Fibrositis in Industry and the Laughton-Scott Technique*

By
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RHEUMATIC fibrositis is of special interest to industrial medical officers as being the cause of much loss of efficiency in industry. Its immediate effect upon the physical worker's ability to continue his work is often as serious as that of more grave conditions, though the amount of time lost through fibrositis is difficult to assess. The medical officer attached to one great motor manufacturing works employing some 12,000 workers states that "on an average about 450 people absent themselves each year on account of rheumatism, which is equal to about 10 per cent. of the total sick absenteeism. The average period thus lost by each person is just over 21 days, but many cases, of course, remain under treatment while at work for weeks, months, or even longer."† No doubt this experience could be paralleled in other industrial organisations.

It is my privilege to put before you a method of treatment for fibrositis which, though its highest success cannot be attained without some instruction, is essentially simple to carry out. It can be given in the out-patient department of the factory with consequent saving of hospital attendance and man-hours.

Fibrositis as a Disease Entity

For a long time I had regarded the diagnosis of fibrositis as a confession of inability to ascertain the true cause of pain and spasm in various muscle areas. Indeed, I did not believe in fibrositis as a separate entity. There are a number of conditions, apart from trauma, which are capable of producing pain and stiffness in muscles; for example, a disc protrusion is accompanied by areas of painful muscle spasm. Copeman and Ackerman (1944) have proved the existence of another cause of muscle spasm and pain in fatty herniations. Thus within recent years two additions to our knowledge of basic causes have been made which have led to beneficial treatment. Little by little we are sorting out and eliminating, there remains a group which consists of the local injection of benzyl salicylate in oil, as described below. If the meaning of the signs and symptoms be considered carefully, surely it must be that their true source arises from some other site than that at which the symptoms present themselves. That the signs are detectable just as in the case of disc lesion I hope to be able to convince you.

Cases conforming to these several criteria constituted the test groups to which we applied the treatment elaborated by Laughton-Scott (1943) which consists of the local injection of benzyl salicylate in oil, as described below. If the meaning of the signs and symptoms be considered carefully, surely it must be that their true source arises from some other site than that at which the symptoms present themselves. That the signs are detectable just as in the case of disc lesion I hope to be able to convince you.

The patients dealt with in our investigation had hung about for months and even years undergoing various forms of treatment. They were often unable to work for weeks, while their tendency to relapse after an apparent cure was a distressing fact. When employees in industry, especially in large works, have to report sick repeatedly it is obvious that costs go up and the organisation suffers; if the condition reappears a few months after return to duty it is a sorry business for the patients, the doctors, and the management alike.

Therefore, being painfully aware of my own inability to alter this picture, when I was asked to investigate the Laughton-Scott technique, which

† Personal communication by Dr. A. R. Thompson (Vauxhall Motors).

* A Lecture given to the Association of Industrial Medical Officers at the London School of Hygiene and Tropical Medicine on 21st March, 1952. The lecture was illustrated with lantern slides and a film illustrating technique.

I am now satisfied indicates a definite pathology. It is this group which I want to discuss, and which, for want of a better name, I am calling fibrositis.

A Recent Investigation

In a recent investigation by Mr. L. W. Plewes, Dr. A. J. Martin, Dr. I. Cowan, and myself (1951), the first care of each observer was to eliminate, by careful history-taking and examination, other conditions simulating the group. We agreed to follow the criteria which Hench (1947) employs in the diagnosis of fibrositis:

- Symptoms. In any given area of muscle the pain must be consistent in type and must be consistently localised stiffness of movement corresponding with the painful area.
- Physical Signs. There must be tenderness on palpation, consistently localised and having accurate correspondence with the symptoms. Areas of palpable spasm should also correspond with both symptoms and signs.
- History. The history of true cases of fibrositis differs to some extent from other diseases, especially in the characteristic of being worse after a night's rest, or periods of inactivity, the patient frequently becoming temporarily free of symptoms during exercise, provided this is not carried beyond a certain point.

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claimed less relapse and quicker clearance of symptoms, I felt that I must not neglect to do so, but I approached the task with little hope that the technique advocated would prove any more satisfactory than other measures. I will first pass in review the methods I have used or seen used.

Common Treatment of Fibrositis

In the Royal Air Force as I travelled round many establishments in my capacity as consultant in physical medicine, I found large numbers who could properly be included in my group. The usual treatment ordered was radiant heat and massage or infra-red and massage. Such treatment was given three or four times a week, but the cases derived little benefit. In some units procaine injections were used, and quite a good proportion gained benefit, but it was so temporary that I was left dissatisfied. Localised intensive doses of ultra-violet light, the area being covered with elastoplast, were to my mind the most effective of all the treatments I saw, but here also the tendency to early relapse was an unsatisfactory feature. Diathermy, long or short wave, usually brings temporary relief, but with little or no curative or lasting value. Pills, lotions, ointments, and a host of patent medicines have their advocates, but their very multiplicity is a measure of their ineffectiveness. The common aim of each treatment was to increase the local blood supply in the muscles affected by fibrositis.

The Laughton-Scott Technique

The central feature of the treatment advanced by Laughton-Scott (1943) consists of weekly injections of 5 cc. of an oily mixture made up with benzyl salicylate 5 parts, camphor 5 parts, and arachis oil to 100. This mixture was prepared for us by British Drug Houses Limited in 5 cc. ampoules, thereby ensuring uniformity and readiness for use. The technique differs in one essential particular from that used when procaine is injected. To secure good results the injected material must be laid down as close to the periosteal origin of the affected muscle groups as possible. Another feature of this technique is knowledge of the surface-marking to determine the site of injection in relation to the patient's signs and symptoms.

Selection of Cases

We took 200 cases for analysis. Of this number 28 had to be excluded because of errors in diagnosis found during treatment or, in no more than 4 or 5 cases, because of non-attendance or refusal of further treatment. Thus a full course was received by 172 patients. The average duration of symptoms was just over three years, because resistant cases were specially chosen for the technique. The number of injections per case was 5.9, and the majority were fairly close to this average.

The follow-up time, an average of nearly nine months, with a minimum of six months and a maximum of fifteen, is a significant and important feature of our investigation. It can be confidently said that there is no other series of such size or such careful follow-up.

It will thus be conceded that a large group was subjected over a long period to a test which could hardly have been more exacting.

Summary of Results

In these 172 cases of fibrositis the condition at an average period of 8.9 months after completion of treatment was as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free of Symptoms</td>
<td>83</td>
<td>48.3</td>
</tr>
<tr>
<td>Plus improved</td>
<td>52</td>
<td>30.2</td>
</tr>
<tr>
<td>Slightly improved</td>
<td>16</td>
<td>9.3</td>
</tr>
<tr>
<td>No change</td>
<td>15</td>
<td>8.7</td>
</tr>
<tr>
<td>C+D+E</td>
<td>37</td>
<td>21.5</td>
</tr>
<tr>
<td>Worse</td>
<td>6</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Thus by grouping the cases free of symptoms and the plus improved, we get nearly 80 per cent. of the total—a high proportion when the three years' average length of disability is considered. The results in the four clinics in which the investigation was carried out were reasonably consistent for each of the categories.

Reaction to Treatment

With the use of this technique, malaise following the injections was common and took a definite uniform pattern. Indeed, the malaise appeared so frequently during a course of treatment and was so often followed by a result which left the patient free of symptoms or greatly improved that we came to look upon it as a favourable prognostic sign. We noted also that when the reaction had cleared up the majority of the patients volunteered the information that their general health was improved.

The question arose as to whether healthy and normal individuals exhibited malaise. Fourteen healthy volunteers were taken and showed no such reaction. We also asked ourselves whether the results could be due to the deep multiple needling which was associated with every treatment—a form of auto-haemotherapy. Dr. Cowan undertook to investigate this possibility. In 12 cases in which multiple needling took place without any injection being used only one was reported free from symptoms and none was plus improved, two were slightly improved, in five there was no change, and two were described as worse. We also considered whether the arachis oil component, in view of its bulk and slow absorption, might be playing an important part in the reaction. Mr. Flewes took 20 new cases and treated them by precisely the same technique except for the absence of the benzyl salicylate, ensuring that each patient had the impression that he was receiving the same injection as the others who were
number one reported free from symptoms, one admitted to Professor Wood Jones. He injected procaine and had failed to respond. All these improved, but the great majority (14) no comment so favourably on the results. Of this procedure.

We therefore tentatively punctured the cortex in a few cases and injected the metaphysis with from 2 to 3 cc. of the oily mixture. The results in relief of symptoms were better than when the usual technique was employed. In order to determine why this occurred we added a radio-opaque dye and repeated the bony injection. The results of this procedure were quite dramatic. The radio-opaque material injected into the bone rapidly flowed out from the bone in a finely divided spray throughout the entire muscle, whereas when the injection is made in the usual way into the belly of the muscle it has quite a different appearance from that following injection into the cortex. It then forms a large blob-like mass with little or nothing of the spray effect. If the cortex is penetrated more deeply so that the needle goes well into the marrow of the diaphysis, the injected dye leaves by venous channels, which is presumably the route taken when blood transfusions are made.

It was obviously important to find out what was happening with these injections into bone; a number of biopsies were carried out, and I also obtained a post-mortem specimen which I submitted to Professor Wood Jones. He injected the bone in the same way as we had done but with a gelatine dye, and the material flowed out rapidly, as in our cases. Professor Wood Jones considered that the dye left the bone in fine channels alongside Sharpey's fibres. I think the meaning of this is reasonably clear. There must be a normal channel of communication between the marrow of the metaphysis and the muscles attached to it. If this normal process is interfered with by an inflammatory condition, the factors injected are made to the bone. We therefore tentatively punctured the cortex in a few cases and injected the metaphysis with from 2 to 3 cc. of the oily mixture. The results in relief of symptoms were better than when the usual technique was employed. In order to determine why this occurred we added a radio-opaque dye and repeated the bony injection. The results of this procedure were quite dramatic. The radio-opaque material injected into the bone rapidly flowed out from the bone in a finely divided spray throughout the entire muscle, whereas when the injection is made in the usual way into the belly of the muscle it has quite a different appearance from that following injection into the cortex. It then forms a large blob-like mass with little or nothing of the spray effect. If the cortex is penetrated more deeply so that the needle goes well into the marrow of the diaphysis, the injected dye leaves by venous channels, which is presumably the route taken when blood transfusions are made.

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X-rays and Biopsy

So much for the results we obtained and the limited controls we undertook. A fact which impressed us was that the results were better the closer the injection was made to the bone. We added that this comparative method also helps to eliminate the question of psychological effects.

Salicylic acid ... ... grs. 5
Sodium salicylate ... ... grs. 90
Procaine ... ... grs. 45
Camphor water ... ... oz. 20

To this is added 0.5 per cent. chlorbutol. The pH of this solution is 6.4 and from 10 to 30 cc. can be injected weekly without producing excessive malaise. If this method is used it is preferable to mix the procaine from separate ampoules unless the solution is to be used within about three months, because when the procaine is in the mixture the salicylic acid tends to produce a steady loss of the procaine, which would not occur if the procaine were kept separate and mixed at the time of injection. It is necessary to have some procaine in the mixture because even weak acids of as low dilution as this prescription tend to be painful. Except to prevent pain, the procaine plays no part, and when, in extensive treatments under general anaesthetic, it is omitted, clinical results are not affected.

The sodium salicylate, as the salt of a weak acid, has a buffering effect. It might be said that salicylic acid introduced into the body tissues must be rapidly changed into the salicylate. But comparatively high concentrations of salicylate have no clinical effect at all. It is conjectured that possibly the acid is taken up by the fatty tissues and is thus only slowly converted into the salt.

Although I have no definite statistics, such as I have given with regard to the oily injection, this watery solution has now been used for some two years, and, as already stated, the results appear to be equally satisfactory.

Summary

On the clinical side those associated with this investigation are convinced that the treatment by the Laughton-Scott technique constitutes an advance on existing methods. It saves disability time and hospital attendance, and in uncomplicated cases of fibrositis it relieves symptoms for longer periods than other methods familiar to us.

On the speculative side we hold no fixed or formed views as yet on the later stages of our...
work (of which the merest outline has been given above). But we have naturally speculated among ourselves, and we have asked ourselves the following questions:—

(1) Does the essential aetiology of fibrositis lie within the bone?

(2) Does the marrow of the metaphysis of bone play a more important part and active part in the metabolism of the body than has been hitherto recognised?

(3) Are the generally accepted symptoms and signs of fibrositis merely external manifestations of some disease whose true site does not lie where the symptoms are felt and the indefinite signs detected?

(4) Are these symptoms and signs indications of some derangement of a normal physiological function or interplay between bone marrow and muscle?

(5) Has this work pointed the way to the recognition of another sub-group of muscular rheumatism?

The technique of this method is not difficult to acquire by starting with simple muscles such as the gluteal region, but since practical demonstration is always more profitable preliminary arrangements have been made for demonstrating the technique by two of my collaborators—Mr. L. W. Plewes, F.R.C.S., at the Luton and Dunstable Hospital, and Dr. George Dobney, D.Phys.Med., at the Archway group of hospitals.

All those engaged in this research wish to acknowledge their indebtedness to Dr. Laughton-Scott himself, in particular his response to their requests and criticisms. We are grateful also for the help of Dr. A. R. Thompson and others. The support and encouragement given us by the Dora Garrod Thomas Trust and the Sir Halley Stewart Trust has made this work possible. The late Miss Dora Garrod Thomas requested that certain monies from her estate should be devoted to research into chronic rheumatism, and she desired that any knowledge so gained should primarily benefit industrial workers. I have been asked to say that if any requests are received for practical demonstration or collaboration in clinical trials the trustees will be glad to be informed so that they may consider whether they would be in a position to contribute towards the expense incurred.

References

A Case of Metol Poisoning
with a Discussion on the Chemistry and Toxicology of Colour

By

H. WYERS,

From the Health Department, May & Baker Ltd.

In the following case history is recorded the first example, so far as is known, of systemic poisoning by the photographic developer metol in a pure state. The presenting features were lilac cyanosis and black urine. The case illustrates the importance of the phenols and aromatic amines, in the toxicology of coloured substances.


He had been engaged on the manufacture of metol for three to four months. Part of his job consisted in mixing batches of finished material and scooping it into kegs by hand. The top of the mixer was open and allowed dust to escape. He wore gauntleted gloves and covered his mouth with several layers of gauze. On occasion, he had mixed 1.600 lbs. He was engaged on this work from 3.30 p.m. until 9.30 p.m. on the 25th April, 1947. It was a hot night, he wore thick, heavy clothes and sweated profusely. On the morning of the 26th April, 1947, he presented himself at the works surgery with a complaint that his urine was black. He had first noticed this at 9.20 p.m. in the previous evening, although the same phenomenon had occurred on two previous occasions whilst engaged on this aspect of his job and he had not bothered to report it. On these occasions he had not noticed the change in colour until the day following the mixing process, but he had passed his urine in the darkness on the previous evenings and could not be sure when the colour change occurred. He had not been taking any medicine, e.g. headache powders or tonics nor had he applied any liniments or surgical dressings to his skin.