

THE COINCIDENCE OF CERVICAL RIBS AND SYRINGOMYELIA *

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The Berlin surgeon Borchardt¹ appears first to have observed the coexistence of cervical ribs and syringomyelia, in a woman 35 years old, who also was examined by Oppenheim. The latter² in his textbook comments on this case and points out that cervical ribs belong to the so-called stigmas of degeneration and may be combined with other disorders which are not caused by the ribs but, like them, are features of an underlying neuropathic diathesis. He specifically mentions hysteria, hypochondriasis and spinal gliosis. In connection with the latter he refers to the case mentioned above and to one reported by Marburg.³ This case, which occurred in a woman 19 years old, was complicated by scoliosis which caused the cervical ribs to be prominent and to be mistaken for a bony tumor until operative removal was attempted. Later the appearance of sensory dissociation, painless burns, muscular atrophy and lagophthalmos led to a positive diagnosis of syringomyelia. I have found no other cases in a rather hasty search of the literature, but the combination has been the subject of comment. Thus, Haenel⁴ warns that the onset of brachial pains, atrophies and cervical scoliosis or kyphosis in a young person with cervical ribs should lead one to suspect syringomyelia. Jelliffe and White⁵ state: "Several cases have been observed in which a cervical rib was removed from a patient suffering from syringomyelia to which the symptoms were due."

In Streissler's⁶ comprehensive review of the subject of cervical ribs, Oppenheim's idea of their being degenerative stigmas is looked on with favor. He mentions scoliosis in the cervical and upper thoracic region as a frequent association and does not consider it secondary to the rib, also spina bifida and other malformations, such as harelip,

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1. Borchardt, M.: *Symptomatologie und Therapie der Halsrippen*, Berl. klin. Wchnschr. **38**:1265, 1901.

2. Oppenheim, H.: *Lehrbuch der Nervenkrankheiten*, Ed. 5, pp. 498 and 440.

3. Marburg, O.: *Syringomyelie und Halsrippe*, Wien. klin. Rundschau **20**: 241, 1906.

4. Haenel, H.: *Handbuch der Neurologie* **2**: 609.

5. Jelliffe and White: *Diseases of the Nervous System*, Ed. 1, p. 301.

6. Streissler, E.: *Die Halsrippen*, *Ergebn. d. Chir. u. Orthop.* **5**:280, 1913.

cryptorchidism, dislocated lenses, clubfoot, congenital lipoma; finally, combination with psychoneuroses, syringomyelia, multiple sclerosis (Levi),⁷ muscular atrophy (Spiller and Gittings).⁸

REPORT OF CASES

CASE 1.—*History.*—The early history of this case is related by the late Dr. John B. Murphy.⁹ A man, 34 years of age, was admitted to Mercy Hospital, Nov. 2, 1915. Nine months before, on Feb. 13, 1915, he slipped on the ice and fell. Two days later he had fever (100 F.), pain in the cervical region of his spine, and universal muscular tenderness, and took to bed for two days under the impression that he had grip.

Ten days after the onset of the pain in the cervical region of the spine, it radiated down the left upper extremity until it reached the fingers, where it remained. The pain was worse during the night. There was, however, no atrophy of the muscles of the hand and no alteration in the color of the skin. Pain was present in the right upper extremity.

Examination.—Palpation of the neck revealed an elongation at the tip of the transverse process of the left seventh cervical vertebra—at the site which appears to be just under the point of greatest pain irritation; the space between the process and the clavicle was diminished but not occluded. In making the comparative examination between the right and left sides it was found that on the right side the whole thumb could be inserted into the supraclavicular space, while on the left but two thirds of the digit could be inserted. There was a seventh cervical rib on the left side which put tension on the eighth cervical nerve on its way to the ulnar.

The cervical rib was plainly demonstrated by the roentgen ray.

Treatment and Course.—On Nov. 5, 1915, Dr. Murphy operated and during the operation he said: "Now you can see in the field the anterior portion of the cervical rib; instead of being a round, blunt process, it is articulated and exhibits a sharp dentate edge which nips the brachial plexus and accounts for the pain radiating down along the arm to the forearm and hand. The plexus has been displaced." After removing the rib he added: "With the rib out of the way, it is clearly to be seen where the brachial plexus was compressed by the rib. The nerve to the rhomboids was involved, showing that the fifth cervical nerve from which this branch takes origin, felt the stress of the compressing rib. The knife-blade-like edge of the cervical rib had irritated the brachial plexus until a membrane formed upon one of its constituents—the eighth cervical from which the ulnar nerve is derived."

A postscript dated Jan. 7, 1916, says: "The patient made an uneventful recovery, and at the present time the preoperative thickening which was present in the lower portion of the left side of the neck has to a great extent subsided."

This apparently happy ending was really only the introductory chapter to the story of this patient's troubles. He soon began to have severe pain in the scar and then in the whole arm as before. Examination by the writer on

7. Levi, H.: Beitrag zur Kasuistik. der Halsrippen, Neurol. Centralbl. **23**: 988, 1904.

8. Spiller, W. G., and Gittings, J. C.: Progressive Muscular Atrophy of Cervicobulbar Type, Occurring with Cervical Rib, New York M. J. **84**:683, 1906.

9. Murphy, John B.: Cervical Rib, The Clinics of John B. Murphy **5**:227 (April) 1916.

Oct. 6, 1916, revealed analgesic areas along the outside of the left arm and forearm and absence of the wrist and elbow reflexes on the left side while these reflexes were normal on the right side.

A more detailed examination was made on March 31, 1917: There were relative analgesia and thermo-anesthesia on the left side in the distribution of all the segments from the second cervical to the third thoracic. Circumference of the arms: right, 27 cm.; left, 23.5 cm.; forearm, right, 23 cm.; left, 21.5 cm.; hand, right, 20 cm.; left, 18 cm.

A lumbar puncture was made at this time and the Wassermann, Lange, and Nonne tests were negative; the cell count was 7.

A tentative diagnosis of syringomyelia was made and the patient was given roentgen-ray treatments of the lower cervical region of the spine.

Since that time the patient has been examined every few months. Both the subjective symptoms and the findings have remained practically the same. He was recently thoroughly studied by Dr. William G. Spiller, who also made a diagnosis of syringomyelia.

CASE 2.—History.—A woman, about 40 years old, was referred to the writer for examination by Dr. George F. Dick in October, 1916. Thirteen years previously she had first noticed atrophy in the right hand, and in the left hand during the preceding year only. There was no pain but the hands had become weak. Roentgen-ray examination had revealed distinct cervical ribs on both sides. An operation had been considered but on account of the high degree of atrophy and disability of the hands a more serious disorder was suspected.

Examination.—Examination at this time, in addition to the atrophy of the small muscles of the hands, revealed extensive analgesia and thermal anesthesia of both arms and of the chest and back on both sides down to the fourth rib. The right pupil was larger than the left and the right palpebral fissure smaller than the left, showing involvement of the cervical sympathetic. The tendon reflexes in the legs were moderately increased but there was no clonus and the plantar reflexes were normal.

The patient was examined again in April, 1920, and the picture of syringomyelia was more fully developed. The atrophy of the hands was marked. The thumbs and fingers were hyperextended at the metacarpophalangeal joints and flexed at the phalangeal joints. There was no power of abduction and adduction of the fingers or of opposition of the thumbs. Flexion at the wrists was weak; extension a little better. The other arm movements were quite strong. The loss of pain and temperature sense now involved the neck and the trunk as far down as the level of the umbilicus. Tactile sensation remained normal. The knee reflexes were increased and ankle clonus was present on both sides. The abdominal, wrist and elbow reflexes were absent, the plantar reflexes normal.

CASE 3.—History.—For the privilege of seeing and recording this case I am indebted to Dr. Lewis J. Pollock, who already had made a diagnosis of syringomyelia. He and I had examined the first patient reported in this paper a short time before and with the coincidence of the two affections in mind Dr. Pollock had sent the patient to Dr. Hollis E. Potter for roentgenologic examination which, to the great surprise of all concerned, showed bilateral cervical ribs, much larger on the right side.

The main points in the clinical history, which did not at all suggest cervical rib were:

The patient, a business man, single, 32 years old, when examined in July, 1919, a few days after excessive sexual indulgence in 1907, noticed a sensation of warmth in the right leg. During the following month the whole right side became involved and there was a sensation of tingling. The right side became somewhat rigid. A few days after the onset a physician had discovered analgesia and thermal anesthesia of the whole right side, while tactile sense was preserved. At the time of examination the chief complaint was numbness in the right leg.

Examination.—Examination revealed loss of temperature sense in the whole right lower extremity and diminution of this sensation on the right side of the rest of the body, gradually diminishing upward; even the face was slightly involved. Sensation to pain was diminished in the right leg and slightly so in the right arm and right side of the trunk. Tactile and joint sensation were normal and vibration sense slightly diminished on the left side. All of the tendon reflexes, as well as the abdominal and cremasteric reflexes, were diminished on the right side, the ankle reflex showing the greatest degree of diminution. There was no atrophy or paralysis, and coordination was normal. The Wassermann test with blood and spinal fluid and all other spinal fluid tests were negative.

CONCLUSION

In conclusion, I wish to state that were I to be guided by my own experience, which is very limited, I would be inclined to regard all bearers of cervical ribs with extreme suspicion and to accept them as possessed of well-balanced minds and structurally normal central nervous systems only after very close scrutiny. Three patients whose local symptoms led me to advise operation, which in each case was a surgical success, were made decidedly worse, one passing through a severe postoperative psychoneurosis, the other two having now led for years miserable lives as profound hypochondriacs with persistence of the local symptoms in spite of repeated subsequent exposures of the brachial plexus and injections of procain and dilute alcohol.

Fortunately, this gloomy picture is incorrect when a broad view of the situation is taken. Good results from operation in a large series of cases are reported by so many reliable observers that even repeated ill luck in one person's experience should not shake our optimism.

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