

A case of extensive disease of the cervical vertebrae, with clinical observations on this and some other forms of caries of the spine ; also, A report of an operation for neuralgia / by Buckminster Brown.

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A
CASE OF EXTENSIVE DISEASE
OF THE
CERVICAL VERTEBRÆ,
WITH
CLINICAL OBSERVATIONS ON THIS AND SOME OTHER
FORMS OF CARIES OF THE SPINE.
ALSO
A REPORT OF AN OPERATION FOR NEURALGIA.
BY
BUCKMINSTER BROWN, M.D.

FROM THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES.

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Wm. Fergusson Esq.

CARIOUS DISEASE
OF THE
CERVICAL VERTEBRÆ.

SCROFULOUS disease of the spine, terminating in caries, is one of the most frequent, as well as one of the most inveterate forms in which this constitutional taint presents itself to our notice. It often commences without any external exciting cause, and is as often traced by the patient or his friends—who are actuated by the desire, so inherent in the human mind, to find for every result an evident cause—to some injury, slight or severe.

Angular curvature, however, may, without exception, be attributed to an original or acquired feebleness of the recuperative powers of the system, and is generally attended by other of the distinguishing and characteristic insignia of the strumous diathesis.

Undoubtedly, a blow or fall, which, in a healthy subject, would occasion but trifling and temporary inconvenience, may, in certain instances, produce a low degree of subacute inflammation in the spine, or elsewhere, sufficient to arouse that slumbering hereditary predisposition, which, lying dormant, is ready, on the slightest excitement, to spring into action.

It is, however, but the spark applied to a storehouse, hastening the explosion which would, sooner or later, have spontaneously taken place from the chemical action insensibly going on among its own materials.

The bones of the spine and of the hip-joint are the parts most frequently affected by caries; and, when the disease proceeds unchecked by treatment, suffer the most severely from its devastations. Of this elective tendency, we have ample proof in the

numerous pathological specimens of carious spine and hip to be met with in every cabinet of any size, either in Europe or America; and, independent of this evidence, private experience sufficiently evinces that such is the fact.

An example of disease of the vertebræ so extensive in its effects as the following, both as regards the bony structures destroyed or removed, and the implication of parts so essential to vitality as the upper portion of the spinal nerve, even impinging on the locality, so to speak, of life itself (the respiratory tract of Bell), is of most rare occurrence, and perhaps has never before been met with.

The patient, George Burr, was 27 years of age. His stature was short, bones small. In February and March, 1851, he was treated for what his friends believed to be rheumatism. He had severe pain in the back of his neck, between his shoulders, in his arms, and shooting through his chest. While under treatment, a puffy swelling made its appearance between the scapulæ. This swelling disappeared in a few weeks. The latter part of March, while on his way from Boston to Plymouth, an accident happened to the cars, a short distance from the city, by which he was thrown into the water, but sustained no other injury. He appeared to suffer no immediate inconvenience from this exposure further than a severe chill, which came on after his long walk back to the city in drenched clothes, the day being cold and stormy. The latter part of the summer, which was passed in Plymouth, he frequently complained of a feeling of numbness in his lower limbs. In October, he had a severe attack of epistaxis, which threatened life, and by which he was much debilitated. The latter part of October he returned to Boston. At this time, there was a swelling on the back of his neck extending from the occipital bone to the fifth or sixth cervical vertebra. The jar of the cars produced much distress, and he was obliged constantly to steady his head with his hands during the journey. At this period there was at times some degree of deafness.

For some months after his return to Boston, the patient continued in about the same situation. I saw him for the first time the latter part of February. A fortnight previous, after making a sudden movement to look out of the window, he lay down with less caution than usual, resting his head upon the arm of the sofa, when he felt a sudden twinge, and heard a crack in his neck; at the same time his head was violently twisted towards the left shoulder. He was

immediately seized with the most intense agony, dyspnœa, general convulsions, alternating with rigidity or a cataleptic state of the limbs. He remained in this situation some hours, after which he walked across the street home, where he had another similar attack. At times, during the night, he appeared to be in *articulo mortis*, lying perfectly motionless, covered with large drops of cold perspiration. Towards morning there was some improvement in his symptoms.

When first seen by me, the head was, as above described, strongly rotated to the left; the swelling in the neck had partially disappeared; there was total inability to move his head independently of his body, and it was drawn somewhat backward, as well as to the side. All the muscles of the cervix were rigidly contracted; and in every motion the consentaneous and instinctive energy of the whole body seemed to have but one object,—that of keeping the head steadily in its place.

The usual diagnostic marks of carious vertebræ were not present. There was no angular projection of one or more of the spinous processes; and, more especially, there was no anterior or lateral drop of the head, pathognomonic of disease of the cervical vertebræ, particularly of the superior; and, also, there was wanting that peculiar sinking of the head between the shoulders, which I have learned to consider as characteristic of caries of the inferior. And there was as yet no paralysis.

On more minute examination, however, of the spine in this region, I found a remarkable condition of the vertebræ. One of the spinous processes had disappeared from its normal position; and, at the upper part of the neck, the finger sunk into an excavation in which it could be laid flatwise, without any more than filling the space. On examining the pharynx, a projection or fulness was observed at the back part, on a level with the third or fourth cervical vertebra. A slight degree of soreness of the throat was complained of. I stated my opinion that there was luxation of the cervical vertebræ at the point indicated; the result of caries.

In the course of a week from this time, paralysis supervened. It commenced in his arms, and extended until voluntary power over every muscle in the body was destroyed, with the exception of those about the mouth and eyes, which were only partially affected.

The muscles of the lower extremities still possessed a firmness and tone very different from the flabby, lax condition observed in

paralysis from disease of the lower portion of the spinal cord. This evinced a continuance of reflex power below the seat of the disease; and that the property, inherent to the nerve, of maintaining the contractility of the muscles paralyzed to the influence of the will, was undiminished. On the contrary, and in confirmation of the observations of Dr. M. Hall and others, the power referred to was in this case, and others which have fallen under my observation, increased, so as to produce a remarkable degree of rigidity. The muscles about the neck and arms were totally deficient in firmness or tone, and hung like those of a corpse. Sensation below the disease was lessened, but not annihilated. The arms, hands, legs, and feet were very cold to the touch, although the patient thought them comfortably warm, and sometimes he felt in them a burning heat. His pulse was 100, and his respiration 17 or 18 per minute. In respiration, there was no motion of the abdominal muscles. It was entirely thoracic; probably maintained chiefly, if not entirely, through the par vagum, and perhaps the sympathetic, by means of the filaments which this nerve derives from the cerebro-spinal system.

The emaciation was extreme; appetite good; deglutition not materially impaired; bowels costive; and he had a slight cough. His mind was clear, and his countenance tranquil.

For the two or three succeeding weeks, the patient was in the hands of an Indian or botanic doctor. When I again saw him, his situation had not varied much from that above described. The cough had increased, and he expectorated large quantities of bloody muco-purulent matter. The physical signs of pulmonary disease were not strongly marked. There was complete relaxation of the muscles of the neck; they had not the slightest power over the motions of the head, which fell when any attempt was made to move him. The signs of dislocation had partially disappeared after the complete loss of contractibility in these muscles. The least change of position was attended with the most alarming symptoms. The assistance of four persons was required when he was turned; one to guide the head, while another took the shoulders, etc. Even with all this caution, there was always dyspnœa, spasm, cerebral symptoms, as dizziness, &c., aphonia, and extreme exhaustion.

He experienced much relief from a spring support that I adapted to his neck, which sustained his chin, and, bearing on the mastoid process and base of the cranium on each side, and on the sternum and clavicle below, effectually steadied his head. This he wore to

the time of his death. Generous and somewhat stimulating diet was directed.

Convulsive movements of the legs were frequently excited by gently touching his feet; and he was constantly annoyed by spasm of the different muscles, or by "a springing" of the legs without any external cause.

The patient remained in this state until his death, the immediate exciting cause of which appeared to be some mince-pie that was clandestinely procured by one of his attendants. His mind was unclouded to the last. He died on the 18th of April. There was at no time relaxation of the sphincter.

Post-mortem.—Body excessively emaciated. No curve or projection of any part of the spinal column. On the anterior face of the bodies of the cervical vertebræ, the cyst of an old abscess was found. This cyst contained no fluid, was about the size of a hen's egg, and through an opening formed by the removal of the body of the second vertebra, and which extended from the first to the third, it communicated with the rachidian canal between the dura mater and the arachnoid. It is probable that the collection of pus existed at first external to the membranes, and finally opened through the dura mater into its cavity, which accounts for the disappearance of the effused fluid. On opening into the upper part of the cyst, towards the medulla oblongata, a loose piece of carious bone, the size perhaps of half a filbert, rolled out of the medullary cavity. In the course of a careful dissection, another piece, much larger than the first, also loose and carious on all sides, was found. These were the remnants of the odontoid process, and of the body of the axis which was entirely destroyed or removed, with the exception of a small lamina on the left side, that still remained attached to the semicircle of bone. The inferior articulating process on the right side was carious. The superior on the same side, and the transverse with its vertebral foramen, destroyed. The superior articulating process on the left carious, its articulating cartilage and capsular ligament gone, and the caries extended over the lamella towards the posterior arch. Ascending to the atlas, the disease had destroyed both inferior articulating cartilages, and partially the processes, extended anteriorly round the condyles, upwards towards the superior condyles, and posteriorly through the left lamina of the posterior arch, breaking entirely through it at one point, and continuing on until it involved the posterior tubercle. In the occipital bone, the

right articulating condyle and the basilar process were roughened, and in some places the continuity of the bone was destroyed.

The apex of the odontoid was found suspended by its alar ligaments in its normal situation. The occipito-axoid ligament which incloses the odontoid process was ulcerated through, thus permitting the fragments of this process to find their way into the vertebral canal. This process had been twice broken; once from its apex, which had been left adhering by its ligaments to the margin of the foramen-magnum, and once at its base, from the body of the dentatus, which had likewise separated from the rest of the bone.

It is evident that one of these fractures must have occurred at the time when a crack was heard and felt in the neck, followed by immediate luxation and the symptoms previously described.

The anterior face of the body of the third vertebra was also affected with caries, and the intervertebral substance almost completely destroyed, together with a part of its right articular process, and the whole of its anterior pedicle, which should have inclosed the vertebral foramen.

Softening had likewise commenced in the cartilage between the bodies of most of the other cervical bones. Some, when in a fresh state, presented fine examples of central softening; and others, of well-defined ulcerated perforations, illustrative of the earliest stages of the disease when commencing in this part. The body of the sixth was deeply corroded, and the transverse processes of the seventh somewhat so. There was a remarkable, almost translucent, thinness of some parts of the os occipitis.

The medullary substance in the cervical region was softened from the foramen-magnum to the first dorsal. The upper part was reduced to a pultaceous, semi-fluid mass. The medulla oblongata, of its natural consistence and appearance. The brain was healthy. Tubercles were found in the lungs, and strong, old pleuritic adhesions on both sides.

It is an extraordinary circumstance, that, after the fracture of the dentatus, the head should still have maintained its upright position until the occurrence of paralysis. This phenomenon can only be accounted for by the dislocation, made evident at the time by the injury inflicted on the nervous system, by the rotation of the head, and displacement of the spinous process, in consequence of which the vertebræ were turned in such a way as to support each other, and in some measure supply the place of the broken bone.

It will perhaps be interesting to describe the exact position of the parts by which this fortunate result, so far as the life of the individual was immediately concerned, was rendered possible.

The thin, brittle fragment which still remained of the body of the axis on the left, rested on the pedicle of the third vertebra on the same side, anterior to the vertebral foramen, thus affording support in an upright, though rotated position; while a rapidly decaying pedicle of the posterior arch on the right, which had slipped forward on the inferior articulating process of the vertebra above, with its lower edge resting on the body of the third, effectually prevented the drop of the head forward.

The spots specified bear the marks of pressure from the corresponding points of bone.*

That entire loss of power did not immediately follow the accident, is accounted for by the fact, that although the calibre of the canal was lessened, yet it was not directly impinged upon by any sharp edge, or point of bone.

When paralysis did take place, it was a consequence of the extension of the disease to the membranes, and through them, thus bringing the purulent matter in contact with the spinal nerve, which, at the point indicated, *appeared* to have suffered complete disorganization. That its functions were not wholly annihilated is, however, evident. There must have been a portion, the most remote from the earliest seat of the disease, viz., of the posterior columns, that still retained, however imperfectly, the power of conducting to the brain the slight degree of sensation which remained in the body below this point.

It will be found, upon investigation, that the spinal nerve does in reality permit of a much greater degree of equable compression, without producing immediate paralysis or disorganization, than *à priori* we should have deemed possible.

If, at the moment of the first occurrence of the displacement, life is not instantly extinguished, the nerve may become accustomed to the new state of things, and fulfil its functions more or less perfectly, according to the amount and cause of the accident.

There are accounts of two remarkable cases reported by Gœtz of Halle, and Wigan, which latter has been cited by Mr. Lawrence, proving the extent to which this diminution of the compass of the canal may take place without destroying nervous power. In the

* The parts described have been carefully preserved.

former, the occipital foramen was diminished one-half without paralysis.

The case was that of a young man sixteen years of age. He had a gouty constitution. The bones of the neck finally became diseased, and his head gradually inclined in a lateral direction, so that, in course of time, it fairly lay upon the right shoulder, where he was obliged to carry a cushion for his head to rest upon. This patient died of apoplexy while walking in the street. There was complete ankylosis of the os occipitis with the atlas and odontoid process. The first vertebra was displaced anteriorly, and the process of the second projected into the foramen-magnum in such a manner as to lessen it one-half, producing, of course, great compression of the nervous mass.

In the case cited by Mr. Lawrence, there existed bony union of the occipital bone with the atlas and axis, with displacement of the first vertebra to the left, of the second to the right, and projection of the odontoid process into the occipital foramen, close upon the right anterior condyloid foramen. The subject died of caries of the lumbar vertebræ.

Sandifort gives a drawing of a case, in which the first and second vertebræ were solidly ankylosed together, and with the occiput. Previous to the union, a most remarkable displacement of the upper vertebræ had taken place, by which two-thirds of the foramen-magnum had been closed. In addition, a strong osseous column extended from the jugular process of the temporal bone, on each side, down to the transverse process of the atlas, to which it was firmly united. This was certainly a most extraordinary provision of nature for preserving equilibrium and supplying the place of the dislocated bones. These adventitious side-bones were, in fact, two natural splints.

The history of this case is imperfect. The individual lived a long time after the luxation; but we are not informed of the state of the motor or sentient nerves. The case is, nevertheless, an interesting one, and worthy of note in this connection.

Duverney has likewise described one somewhat similar. The six upper vertebræ were united by bone, and there was a luxation so complete as to throw the odontoid process back to within the distance of two lines of the posterior arch.

Other writers, as Hunauld in the *Anatomie Chirurgicale*, Frank, and Meckel, have related instances resembling in some respects the preceding. These descriptions, however, are not accompanied by

any accounts of the symptoms which attended this state of things during life, and therefore can be considered simply as scientific curiosities.

In the more common forms of angular curvature of the spine, the diameter of the canal, instead of being decreased, is sometimes enlarged; and, in the majority of cases, the paralysis, which is so frequent an attendant on this disease, cannot be attributed to the alteration in the position of the bones. When it does occur, it is probably occasioned by the pressure of the tuberculous and puriform matter which is effused; or, when this is not confined within parietes sufficiently inelastic to produce such an effect, and as an additional independent cause, it comes on as a consequence of the disease involving the membranes, or the cord itself; in which case, the paralytic symptoms occur in the latter stages.

When, combined with abolition of the voluntary power, we find in the muscles, not simply the property of tone remaining, but, as is sometimes the case, strong contractions, we may with justice conclude that there is present some more active exciting cause; that there is probably some mechanical irritant, as points or spicula of bone, impinging on the posterior columns of the spinal cord. In the case of Burr, which we have given above, the rough fragments that were found floating about in the vicinity of the medulla-oblongata, at times, if not constantly, lying directly upon it, will account for the state of rigid flexion in which the lower limbs were for the most part retained.

It is an interesting object of inquiry, in connection with angular disease, which of the spinous processes it is that projects; or, when more than one are implicated, which is most salient.

This has been the subject of experimental and pathological investigation by various writers. MM. Nichet, Delpech, and Bonnet, have determined that it is always the one diseased, or that which has been most affected, which forms the angle.

According to the observations of these gentlemen, the vertebra placed immediately above tips forward, or "submits in its totality to a forward movement," by which the spinous process of the diseased bone is left uncovered, forming, of course, a sharp projection.

This undoubtedly is the fact, as can be satisfactorily ascertained, not only by examinations of the diseased parts after death, but also experimentally, on the skeleton, by bevelling off anteriorly the bodies of one or two vertebræ in a normal spine, in such a way as

to simulate, as nearly as possible, the state in which they are most frequently found when affected with caries.

I will here refer to a circumstance that has, in one or two instances, attracted my attention, and which was particularly to be observed in the case of young Burr. When relating the case, I stated that there was no pus found in the cyst after death. The small amount in the spinal canal, or which was at any time effused, when placed in comparison with the extent of the disease, is an incident worthy of note.

Destruction of the vertebræ may be the result of three different forms of disease. In the first, there is simply slow absorption, without suppuration or caries. In the second, there is caries, with ulceration and abundant purulent or tuberculous deposits; and authors speak of a third, but certainly very rare species, which has been denominated by the French *carie sèche*, an ulceration of which the products are absorbed as fast as they are generated. There has likewise been observed a species of caries, in which the disease discovered after death was comparatively inconsiderable, forming a remarkable contrast with the obstinacy and severity of the symptoms that had existed during life. Symes draws attention to this fact, and relates one or two striking examples. He says, "there is in his possession the thigh-bone of a woman who labored for thirteen years under caries of the trochanter major, yet the whole disease may be covered by the point of a finger, and is not thicker than a sixpence." The reverse of this is, however, of most frequent occurrence. The quantity of pus which is deposited, particularly when the dorsal or lumbar vertebræ are affected, is sometimes enormous. In a subject who died of this disease, which I examined in Basle, Switzerland, a few years since, the entire spinal column, from the upper dorsal to the lower lumbar, was imbedded in one large abscess, which, pursuing the course of the great vessels through the abdominal ring, formed a double psoas abscess in the groins.

The amount of pus found in this case was immense, although the pleuritic and other symptoms had so veiled the primary disease during life, that it had not been with certainty diagnosticated.

In a case of angular disease of the lower dorsal region at present under treatment, there is an excessive accumulation of fluid, probably behind the peritoneum. The abdomen is swollen to the size of a woman's in the latter months of gestation. The intestines are found by percussion to have been divided, and pushed to each side,

by the gradual advance of the tumor; and the double layer of the peritoneum, stretched tightly beneath the integuments, seems to render further enlargement impossible. The disease, in fact, appears to have been arrested, the swelling having remained stationary for several months; while, in other respects, there has been a decided and manifest improvement. The lower limbs, which were completely paralyzed, are recovering their power, the patient having commenced walking with assistance; while the distress, on assuming the erect or semi-erect position, has entirely disappeared. Respiration, digestion, and other functions, are healthy.

During the early part of the disease, the patient frequently experienced, on being moved, a feeling of grating, or crepitus, between the denuded surfaces of bone. Appearances and symptoms now countenance the hope, that, during the many months she has observed the horizontal position, with her back firmly supported in such a manner as to prevent motion at the diseased part, — nature being in this way afforded uninterrupted opportunity to perform the cure, — osseous union has been gradually taking place between the bones.

The extent to which the bony structures are implicated in this case can, of course, only be a matter of conjecture, aided by the appearance of the curvature, and past experience in similar cases. From the local indications, independent of the amount of fluid, we are led to the opinion that the disease is confined within comparatively narrow limits, not extending beyond two, or, at the most, three contiguous vertebræ.

Lateral curvature of the spine to the right or left, the most common form of spinal deviation, characterized by a greater or less prominence of one of the scapulæ, — which is so prevalent among persons of sedentary habits of both sexes, — is rarely combined with the formidable disease we are now considering.

In 532 cases of spinal affection which have come under my observation, in the practice of Dr. J. B. Brown and in my own, 288 were simple lateral curvatures, 102 angular projections from tuberculous softening and carious disease, 21 a combination of these two forms, while the remainder consisted of posterior and anterior curvatures, etc.

Thus, in 123 cases of angular disease, I find 21 only in which this curvature is united with a lateral deviation.* Duval found a lateral curve in 10 out of 116 cases of angular projection.

* As a remarkable fact, I would mention that one of these cases, a patient affected

This infrequency is only what we should expect when we consider the want of analogy in the cause, and the comparatively innocent nature of the former deviation.

Both curves, in these exceptional cases, may unquestionably originate in the structural disease. But this is not constantly true, as can easily be made evident, in the first place, by the general appearance of the spine; the side curve being rarely so decidedly angular at any one point, as to indicate the existence of a complaint which usually attacks but one or two bones at the same time, and also by the consideration of the greater predisposition to caries, which characterizes the anterior portions of the vertebræ, where it is almost universally far advanced before the sides are materially affected. It follows, then, that for the most part the lateral curve here arises from the same cause as when it exists alone.

The natural curves of the spinal column, and the natural obliquity of the pelvis, in angular curvatures, is always nearly or completely obliterated. The position of the pelvic cavity, particularly if the projection is in the loins, becomes nearly horizontal, and satisfactorily accounts for the rapid deliveries which are reported as so frequently taking place among women affected with this form of ankylosis.

In respect to the frequency of caries in the cervical region, as compared to those instances in which the dorsal or lumbar vertebræ are attacked, I find but few data upon which to base statistical inquiries. Thus, in Duval's 116 examples of carious vertebræ, there were five only in which the complaint was in the cervix. Nichet reports 33 cases, in six of which this was the part affected.

In the 123 cases of angular projection from caries, of which I have notes, eight had the disease in the cervical vertebræ. In three of these, the chin rested on the sternum; in one only was the head drawn backwards. In the majority, the disease was at the root of the neck, in the fifth, sixth, or seventh vertebra.

These latter have been uniformly marked by the peculiar and characteristic symptom to which I have referred; the head appearing as though it had sunk or been driven down, wedge-like, between the shoulders. I have likewise constantly noticed that there is a peculiar respiration attendant on this form of the complaint. It is noisy, hurried, and at times painful; yet it is quite different from

with severe angular disease conjoined with a lateral curve, when she first came under treatment was *enceinte* with her eleventh child, after having borne ten during the twelve previous years. She was at this time thirty-two years of age.

the kind of respiration to which we usually apply the term dyspnœa. I have, therefore, avoided the use of this term in speaking of the symptom.

When the upper dorsal are affected, there is not unfrequently disturbed respiration, although not usually to the same extent. In many instances it is apparently independent of any diminution of the costal cavity. It exists where the capacity of the chest has been but little, or not at all, infringed upon; and owes its origin, either to some functional derangement of the nervous system, or, undoubtedly, in a certain number of cases, to undiscovered purulent effusion accumulating in the posterior mediastinum, separating the pleura from its natural adhesions, thus producing a pressure upon the thoracic viscera; the cause of which may not improbably be overlooked, or not receive due consideration. The reflex functions of the spinal nerve, as concerned in the act of respiration, have appeared to me, even at an early stage of cases of this description, often decidedly impaired. Upon such a supposition only can I account for the fact, that a considerable amount of voluntary effort is necessary to the due performance of the respiratory process. If this act of volition is withdrawn, as in sleep, or when the mind is intent upon some object of interest, we have noisy respiration; each expiratory act being accompanied by a distinct or smothered groan, which is in truth painful to hear, but of which the individual himself appears almost unconscious. This phenomenon has frequently attracted my attention, although I am not aware that it has been elsewhere particularly remarked upon.

By far the most common seat of caries of the spine is the bodies of vertebræ, particularly the anterior portion. Mr. Potts says that it is always thus limited in its effects, seldom or never implicating the articular processes. Mr. Lawrence states that "this disease attacks only the bodies of the vertebræ;" and that "the processes, which are composed of firm or compact bony tissue, it does not attack." Other cases, however, besides the one at the commencement of this article, could be cited; and there are one or two specimens in the cabinet of the "Boston Society for Medical Improvement," which prove that the transverse processes and laminae are not exempt from the inroads of this disease.

I have seen two cases, and two only, in which the appearances during life were such as would *seem* to indicate carious destruction of the posterior part of the vertebra, in the articular processes, or their vicinity, while the anterior remained in the normal state. In

the first, one of the spinous processes, in the other, two, had sunk from their original level, appearing to have slipped forward, as well as downwards, approximating the one below; and the depression, which was well defined, would be thus explained. After due consideration, however, the appearance in question may be accounted for on the more plausible conjecture, that, instead of posterior destruction, there was relaxation of the ligaments, and swelling of the intervertebral substance anteriorly, sufficient to separate to a considerable extent the front part of the bodies of the vertebræ, producing the effect described. These cases stand alone; and the true explanation can only be ascertained by the future course of the disease, or by a *post-mortem* inspection. In one, there was angular disease above the depressed spot, with the counterbalancing anterior curve, always present to a greater or less extent. In both, there were well-marked manifestations of serious injury inflicted on the spinal nerve.

Of destruction or fracture of the odontoid process of the dentatus, as the result of disease, I have been able to find the record of but three cases. Ollivier, Delpech, and Sir Astley Cooper, describe each one case. Ollivier, in the first volume of his able and comprehensive work, *Traité des Maladies de la Moelle Epinière*, relates a case somewhat similar to that of young Burr, above narrated. The disease, however, was not so extensive, being limited chiefly to the destruction of the process and its ligaments. There was, likewise, spontaneous luxation of the upper cervical vertebra, accompanied by a gradual relaxation of the capsular ligaments, but no general paralysis. The head was so strongly flexed upon the chest, that the skin of the neck formed deep folds under the chin, and there was an angular projection formed by the spinous process of the axis. This writer states that the case he describes was the only one which had come to his knowledge.

Delpech's case* is that of a soldier in the Hôpital St. Eloi, who had an angular inclination of the head on the chest, where it was held by the will of the patient, as far as possible, completely motionless. He died suddenly, from his head dropping backward one morning, when he was raised to have his bed made. The body of the axis, and its process, were almost completely destroyed.

Sir Astley Cooper† mentions the case of a woman in the venereal wards of St. Thomas's Hospital, who, while sitting in bed eating

* De l'Orthomopie, par Rapport à l'Espèce Humaine, vol. i. p. 247.

† Dislocations and Fractures of the Joints, p. 463.

her dinner, was observed to fall suddenly forward. The patients, on hastening to her assistance, found that she was dead. At the autopsy, it was ascertained that the dentiform process was broken off, and the head, in falling forwards, had forced the root of the process back upon the spinal marrow, which occasioned her instant dissolution.

In concluding this paper, I would remark, that it was far from my intention to write a treatise upon the subject to which it relates. I have here briefly alluded to but one of the several branches into which derangements of the spinal system, osseous and nervous, may be divided. This branch, with others, may be more fully discussed at some future opportunity, when more extended clinical and pathological observation shall have opened the path for a complete and thorough investigation of the various guides by which accuracy in our etiology, diagnosis, and prognosis may be attained, and to the benefit which is derived, and which we may expect to derive, from appropriate treatment.

NEURALGIA,

EXISTING EIGHTEEN YEARS,

CURED BY AN OPERATION.*

July 22.—Mrs. R. had suffered for eighteen years from pain and tenderness of the thumb of the left hand. She could not trace it to any injury. About a year previous to my seeing her, she had had a severe labor, and had miscarried at the eighth month. From that time, the pain and tenderness had increased to an alarming degree.

The tenderness of the part above the second joint was at this time exquisite, and the pain was extreme both night and day, with but rare and irregular intermissions. It commenced in the neighborhood of the internal corner of the root of the nail, and extended up the side of the thumb, through the hand up the arm to the shoulder, and terminated in the back of the neck, and was reflected on to the breast. If the thumb received an accidental blow, the whole arm would be convulsed, and the pain become so intense as to produce faintness. During these paroxysms, she described the arm as assuming a blue appearance.

On examining the thumb, I found it somewhat swollen, and a slight degree of blueness around and beneath the nail; and that, in addition to the excessive tenderness of the thumb, there was a considerable degree of soreness along the course of the median nerve. There was no marked tenderness of any of the dorsal or cervical vertebræ. Thinking, however, that it was possible the difficulty

* From the records of the Boston Society for Medical Improvement, extracted into the American Journal of the Medical Sciences.

arose from some irritation or inflammation about the roots of the nerves, the treatment was commenced by applying a blister to the spine, at the point indicated. This was kept open with an irritating ointment, and sprinkled every second night with sulph. morph.; and a cathartic was given every second day. About the same time, she took carb. ferri two or three times a-day.

For two or three days after commencing this treatment, the pain in the arm was increased. Antimonial ointment was rubbed along the course of the nerve. The tenderness in the arm gradually decreased, but continued about the same in the thumb. Leeches were now applied to the dorsal region, which afforded very considerable temporary relief.

The pain and tenderness, however, returning to its fullest extent, a blister was applied to the thumb itself, entirely enveloping it; and this, when dressed, was sprinkled with morphia. A small abscess formed on one side of the thumb; this was opened, and touched on its internal surface with lunar caustic.

The thumb was now decidedly less sensitive. During treatment, she took extract of conium, in gradually increasing doses, but without any essential improvement in the symptoms. As the dead skin peeled off, and the new formed, the sensitiveness returned, and the pain became as severe as ever.

As the list of remedies from which I thought there was any chance of deriving benefit was now about exhausted, I decided to excise a portion of the internal digital nerve of the thumb, as it was in the ramifications of this nerve around the root of the nail and side of the thumb that the disease appeared to be seated. This was done December 18th, 1849, with the assistance of Drs. J. M. Warren and Morland.

The patient being etherized, an incision was made from the internal metatarsal head of the first phalanx of the thumb, to the internal tuberosity of the phalanx, about one inch and a third in length. A dissection was then made to the bone, and without much difficulty the nerve was seized, and a piece about one inch and one-third in length was removed. The thumb had always been so exquisitely sensitive that I had never been able to make a satisfactory examination until she was under the influence of ether. The next day the extremity of the thumb was still very painful and sensitive; but there was no pain or tenderness below the place where the operation had been performed, on that side of the thumb which before had been the most painful and susceptible. So far as

this branch of the nerve was concerned, the operation was of course successful. The relief, however, was not so complete as had been hoped; and, a considerable degree of pain and susceptibility still continuing through the winter, another operation was decided upon. The patient being again etherized, a puncture was made above the most sensitive spot, just clearing the joint. A subcutaneous operation was then performed. A long thin knife was introduced anteriorly and posteriorly, and all the parts from the skin to the bone thoroughly divided; thus semi-girdling the thumb, another puncture was made on the other side, and the same operation repeated.

March 13. — The last operation has been attended with complete success. The extremity of the thumb below the incision, that is, below the second joint, is perfectly numb, and there is no pain in the thumb or hand.

April 16. — Mrs. R. has had no return of pain in the thumb or hand; and all that remains to remind her of eighteen years of suffering is a slight shooting pain across the chest at distant intervals, on exposure to cold, &c.

A case somewhat similar to the above is on record, in which the disease was also in the thumb, and was the consequence of a puncture from a shoemaker's awl. In this case, the diseased nerve was cut down upon, and a small tubercle (neuroma) was found, and removed with the nerve, to which it was attached, and of which it formed a part. The operation was attended with success. In the case above related, no tubercle was discovered.

I am not aware that the method adopted in the last-mentioned operation on Mrs. R., viz. that by which all the nerves proceeding to or from a painful part were divided, thus destroying all possible nervous communication between the diseased portion of nerve and the central organ of sensation, has ever before been practised. It is, of course, applicable to but a limited number of cases.

In this instance, a permanent and entire cure has been the result. The patient at the present date, February, 1853, three years since last operation, is stout, healthy, active, able to use her hand with entire freedom, with not even the slight remnant of pain previously mentioned, to recall her former state of suffering and comparative helplessness.
