SYRINGOMYELIA IN ASSOCIATION WITH ACROMEGALY.

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The association of acromegaly and syringomyelia in the same patient has been mentioned in the literature for many years and has now become accepted as more than a coincidence. Examination of the recorded examples, however, shows that some of them at least are open to criticism. Apparently no record of this association has been reported in the literature during the last ten years, hence the present contribution may not be without interest and documentary value.

CASES FROM THE LITERATURE.

The cases in the literature can be conveniently drawn up under three headings: (1) not true acromegaly; (2) doubtful acromegaly; and (3) genuine acromegaly.

1. The cases published by Chantemesse,1 Holschewnikoff and Recklinghausen,2 Lunz,3 and Hoffmann, Charcot and Brissaud,4 were certainly not genuine examples of acromegaly. The use of the term acromegaly in connection with them has been misleading. The condition these authors described has, in fact, no more than one of cheiromegaly, i.e., an enlargement of the hands and feet, which is not infrequently found in syringomyelia. Schlesinger5 called the state "rudimentärer Akromegalie," while Marie named it "acromégalie partielle." These cases cannot therefore be accepted as bearing out this association.

2. Petrén's6 first patient had the appearance of an acromegalic, but at autopsy no abnormality could be found in the pituitary body. The spinal cord showed definite signs of syringomyelia. He quoted several instances from the literature in support of the view that his case was one of true acromegaly, despite the fact that there was no abnormality of the pituitary body. In my opinion, this case ought to be placed with the genuine cases. Fischer7 refused to accept it, however, as one of acromegaly, and said it was a case of gigantism. The best authorities, on the other hand, regard gigantism as the adolescent form of acromegaly, developing before the epiphyses have ossified. Peterson8 mentioned a case of syringomyelia with enlarged hands, feet and jaw. No signs of enlargement of the pituitary body were found, so that the acromegaly was doubtful. Sternberg9 refused to accept this case as
one of acromegaly and placed it in the same category as those of Chantemesse, etc. In his monograph, Sternberg mentions a case of the association of the two conditions published by Fiseher, the acromegalic part of which he likewise refuses to accept as genuine.

3. The second case described by Petré in was undoubtedly one of acromegaly with syringomyelia. This case also came to autopsy, when a tumour of a cystic nature was found in the pituitary, and the spinal cord showed the definite appearance of syringomyelia. Gross published two cases of enlargement of the pituitary fossa with syringomyelia. One of them came to autopsy, when the state of the spinal cord confirmed the diagnosis of syringomyelia and the pituitary was found to be definitely enlarged. The other case exhibited the physical signs of lumbar syringomyelia. Under this heading of genuine cases of acromegaly associated with syringomyelia, I place my two examples, which will be described in full later.

We now come to consider another group of cases of acromegaly in the literature, in which changes were found round the central canal of the spinal cord at autopsy. As far as one can find from the description of these cases there were no physical signs during life to suggest any lesion in the spinal cord. In Schultze and Fischer's example, which was one of a combined Froehlich and acromegalic type, there was an increased growth, or hyperplasia, of the ependymal cells of the central canal of the spinal cord. Linsmayer's case was one of definite acromegaly and was reported in Atkinson's useful monograph as having had enlargement of the central canal. I was unable to confirm this statement, however, by a consultation of the original paper, and could only find some mention of enlargement of the cervical region of the spinal cord. There was an increased amount of glial tissue round the central canal in Meyers' case, associated with genuine acromegaly. This glial increase extended up into the medulla. In the pituitary an adenoma was found. Hypertrophy of the grey substance round the canal was described by Finz, with degeneration of the pyramidal tracts. In the pituitary region of his case there was a "white detritus" and the optic nerves were atrophied. In Dalton's example the central canal was obliterated by increase of glial tissue, while the pituitary was enlarged and gave the microscopical appearance of a sarcoma. A sarcoma was found in the pituitary in Dallemange's case of acromegaly with optic atrophy. On examination of the spinal cord, there was marked proliferation of the ependymal cells of the central canal, almost obliterating it. These cells had invaded the substantia gelatinosa of Rolando to form little masses. In the bulb, ependymal cells had migrated out to form little "gliomatous masses" in the nervous tissue.

Whatever doubt may have been entertained about many cases of this combination in the literature, I hope, by a full description of the
following two cases, to convince the reader that they are genuine examples of acromegaly with associated syringomyelia.

PERSONAL CASES.

Case 1.—The patient was a man of fifty-nine years who was a wood worker by trade, and who came to the National Hospital complaining
of weakness and mid-frontal headaches. The weakness was chiefly in the upper extremities and had begun three years previously in the left hand. In 1911 he had had iridectomy performed on the right eye, and in 1919 the left eye was removed on account of some inflammatory condition.

Ten years ago he noticed that his feet were becoming much broader than they used to be, and in the succeeding years he noticed in turn that his hands were becoming much bigger, and then his face. His headaches, which were of two years' duration, were sometimes accompanied with vomiting.

On examination the face was seen to be large, with prominent supraorbital ridges, enlarged malar and zygomatic bones, a broad, much enlarged nose and marked prognathism of the mandible. The lips were greatly thickened and everted, while the teeth of the lower jaw were more separated than normal. No abnormality was found in the ears. The tongue was abnormally large. The shoulders were broad and massive-looking, the clavicles having a very uneven surface, especially at the acromial end. The arms were long, reaching almost to his knees, and ended in large spade-like hands. A certain amount of kyphosis was present. The lower extremities were normal, except for rather broad feet. On the whole the skeleton was well covered with flesh and there was an abundance of hair especially over the chest, though over the eyebrows it was somewhat scanty. When the patient stood up and was regarded in profile, he had the appearance almost of an orang-utang.

The general systems appeared normal.
Nervous System.—The cranial nerves were normal except for some pallor of the right optic disc and considerable restriction of the right temporal field of vision. Speech was a little indistinct and had a nasal intonation. The patient stated that he spoke very well previous to this illness.

Motor System.—There was considerable weakness of the upper extremities, which was emphasized by contrast with the massive appearance of the arms and shoulders. The grips were very weak, especially the left. The trunk and lower limbs were slightly weaker than one would have expected from their appearance. Atrophy was present in the left hand, where the thenar and hypothenar eminences were decidedly flattened. In the right hand there was doubtful wasting of these same eminences.

Sensory System.—Painful stimuli were scarcely appreciated on the left side of the body, including the left side of the face. They were less felt at the periphery of the facial area, and the defect extended slightly into the periphery of the right side of the face also. Sensibility to heat was much diminished over the same areas as were affected in the appreciation of painful stimuli. On the right forearm thermal (heat) and painful stimuli were slightly diminished. Cold and light touch were distinguished all over, but just slightly better on the right side of the body. Vibration, passive movement and deep muscle sense were normal.

An x-ray photograph of the skull showed marked enlargement of the sella turcica.

The Wassermann reaction was negative in the blood.

Tendon reflexes were present and equal; the plantars were flexor.

Case 2.—The patient was a woman, unmarried, who was thirty-five years of age on her first admission to the National Hospital in 1921. She complained of wasting of the hands, headaches, and fits. There was nothing in her previous or family history which had any bearing on her illness.

In 1914 she began to have pain in the right arm and hand, with gradual wasting of the hand muscles. Accompanying this wasting was loss of sensation in the peripheral portion of the right arm.

In 1919 she had pain in the left arm at the elbow and “cramps” in the fingers of the left hand. Wasting and contracture then began in the left hand.

Just previous to admission she had had several attacks in which she fell down unconscious and remained so for a few minutes. Immediately before one or two of these attacks she experienced a “nasty, earthy sort of smell.”

From the age of twenty-five her features had changed and her hands had enlarged. Since 1921 her headaches had become more severe
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and were localized to the top of the head and across the left side of the forehead. The right hand had contracted more and her feet had become larger. Frequently she had had painless burns in different parts of the body and extremities.

When examined on her readmission in 1928 the general systems appeared normal.

She was a largely-made woman with a large oval-shaped face. The forehead was of a good depth and flattened. The supraorbital ridges were not prominent. There was a certain amount of exophthalmos and the eyes were widely separated by a broad-bridged nose. The infraorbital ridges and zygomatic arches were heavy and prominent. From the bridge the nose ended in a broadened tip, with hypertrophied alæ nasi. The lips were thickened, the lower being everted and the lower jaw prognathous. No abnormality was found in the size of the ears. In profile the head had a square shape, with the height above the external auditory meatus much increased; the meatus was on the same level as the alæ nasi. The hair was more or less normal in its distribution, except on the head, where it was a little thin, and there was a slightly hirsuted upper lip. Over the face the skin was thick and wrinkled, especially over the forehead and under the eyes. Several brown moles were scattered over the face.

The arms were long and heavy to lift. The left hand was large and
square-shaped, with fingers broadened especially at the joints and terminal phalanges. The thumb was huge like that of a manual labourer. In the right hand there was wasting of the intrinsic muscles; it was held dorsiflexed at the wrist, with the fingers in the position of "main en griffe." The skin over the hands was thickened. Wasting was also present in the right forearm.

A kypho-scoliotic curve was noticeable in the cervico-dorsal region of the spine, and the abnormality of the chest was due to this. The wings of the pelvis girdle were widened out and the anterior superior spines were widely separated. The abdomen was almost as broad as it was long and protruded on account of the excessive fat. Hair on the trunk was normal in amount and distribution.

The legs were long and tapering and the feet had a high instep. The toes were broadened, especially the big toe.

Scars of painless burns were found on the right forearm, left hand, and left side of the abdomen.

The cranial nerves were normal, except for marked constriction of the visual fields and some blurring of the optic disc edges, due to slight papilledema. The pupils showed inequality in size, the left being larger than the right.

In the motor system there was marked weakness of the upper extremities.

Painful and thermal (heat) stimuli were poorly appreciated over a large part of the body, while light touches and the sense of cold were fully appreciated all over. Vibration sense was lost over both upper

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**Case 2.**

Marked diminution to pinprick. Diminution to pinprick. Diminution to heat stimuli. Diminution to heat stimuli. Slight diminution to pinprick. Slight diminution to heat stimuli.
limbs, but was present in both lower limbs, the left better than the right. Joint sense was normal, except in the fingers of the right hand.

The arm jerks were absent on both sides; knee jerks exaggerated and equal on the two sides; ankle jerks were present; abdominals present and equal; plantars gave a double flexor response. There was no sphincter trouble.

An x-ray photograph of the skull showed an enlarged and flattened pituitary fossa, with very little sign of the dorsum sellae.

The Wassermann reaction in the blood and cerebrospinal fluid was negative.

The resting blood sugar was high—0·17; half an hour after 30 grm. of glucose it had risen to 0·215, and the curve did not reach resting sugar level till two and a half hours after the meal.

In January, 1924, Mr. Percy Sargent performed an operation to expose the pituitary region. This was done by a left frontal osteoplastic flap and the pituitary fossa was found to be occupied by a cystic swelling which voided a quantity of clear fluid. The patient made a good recovery from the operation: her condition improved and her headaches disappeared.

COMMENTARY.

In the two cases just described the changes in the bony skeleton preceded those of weakness, wasting and sensory disturbance. We must, therefore, be dealing with two separate conditions, otherwise we should have expected these changes to have manifested themselves simultaneously. If one assumes any definite relationship between the two conditions, syringomyelia and acromegaly, one must place syringomyelia as secondary to or a complication of acromegaly, since the latter is the first to make its appearance.

Reference has already been made to several cases of acromegaly in the literature, in which changes round the central canal have been found at autopsy. In an endeavour to trace a relationship between the diseases in question, is it not justifiable to say that had these patients lived, the changes in the spinal cord might ultimately have given rise to symptoms of syringomyelia? Again, is it not possible that changes in the spinal cord are to be found in many cases of acromegaly and that lack of a complete examination of the spinal cord at autopsy has been responsible for their not having been mentioned more often in the literature?

To complete this paper it is necessary to attempt some explanation for the association of these two diseases.

From an embryological point of view, no possible relationship can be discovered to account for this association. A congenital anomaly or defect, however, would fit in with both diseases.
Splanchnomegaly has not infrequently been found in acromegaly. The increase in size of the organs is due to a hyperplasia of the functional cells, with ultimate fibrosis. Might not a similar process take place in the spinal cord, with a selective action on the ependymal cells of the central canal, the end result being a gliosis? This conjecture, on the other hand, would not fit in with the theory that syringomyelia is due to a primary gliosis. In some cases of syringomyelia the gliosis and cavity formation are entirely apart from the central canal, the latter being intact. In this respect, the case described by Dallemange is of interest; little gliomatous patches were found in the nervous tissue, supposed to have been migrated ependymal cells.

It is known that some hydrocephalic states can give rise to the symptoms of acromegaly. In frequent association with hydrocephalus is a hydromyelia, which in its turn might quite well give rise to the symptoms of syringomyelia. By this means a conceivable explanation could be given of some of the cases.

In conclusion, however, it must be admitted that there is no really satisfactory explanation which one can accept, and none which by itself will account for all the cases of this association.

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