MUSCLE EXTRACT TREATMENT OF INTERMITTENT CLAUDICATION

BY

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During the last few years much interest has been aroused by various papers, appearing chiefly on the Continent, on the treatment of circulatory disorders with extracts of mammalian muscle. In 1929 L. Haberlandt obtained an extract from the sinus of the frog's heart which increased the force of the ventricular contraction. He called this substance "Das Herzhormon" (heart hormone). Later G. Zuelzer obtained an extract from the liver which he called "eutonon," and which was said to have a similar action. Since then numerous other muscle and glandular extracts, such as myoston (myol 111), hormocardial, kallikrein, and lacarnol have been used for various types of circulatory troubles. Since the chief action of these muscle extracts is to dilate the coronary arteries and peripheral vessels, they have been used in such conditions as angina pectoris, thrombo-angiitis obliterans, intermittent claudication, etc. Many observers have published favourable results in angina pectoris.^{1 2 3 4} M. S. Schwartzman used muscle extract in the treatment of intermittent claudication and similar peripheral vascular diseases and obtained very favourable results.⁵ The extract he used was myol 111, and in a few cases myoston.

I have treated a series of ten cases of intermittent claudication with muscle extract using lacarnol and padutin (kallikrein) prepared by Bayer. Lacarnol is a nucleoside extract prepared from mammalian skeletal muscle. It does not contain histamine, and is free from suprarenin and choline. The exact chemical nature of the active principle has not yet been determined, but it is probably a non-specific chemical substance, present in many animal tissues, containing adenosin. Padutin is an extract obtained from the pancreas, but is quite distinct from insulin; it is a complex chemical substance the formula of which is at present unknown. The most important action of these extracts is their vaso-dilatation effect on the arterioles of the periphery, and the dilatation of the coronary arteries.

Of these ten cases of intermittent claudication all except one showed some definite degree of improvement after treatment with muscle extract. The one exception was an advanced case of general arteriosclerosis with calcified arteries. Some of the cases had been progressively deteriorating in spite of all other methods of treatment, but after administration of muscle extract remarkable improvement occurred; in the words of one patient he "felt ten years younger in activity." The extract was first injected into the gluteus muscle; a course of six daily injections of one ampoule was given, followed by 20 minims of the extract by the mouth, three times a day, for some weeks. A general examination was then made, the amount of improvement noted with particular regard to the intensity of pain, the distance the patient was able to walk free of pain, pace, and frequency of attacks. Further courses of treatment were then given until the maximum improvement was obtained.

Space will not allow me to record the ten cases in detail, all of which have maintained their improvement for over six months and several for over twelve months; I will therefore briefly describe the first three. As the patient in Case I was a highly educated and intelligent person who described his symptoms very accurately I will record his case more fully.

CASE I

The patient, a man aged 55, had no history of venereal disease, alcoholism, or tobacco smoking, nor had he had any previous serious illness. He had always been a keen sportsman; he played tennis and golf, and was fond of shooting, swimming, etc. In 1924 he began to have severe cramp-like pains in the right leg localized to the calf muscles. The pains came on after walking a short distance, particularly if uphill and in cold weather. He could not walk faster than two miles an hour, and when the pains came on he had to stop for a few seconds, when the pains disappeared and he could walk on. In 1927 the left leg began to give similar trouble, and he had to give up his daily round of golf.

On examination the heart was normal in size and the heart sounds normal; blood pressure was 145/95. There was no thickening of the superficial arteries. The femoral arteries were palpable, but the posterior tibial arteries were not. The feet were cold but not blue. The nervous system was quite normal: knee-jerk and pupil reflexes normal. Before coming under my care the patient had been all over Europe trying to find some relief for his leg condition. Electric treatment such as radiant heat and diathermy had been applied, vaccines for protein shock had been given, and various mud baths, etc., administered, but without relief; the patient himself said "life was a misery to him."

Treatment.—I gave the patient a course of six intramuscular injections of lacarnol followed by the extract per os. He then wrote to me stating he found "his legs greatly improved, being able to walk much more quickly without inconvenience for about 500 yards. When the pain does come on it is much less acute than it was before treatment, even when I push the pace when it comes on." After an interval I gave him another course of injections. He subsequently wrote to me stating that "the sensation of cramp in the calf of the legs has not been apparent at all. The trouble is now definitely lower down the leg, and feels to be between the calf and ankle." I gave him a third and final course of injections, after which he sent me a report of his condition, stating that "there was a marked improvement. I am walking more quickly and in greater comfort than since the trouble began. There is now never any feeling of cramp or severe pains, but occasionally an aching, tired feeling after walking some distance. I can now walk in comparative comfort at three miles per hour, and can play and enjoy a round of golf." This patient is still keeping well, although he has had no treatment for some months.

CASE II

In this case, that of an engineer aged 57, the cramp-like pains in the calves of the legs on walking some distance had started four years previously. He had to stop, when the pains would cease and he could then resume his walk. Recently the pains had become more frequent, so that he could only walk a hundred yards without discomfort. On examination the superficial arteries were hard and calcified. There was no pulse in the posterior tibial or dorsalis pedis arteries. The lower limbs were cold and blue. The heart, knee-jerk, pupil reflexes, etc., were normal. Blood pressure 160/90.

Treatment.—The patient had had various medical treatments with no signs of improvement. I gave him two courses of injections of lacarnol, followed by the extract per os for some weeks. At the final examination he stated that he no longer suffered from any pain on walking; he could walk a greater distance in comfort and at a quicker pace. A feeling of stiffness came on if he walked too fast or for too long at a time. There was some pulsation in the posterior tibial arteries. The limbs were warmer and not blue, and the blood pressure was 140/85.

CASE III

A commercial traveller, aged 62, had complained since 1928 of pain in the legs on walking fast or uphill. Resting a few seconds relieved him, but lately the pain had become more intense and more frequent; he also had an occasional tight feeling over the sternum on exertion. There was no history of any previous illness. He was a teetotaler and moderate smoker; he had given up tobacco on his doctor's advice, but the pains still persisted on effort. On examination no

abnormality was made out in the heart apart from an accentuated aortic second sound. The blood pressure was raised 180/110. There was no albuminuria or enlargement of liver or spleen. Reflexes were normal.

Treatment.—After two courses of intramuscular injections of padutin his symptoms were relieved to a certain extent but, in his own words, he was "still unable to walk smartly, particularly if the weather was cold, for more than about 200 yards without having to slow down." I then gave him two more courses of lacarnol, and there was then more definite improvement in his legs as well as in his chest. He can now "walk for an hour and three-quarters, in spite of a strong head wind, without discomfort."

REFERENCES

- ¹ Frey, E. K.: *Münch. med. Woch.*, 1929, lxxvi, 1951.
- ² Buchholz, B.: *Deut. med. Woch.*, 1931, lvii, 188.
- ³ Schwartzman, J. S.: *Münch. med. Woch.*, 1929, Nos. 32 and 43; 1930, No. 18.
- ⁴ Fahrenkamp, K., and Schneider, H.: *Med. Klinik*, 1930, ii.
- ⁵ Schwartzman, M. S.: *British Medical Journal*, 1930, i, 855.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

RECURRENCE OF MALIGNANT PUSTULE

Cutaneous anthrax is by no means rare in Iraq, but as this country has a large export trade in hides and wool the actual existence of the infection can hardly occasion surprise. The literature contains but few references to recurrence of the infection, and the case about to be recorded represents the first instance of the phenomenon in my experience here. Since cases of recurrence afford, to some extent, indication of the period of immunity which infection with *B. anthracis* confers, a further example may be of sufficient interest to merit publication. Reviewing the cases previously recorded, the time interval in the following appears to have been exceptionally short, sixteen months only having elapsed between the two infections.

CASE HISTORY

An Englishman, aged 30, who was employed by a British firm in the purchase and exportation of sheep's wool, consulted me on the morning of February 4th, 1931, complaining of a "boil" on the left side of the neck about an inch below

the centre of the lower jaw. Thirty-six hours previously he had first noticed a small red papule, and when examined by me the lesion had become vesiculo-pustular, and had a central blackened scab. A wide zone of inflammatory oedema, characteristically brawny, surrounded the pustule, itself ringed by an incomplete circle of small secondary vesicles. Pain was slight but tenderness marked. The temperature was 101.4°, pulse 104, and the patient complained of malaise and severe headache; toxic symptoms, however, were not pronounced. Smears from the pustule revealed *B. anthracis* in large numbers, the identity of the infective organism being confirmed later by culture. Forty c.cm. of Sclavo's serum was at once administered subcutaneously, and the patient was admitted to the Civil Isolation Hospital, Bagdad.

By the evening the temperature had risen to 103.4°, the pulse was 118, and the general symptoms were much more severe. A further 20 c.cm. of serum was injected subcutaneously. The temperature on the following morning (February 5th) was 102° and the pulse 110, when a further 40 c.cm. of serum was given subcutaneously. That evening the temperature was 103.4° and the pulse 120, but neither general nor local symptoms showed aggravation. On the following morning (February 6th) the patient felt very much better; the local condition too showed decided improvement. The temperature, however, was 101.6° and the pulse 112; a further 20 c.cm. of serum was injected. By the evening, following a series of profuse sweats during the afternoon, a further improvement was noted; the temperature was 100.8° and the pulse 106. The next morning (February 7th) the temperature had risen to 102°, but the patient was obviously so much better that no further serum was injected. By evening the temperature had fallen to 99°, and by the morning of February 8th had reached normal. For the two following nights the temperature rose to 99°, but convalescence was rapid and uninterrupted. The patient was discharged from hospital on February 17th, the lesion having completely healed, leaving at the site a slightly depressed irregular rounded scar about half an inch in diameter. The left side of the neck was still swollen and extremely indurated. The induration disappeared very slowly, persisting for several months. It was associated with contracture of the superficial tissues of the neck, evidence of which still remains and is the cause of slight limitation of neck movements.

RECURRENCE OF INFECTION

On discharge the patient resumed his former employment. On May 28th, 1932, he again consulted me for what he described as "three septic mosquito bites." There were three small pustules situated triangularly above the right orbit; two were half an inch from each other just above the eyebrow, and the third an inch higher. There was no definite evidence of the pustules being insect bites, but their multiplicity was at least suggestive. The three lesions had been noticed in the form of minute red papules a little over two days previously. When I saw the patient each pustule was scantily surrounded by small vesicles, and both right eyelids were very swollen and the eye almost closed. Constitutional symptoms were slight, the temperature only 99° and the pulse 86.

Smears and cultures again identified *B. anthracis*. The patient was readmitted to the Civil Isolation Hospital, and 20 c.cm. of Sclavo's serum was at once administered subcutaneously. The evening temperature was 99.5° and the pulse 90; the patient complained of a headache, but otherwise the symptoms showed no aggravation. The temperature had fallen to normal by the following morning, and the patient felt a little better. The three pustules had dried considerably, and were covered by dry black scabs; the eye, however, was still closed. A further 20 c.cm. of serum was injected. The temperature rose to 99.4° at night, but was subnormal the next morning; fever did not recur. Convalescence was rapid. The lesions were completely healed by June 4th, on which date the patient was discharged. Three very small depressed scars remained, but the oedema had almost completely disappeared.

SUMMARY

Second attacks of malignant pustule are rare, and recorded cases suggest that any immunity produced by infection is comparatively short-lived. In this case the extreme mildness of the symptoms of the second attack suggests the existence of partial immunity after a lapse of sixteen months. In conclusion, I would emphasize the therapeutic value of the appropriate serum in this infection. My experience of the condition in Iraq prompts me to the belief that excision of the pustule is inadvisable, and that early and adequate administration of serum constitutes the essence of successful treatment.

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