

A case of intradural spinal cyst, with operation and recovery / by W.G. Spiller, J.H. Musser and Edward Martin ; with a brief report of eleven cases of tumor of the spinal cord or spinal column, by William G. Spiller.

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OPERATION AND RECOVERY.

BY

W. G. SPILLER, M.D.,

J. H. MUSSER, M.D.,

AND

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WITH A BRIEF REPORT OF ELEVEN CASES OF TUMOR
OF THE SPINAL CORD OR SPINAL COLUMN.

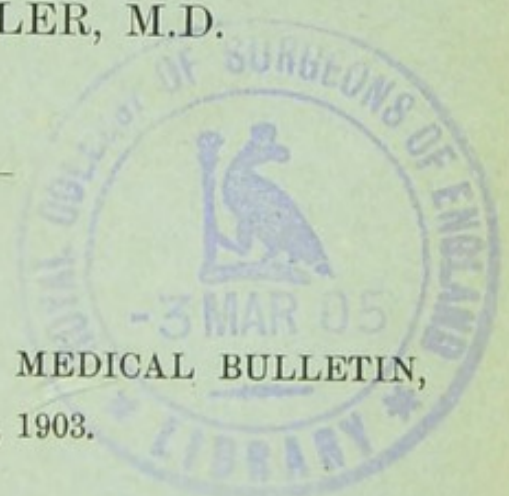
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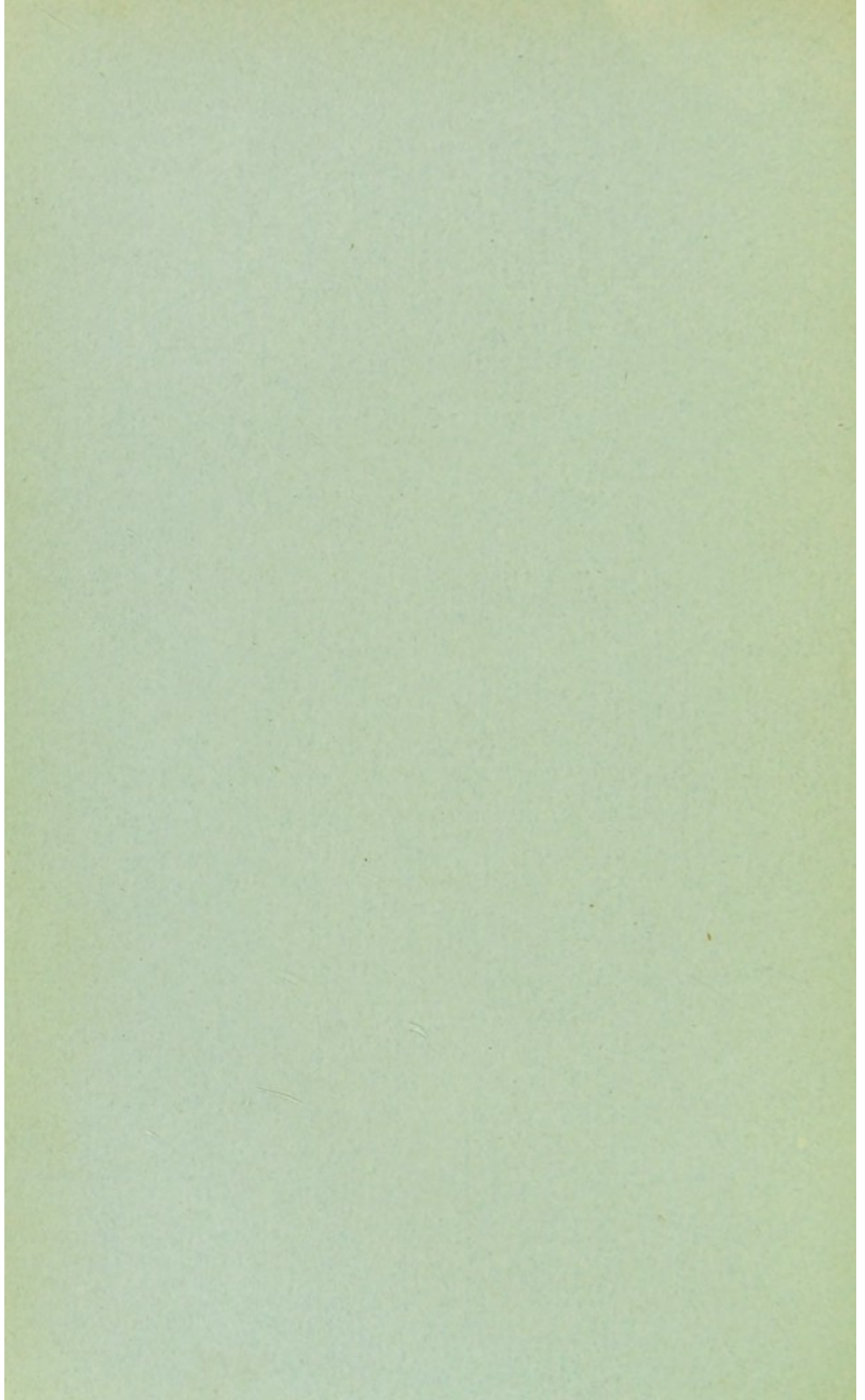
WILLIAM G. SPILLER, M.D.

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WITH A BRIEF REPORT OF ELEVEN CASES OF TUMOR
OF THE SPINAL CORD OR SPINAL COLUMN.¹

BY WILLIAM G. SPILLER, M.D.

A. B., a woman, aged twenty-six years, single, in 1898 or 1899 suffered from pain at night in the left side of the sacrum. This pain would awaken her, but by putting an extra pillow under her head she would get relief and be able to go to sleep again. The pain was felt about two nights in a week, but was not present during the day. The suffering could not have been severe, as in most accounts of her condition she made no mention of pain previous to 1901. In April, 1901, she began to have sharp pain, like that of toothache, extending down the front of the left thigh as far as the knee, but never beyond, and confined to the left lower limb, and felt only at night. The pain would usually awaken her about 2 or 3 A.M., and she was able to obtain relief only by sitting up in bed. In October, 1901, the pain still seemed to start in the same spot, and extended across her

¹ Read before the College of Physicians of Philadelphia, January 7, 1903.

back. She remained in bed until January, 1902, and was treated for sciatica. The pain still was felt only at night. On January 2, 1902, she came to the Presbyterian Hospital under our observation. She remained there seven weeks, and the pain was less severe during her stay in the hospital. During the two weeks following her arrival in Philadelphia she was obstinately constipated, but she was then given an iodide and her bowels became loose. An examination was made on February 8, 1902. The pain was then felt in the anterior part of the left thigh, over each sacrosciatic foramen, and in the lumbar region on both sides of the spinal column. It had changed somewhat in character, and was duller. The patellar reflex on each side was exaggerated, and patellar clonus was present on each side, but ankle clonus was not obtained on either side. Achilles-jerk was prompt. Babinski's reflex was not obtained on the right side, and the toes on this side were flexed from irritation of the sole of the foot, but irritation of the left sole caused slight extension of all the toes except the big toe, the latter not being moved. No objective sensory disturbances were found, and there was no pain on pressure over the spinal column, over the sacrosciatica foramina, or elsewhere. She had a slight scoliosis. The tendon reflexes of the upper limbs were prompt, but not exaggerated, and the upper limbs were not implicated. The urinary examination was normal, except that the specific gravity was high. From the results of this examination the opinion was expressed that the case was probably one of tumor on the spinal cord. Pott's disease and syphilis were considered, but the symptoms were regarded as more indicative of tumor.

On February 11, 1902, the patient was seen again. Patellar clonus or ankle clonus was not obtained on either side. The patellar reflex was very prompt on each side. Babinski's reflex was not distinct on either side. No objective sensory disturbances were obtained anywhere. Walking increased the pain. She had no girdle sensation. She expressed the opinion that the pain had become more severe, because during the summer of 1901 she danced much, and sat out in the dampness after dancing.

Miss A. B. returned home February 15, 1902, and was comparatively comfortable for two or three weeks; then the pain became more severe, and began to be felt during the day. She went to Brooklyn and was treated during nine weeks by electricity, which made her much worse, and she then returned home. At this time the pain was felt across the lower part of her back, down the front of her left thigh, down the back of the left lower limb, and in both hips, but more in the left. She now noticed numbness in the toes of the left foot, extending on to the dorsum of the foot, and the pain was becoming even more severe than it had been.

She was examined again on June 10, 1902, and the notes made then are as follows:

The pain has become much more severe since last January, and is felt while the patient is lying down. It is deep in the hip-joint, and feels as though something were pressing on a nerve. The pain is chiefly down the front of the left thigh, and only occasionally along the course of the sciatic nerve. It is felt at the sacrosciatic notch, and low in the lumbar region on both sides, but chiefly on the

left side. It has been felt in the left lumbar region at a time when it was not felt in the right lumbar region, but never in the right lumbar region without being felt in the left lumbar region. No muscular atrophy or weakness of either lower limb has developed. The pain has never been felt in the right lower limb. Since last January constipation has been pronounced, and the patient has not during this time been on a special diet or confined to bed. Sometimes, when the pain is severe in the left lower limb, the leg will give way if the patient is standing. The patellar reflex is exaggerated, and equally so on the two sides, but patellar clonus cannot be obtained on either side. The Achilles-jerk is present on each side, equal on the two sides, and about normal. Babinski's reflex is not obtained on either side. Tactile sensation is normal in each lower limb. No bladder symptoms are present. No tenderness is felt on pressure over any of the nerves. The patient has noticed once or twice that pressure over the vertebral column of the lumbar region caused a shooting pain in the back of the left thigh. Lasègue's sign—*i. e.*, pain in flexion of the thigh on the abdomen with the leg extended—seems to be present on each side.

She came to the University Hospital June 26, 1902, and notes made at that date are as follows: Since the last examination, June 10th, the pain has become much more intense, and has on several occasions been felt in the right lower limb, in the anterior part of the thigh, and it did not extend below the knee. She has not felt any pain in the posterior part of the right thigh. The pain has become intense in the right lumbar and sacral

regions since the examination on June 10th, and is almost as intense on the right side as on the left. Constipation has not increased, possibly because the patient has been taking magnesium. She has no girdle sensation, and has not felt any loss of motor power in the lower limbs. During the last two or three days she has had considerable pain in the left inguinal region. Menstruation has persisted during her disease. While being examined the pain is so intense that she is unable to sit still, and squirms from side to side in her chair in the hope of getting relief. Tactile sensation is more acute in the right lower limb below the knee than in the corresponding part of the left lower limb. She complains of numbness in the left foot, and both feet are cold. The patellar reflex on the right side is exaggerated, but is not obtained on the left side even by reinforcement. Patellar clonus and Babinski's reflex are not obtained on either side. Achilles-jerk is present on the right side, but absent on the left side. Ankle clonus is not obtained. Attempts to extend passively the right leg and thigh cause great pain in the lumbar region. Standing gives some relief. Gait is peculiar only because of the movements caused by pain. The upper limbs are not affected. Turning the head passively from side to side or coughing causes pain in the lumbar region.

On June 28th the left foot felt dead; the paræsthesia did not extend above the ankle, and the foot was also described as if asleep. Resistance to passive movement in the flexors of the left thigh was distinctly less than in the right thigh, but resistance to passive movement in the muscles of the left leg seemed to be as good as in the right

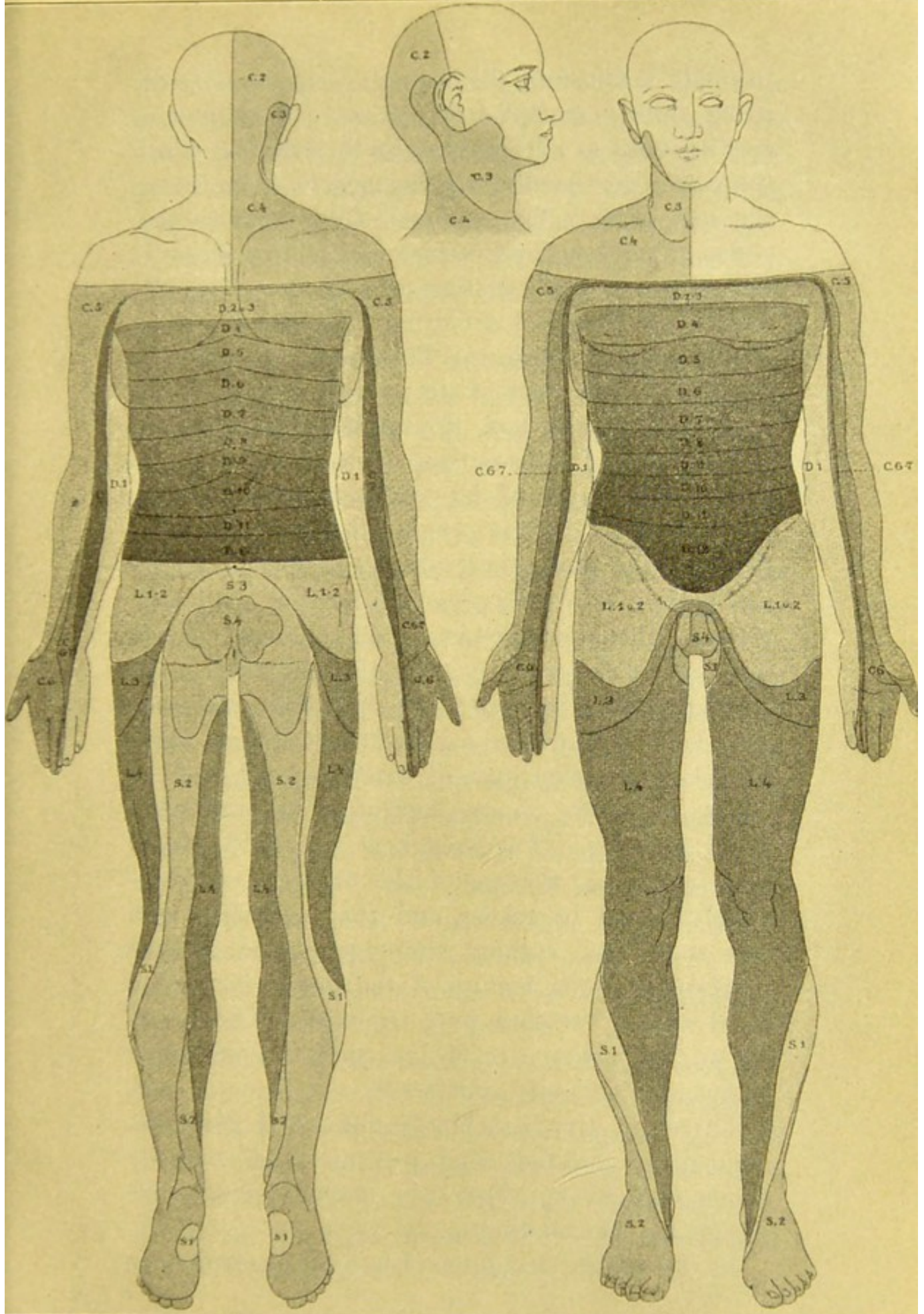
leg. Since the day previous the left lower limb gave way when the patient stood. When walking she spared the left lower limb, but would stand on either limb alone, and yet the left limb soon gave way.

On June 30th the flexor muscles of the left thigh were very weak. The flexor muscles of the right thigh were also affected, but not so much so as those of the left thigh. The extensors of each leg were not weak. The patellar reflex was lost on each side. An operation was decided upon, and done on this day.

As the pain had been felt chiefly in the distribution of the left third and fourth lumbar roots (see diagrams), it was decided to remove the laminae of the first, second, and third lumbar vertebræ, as in this way the whole of the third and the greater part of the second and fourth lumbar roots would be exposed. The operation was done by Dr. Edward Martin, and his report is here given :

Though the operation of laminectomy often fails in accomplishing the purpose for which it is attempted, it is one which, if performed in a cleanly manner, is so simple, rapid, and safe, and apparently so devoid of crippling after-effects, that the conservative attitude of the profession toward it is somewhat surprising. In the case reported by Drs. Spiller and Musser there seemed every reason for believing that a pressure lesion would be found in or upon the cord.

No attempt was made to turn back the osteoplastic flap. An incision was made in the middle line, and carried close to the bone on either side of the spinous process of the last dorsal and four lumbar vertebræ until the site of the laminae was reached. No attempt was made to check the bleed-



Diagrams showing distribution of the sensory roots, from Edinger's "Vorlesungen über den Bau der nervösen Centralorgane." Sixth edition.

ing with hæmostats, the wounds, as soon as made, being tightly stuffed with gauze. This packing was kept up at all points excepting that at which the periosteal elevator was engaged in stripping up the soft parts. The removal of the spinous processes of the last dorsal vertebra gave free access to the upper lumbar laminæ, which were rapidly divided by means of a cutting drill attached to an electro-surgical engine. This instrument greatly facilitated this part of the work, which, in the absence of such a tool, should be accomplished by a long pair of bone-cutting forceps. The veins lying in the layer of fat which covered the dura mater were much less prominent than usual. On splitting the dura a cyst about one inch in length and half an inch wide presented itself at once, with walls of flimsy consistence, so diaphanous and thin that in opening this cyst to the pia these walls could no longer be identified. The fluid evacuated was clear, and after emptying the cyst there was a forcible continuous gush of cerebro-spinal fluid, of about five or six ounces, indicating unusual intradural pressure. The escape of the fluid caused clonic spasms. Because of this the dura was completely closed by suture, and the external wound was sewed up without drainage. The spinous processes and the laminæ of the first, second, and third lumbar vertebræ were removed. The exposure of the lower part of the cord and the cauda equina was perfectly satisfactory.

There was very little bleeding from the operation, incident to the fact that pressure was carefully employed, and no effort was made to clamp the vessels by the hæmostats.

In the ventral decubitus chosen for operation the

breathing was not interfered with, since sandbags were placed under the shoulders and beneath the bony pelvis, thus supporting the weight on these parts of the body and preventing the abdominal viscera from being thrust up against the diaphragm. This, I believe, an important matter. Free diaphragmatic motion should also be secured in these spinal operations.

Notes made on July 10th are as follows : Miss A. B. had no pain in the left lower limb after the operation until July 5th, but during this period she had pain at the end of the spine and in the rectum. This was supposed to be from the operation. The numbness in the left foot began to lessen four or five days ago, but is still present. On July 5th she began to have attacks of severe pain, confined to the anterior part of each thigh and exactly in the middle of each thigh; in the right limb this pain extends as far as the foot; in the left limb the pain extends only as far as the knee. She began at the same time to have severe headache on the left side only, the pain beginning in the neck and shooting up into the head. Patellar reflex and Achilles-jerk are not obtained on either side. Resistance to passive movements in the flexor muscles of each thigh is not very great.

On July 14th the patellar reflex was obtained on the right side, but not on the left.

By July 26th the numbness in the left foot had become much less than it was before the operation. She still had some pain in the front of the left thigh. Resistance to passive movements was somewhat diminished in the left lower limb, but was normal in the right lower limb. The bowels and bladder were in good condition.

On August 21, 1902, Miss A. B. still had some pain across the back near the wound. Since the operation she has had no pain near the left sacro-sciatic foramen, where the pain was so intense before the operation. The pain occasionally shoots down the front of the left thigh as far as the knee, but there is no pain in the thigh on pressure, and she has no pain during the daytime. The pain in the back has been getting less severe and less frequent since the operation. She can stand well on her left limb alone, and her gait is normal. The right lower limb is normal and entirely free from pain. Resistance to passive movements is about normal in the left lower limb. Patellar reflex is not obtained on the left side, but is normal on the right side. Babinski's reflex is not present on the left side, and the left Achilles-reflex is absent. Sensation for pain and touch is normal in the left lower limb. She returned to her home on August 23, 1902.

At the time this report is published Miss A. B. is in excellent health. She has some pain at times down the front of the left thigh, but only after walking or getting excited. She has no pain in the thigh when she is quiet. As she has at times had hysterical manifestations, the pain she now has may be hysterical, especially as it appears when she gets excited. She may be said to be cured, although of course we cannot say with certainty that no further pathological condition exists.

The question has arisen whether the cyst found was of parasitic nature. It was probably not a parasitic cyst.

H. Schlesinger,¹ in his monograph on *Tumors*

¹ Beiträge zur klinik der Rückenmarks und Wirbeltumoren, Jena, 1898, p. 51.

of the *Spinal Cord and Vertebrae*, remarks that parasitic cysts within the vertebral canal are either cysticerci or echinococcus cysts, and the latter occur about five times more frequently than the former, and yet the cysticerci are more likely to be overlooked, because they are smaller and not so numerous in any one case. Cysticerci have never been found within the vertebral canal unless they existed elsewhere in the body, especially in the brain and its membranes. They occur as round or oval cysts, or much more rarely as cysts with processes—*cysticercus racemosus*—as in the cases of Hirt and Richter. In these two cases numerous cysts were found within the spinal dura. Of seven other cases of *cysticercus* of the vertebral canal six were examined critically by Schlesinger. (Cases of Westphal, Hebold, Walton, Gerhardt, Rokitansky, Gribbohm, Alcalai.) In seven of the eight cases the cysts were intradural, so that this variety is much more frequently intradural than extradural. As many as seven cysts have been found within the vertebral canal in one case, but there may be only one within the vertebral canal. The cysts are frequently on the ventral side of the cord, and sometimes within the substance of the cord. Usually they are not very large, the size of a pea, and rarely as large as a bean. They are sometimes free, sometimes attached to the spinal cord.

Schlesinger collected forty-four cases of echinococcus cysts of the spinal cord and its membranes. When the parasite is intradural it is round or oval and compresses the cord. The dura is usually not implicated and merely distended. They are more frequently extradural than intradural. Of the forty-four cases only five were intradural, so that

the extradural location is seven times more frequent than the intradural. The cysts are usually unilocular, and frequently multiple, but in the cases of Ransom, Anderson, and Cruveilhier only one cyst was found in each case, and in these the cysts were extradural. The cysts are usually on the posterior surface of the spinal cord. The thoracic region is the portion of the vertebral canal most frequently affected, at least in the extradural variety. The cysts may be the size of a pea, the size of a walnut, or even larger, and their contents are clear, and they often contain daughter cysts. The rapidity of growth of these cysts varies greatly, and years may pass after symptoms have appeared before the symptoms become very serious.

A BRIEF REPORT OF ELEVEN CASES OF TUMOR OF
THE SPINAL CORD OR SPINAL COLUMN.

Tumor of the spinal cord, either extradural or intradural, is a subject of interest alike to the physician and the surgeon, and at present it seems to be attracting unusual attention. The two papers by Oppenheim,¹ the paper by Collins,² and the paper by Putnam, Krauss and Park,³ have been published so recently that it is unnecessary to refer further to the literature. I shall report briefly my own experience as regards spinal tumors. At least eleven cases of tumor of the spinal cord or vertebræ with operation or necropsy have come under my

¹ Berliner klin. Wochenschrift, 1902, Nos. 2 and 39.

² Medical Record, December 6, 1902, p. 882.

³ American Journal of the Medical Sciences, January, 1903, p. 1.

observation; some of these were seen in the service of others and some were cases of my own.

The first was in the service of Dejerine¹ at the Salpêtrière, in 1895, and presented the symptoms of compression of the cauda equina. Operation was attempted by Chipault, but was unsuccessful, and the patient died three hours after the completion of the operation. A round-cell sarcoma of the cauda equina was found, but it could not be removed. The case was reported by Dejerine and myself.

The second case was also in the service of Dejerine at the Salpêtrière. A small intradural osteoma confined to one sacral root was a chance finding at the necropsy. So far as I know no symptoms of tumor had been observed during the life of the patient. The tumor was so small that it probably did not give rise to any symptoms. Had it done so it probably would have caused severe pain in a very limited area, and the correct diagnosis would have been extremely difficult. It is important to remember that a tumor confined to one root may exist, and this possibility should be in our minds when we meet with a case of intense and persisting pain in one nerve root territory. The spinal cord in this case of osteoma of one root was examined by me, but secondary degeneration could not be detected. The report of this case has never been published.

The third case was also in the service of Dejerine, and the tumor, a lipoma of the filum terminale, was likewise a chance finding at necropsy. It had

¹ Dejerine and Spiller. *Comptes-rendus des Séances de la Soc. de Biologie*, 1895.

caused no symptoms. A lipoma of the central nervous system is a very rare tumor, and I¹ believe there is no other case of lipoma of the filum terminale on record, although Gowers² has reported a lipoma of the conus medullaris. A tumor of the filum, as in a case of glioma of this portion of the spinal cord reported by Lachmann, may compress the spinal roots nearest to it—*i. e.*, the lower sacral—which innervate the bladder. Such a tumor may cause disturbance of function only of the bladder, without motor or sensory symptoms in the lower limbs, and in Lachmann's³ case the mistaken diagnosis of carcinoma of the bladder was made.

The fourth case was seen in the service of F. Kraus, in Vienna. A sarcoma of the vertebræ compressing the spinal cord was found. No report of this case has been published so far as I know. Operation was not attempted.

The fifth case was a patient of Dercum,⁴ and the case was reported in full by him. Quadriplegia finally developed. A chondrosarcoma situated at the foramen magnum was found. I merely saw the patient once and assisted in the necropsy and prepared the microscopic specimens.

The sixth case was in my service at the Polyclinic Hospital, and has not been published.

A woman, aged forty-eight years, in November, 1898, began to have severe pain in the back of the neck and back of the head, and this pain was

¹ Spiller. *Journal of Nervous and Mental Disease*, 1899.

² *Transactions of the Pathological Society of London*, 1876, vol. xxvii.

³ *Archiv für Psychiatrie*, 1882, vol. xiii. p. 50.

⁴ *Journal of Nervous and Mental Disease*, August, 1899.

attributed by her to taking cold. In December, 1898, the pain became more severe after an attack of grippe. When seen by me on October 14, 1899, the pain was felt in the back of the neck and head, and radiated into the shoulders and down each upper limb half-way to the elbow. Sight had been failing for three years. She had been obstinately constipated. The movements of the head in all directions were much restricted, but she had free use of the upper and lower limbs. The patellar reflex was prompt on each side. Pressure upon the head downward caused pain in the back of the neck. The gait was slow but not ataxic. Movements of the upper limbs were not ataxic. High-grade choked disk was found on each side. She was admitted to the hospital on October 23, 1899. Vomiting began soon after she entered the hospital, and became frequent. Vision gradually was lost. Sense of smell was lost when tested on November 9, 1899, and on this date her hearing was good. The first attack of unconsciousness was observed November 19, 1899, and these attacks soon became frequent, and lasted from a few minutes to half an hour or more, and during the attacks the heart-beat became weak and sometimes rapid. Weakness of the shoulder and upper arm muscles soon developed, and at a time when the hands could not be moved at the wrists the movements of the fingers was fair, but later the fingers could not be moved voluntarily. Pain preceded this paralysis for months. The patellar reflexes were never very distinctly exaggerated, and on several examinations were weak or even absent. The only cranial nerves implicated were the optic and to a very slight extent the right hypoglossal.

Hearing may have been affected late in the disease. The facial nerve on each side functionated normally. Babinski's reflex was not obtained until the day before the patient's death, and was soon exhausted. Dizziness was complained of on March 3d. The upper limbs were never spastic, and when paralyzed the limbs were very flaccid. Objective sensation was not found disturbed in the upper limbs until May 2d. The sensation of constriction passed downward gradually from the neck to the chest. Slight nystagmus on lateral movement was observed April 4th. No paralysis of the external ocular muscles existed. On May 9th weakness in the lower limbs was intense, and much pain was felt in the left lower limb. Death occurred on May 17, 1900. Extension of the head was employed for some time after the patient entered the hospital, and at first seemed to be of benefit. At a time when the patient could walk without difficulty no ataxia of gait was observed, but no note is made of her gait later than October 23d. The attacks of unconsciousness became so frequent and were so serious in the cardiac involvement, and the patient disliked so much to be disturbed, that the gait was not tested in the later stage of the disease.

I made a diagnosis in this case of tumor of the upper cervical cord near the foramen magnum, and during many months I watched the paralysis passing from the muscles of the shoulder to the forearm and hands, until finally the lower limbs became paralyzed. The tumor was believed to be extramedullary, but operation was not attempted on account of the position of the growth. A necropsy was obtained, and an intradural tumor, that probably should be classed under the sarcomata, although

it has some peculiarities, was found compressing the upper cervical cord and medulla oblongata, and extending on to the pons. A small tumor was

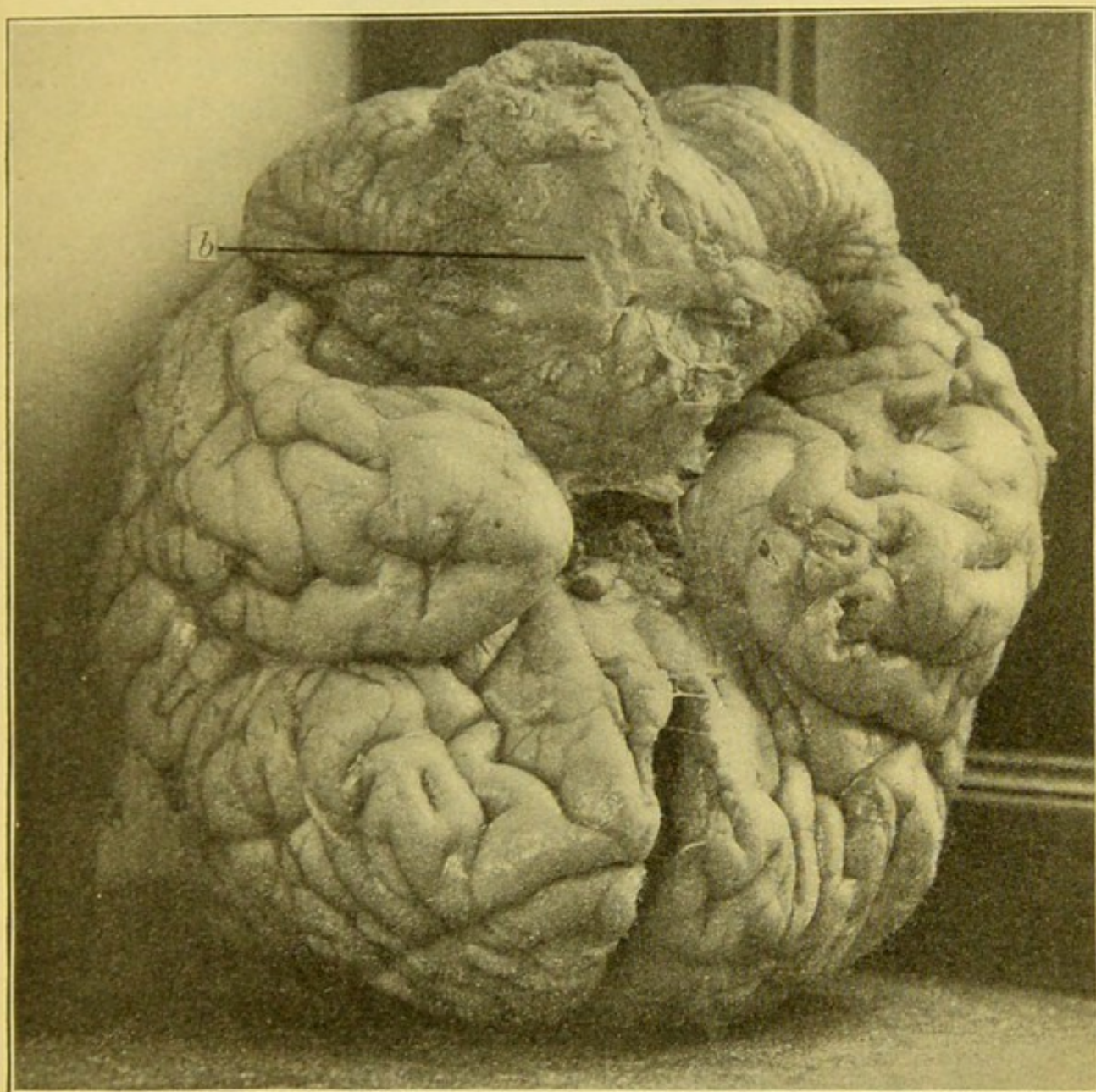


FIG. 1.—Flat tumor (*b*) covering the medulla oblongata and the left side of the pons.

found in the lower thoracic region. (See Figs. 1 and 2.)

The seventh case was not under my care, but was one in which the necropsy was made by me.

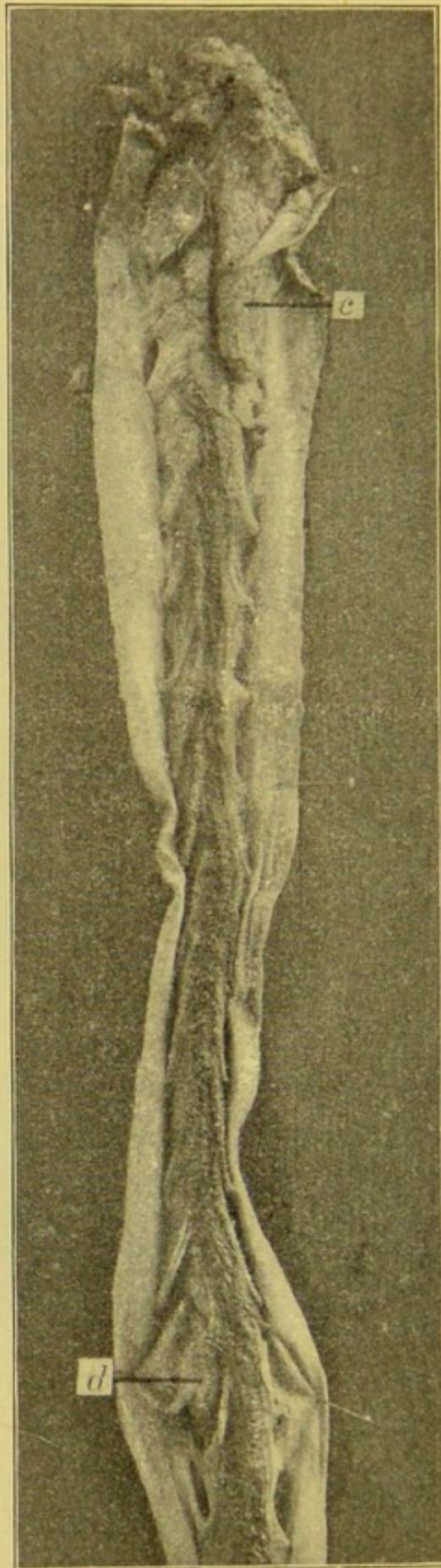


FIG. 2.—The tumor shown in Fig. 1 extends downward (*c*) on one side of the cervical cord. At *d* a smaller tumor is found.

An intradural fibroma of the lower cervical cord was found, and could have been removed easily if operation had been done. (See Fig. 3.)

The eighth case was one in my service at the Philadelphia Hospital. The man was completely paralyzed when he came under my care, and his previous condition could not be fully determined. A sarcoma within the spinal cord in the thoracic region and entirely destroying the cord at this portion was found.

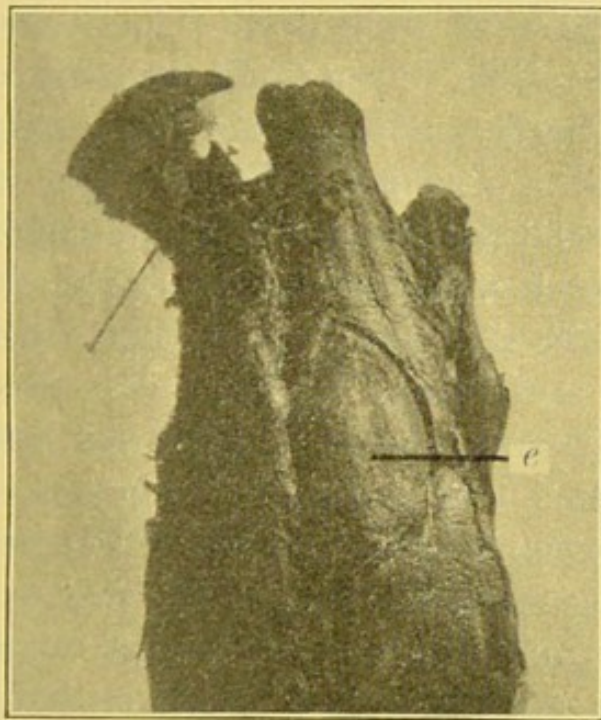


FIG. 3.—Intradural fibroma compressing the cervical cord.

The ninth case was seen with Dr. Van Gasken at the Woman's Hospital of Pennsylvania. The patient, a woman, had been well until one year after marriage. Three days after the birth of her child she had severe headache in the occipital region. After the headache ceased she was dizzy, and had diplopia from external ocular muscle palsy. The lower limbs gradually became stiff

and weak, until finally they became completely paralyzed and control over bladder and rectum was lost. Examination of the eyes showed paralysis of both external recti muscles, with paralysis of one of the oblique muscles, but the patient's condition made it impossible to determine which one. There was marked swelling of the optic disks, with hazy outlines, and the vessels were tortuous. I saw the patient about five months after the birth of her child. The head was slightly retracted and the neck was a little stiff, and she moved the head from side to side with difficulty. The headache was still severe. The upper limbs were moved voluntarily and freely, and sensation in the upper limbs was normal. The lower limbs were completely paralyzed, and the patellar reflex was much diminished on each side. A slight ankle clonus was present on the right side, and Babinski's reflex was present on each side. All forms of sensation were lost in the lower limbs. Kernig's sign was present on each side. The patient died about two months after my examination. Operation was not advised in this case, because the process was evidently a diffuse one, and the symptoms were suggestive of meningitis, especially as they developed one year after marriage and a few days after the birth of a child. Syphilis and septic infection were considered, but the duration of the process for five months seemed to make a diagnosis of purulent meningitis improbable. Sarcomatosis of the entire spinal pia was found, with a large sarcoma on the pons and another within the spinal cord in the thoracic region. The sarcomatosis of the pia resembled meningitis pathologically as well as clinically.

The tenth case was one of multiple carcinoma of the vertebræ, with compression of the spinal cord. The patient was in my service at the Philadelphia Hospital. She was weak in all four limbs, especially in the lower, and suffered much pain. The muscles were greatly atrophied.

The eleventh case is the one reported in this paper in which a cyst and not a tumor was found, but the case may be classed with those of spinal tumor, as the symptoms were the same.

These eleven cases are not the only cases of spinal tumor that I have seen, but they are sufficient for statistical purposes. Only three were cases in which operation could have been attempted justifiably, and these were cases one, seven, and eleven, and in the first operation hastened death; in the seventh operation was not attempted, and in the eleventh very great benefit was obtained by operation.

The cases to which I have referred are interesting in connection with the recent paper by Collins,¹ in which he says: "Basing the statement upon the reports of cases operated upon, and those that have come to autopsy without operation, it may be said that 50 per cent. of intraspinal tumors are operable, and of this number one-third to one-half are benefited by operation. Spinal cord tumors are, therefore, twice as operable as brain tumors, and the results of operation are twice as successful." I take the following from the paper by Putnam, Krauss, and Park:² "The percentage of recovery [from spinal cord tumors with operation] in Bruns' and Lloyd's collections is practically the same,

¹ Loc. cit.

² Loc. cit.

being 30 per cent. in the former and 31.37 per cent. in the latter. In Putnam's and Warren's collection the percentage is lower, being 21.2 per cent., while the percentage of improvement is also 21.2 per cent."

My own experience makes me very careful in giving a favorable opinion regarding operation in cases of tumor of the spinal cord or vertebræ, and yet in view of the hopelessness of treatment without operation I believe that operation should be attempted in every case of spinal tumor which seems suitable.

Of the eleven cases to which I have referred two were without clinical signs of tumor; two were cases of tumor of the spinal vertebræ; four were cases of intradural but extramedullary growths, the tumor being situated on the medulla oblongata in two, compressing the cervical region of the cord in one, implicating the cauda equina in one. Two were intramedullary growths in the thoracic region. One was an intradural cyst compressing the spinal cord in the lumbar region. Disregarding the cases without symptoms of tumor and those with tumor of the vertebræ, we have remaining seven cases of tumor on or within the spinal cord, and in only two of these was operation advisable.