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Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

Vol. VII.

CHICAGO, OCTOBER 23, 1886.

No. 17.

ORIGINAL ARTICLES.

THE INCISION, DIGITAL EXPLORATION AND DRAINAGE OF LUMBAR ABSCESES.¹

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Lumbar abscesses in their own intrinsic nature are not more dangerous than others. They are rendered especially perilous only by the inefficiency of our explorations and by the consequent incompleteness of our local treatment. When thoroughly explored and kept completely disinfected, they rarely cause death.

The first step towards safety is the exploration. Here we are confronted by the published opinions of some of our ablest men, especially of the older class, insisting that the opening of lumbar abscesses and even the aspiration of them is fearfully dangerous. The limits of this paper do not permit an elaborate discussion of this antiquated opinion, which was true under old methods, but false under new ones. I shall assume that the nine cases related in this paper, as well as other established facts of antiseptic surgery, prove that where a lumbar abscess can be freely opened and kept thoroughly disinfected, there is positively no danger in the procedure. There is no hectic, no exhaustion, no pyæmia nor septicæmia. On the contrary the patient rebounds towards health, as if relieved of a great depressing influence. He grows plumper and ruddier, and makes in many instances a good recovery. I grant that certain cases are best treated at the outset by repeated aspiration, but if this fails, or is inapplicable from the abscess being already open, then the open method with regular disinfection is necessary.

Assuming this to be true, the thorough exploration of the interior of the abscess is a prime necessity, and it cannot be accomplished without the use of the surgeon's finger. Treves, of London, publishes three cases of digital exploration, and Erichsen quotes them with approval; but most authors seem not to have thought of it, and apparently would be horrified at the very proposal of such a thing.

The time to be selected is the earliest one at which a diagnosis can be made. A lumbar abscess at the outset is a simple sac, without any complicated pouches, but as it gets older, the pus sometimes bur-

rows to far distant parts, greatly increasing the difficulty of exploration and of disinfection and drainage.

The steps of the operation vary with the locality. Where the abscess points behind in the lumbar region, the following anatomical arrangement almost always exists: The original sac is inside the body, but behind the peritoneum. A small orifice at the outer border of the common mass of the *erectores spine* muscles conducts the pus outward to another broad sac which expands beneath the integuments. This double arrangement is an effectual barrier to any efforts to disinfect the abscess by antiseptic injections thrown merely into the outer sac. The great interior fountain itself must be opened, explored and tubed. The first step is to open the external sac widely. The second is to examine the floor of the cavity with the finger, and if necessary with a large probe, until we find the opening leading to the interior sac, which orifice is usually in the groove just outside the border of the common mass of erector muscles, but sometimes lies in the angle where the crest of the ilium approaches the spine. These openings vary in size from an eighth of an inch to three-quarters of an inch in diameter. Dilating the orifice, with the aid of an incision if necessary, the finger is inserted to examine the interior. Passing inward the spinal column can be examined to search for necrosed portions, or for excavations whence sequestra have previously exfoliated. In the lower parts of the sac pieces of the exfoliated bone are sometimes found. Passing upward beneath the ribs one often finds the kidney lifted out of its bed, and pressed forward with other tissues. Still higher the sac may terminate in a rounded pouch behind the liver, or extend upward behind the edge of the diaphragm, requiring a long bent probe to complete the examination. Below, it may terminate in a rounded hollow, or extend down into one or both iliac *fossæ*, or passing into the lesser pelvis make its escape by the sciatic notch into the thigh. Still oftener it burrows beneath Poupart's ligament into the front of the thigh. Probes and flexible bougies are valuable in tracing extended channels, but the touch of the finger is indispensable in exploring the short pouches, and in finding the entrances to the longer ones.

When the abscess points in the angle between the crest of the ilium and the spinal column a wide opening should be made into the external sac, and as before said, the narrow opening into the inner one must be enlarged. The finger then readily explores the cavity. Often it runs forward along the internal

¹ Read in the Section on Surgery at the Thirty-Seventh Annual Meeting of the American Medical Association.

iliac fossa towards Poupart's ligament, where another free opening must be made. At other times it runs upward behind the kidneys, and sometimes sends pouches in three or four directions.

When the abscess points above Poupart's ligament, it presses away the peritoneum so that there is usually no danger in opening it a little above the ligament and in front of the anterior superior spinous process of the ilium. If it opens below the ligament, a free incision must be made to admit the finger. If the finger is too short, or too large, a Britannia metal sound is bent to proper form and carried upward under the ligament, if possible. If the great length of the lower channel prevents this, we must cut down upon it just below the ligament, and pass the sound under it into the pelvic section, and then cut down upon it as before. The finger being introduced shows the size and form of the sac at that part. Next let the metallic sound, or what is often better, a flexible Mercier's *sonde coudée*, be used to trace the channel upward and backward into the lumbar region. If this is successfully accomplished, the next step is to turn the patient on his face or side and cut down upon the sound by an incision much like that of lumbar colotomy, only keeping more towards the spine and passing into the cavity through the groove along the external border of the common mass of erector muscles. The incision may be either longitudinal or transverse at pleasure. Motions of the sound made by an assistant will help the surgeon's finger to identify the exact position of the abscess, especially if the instrument be pretty large and firm. The finger should now be inserted into the lumbar cavity and made to search the whole interior exactly as in cases where the first pointing is in the lumbar region. Every opening must be tubed, and the cavities all be kept well disinfected. As the upper tube will take away the pus at its source, and prevent it flowing down to the lower cavities, the latter can be healed without difficulty, thus reducing the dangerous size and complexity of the cavern, and giving us a comparatively small and simple abscess to deal with.

The following cases from my own experience illustrate the subject:

Case 1.—A woman of middle age entered Mercy Hospital with a fluctuating tumor four inches in diameter on the right lumbar region. Coughing caused succussion as in hernia. The exploring needle brought out pus. The patient being anesthetized, I incised the tumor freely and evacuated the fluid. The floor of the sac was on the external surface of the muscles of the trunk. In the groove along the external border of the common mass of the erector muscles, I found a hole about a quarter of an inch in diameter leading through the abdominal walls. Enlarging this with a bistoury I inserted my finger and found a large interior cavity, some seven inches long and three inches broad. The inner border was formed by the spinal column. The vertebrae were exactly normal in form, there was no naked nor ulcerated bone, and the bony surfaces were covered with a thin healthy periosteum. The upper end of the cavity was a rounded *cul-de-sac* behind the right lobe of the liver. The kidney and the ascending colon were lifted

forward and inward by the pressure of the abscess. The inner surfaces of the lower ribs were examined and found healthy, and the lower end of the abscess was a simple *cul-de-sac*, like the upper. Neither the finger nor the probe could detect any diseased bone, nor any pouches or passages leading to other parts. It appeared to be purely an abscess in the cellular tissue, and though large, it was very simple in form. It was very thoroughly washed out with antiseptics, a large drainage-tube inserted, and the patient under daily antiseptic injections and dressings rapidly improved in health, and is now nearly well.

Case 2.—A married woman, aged about 33 years. She had a fistulous orifice in the right lumbar region, which had been discharging several months. Potts' disease caused by a fall existed with protuberance of the second lumbar vertebra. She was thin, rather weak and very nervous, but able to keep about the house. Ether was given and the patient placed on the left side, and a free opening made through the skin. The outer sac was found to be small. The opening from the outer to the inner sac was about a third of an inch in diameter. This was enlarged, and the finger inserted. The inner cavity was ovoid in form, about six inches in length and two and a half inches in breadth. Two small pieces of bone lay loose within it, and several others had previously been discharged. The affected vertebra lay directly opposite the opening and was easily examined with the finger. The periosteum was thickened and the form of the body of the bone somewhat changed by the effusion of provisional callus, as well as that of the vertebra below. On the side of the body of the bone was a concave excavation like the bowl of a teaspoon, but there was no longer any naked ulceration of bone to be felt. Apparently the ulcer was healed, and a smooth periosteum lined the hollow. Neither the finger nor the probe succeeded in touching carious bone anywhere. Apparently the caries had become spontaneously cured and only the abscess with the two loose pieces in it remained. These were extracted, a large drainage-tube was inserted, and antiseptic injections regularly kept up. The patient did well as long as she remained within reach of observation, but I lost sight of her, and do not know her present condition.

Case 3.—A boy aged 7 years, much emaciated and weak. A bad Potts' disease existed at about the first lumbar vertebra, with very great deformity. A lumbar abscess pointed on the left side behind. I aspirated the tumor about three times, in hopes to obtain one of the cures which sometimes reward this method of treatment. After the last aspiration, the pus ulcerated its way out along the track of the puncture. Knowing very well the disasters impending from sepsis unless met by prompt measures, I anesthetized the patient and opened the external sac, which was about three inches across. The opening to the inner sac lay in the usual position alongside the common mass of the erector muscles, and was over half an inch in diameter. The inner sac was very large, some parts being beyond the reach of the finger. This being my first case of digital exploration of lumbar abscess, I was more timid than

I am now, and did not examine the bodies of the vertebrae, but withdrew my finger, inserted a large drainage-tube, and instituted a daily wash-out with a 2½ per cent. solution of carbolic acid. No hectic followed; on the contrary the patient gained greatly in health and strength, and was obviously relieved of a deadly depressing influence. As the patient lived at a distance, I did not learn the subsequent history, and do not know whether the antiseptic measures were steadily followed up, but so long as kept under observation, the improvement in his condition was immense.

Case 4.—An exceedingly complex case. The patient was an adult male aged about 42 years. He came from a distance with the belief that he had a hip disease with an abscess pointing on the outer side of the left thigh. It was a remarkable instance of a lumbar abscess burrowing a long distance, and requiring several openings to explore and disinfect the cavity. The external tests, such as rotation of the femur, etc., failed to prove any true hip disease, but I found, much to the patient's surprise, a moderate but perfectly distinct Potts' disease with the usual deformity affecting the ninth dorsal vertebra. There was a small contracted fistula yielding only a slight discharge at the angle where the crest of the ilium approaches the spine. On the middle of the outer side of the thigh there was a large fluctuating tumor some six inches in diameter.

Having anesthetized the patient, I opened the tumor freely and evacuated the pus. It extended upward and backward far beyond the reach of the finger, but a long probe traced the cavity through the sciatic notch, and into the pelvis, where its crookedness prevented further progress of the instrument. I now passed a director into the small fistula above the crest of the ilium, opening the external sac, which was very small, as was also the opening leading to the inner sac. Enlarging the orifice the finger was inserted, and three channels were found, one leading downward through the pelvis towards the sciatic notch, and thence out of the notch and down to the abscess on the thigh; the second led forward into the iliac fossa and terminated near the anterior superior spinous process of the ilium. I opened this widely above Poupart's ligament, and was able by putting an index finger in to touch the index of the other hand inserted at the posterior opening. The peritoneum seemed thickened and firm, making a strong barrier between the fingers and the intestines. The third channel was rather small, and led directly upward along the psoas muscle, and behind the kidney. I inserted a finger and cut down upon it just below the twelfth rib, where, inserting a probe, I traced the abscess still onward behind the diaphragm towards the body of the deformed ninth dorsal vertebra. All the cavities were tubed and disinfected and treated with daily antiseptic injections.

Doubtless by exsecting about two inches of the shafts of the ninth and tenth ribs, the finger could have been inserted directly upon the carious body of the affected vertebra, and perhaps a successful scooping of the bone effected, but I desisted for these reasons: Across the body of each dorsal vertebra

winds a pretty large intercostal artery, whose ligation in such a locality would be rather difficult. I judged it best, therefore, to try every other measure, before encountering this danger. I have proved by abundant experience that a daily irrigation of a weak solution of muriatic acid conveyed through a catheter close to a carious bone will often completely dissolve the dead osseous tissue in a moderate time, and effect a permanent cure. Having therefore provided a route by which this plan could be put in operation, the patient returned to his home with a letter of advice to his physician counseling that measure, as well as the regular disinfection of the channels below. No shock or hectic fever followed the operation, and at the last advices the patient was steadily improving.

Case 5.—A boy 5 years of age with Potts' disease causing decided projection of the tenth dorsal vertebra. He was much exhausted, and unable to walk about the room. An abscess was pointing on the right lumbar region. Being freely opened under anesthesia the external sac was found to be about three and a quarter inches across. The opening leading to the inner sac was in the usual location at the outer border of the erector muscle, and was of a size barely sufficient to admit a pencil. Enlarging it partly by notching with a bistoury and partly by dilatation with the finger, the index was freely inserted. The inner sac was smaller than the external. A prolongation extended to the affected vertebra, but neither the finger nor the probe after a very careful search could detect any really naked or carious bone. The cavity was disinfected, a large drainage-tube inserted, and daily injections of antiseptics instituted. A spinal brace was applied, and the patient returned to his home and to the care of a skilful family physician. He progressed well. No hectic nor septicæmia occurred. The discharge diminished to a mere trifle, the patient became fat and strong, and the spinal inflammation disappeared so as to allow of free and active motions without pain. Several months have now elapsed and the tube is still kept in as a matter of prudence, but the child runs freely about the house, and has grown so tall as to necessitate a new spinal brace.

Case 6.—This is an instance of an abscess breaking in the lumbar region; though really iliac in its origin. The patient is a woman aged about 26. Hereditary syphilis was suspected in the case, but not proved. Some months prior to my visit an abscess pointed and broke in the left lumbar region in the angle between the ilium and the spinal column, and discharged freely. She fell into hectic fever, which, however, subsided after a time. At the time of my visit there was no fever and the discharge was small, but the patient was very thin and feeble. Opening the outer sac, I found a small orifice leading to the inner cavity, which I enlarged and inserted my finger to explore the interior. To my surprise I found no lumbar cavity, but an elongated and irregular sac lying in the iliac fossa and reaching nearly to the anterior superior spinous process. The cavity was tubed and disinfected, and placed under full antiseptic treatment, in the hands of a skilled family physician. She improved in all respects and continued to

gain for two months, when inflammation occurred to some extent near the anterior superior spinous process of the ilium, which is doubtless due to the anterior portion of the abscess sac being imperfectly drained and disinfected. I judge that complete success will require an anterior opening, as well as a posterior one.

Case 7.—Male, æt. 36. No evidence of Potts' disease present. A tumor gradually formed in the right iliac fossa, extending laterally further than is usual in perityphlitis, as it could be felt above the crest of the ilium. Fluctuation was very evident above the outer third of Poupart's ligament, and upward to the anterior superior spinous process of the ilium.

I anæsthetized the patient, opened the sac freely and evacuated the pus. The peritoneum was already pushed well aside by the pressure of the abscess, so as to require no special care. A very large reservoir of pus occupied the iliac fossa, but the finger detected no caries of the ilium. The upper and posterior part extended beyond the reach of the finger, but a flexible metal sound passed readily into the lumbar region to a distance proved by measurement to reach above the kidney. The sound was left in this position and the patient turned on his side. I then made an incision in the groove along the outer border of the common erector mass of muscles, and dissected down to the sound. Inserting the finger, I found that the cavity extended well up behind the kidney, but was much narrower than that in the iliac fossa. No other prolongations were discovered, and the patient did well at first. However, in a short time a hard inflammatory swelling appeared in the iliac fossa of the opposite side of the body. The temperature rose, and the patient fell into delirium. The swelling increased in size, but presented no fluctuation. However, after a little delay I opened it above Poupart's ligament and found deep in, and covered with a thick mass of inflammatory deposit, a large cavity of putrid pus, which was evacuated, and the cavity tubed and disinfected.

A day or two later the old channel of communication from the original abscess to this one, which seemed to have become blocked by the swelling or clots, re-opened, so that injections could be thrown across from one iliac abscess to the other. The delirium continued and the patient died of a cerebral attack caused, probably, by septicæmia.

I look upon this not so much a failure of the principle of the operation, as an instance showing the danger and folly of postponing it until long passages have burrowed into distant parts, and the whole system become poisoned with septic absorption. It is obvious that the operation should be made at the earliest possible period.

Case 8.—A young woman with no evidence of Potts' disease. She had a large abscess pointing above the outer part of Poupart's ligament. On opening and exploring, I traced it upward and backward to the angle between the crest of the ilium and the spine, where I made a counter opening and instituted free drainage and injections to be thrown

through from one opening to the other. I believe the patient did well, but as she lived at a great distance I soon lost sight of the case.

Case 9.—A woman with no clear proof of Potts' disease. She was able to take the journey to the city, but was considerably exhausted from a lumbar abscess which had been discharging just above the groin for months. I opened freely both above Poupart's ligament and in the lower end of the lumbar region behind. Large drainage tubes were deeply inserted, and copious carbolyzed injections daily thrown through from one wound to the other. The patient began to return towards health at once. She grew daily stronger and plumper, and when last heard of some months later she was almost restored to soundness, though still wearing the tubes for safety.

The following list of opinions shows the contradictory and confused state of thought on the opening of these cavities:

The elder Gross left on record his opinion that lumbar abscesses, especially old ones, should not be opened until about ready to burst.

Prof. D. Hayes Agnew expresses views nearly similar (*Agnew's Surgery*, vol. II, p. 884).

Alex. Shaw, of England, discourages opening the cavities, but still hopes something from Listerism.

Mr. Treves, of London, at first advocated only repeated aspirations, but later has published three cases of digital exploration, with favorable results. In one of them he removed a piece of necrosed bone.

Erichsen, of London, advises antiseptic opening, and even suggests digital exploration, but does not speak of having tried it.

König, of Germany, advocates drainage in a downward direction, but omits to speak of antiseptic cleansing.

Holmes, of England, advises to allow the abscess to burst spontaneously, and on no account to open it.

Ashurst, of Philadelphia, opposes opening.

Bryant, of Guy's Hospital, London, advises not to open early, but if the abscess progresses, to open antiseptically.

Hamilton, of New York, remarks on the contradictory state of surgical opinion, and evidently hesitates. On the whole, he advises to evacuate gradually, and never to use probes, tents, or injections, until the opening has been running several weeks.

I am led to the following conclusions by a pretty extensive experience in various methods which have been in vogue:

1. Some lumbar abscesses recover simply by a series of aspirations, with or without antiseptic washing out. This method is simple, and where the choice offers itself should be tested first.

2. If the aspiration plan fails, or is inapplicable in consequence of the abscess being already open, then free incision, exploration, and complete disinfection should be carried out at once.

3. If residual abscesses appear in the course of the treatment, they should be served in the same way as the primary one.

4. The sudden evacuation of a large cavity filled with pus, provided the sac is immediately disinfected

and kept so, has none of the dangers supposed by the old authors to beset the case.

DR. BYRD, of Quincy, Ill., in discussing the paper, spoke of the value of per-oxide of hydrogen.

DR. FENGER, of Chicago, suggested that the danger in opening psoas abscesses was to be found in the character of the abscess, the result of tubercular abscesses being much worse than a simple psoas abscess; that the value of the treatment suggested by Dr. Andrews consisted in the fact that he made his counter openings near the origin of the trouble.

DR. LEWIS, of Kansas City, inquired concerning the earlier symptoms of psoas abscess.

DR. HAMILTON, of Ohio, thought it strange that such large accumulations of pus existed without being detected by the physician.

DR. J. RANSOHOFF, of Cincinnati, believed that such abscesses should be drained after free incision if not arising from tubercular processes. Abscesses of tubercular origin he thought were unfavorably influenced by incision. The origin of the trouble was to be sought before determining the character of treatment.

DR. ANDREWS, in closing, said that the symptoms of such condition where caries was present consisted in elevation of temperature, some fulness or swelling, dulness in percussion at site of tumor, and the possible use of aspirator. That the incision should be carried to the extent of a thorough exploration of the cavity seeking for dead bone, providing for thorough drainage and antiseptic cleansing. That he had opened abscesses where spicula of bone were found in the cavity, but where the neurotic process had already been limited and the parts were healing.

A REMARKABLE CASE OF FOREIGN BODY CARRIED TEN YEARS IN THE EYE.¹

BY T. E. MURRELL, M.D.,
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A student in the Caneyhill College, Arkansas, session of 1875-76, was making some hydrogen gas with iron filings and sulphuric acid in a glass retort. Just as the gas began to escape from the retort pipe, and while still much mixed with atmospheric air, he chanced to bring a lighted match close to the escape pipe, when an explosion took place. The retort was blown to atoms and the pieces of glass driven with great force in all directions. The young man received a severe wound in his right eye. The eye was found lacerated; a transverse cut in the cornea extending from the sclera on one side into the sclera on the opposite side. The supposition was that a flying fragment of glass had done the work by an oblique stroke and had passed on.

The eye was treated antiphlogistically, and although considerable inflammation and pain followed, in a few weeks all became quiet and a transverse corneal scar marked the seat of injury. Some six

years after this Mr. F., then a lawyer, consulted me. I found right eye as follows: Extending some two lines into the sclera inwardly and outwardly and transversely through the diameter of the cornea was a somewhat flattened linear cicatrix, into which the iris was drawn with obliteration of the pupil. Above and below was clear cornea through which could be seen fairly normal fibrillated iris. The scleral conjunctiva was of normal appearance, the eye appearing perfectly quiescent. He had had no trouble with it since the recovery from the accident, and came to me for the purpose of having an artificial pupil made for optical purposes. I found, however, that he had no perception of light, and explained to him the uselessness of such procedure. Taking into consideration the extent of the wound, involving as it did the ciliary body on two opposite sides, together with the fact that the iris was also extensively incarcerated, I warned him particularly of the dangers of sympathetic trouble in the other eye eventually.

Some two years ago Mr. F. again visited me. I found the eye *in statu quo*, with no redness, pain or irritation, or weakness of his left eye. I repeated my injunctions of caution, and now, upon conservative principles, advised enucleation of the injured eye. He returned home and occasionally wrote me, stating that he was afraid, since my information imparted to him of the dangers of sympathetic trouble, to carry the eye, and would at his convenience come and have it removed.

In February last he came with his mind made up to have the operation performed. At this time the scleral conjunctiva was perfectly clear, there was no tenderness over any part of the ciliary body, no pain, and the other eye was clear, strong, and V = Sn $\frac{7}{8}$ sharp. He was a hard student, and up to this time had spent many hours daily in close application to his law books. He said, however, for a year or two, his good eye showed more disposition to tire than formerly after much work, and concluded that one of the symptoms of sympathetic irritation was upon him.

I put a drop or two of cocaine muriate solution, 4 per cent., into the conjunctival sac, and in a minute after injected 10 minims of the same into the circum-scleral tissues at four points. Five minutes later I proceeded to enucleate in the usual way, which was entirely painless, the patient and I carrying on a pleasant conversation all the while. When finished and the hæmorrhage stanchied, I examined the eye in his presence. He asked me to look carefully for a piece of glass, as he could not but believe some fragment had lodged in the eye. I was disposed to make light of his opinion, and stated as my reason, the entire absence of irritation of any sort in the eye, which would hardly have been the case with so irritating a body as a piece of glass lodged in the eye. The eye was divided into halves through its equator. In the interciliary region, occupying the position of the lens, was a mass of lymph. The other structures of the uveal tract, I should say, were entirely atrophic, and the vitreous chamber filled with straw-colored water. On opening into the lymph deposit the knife came upon a hard body which, on further exposure, proved

¹ Read in the Section on Ophthalmology, Otology and Laryngology at the Thirty-Seventh Annual Meeting of the American Medical Association.