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QUADRICEPS MYOPATHY OCCURRING IN MIDDLE AGE

BY

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Cases of myopathy limited to the quadriceps femoris have occasionally been reported. We have had the opportunity of looking after the patient reported by Denny-Brown in 1939 and are describing the case again to emphasize the remarkably slow deterioration which has occurred over the 25 years since symptoms first appeared, together with another recent case with marked changes on muscle biopsy.

Case Reports

Case 1.—Mrs. L. W., aged 43, was admitted under the care of Dr. Denny-Brown in April, 1939, with a six years' history of weakness of both thighs not accompanied by pain. There was nothing relevant in the past history. Her husband had had syphilis which was adequately treated at an early stage and there was a family history of tremor but not of muscle weakness. On examination there was wasting of both quadriceps, especially of the vastus internus with severe weakness of extension of both knees, but there was no other wasting or weakness. The right knee jerk was absent, the left gave a flicker of response, the other reflexes were normal and there were no sensory changes. The blood Wassermann reaction was negative and the cerebrospinal fluid was normal. A biopsy of the vastus internus was carried out and the section (Fig. 1*a*) (Dr. Denny-Brown) shows small necrotic muscle fibres scattered throughout the muscle. The number of nuclei were greatly increased and the sarcoplasm stained deeply with eosin. In longitudinal section the necrotic changes extended throughout the length of the fibre. In places small fibres in a more advanced stage of degeneration were represented by bands of nuclei. The remaining muscle fibres were larger than normal and the majority showed nuclei in the substance of the fibre instead of the normal arrangement around the periphery. There was no inflammatory reaction.

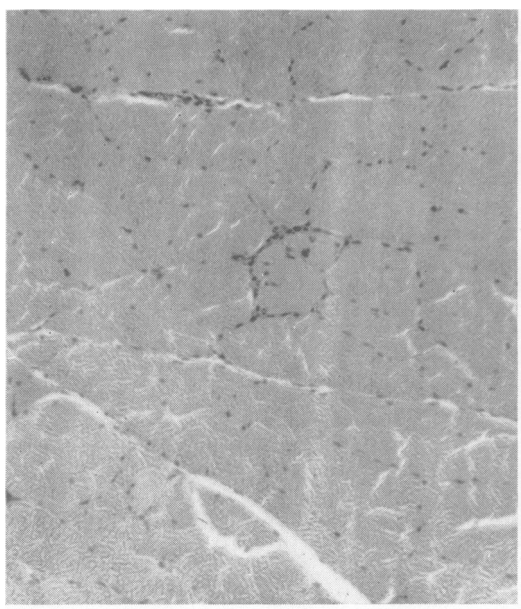

FIG. 1

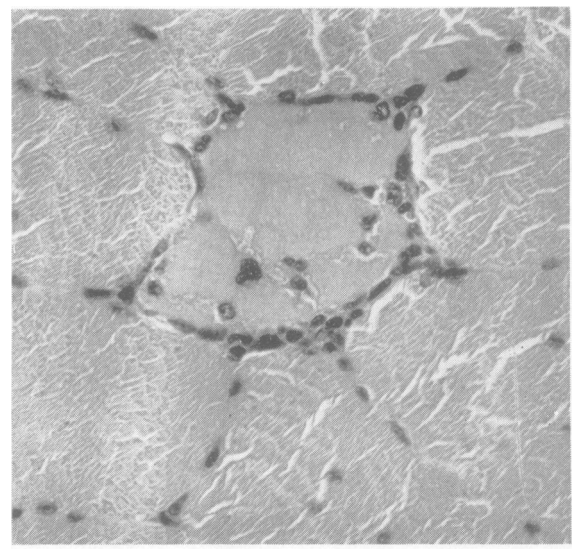

FIG. 1a

FIG. 1.—Case 1: Biopsy of vastus internus. ×125.

FIG. 1a.—Same section as in Fig. 1. ×400.

The patient was treated with glycine and attended the Out-patient Department at intervals and was readmitted in October, 1949. In the intervening 10 years the legs had become very gradually weaker and she had noted some weakness of the trunk muscles for about a year and slight weakness of the arms for two years. The menopause had occurred three years earlier. On examination, there was a small swelling in the mid-line of the thyroid which she said had been present for 20 years and which had been noted on her admission in 1939. There was slight wasting and weakness of both triceps with absent jerks, gross wasting and weakness of both quadriceps with absent knee jerks, and slight weakness of the hip flexors and extensors. Other muscles were of normal power except for slight weakness of the lower trunk muscles. The other reflexes were normal and there was no sensory change.

X-ray examination showed some antero-posterior narrowing of the trachea underneath the thyroid. The B.M.R. was 10%, the blood cholesterol level 182 mg. per 100 ml., and an E.C.G. normal. The thyroid nodule was removed on November 11, 1949, by Mr. Alan Hunt and histologically this showed thyroid tissue of low colloid content, together with two localized "adenomata". Biopsies of the right sterno-mastoid and left sterno-hyoid were made at the operation and these showed little abnormality apart from small areas in which the muscle fibres were atrophied and the interfibrillary connective tissue increased.

She has been seen at intervals up to October, 1959, and when re-examined then showed no apparent change in the muscle wasting and weakness. The disease process was still limited to the quadriceps in the lower limbs and the deltoid and triceps muscles in the upper limbs, although there was moderate weakness of the trunk; no skin lesions were present.

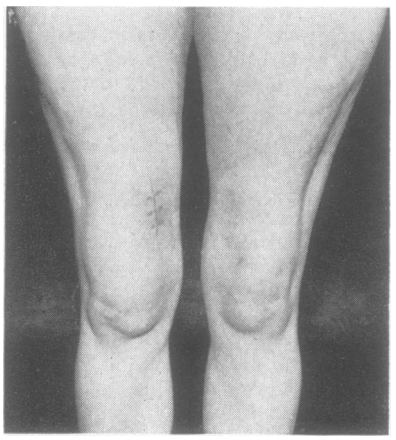

FIG. 2.—Case 2: showing the wasting of the quadriceps and position of muscle biopsy.

Re-testing the muscles electrically, it was found that

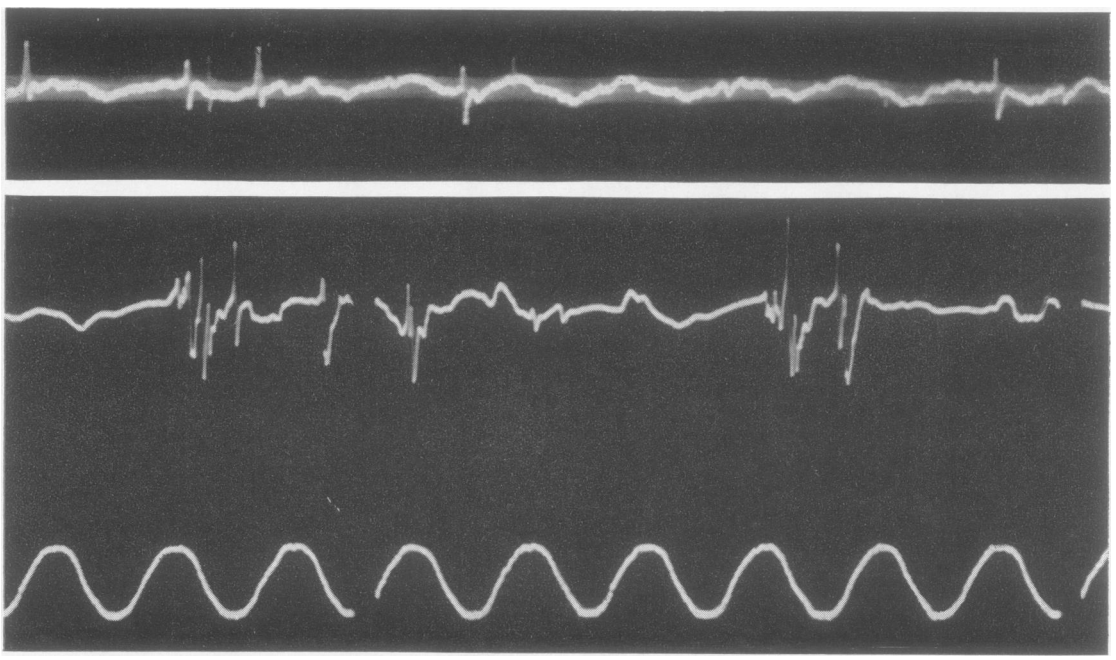

FIG. 3.—Electromyogram of quadriceps of Case 2. Calibration 50 cycles at 500 microvolts. Top tracing shows spontaneous fibrillation potentials. Second tracing shows disintegrated motor action potentials with reduced activity on full volition.

the intensity duration curves of both quadriceps and triceps muscles were normal. The left quadriceps (vastus medialis) showed discrete high-voltage long-duration polyphasic potentials. The right deltoid showed an atypical myopathic pattern.

Case 2.—Mrs. D. H., aged 52, was admitted on September 5, 1958, complaining of weakness of the legs. In November, 1957, she had a mild attack of influenza from which she made a complete recovery. In January, 1958, she noted difficulty in getting out of a chair and in walking upstairs and in April, 1958, when she consulted her doctor, he found wasting of the thigh muscles. She did not think that the wasting or weakness was increasing and she could play a round of golf without difficulty. There was no pain or sensory symptoms. There was nothing relevant in the past history and no family history of weakness of the limbs.

On examination there was considerable wasting of both quadriceps (Fig. 2), especially in the distal halves of the muscles; no fasciculation was seen. There was marked weakness of both quadriceps but no other wasting or definite muscle weakness was found. The knee jerks were absent, the other reflexes were normal, and there was no sensory impairment. The urinary creatinine level was 2·7 g. in 24 hours, creatine 0·1 g. in 24 hours, serum proteins 7·1 g. per 100 ml. (albumin 4·7 g. and globulin 2·4 g. per 100 ml.), and the E.S.R. 25 mm. in one hour. Strength duration curves showed no significant abnormality in any part of either quadriceps.

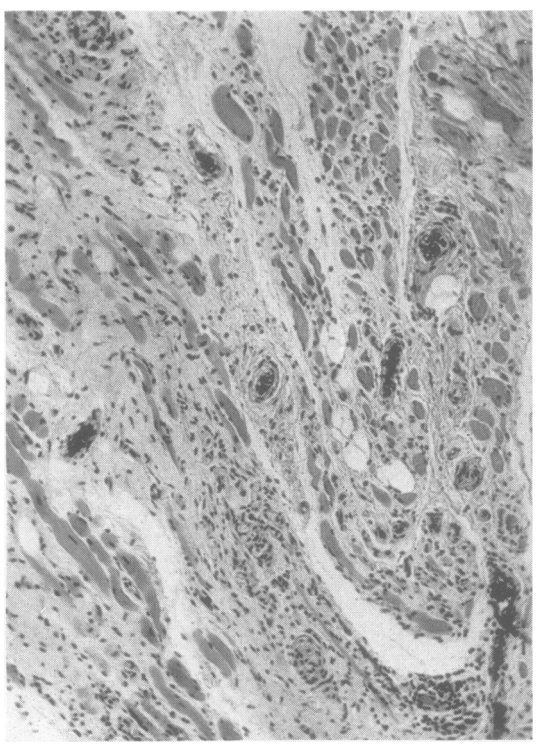

FIG. 4.—Case 2: Biopsy of vastus internus. ×75.

An E.M.G. was normal on two occasions while she was in hospital but was repeated on November 19, 1959, by Dr. J. T. Richardson. A small patch of fibrillation, together with a myopathic pattern, was found in the left quadriceps muscle (Fig. 3). Intensity duration curves of both quadriceps were normal. A biopsy of the right vastus medialis (Fig. 4) showed a very severe loss of muscle fibres with extensive fibrosis and adipose tissue replacement. A small number of fibres of approximately normal size were seen but no enlarged fibres, and the majority were in all stages of vacuolation and degeneration. Muscle spindles stood out clearly and generally appeared normal although occasional spindles also showed degeneration. Some clumps of sarcolemmal nuclei were seen but there was, on the whole, little evidence of regeneration. Nerve bundles, as stained by Holmes' method, showed a normal appearance with no empty Schwann tubes apparent. Inflammatory cells were numerous and fairly evenly scattered but occasionally they accumulated around blood vessels. Neutrophils were scanty, most of the inflammatory cells being lymphocytes and plasma cells and a few resembled mast cells. There was no sign of arteritis, fungi, or other infective agent, and no sign of sarcoidosis.

The patient was seen again in November, 1959, and there had been no change in her condition except that the quadriceps were slightly weaker. In view of the relative lack of disability and possible side-effects from the treatment, it was not considered advisable to give her steroid drugs.

Discussion

In 1923, Bramwell recorded two middle-aged men with wasting and weakness limited to the quadriceps of both legs, in one the vasti interni were especially involved and in the other the lower two-thirds of the thighs. The weakness had come on gradually, in the first over the course of a year, and in the other over six to seven years. There was no other wasting or weakness and the knee jerks were absent while the other reflexes were normal. Electrical testing showed a quantitative reduction of response in the wasted part of the quadriceps and Bramwell considered that these patients were examples of a myopathy limited to the quadriceps. In 1939, Denny-Brown, at a clinical meeting, showed the first case recorded in this paper. In the subsequent discussion, Symonds said that there were patients in whom wasting and weakness of the quadriceps, however long the condition persisted, might remain confined to those muscles. In 1956, Walton described two men, one aged 22 and the other 57, with wasting and weakness of the vasti interni and enlargement of the vasti externi, and biopsy in the younger patient showed the typical appearance of a muscular dystrophy. The second patient refused a

biopsy. The younger patient was followed up for four years from the onset and the older one for four years after being first seen (in all, nine years from the onset of symptoms) and their condition had not deteriorated during this period.

In our first patient, over the 20 years since the case was described by Denny-Brown, there has been only very slow deterioration. There has been some spread of the muscle weakness in the 14 years after the quadriceps weakness was first noticed; she complained of some weakness of the arms and this was found to be due to wasting and weakness of the triceps with absent triceps jerks and, at about the same time, she developed slight weakness of the flexors and extensors of both hips and slight weakness of the lower trunk muscles, but over the last nine years the weakness has increased only very slightly.

Difficulties arise in the nosological classification of these cases. They are undoubtedly myopathic in the sense that the condition is primarily muscular rather than neurogenic but the problem remains whether they should be considered as muscular dystrophies or as examples of polymyositis. When Denny-Brown reported our first case in 1939 he considered that the pathological changes on muscle biopsy were the same as in the two women recorded by Nevin in 1936 in whom there was considerably more widespread muscle involvement, starting in one at the age of 59 and in the other at the age of 57. Nevin considered that the pathological changes were different from those usually seen in muscular dystrophy in that degeneration of muscle fibres had occurred not by gradual atrophy but by intense degeneration in which muscle fibres had broken down, the sarcolemmal sheaths had disappeared, and the debris of degenerating muscle and proliferated sarcolemmal nuclei had called forth an apparently phagocytic response. He considered the possibility of polymyositis but thought this improbable on clinical rather than pathological grounds, the long history with good general health, the complete absence of contractures and the absence of involvement of the skin being unlikely in polymyositis. He finally regarded his cases as examples of progressive muscular dystrophy but pathologically distinct from other late cases recorded in the literature. In 1951, Shy and McEachern described 12 patients, 11 women and one man, with clinical and muscle biopsy features similar to those of Nevin's two cases and suggested the name of menopausal muscular dystrophy for the condition. The authors also showed that in some of these patients improvement occurred with administration of wheat germ oil or cortisone. Adams, Denny-Brown, and Pearson (1953) consider that these patients are in fact suffering from chronic polymyositis rather than a muscular dystrophy and Walton and Adams (1958) are of the same opinion. No muscle biopsy of the muscles mainly affected in our first case has been done since 1939; in the second case the findings were of a similar type to those in the first case in 1939 with, however, a definite inflammatory reaction. We consider that these two patients are suffering from chronic polymyositis rather than a progressive muscular dystrophy.

The biopsy findings show the two common types of abnormality seen in polymyositis. In Case 1 there was focal necrosis of muscle fibres with secondary phagocytic changes and in Case 2 inflammatory cells were seen between the muscle fibres. A rash is by no means always a feature of polymyositis, and fever, leucocytosis, and other evidence of inflammation are often lacking.

In the first patient, electro-myography gave a record indistinguishable from a muscular dystrophy, but in the second patient earlier records were normal but later ones gave a myopathic pattern with, in addition, fibrillation which is not found in muscular dystrophy.

Summary

A patient, reported in 1939, with wasting and weakness of the quadriceps, has been followed up for 20 years, in which time there has been very slow spread of the muscle involvement.

A second patient with similar localized wasting and weakness of the quadriceps and marked changes on muscle biopsy is reported.

It seems probably that these patients are suffering from chronic polymyositis rather than from progressive muscular dystrophy.

Muscle biopsy may be necessary to determine the cause of wasting of the quadriceps muscles.

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