to reach the vertebral column. The sequestrum was composed of a mass of cancellous bone and measured about one inch by half an inch. The improvement in the patient's condition was immediate and very marked. Her temperature sank so as to reach nearly the normal line. She no longer suffered any pain. Her appetite improved and she began to gain flesh rapidly. By September 24th the patient was able to sit up for the greater part of the day, the sinus left by the wound had greatly contracted, and the amount of discharge had become quite insignificant. On the 29th of September the antiseptic dressings were discontinued. The patient is now well. She walks about without inconvenience and is much improved in appearance and in general health. There is no longer any tenderness about the spine, and the wound has quite healed.

The second case is of a different character and serves merely to illustrate the ease with which the lumbar spine can be examined under circumstances of doubt. The

patient was a little girl *æt.* 12, who was admitted on July 25th, 1883. She had a conspicuous angular curvature in the lumbar region of the spine, the most prominent spinous process being that of the second vertebra. She was an orphan and without friends, so that no account of her past history could be obtained. All that could be ascertained was that the "lump" in the back had been there for some months, that she had had no accident, and had not been laid up. She was pale, thin, and ill-nourished, and in the right groin there was a small, dull, fluctuating swelling painful on pressure. I concluded that this abscess was connected with the mischief in the spine. On August 15th the swelling was aspirated and two ounces of pus evacuated. About a week afterwards pus spontaneously escaped through the trochar puncture and the abscess was then freely opened with the scalpel. It proved to be a small chronic abscess of no great magnitude and apparently was in no way associated with the spinal affection. Its origin, indeed, was probably quite casual.

By the 1st of September the abscess had almost ceased to discharge, but the child had become much worse. Her temperature has been rising for the last two days; she looked ill; she had lost her appetite, and she complained of vague pains about the lower part of her back. There was then no symptom that directed any attention to the lungs. I imagined—erroneously, as the sequel proved—that these evidences of inflammation depended upon some fresh mischief about the lumbar spine, since they were in all points consistent with commencing suppuration. I therefore cut down upon the affected vertebræ from the right loin by the procedure already described. The spine was readily reached, and my examination of it merely revealed great inequality of the bony surfaces and great thickening of the soft parts about the site of the deformity. It was evident that the spinal disease had been long cured and had nothing to do with the child's present symptoms.

The operation was performed antiseptically, and the

wound did well. On the following morning the child was found to be breathing rapidly, and an examination of the bases of the lungs revealed extensive dulness and tubular breathing. The patient remained for some time very ill, and on September 27th evidences of empyema having appeared the chest was tapped and much pus evacuated. Since then the child has done well and has been some time discharged from the hospital. In this case I must confess that the operation was based upon error, and I have to congratulate myself upon the circumstance that the case ended as favorably as it did. It, however, served to show with what comparative ease the lumbar vertebræ can be subjected to examination.

The third patient was a lad æt. 16, who was admitted into the London Hospital on October 19th.

In his case an angular deformity in the lumbar region was noticed two years ago. Some six months ago an abscess was opened in the right groin about one and a half inches below Poupart's ligament. The boy has been under treatment at different hospitals since the incision was made and has been to the seaside. On admission the sinus was discharging very freely, the patient had suffered greatly in health from the continuous drain of pus, and nothing that was done in the way of irrigating the abscess cavity, had any effect upon the amount of the discharge. On October 27th the incision already described was made along the right side of the lumbar spine. The angular deformity was considerable, the most prominent spinous process corresponding to the second lumbar vertebra. This bending of the spine had brought the transverse processes more together, and in order to more readily reach the psoas muscle I removed with bone forceps the transverse process of the third vertebra. No pus had been encountered by the time that the psoas muscle was reached, but upon cutting into that muscle an abscess cavity was opened up from which pus escaped through the wound. I found that the bodies of two of the lumbar vertebræ lay in the abscess cavity, and from the surface

of bone thus exposed I removed with the finger a few minute fragments of carious bone. I believe that no active mischief was progressing in the bones, but rather that their condition at the time of the operation depended upon their having been long kept in contact with retained and offensive pus. The operation was performed antiseptically, but as the whole abscess cavity was rendered septic by the communication of the sinus in the thigh with the air the dressings were soon abandoned. When a few days had elapsed I passed a large drainage-tube in at the sinus in the groin and brought it out at the wound in the back. By this means the whole psoas muscle was drained from one end to the other and the entire abscess cavity could be readily washed out.

By December 3rd the discharge had become much less than it was before the operation, the boy was improved in health, and was free from pain. An examination of the part under chloroform revealed the fact that the bared surfaces of bone were now quite covered over by granulations and no bare bone could be anywhere felt in the depths of the wound.

As the discharge of pus was more free on some days than on others, I imagined that the abscess cavity might be sacculated and that within these sacculi pus might be lodged. To meet this condition it appeared desirable that the cavity of the abscess should be irrigated more frequently than twice a day. By passing a very large fenestrated tube through the length of the psoas muscle, and by making use of a syphon arrangement, a continuous stream of cold water was allowed to run through the abscess cavity from one end to the other. This was kept up for seven days, during which time the boy's temperature remained at or but little above the normal. After the removal of the tube the discharge was found to be greatly diminished. The lad succumbed to chronic lung disease two months after the operation. The autopsy showed that the once carious bone was covered over by healthy granulations, and the once large abscess cavity in

the psoas muscle was reduced to a very narrow tract. (The specimen was exhibited.)

In conclusion I would draw attention to one or two pathological circumstances that more or less directly concern this operation.

In the first place it cannot be said that the lumbar region is so seldom the seat of caries as to render the operation of very limited application. According to Hueter the twelfth dorsal and the first lumbar are the vertebræ that of all others are the most frequently attacked with this disease. The latter of these vertebræ can be reached without difficulty, but the last of the dorsal centra is much less accessible. It may be noted, however, that the psoas fibres reach to the lower border of this vertebra and that the muscle may be made use of to reach the bone. Probably in most cases an abscess would exist, under which circumstances the abscess cavity would form an easy and safe guide to the surface of the vertebra.

In the second place it must be remarked that in the great majority of all cases of spinal caries the disease commences in the superficial parts of the bone, if not actually in the subperiosteal tissue. This being the case, an operation such as has just been described could be effectively carried out at the very earliest stages of the disease, and at a time when the extent of the malady was yet insignificant. Sometimes the disease has commenced in the centre of the bone and even at its posterior surface; but in all such cases there is a tendency for the morbid process to advance towards the anterior aspect of the bone and thus to assume a position in which it would be more amenable to treatment. Probably the least satisfactory cases would be illustrated by those few examples of vertebral caries where the disease has commenced simultaneously in two or more points of the column. Such cases are, however, I believe, very rare.

Thirdly, it must be borne in mind that when much angular deformity exists the space between the last rib

and the iliac crest becomes much encroached upon. Indeed, the rib may touch and even overlap the pelvic bone. Cases, however, where the space available for this operation is seriously narrowed are not common, are mostly found in instances of extensive disease in the dorsal spine, and are, for several reasons, unsuitable for active treatment.

Lastly, I think it may be said in favour of this operation that it directly reaches the seat of disease and renders the affected part amenable to modes of treatment that are commonly adopted in like maladies attacking more superficial bones. It opens any abscess that may exist at the actual seat of disease, and, so long as the patient retains the recumbent posture, at its most dependent spot.

It evacuates the matter by the shortest route, and if applied early enough should prevent the formation of a huge abscess that may burrow into the iliac region, the pelvis or the thigh. I would urge that a psoas abscess when diagnosed, should be opened, other things being equal, at its point of origin from the lumbar spine rather than at a spot quite remote from that point. In suggesting this mode of treatment I am merely advocating for the relief of psoas abscess the same method that is usually adopted in suppurating collections more favorably placed. Moreover, when the whole psoas muscle has been converted into a huge abscess and when the pus is pointing in the thigh or is actually discharging at that spot, I think that by evacuating the matter through an opening in the loin and a counter opening in the thigh and by draining the whole cavity from one end to the other, one is merely carrying out a recognised and successful plan of treatment that has been extensively applied to abscesses elsewhere.

I am well aware, however, that this method of treatment, even if entirely carried out, cannot place spinal caries in the same position as regards opportunity for cure in which surgery has placed carious maladies of surface

bones, until two great obstacles are removed—the difficulty of recognising the disease at its earliest stages and the difficulty of keeping the spine at absolute rest.