

**Dislocation of cervical vertebrae : five cases, recovery without operation /
by George L. Walton.**

Contributors

Walton, George Lincoln, 1854-1941.
Royal College of Surgeons of England

Publication/Creation

Boston : Damrell & Upham, 1889.

Persistent URL

<https://wellcomecollection.org/works/g545679s>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

7

DISLOCATION OF CERVICAL VERTEBRÆ.

Five Cases; Recovery without Operation.

By GEORGE L. WALTON, M.D.,

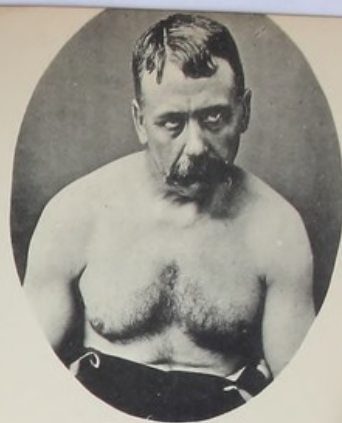
*Clinical Instructor in Diseases of the Nervous System, Harvard
University; Physician to the Neurological Department
of the Massachusetts General Hospital.*

*[Reprinted from the Boston Medical and Surgical Jour-
nal of March 21, 1889.]*



BOSTON
DAMRELL & UPHAM,
283 WASHINGTON STREET.
1889.







Digitized by the Internet Archive
in 2016

<https://archive.org/details/b22309020>

DISLOCATION OF CERVICAL VERTEBRÆ.

FIVE CASES; RECOVERY WITHOUT OPERATION.¹

BY GEORGE L. WALTON, M.D.,

Clinical Instructor in Diseases of the Nervous System, Harvard University; Physician to the Neurological Department of the Massachusetts General Hospital.

THE prevailing view among earlier writers, that vertebral dislocation uncomplicated by fracture was of the rarest occurrence, if not impossible, has been materially modified during the past twenty years, and it is now generally acknowledged that this injury is by no means uncommon.

The mobility of the cervical vertebræ, together with the inclination of their articular surfaces towards the horizontal, render this region the common seat of simple dislocation, and it is probable that the list of recorded cases in this locality would be considerably lengthened were it not for the fact that many cases terminating favorably pass unrecognized through lack of familiarity on the part of the practitioner with the characteristic features, perhaps also through hesitation in making a diagnosis of so serious import. The prognosis, however, of cervical dislocation, as shown by Ashurst's tables, is not necessarily grave, particularly when the displacement is unilateral,—only eight out of twenty-nine cases of this variety there recorded having proved fatal; four having recovered without an attempt at reduction.

Since forwarding the title of this paper as it

¹ Read before the American Neurological Association, at the Congress of Physicians and Surgeons, Washington, September, 1888.

appears in the Programme,² three additional cases of cervical displacement have been brought to my notice, all terminating in recovery (as regards life) without operation. I shall therefore present these cases briefly before describing in detail the two which it was originally intended to report.

Of these five consecutive cases which have been treated at the Massachusetts General Hospital, two (one unilateral, the other bilateral) are practically well, with scarcely any deformity and no paralysis; a third (bilateral) with only a moderate irregularity of the vertebral column; a fourth is out and about, though with the head bent to one side and twisted in the manner characteristic of unilateral dislocation and with paralysis causing partial disablement; the fifth with the head in a similar position, and with progressive paralysis of an upper extremity which points to pachymeningitis, on account of which the prognosis is less favorable than in the other cases.

Reduction was attempted in one only of these five cases, and in this case it was unsuccessful, although spontaneous replacement occurred later.

The two cases which I shall first present briefly are of comparative rarity, in that dislocation was present with practically no paralysis.

CASE I. M. D., under the charge of Dr. M. H. Richardson at the Massachusetts General Hospital, six years old, is said to have fallen, twenty-five days before admission to the hospital, an unknown distance from a tree, striking on his head. He was unconscious for a short time. The head was bent forward on the breast, and deflected to the right side, the neck being held stiffly. Considerable swelling of the back of the neck followed. There

² Dislocation of Cervical Vertebrae. Two cases; Spontaneous Recovery.

was pain locally and over the occiput. There is said to have been some slight difficulty in swallowing, and some impairment in speech for two or three days after the injury, but no other symptoms. There is no history showing a likelihood of previous cervical caries. The patient is a well-nourished child. The following notes are taken from the hospital records:—There is considerable swelling on the back of the neck, the neck is held stiffly, the head bent forward on the breast. There is a local pain and tenderness. Movement of the neck unaccompanied by the body is impossible. There is a marked bony projection, apparently of the posterior arch of the fourth cervical vertebra. Through the mouth a projection of bone into the pharynx is felt. There is no trouble in deglutition; there are no paralytic symptoms whatever. Five days after admission he had retention of fourteen hours, relieved by a hot bath. The swelling over the neck lessened under rest in bed, and the pain disappeared. At the end of three weeks the swelling and flexion of the head disappeared, but the prominence was still felt in the neck, as well as the projection in the posterior wall of the pharynx. These were present when he was discharged, four weeks after admission into the hospital.

CASE II. C. E., seventeen years of age. Referred by Dr. Mulligan, of Milford, to the Massachusetts General Hospital, where he was seen by Dr. J. C. Warren, at whose suggestion I examined him later at his home, when practically recovered. One year ago he fell from a trapeze about eight feet, striking the top of his head. Displacement of the neck followed, the head being bent forward on the chest and to the right, so that the chin nearly reached the shoulder. It was impossible to move the head without the body. There was pain and sensitive-

ness in the back of the neck. There was no trouble in deglutition, respiration, or micturition, no numbness or motor paralysis from the first. The head returned to its present position within three months. The head is now held somewhat stiffly forward, and there is an apparent shortening of the neck. Lateral motion is somewhat limited in both directions, and there is a tendency to turn the body with the head. There is a marked prominence over the fifth cervical vertebra; the third and fourth cannot be made out. The general condition of the boy is that of perfect health, and he is able to work as before.

The following is a typical case of unilateral dislocation, followed probably by pachymeningitis giving rise to paralysis of one arm, at present increasing: —

CASE III. F. L. applied for treatment at the Nervous Out-patient Department of the Massachusetts General Hospital, in August of this year. Dr. Putnam, who recognized the nature of the case, kindly referred him to me for examination. The patient, a boy of eleven, fell about eight months ago on the ice while skating, and struck on the back of his head, which was thrown forward and turned to the left. There was no trouble in deglutition or respiration. No paralysis was noted until about three months ago, when weakness appeared in the left hand. This has gradually increased, and there is now a marked impairment in all the movements in the left arm and shoulder, the patient being unable to place his hand on his head, to grasp firmly, or to approximate the thumb and little finger. He now complains of severe pain in the back of the neck, running up into the head; there is some tenderness over the region of the fourth cervical verte-

bra and above. The head is held stiffly to the left, the chin being depressed towards the left shoulder. The muscles are quite tense on the right and comparatively lax on the left. Rotation and flexion of the head are possible only in a very slight degree. There is a prominence over the fourth cervical vertebra; a prominence, which appears to be the spinous process of the second, is found to the right of the median line. There is atrophy of the scapular muscles, most marked on the left.

In marked contrast to these cases, as regards paralytic symptoms, are two cases which formed the original subject of this paper, and which I shall present more in detail.

The first of these cases was one of typical bilateral dislocation, the third cervical vertebra being dislocated forward on the fourth, paralysis of all extremities following, as is commonly the case, through pressure of the posterior arch on the spinal cord. The interesting feature is the fact that spontaneous replacement and recovery ensued after failure of operative interference, and after progressive paralysis and enfeeblement lasting over a period of fifteen months.

CASE IV. A. W., cook, single, thirty-five years of age, was admitted to the Massachusetts General Hospital in the service of Dr. J. C. Warren, with whom I saw him from time to time during his stay. He was seen also by a number of other physicians, including Dr. J. J. Putnam and Dr. M. H. Richardson.

The history was as follows:—On January 3, 1885, he fell down a flight of steps backwards, striking his neck on the edge of a doorpost. His head was thrown forward with the chin elevated, in which position it remained up to the time of entrance. He lost consciousness for six hours, and remained

in bed about one month, complaining principally, apart from the displacement and rigidity of the head, of general weakness, numbness, and stiffness of the legs when getting up, and a slight twitching in the hands. There was no trouble in breathing from the first. He entered the hospital March 30th, about two months after the accident. He complained at that time of pain in the shoulders and across the back, and of gradually increasing weakness. The head was projected forward with the chin elevated. There was a marked prominence over the fourth cervical vertebra; above this point the spinous processes of the vertebrae were less prominent than normal. Digital examination of the throat showed a projection in the posterior pharynx. The patient was able to walk, but with a spastic gait. Ankle clonus was present; the patellar reflex was so greatly exaggerated that tapping the tendon produced a continuous clonus. Respiration was normal. There was at that time no objective disturbance of sensation. The grasp was weak on both sides, as well as extension of the wrist. The supinator longus was strong, as were the muscles of the upper arm, excepting the triceps on the left, which were feeble. There was no marked reflex in the arm. Every attempt at movement of the legs caused tremor. Flexion and extension of the thigh was fair on both sides; the tibialis anticus and gastrocnemius were fairly strong; the peroneal muscles weak. The legs were rigid; there was no atrophy or coldness. The plantar, abdominal, and cremaster reflexes were normal. The pupils were equal and reacted to light; there was nothing abnormal about the face. The respiration was 20, the pulse 86, the temperature normal.

Three days after, operation was undertaken by Dr. Warren. The patient was etherized; the cer-

vical vertebræ was extended by pulling the head in one direction and the body in the opposite. No distinct snap was felt, but the prominence of the vertebræ was considerably diminished. The neck was held in position by bandaging the head and body to a broad leather splint. The second day after the operation there appeared to be an improvement in the patient's condition; the grasp was stronger and the ankle clonus less marked. On the fourth day the apparatus was omitted. On the sixth day careful examination by myself showed no improvement over his previous condition. On the sixteenth day the patient was gradually losing ground; he was growing feebler, and the cervical prominence, together with the peculiar manner of holding the head, had returned. Sensation was impaired in legs and arms. One month later the condition was not changed, excepting in the direction of increased feebleness. After two months the patient could not stand on his feet without assistance. After two and one-half months the head of the bed was elevated, and extension was applied to the neck with halter and weights. This apparatus was removed five days later. At the end of three months the patient was gradually failing. Bladder symptoms had appeared in the form of retention. There was tonic spasm of the legs. Sensation in the legs was lost to the groin, and in the arms to the middle of the upper arm. Four months after operation the patient was completely helpless and unable to grasp anything firmly in the hand; he was much troubled by constipation, and suffered at intervals from retention, which required the use of the catheter. At the end of four months and one-half further surgical interference was considered unadvisable, and he was discharged from the hospital, but was allowed to remain at the Convalescents' Home until

ten months after the accident, when he was taken to the Almshouse, where he remained without improvement for three months longer. At the end of this time, that is, about fifteen months after the accident, while taking a lukewarm bath, ice-cold water being meantime thrown upon his back by a syringe, he suddenly felt a sensation like an electric shock. He was rubbed down and put to bed, and the galvanic current was applied to all extremities.

The next morning he found he could rise in bed. Cold water was thrown after this in large quantities on his back every other day, after which the galvanic battery was applied. Improvement was steady and rapid, and within a month he was at work in a restaurant, where he was seen by Dr. Richardson. The head had become gradually replaced during this time. No further symptoms appeared.

I examined the patient carefully three years after the accident. The gait was normal and free, the tendon reflex was normal; there was no rigidity nor ankle clonus; all movements of the extremities were perfect, and the lightest touch was everywhere felt. The head was held rather stiffly, canted slightly to the left, with the chin elevated and turned to the right, the whole head being held somewhat forward. The fourth and fifth cervical vertebræ were rather prominent, though no more than is sometimes found in health. The spinous processes above were distinctly felt; there was no prominence in the posterior pharynx.

The duration of life and final recovery in this case are quite remarkable. Liddell,³ under the subject of bilateral dislocation of the last five cervical vertebræ, in discussing the question of operation, says: "In pursuing such a course (operation) I would be guided by the following considerations:—

³ International Encyclopædia of Surgery, Ashurst, 1884, vol. iv.

(1) *The almost complete certainty of a fatal termination within two or three days if an expectant plan of treatment be followed.* Of thirty-six perfectly analogous cases treated at Guy's Hospital *all died within seventy-two hours.* . . ."

That respiration was unaffected is not unique, a fact probably due to the departure of the roots of the fourth cervical nerve from the cord above the articulation of the third and fourth vertebræ. This is illustrated by the case of Cushing, quoted by Shaw,⁴ in which a patient lived two days after dislocation of the third or the fourth cervical vertebra. The rule is, however, as stated by the same author (Shaw), that where the cord is crushed above the level of the fourth cervical vertebra, that is, above the origin of the phrenic nerve, it may be considered certain that instant death will ensue.

The last case is one of unilateral dislocation of atlas on the axis, produced by violent muscular exertion in wrestling. I saw him, for the first time, one year after the accident, when he was sent to the neurological department of the Massachusetts General Hospital, for an opinion, by Dr. H. W. Boutwell, of Manchester, N. H. Dr. Warren saw him with me in consultation at the hospital, and considered it an undoubted case of dislocation. I afterwards saw him in Manchester with Drs. Boutwell and Wilkins.

CASE V. L. C., forty-four years of age, a weaver. The patient is a stout man of short stature, but unusual muscular development. While wrestling, about a year ago, he put up his right hand to throw off his opponent's arm, which was about his neck, his own head being bent at the time to the right. He made a violent effort, and as he did so suddenly

⁴ Holmes's System of Surgery, 1881, p. 807.

felt dizzy and heard something snap, as did also the bystanders; he immediately found that his head was fixed on one side (to the right). He did not lose consciousness. When given a glass of water shortly after, he found he could not swallow. His articulation was indistinct, he "talked thick," but had no difficulty in choosing words; he does not think he talked through his nose, but as his speech is still decidedly nasal, without his realizing the fact, this condition probably obtained at the time of the accident. About an hour and a half afterwards, on trying to eat, he found that food caught between the teeth and the cheek on the right, and that when caught he could not remove it with the tongue; liquids ran out at the nose. The physician who was summoned about an hour and a half after first noticed that the tongue was deviated to the right. There was no trouble in breathing from the first. The patient was unable to whistle, which he could do perfectly before. There was constant tinnitus auris dextræ for some time. There was a large protrusion over the triceps which gradually subsided (rupture?), but a weakness of the right arm has persisted.

Physical Examination. — The patient is a stout man of excellent muscular development. The gait is normal. There is no paralysis of the lower extremities, motor or sensory; the skin is everywhere natural, and the flesh well nourished; there is no rigidity; the tendon reflex is active, but not exaggerated; there is no ankle clonus. The grasp of the right hand is not quite as strong as that of the left, and the same is true in a slight degree of all the movements of the right arm, though there is no localized paralysis, wasting, or coldness, and no disturbance of electrical reactions. The head is held stiffly bent to the right, with the chin turning

somewhat to the left, the face looking downwards, the position being somewhat similar to that produced by contracture of the right sterno-cleido mastoid muscle. This muscle is, however, quite lax, as are all the muscles of the neck on the right side, while those on the left are comparatively tense; this is quite apparent in the photograph. The head, besides being bent to the right, is set off, as a whole, to the left, as is also apparent in the photograph, especially the posterior view. Attempts to straighten the head forcibly cause pain under the occiput on the right side, a point which seems somewhat sensitive to pressure. A certain amount of rotation of the head is possible, principally to the right. The extreme excursion of the end of the nose is, however, only three and one-quarter inches. Flexion and extension of the head are practically impossible. No weakness is detected in the sterno-cleido mastoid or trapezius; no prominence is felt in the fauces, nor depression over the spinous processes of the vertebræ. The tongue is deviated markedly to the right and cannot be moved to the left; it is also greatly atrophied on the right side, comparatively few fibres being left. The electrical reaction on the left side of the tongue is normal; on the right there is only very slight reaction to the faradic current, the response being apparently that of a few intact fibres. The uvula is deviated to the left, and the right side of the palate reacts only slightly to mechanical stimulus. The speech is thick and somewhat nasal in character. The patient can now whistle, though not perfectly; there is still some difficulty in mastication, the food lodging in the cheek on the right. The forehead wrinkles normally and the eyes shut well, there being only a trace of paresis remaining in the facial muscles, all of which react perfectly to the faradic current.

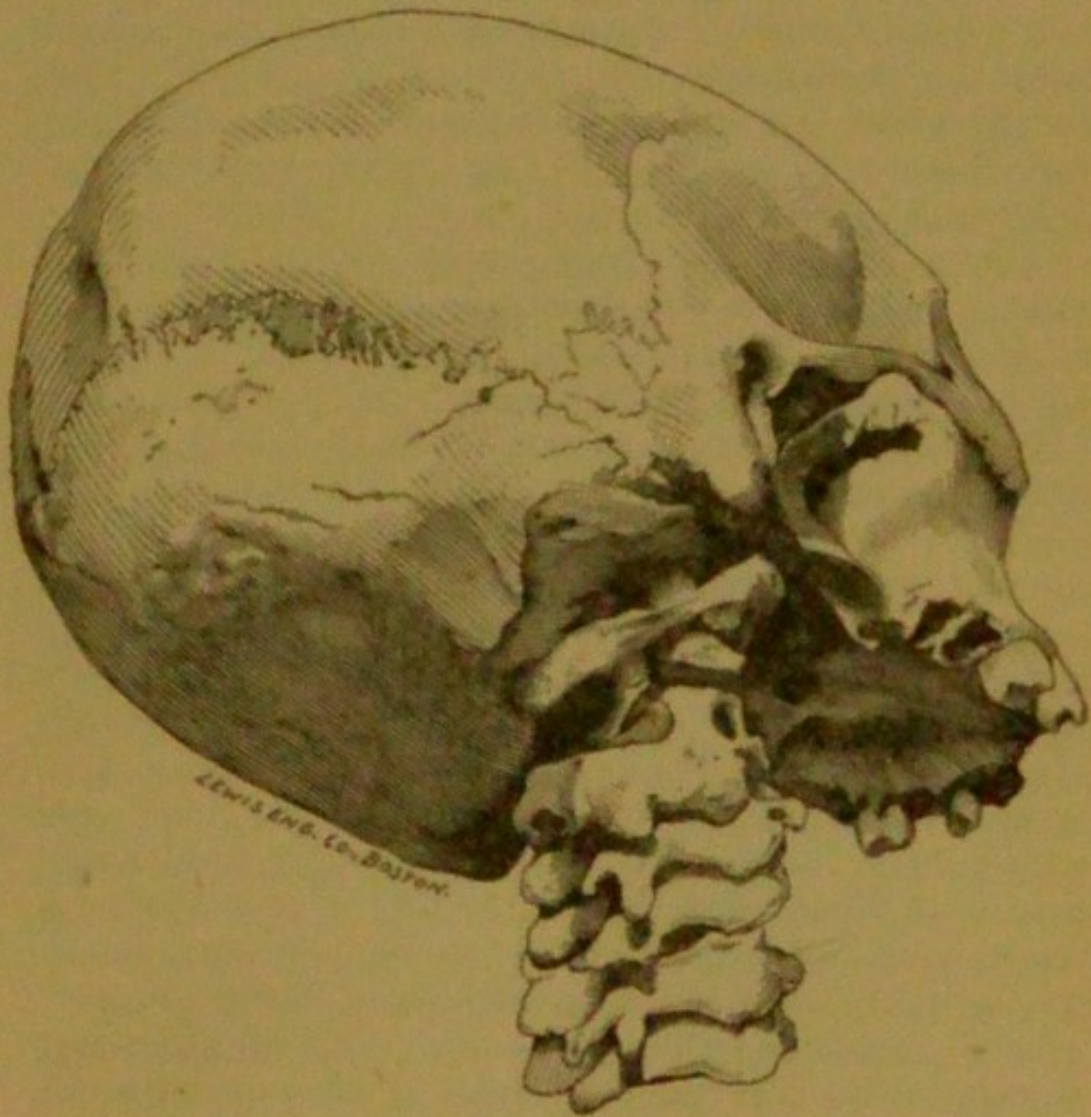
Movements of the eyes are perfect. The right pupil is slightly larger than the left, and reacts less promptly to light. Vision is good in both eyes; the fundus is normal. There is no loss of sensation in the face or elsewhere. The watch is heard at a distance of four inches on the right, of ten inches on the left. Both drumheads are retracted, the reflex dull on the left, and broken on the right; bone conduction is normal. Examination of the vocal cords is impossible on account of the elevation and immobility of the back of the tongue. There is no special rigidity or exaggerated reflex condition of the right arm, but the muscles are not quite as firm as those on the left; the right forearm measures, however, the same as on the left and the upper arm a quarter of an inch more.

The lesion in this case was probably a unilateral dislocation of the atlas on the axis, which "consists essentially" (Liddell)⁵ "in the displacement of the inferior articular process on one side of the cervical vertebra from the corresponding superior articular process of the vertebra which lies next below; this causes the victim's face to be turned towards the side opposite to that on which the luxation is situated."

The diagnostic features correspond closely with those described by the same author, and consist in the twisting of the neck, the fixed position of the face with the chin pointing towards the left shoulder (the luxation being on the right), the immobility, and the tenseness of the muscles on one side of the neck, combined with relaxation of those on the other side. Paralysis of an arm, and sometimes of the lower extremities, may also occur in greater or less severity; in our case the paralysis of the right arm alone being observed from the first, and

⁵ Ibid., p. 732.

this slight in degree. I have found no record of paralysis of cranial nerves like that from which this patient has suffered; the cause being probably, in this case, an extensive effusion in the region of the medulla, pressing on the hypoglossal, glossopharyngeal, facial, and auditory nerve-roots.



The position of the head resembles very nearly that of the skull in the accompanying photograph, which I was able, through the kindness of the curator, Dr. Whitney, to obtain from a specimen in the Warren Anatomical Museum at the Harvard

Medical School, which was called to my attention by Dr. J. C. Warren. The description in the catalogue is as follows:—

“970. *Vertebræ*. Fracture of the second left articulating process of the vertebra, with dislocation of the atlas (co-ossified to the skull) downwards and to the left. The two *vertebræ* firmly united in the new position, and the head tipped to the left at a considerable angle. A young adult. One of the incisors had not completely come down, although the skull is evidently of an adult. — J. Mason Warren Collection.”

Unfortunately the ante-mortem history of this case is not known, the skull having been purchased in Paris by Dr. J. Mason Warren. The intact odontoid process is plainly seen in the posterior view, and it is evident that, notwithstanding the extreme lateral displacement, a canal was left sufficient for the passage of the spinal cord. That such a canal was left in our case is evident from the absence of paralysis of the extremities, excepting in a slight degree in the right arm, and from the fact that respiration was unimpaired. The transverse ligament cannot have been ruptured, as the escape of the odontoid process causes instant death by pressure on the cord, the unfortunate victim being practically pithed. Our case differs from that of the anatomical specimen in that there was probably no fracture, but a simple unilateral dislocation, and also in that a false joint has been formed, allowing some lateral rotation, whereas in the anatomical specimen the bones are firmly fixed in their new position. Quite extensive hemorrhage probably accompanied the dislocation in our case, as it can hardly be supposed that the paralysis of cranial nerves resulted from direct pressure. The difficulty in swallowing resulted, perhaps, in part from mechan-

ical obstruction in the pharynx, although it is probable that the glosso-pharyngeal nerve was involved in the hemorrhage; indeed it is not improbable that the paralysis of the palate results from injury to this nerve, which, it has been suggested, may furnish the fibres (generally credited to the facial) which pass through the Vidian, and supply the levator palati and azygos uvulae. That the hypoglossal and facial nerves were included there can be no doubt, as the paralyses resulting have in great part remained permanent. It is notable that the auditory nerve suffered so little, the only evidence of its implication being the tinnitus aurium and temporary increase of deafness in the right. The deafness now existing in the right ear, like that in the left, is that which would be expected from chronic catarrh, the bone conduction being equally good on both sides, with a tendency in the direction of increase.

Unfortunately, apparatus has not been at hand during the examinations I have been able to make, to test for various tones, or for high tones, or possibly some defective fibres might have been detected.

The recovery in this case as in the other unilateral cases, is less remarkable than that of the patient with bilateral dislocation, the prognosis in these cases being, as already stated, much more favorable on account of the spinal cord being less liable to damage.

Perhaps the most interesting feature in the case is its aetiology, the manner in which the dislocation was produced being probably unique. The causes mentioned in the tables above referred to consisted in turning the head quickly, falling on the head, falling on the neck, a bundle slipped on the shoulder, a fall in running, direct violence, being thrown against a wall, tumbling heels over head on a bed.

It is not improbable that an attempt at early

reduction would have produced a more favorable result, but in consideration of the absence of imminent symptoms, and considering also the comparatively favorable course of cases of unilateral dislocation without operation, the patient is perhaps quite as well off as if operation had been attempted. Whether the nature of the trouble was recognized at the time of the accident I do not know.

