SOME ORTHOPAEDIC ASPECTS OF RHEUMATIC DISEASE

BY

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The rheumatic diseases, including the rheumatoid and osteo-arthritic types of arthritis and non-articular rheumatism, constitute by far the most important cause of crippling. A person suffering from a serious cardiac lesion is also in a sense crippled, so that, if we include the incapacity for work from this condition due to acute rheumatism, the problem is seen to be one of grave national and indeed international importance. In England and Wales alone, the economic loss is at least £20,000,000 annually, while, according to the official publications of the Department of Health for Scotland, 14% of the total invalidity of persons insured under the National Health Insurance Act north of the Tweed is due to rheumatism, and the annual economic loss to Scotland is estimated at £3,000,000. Although these figures have been frequently quoted, it seems that constant reiteration is necessary to awaken the national conscience.

Early Prevention of Deformity

In every case of rheumatic disease, and particularly in the more acute forms, it is absolutely essential that the prevention of deformity by suitable orthopaedic measures must be borne in mind from the first day of onset of the disease. This statement may be considered platitudinous, but it is surprising how often, even at the present day, this important principle is neglected.

Orthopaedic treatment is (or should be) based upon principles that are clear and definite, and, provided these principles are borne in mind from the very commencement of the disease, deformity may be either entirely prevented or reduced to a minimum. It is doubtful whether these orthopaedic principles would be greatly altered even if the cause or causes of rheumatic disease were definitely established; although it is to be hoped that many more cases would be cured before serious deformity had occurred. This point requires mention, because it is sometimes argued that the formation of an adequate number of treatment centres for rheumatic patients, where modern methods of medical treatment, physiotherapy, orthopaedics, etc., can be made available, would be of no use while we remain ignorant of precise aetiological factors. Every facility should be granted for such research and the need for this is urgent, but this

should not be made an argument for deferring the urgently needed treatment centres.

Although the situation has improved in recent years, experience teaches that in Britain we have lagged behind some other countries in recognizing the supreme importance of the orthopaedic aspects of rheumatism from zero hour of the onset of rheumatism, particularly as it affects the joints; real team work has often been conspicuous by its absence. In arthritic units in some other countries there is much closer liaison between the physician and the orthopaedic specialist. In some, every case is seen by the orthopaedist as a matter of routine, and, in the early cases, the methods to be used in combating the onset of deformity are discussed with the physician and other members of the team. British orthopaedic specialists have been in the forefront in the prevention and treatment of deformity in rheumatic disease, and there have been important advances in recent years. Yet it is depressing to see the great numbers of patients with advanced crippling and deformity that report at the few clinics and hospitals in this country that specialize in rheumatic disease. Orthopaedic specialists could do infinitely more for patients if they could see them earlier; in the majority, the most favourable time for treatment would have been months or even years earlier.

ILLUSTRATIVE CASE

My advice was sought recently by a medical colleague with regard to the orthopaedic treatment of a young man aged 25 years suffering from the rheumatoid type of arthritis and with gross deformities. In 1940 he developed thyrotoxicosis, and, after prolonged medical treatment, thyroidectomy was performed at a London hospital. Within a month of the operation he developed a generalized rheumatoid type of arthritis. He was subsequently transferred to another hospital, where, apparently, the gross deformities occurred. After a spell at a spa, where he was given a course of myocrysin and various methods of physical treatment, he was transferred to the L.C.C. Rheumatism Unit in London. There were gross flexion deformities of hips and knees and the feet were fixed in a position of equino-varus. In addition there were typical deformities of the elbows, wrists and fingers.

Careful examination under anaesthesia revealed that the ankylosis of the joints of the lower extremities was

of a firm fibrous nature, and it was not possible appreciably to improve the deformed positions. The orthopaedic treatment of such a case bristles with difficulties. The failure to prevent the occurrence of these deformities may well involve a series of major operations upon the knees and ankles, spread over years rather than months, and, provided the patient's mental stamina and courage are adequate, it may eventually be possible to enable him to stand or even walk a little. Why are such sad cases so frequently seen in modern times or, as King Edward VII once said of tuberculosis: "If preventable why not prevented?"

A weak point in the present system is that cases of arthritis applying for treatment at hospitals and clinics are often automatically referred to the physicians irrespective of the stage of the disease, and some time may elapse before orthopaedic opinion is sought, if indeed at all. During this long period the patients often run through the whole gamut of medical treatment, which, in the prevailing absence of knowledge of causation, is often admittedly empirical, and the orthopaedic treatment which these patients so urgently need is withheld. The percentage of cases that reach the orthopaedic specialist only in the advanced stages I should put at the surprisingly high figure of between 75 and 90. Then there is the deplorable absence of facilities for the adequate investigation and modern treatment of rheumatic disease and lack of research into the causation. The Empire Rheumatism Council under its chairman, Lord Horder, has in recent years endeavoured to draw public attention to this reproach to British Medicine and to overcome the apathy of the Ministry of Health towards this problem. It has been proved up to the hilt that it is impossible to cope with this matter by relying upon the generosity of the public alone. State help is absolutely essential, and it is of vital importance that this should be forthcoming.

Some Defects and their Remedies

Another reason for the great number of advanced cases of deformity seen is that, in the absence of suitable centres and clinics for rheumatic patients, the treatment falls to the lot of general practitioners who have had no proper training or experience in this group of diseases but who do their best under very difficult conditions. They are often unable to get the early acute cases of the rheumatoid type of arthritis into hospital, and it is frequently impossible for them to obtain treatment for the more chronic deforming cases of rheumatism at a hospital, spa, or clinic with modern facilities. The treatment of such chronic cases is often spread over long periods, and with the present acute shortage of beds the hospital authorities look with disfavour upon such long-term cases. The general practitioner is thus compelled to rely largely upon his own efforts. The important point requires emphasis that practitioners almost invariably assert that, during their period of training, instruction in rheumatic diseases has been inadequate or entirely lacking.

The remedies appear therefore to be:

(a) Much closer cooperation between physicians and orthopaedic surgeons with the realization that the orthopaedic aspects of rheumatic diseases are of never less than equal importance to the medical aspects and often greatly exceed the latter in importance.

(b) The provision of adequate facilities for modern treatment and research into causation of rheumatic diseases, for which financial support by the State is indispensable.

(c) Instruction in rheumatic diseases in the training of the future practitioner at the teaching hospitals, and post-graduate courses in this subject for those whose student days are over.

One of the most encouraging factors in the situation, and one which should play a very important part in the campaign against the crippling deformities of rheumatic disease, was an agreement that was arrived at in 1942 between the Empire Rheumatism Council and the British Orthopaedic Association. A common policy was decided upon as follows.

"The Empire Rheumatism Council and the British Orthopaedic Association are in cordial agreement that their mutual cooperation in the diagnosis, prevention, and treatment of crippling conditions will be of the greatest service to the health of the community. Both bodies aim at close liaison between the physician specializing in rheumatism and the orthopaedic surgeon, seeking to enlist the sympathetic cooperation of the general practitioner, the public health services, and social workers generally. Orthopaedic hospitals and orthopaedic departments of general hospitals should include on their staffs a physician with special knowledge of the rheumatic diseases. Rheumatism centres should include on their staffs an orthopaedic surgeon. Since the application of methods of physical therapy and of occupational therapy for orthopaedic and rheumatic patients is largely identical, a combined out-patient clinic should, wherever practicable, serve for both classes of patients. In such combined centres, the orthopaedic cases will be under a team headed by an orthopaedic surgeon; for rheumatic cases, the team will be headed by a physician.

"In view of the growing appreciation of the regionalization of medical services the scheme for rheumatism treatment centres should be planned to fit into such schemes as may be arranged for the future. This has, in fact, already been done in orthopaedic schemes. As in orthopaedic work, the development of successful centres has been based upon the legal requirements of the notifications of certain crippling diseases and upon the public responsibility for the provision and payment for their treatment, so in rheumatic disease a similar degree of responsibility should be assumed by the State or local authority.

"Adequate provision for the training of young physicians and surgeons in research, diagnosis, and treatment should be associated with suitable encouragement to make the study of rheumatic disease a life work."

To put into effect the agreed plan of cooperation, a joint standing advisory committee has been con-

stituted. Thus, amidst the strains and stresses of the most devastating war that this world has ever experienced, and while this country was undergoing intensive bombing, what may prove to be one of the most valuable and far-sighted cooperative efforts in the history of medicine was achieved.

Early Prevention and Treatment of Deformity

Although the problem of prevention and treatment of deformities in the earlier or more acute stages of rheumatic forms of arthritis comes within the domain of the orthopaedic specialist, and in the modern rheumatism centre his advice is often sought in difficult cases, the prevention of deformity is in practice mainly the concern of the physician. It is obviously impracticable for the orthopaedic specialist to see and advise upon every case in a large centre. It is most important, therefore, that physicians at such centres should have a thorough knowledge of the principles of prevention of deformity, and be versed in plaster technique, in methods of extension, and in the optimum positions for joints mentioned below. A good working knowledge of the principles of physiotherapy in rheumatic diseases is essential.

Pain associated with muscular spasm is a prominent feature in early acute cases. Usually the more powerful flexors overcome their opponents, so that flexion deformities must be guarded against, and, in such joints as the hip and shoulder, abduction, adduction or rotation are superadded. In such early cases every effort must be made by rest to the affected joints in the optimum positions to inhibit muscular spasm. Our ultimate aim is, however, to preserve a useful range of movement in the joint, so that great care must be taken to commence gentle movements of the joint as soon as the general and local conditions permit. Prolonged rest causes the joints to become fixed owing to shortening of the joint capsule and peri-articular structures on the side of maximum contracture, or, if deformity has been avoided, in the optimum position. Although this is a lesser evil, ankylosis should not be too readily decided upon, although it may be inevitable in the ultra-acute cases. In these acute cases a period of rest in bed is advisable, particularly in the case of the joints of the lower extremity, and by far the most satisfactory method of applying rest to the affected joint is by means of moulded plaster-of-Paris splints. For joints such as the ankle, knee, wrist, and elbow, and in cases of spondylitis, this method, when the necessary experience has been gained, is of the greatest value and far more comfortable and efficient than the usual types of padded splint of wood or metal. In arthritis cases the plaster should be separated from the skin by a layer of stockinet; a completely skin-tight plaster is inadvisable, and in every case the plaster is bivalved either immediately or within a few hours of application. This avoids the possibility of undue constriction and also permits the removal of the upper segment of the plaster case, or, in some cases, both segments for access to the joint or limb for

any local treatment if this is considered desirable. In the less acute cases a little gentle active or assisted movement is possible and the splint is then reapplied.

A somewhat similar method can be employed when muscular spasm has already brought about early deformity. For instance, if flexion of the knee has occurred a plaster-of-Paris splint is applied to the joint without making any attempt to correct the malalignment by manipulation. A preliminary injection of omnopon or a small dose of intravenous pentothal often has a good effect in lessening muscle spasm, so that the plaster case can be applied in a better position. The case is bivalved, as before. After about a week it will usually be found on removing the plaster that spasm has so far subsided that a fresh plaster case can be applied in an improved position, and the process is repeated until the joint regains the optimum position. In patients suffering from spondylitis ankylopoietica, a plaster bed is a valuable and comfortable way of applying rest and of preventing deformity.

Space will not permit mention of the use of weight extension to correct deformity in acute cases. It is sometimes of value, particularly in the hip, but it is difficult to apply and requires constant supervision by a nursing staff with special knowledge of the methods. In my own practice, I have largely abandoned the method, except in the case of the hip-joint, in favour of the plaster technique described above.

In recumbent patients, every effort must be made to prevent faulty posture in bed. If the patient is propped up with pillows kyphosis is apt to develop, and loss of the normal lumbar curve. Fixation of the hips and knees in flexion is often due to the bad practice of allowing the knees to lie flexed over a pillow, and pressure of the bed-clothes not infrequently brings about a flexed and valgoid position of the feet and ankles.

Orthopaedic and Surgical Treatment in the later stages

It is impossible to review adequately and within the scope of a short paper this large and important subject. It is proposed, therefore, in this section merely to make some general observations about a few special aspects of the subject which the author feels have not received the attention that they merit and which he has personally found of great value. This is a very large subject, and, to avoid repetition of much that is already common knowledge, it is possible to deal with only a few special points, some of which are questions of policy. It is probable that in the near future the number of centres and clinics for the treatment of rheumatic patients will be increased, and, to avoid confusion and overlapping of work, it should be made clear that when deformities have occurred, and particularly when those originally due to muscular spasm have become fixed by adhesions or scar-tissue, treatment by the orthopaedic surgeon is indicated.

TREATMENT BY MANIPULATION

Careful manipulation under anaesthesia in slight or moderate cases of contraction of joints, when the acuter symptoms have subsided, is of the utmost value in selected cases, especially if performed in stages between which the limb is temporarily fixed in the corrected position in plaster. Manipulative treatment is highly specialized work and is dangerous in inexperienced hands. This difficult and highly technical work lies within the province of the orthopaedic surgeon.

Prevention of deformity is one of the most important of the routine duties of the physician at the rheumatic centre and of his medical assistants, aided in difficult cases by the orthopaedic surgeon. The physicians are, or should be, thoroughly conversant with the practical side of deformity prevention, but the treatment by manipulation or other measures when any deformity has actually occurred should be undertaken by the orthopaedic surgeon. An important fact concerning the treatment by manipulation of crippling rheumatic conditions is that the orthopaedic surgeon experienced in this branch finds that he is able to remedy by these measures many conditions for which a major surgical operation was formerly the only solution. Also, by proceeding in careful stages and doing a little at a time, much can often be done for the patient with advanced deformities.

It is often forgotten that a certain amount of natural repair takes place in chronic osteo-arthritis joints and in the later stages of the rheumatoid type. When the articular cartilage has been destroyed the underlying bone becomes sclerotic and highly polished. This can take place only when movement has been maintained. By restoring a fuller range of movement to the stiffened rheumatic joint by manipulation we assist the natural powers of repair. Personal experience of cases of established arthritis of the hip bears out this statement. Before performing arthrodesis or some other major operation upon the painful arthritic hip, a fair trial should always be made of routine medical and physical treatment and of careful manipulation. Arthrodesis is reserved for those patients who resist such measures and whose general condition is suitable for such a severe operation. The number of operations of arthrodesis of the hip performed by the author in the last 20 years has in this way steadily diminished. Space will not permit a mention of some of the other drawbacks and dangers of arthrodesis, except the fact that the onset of arthritis in the non-operated hip, which not infrequently happens, is very serious, as the patient may be left with two ankylosed hips.

It is important to realize that the treatment after manipulation is of great importance. Indeed, in many cases the manipulation should be regarded as merely the first step in a campaign of treatment which may be protracted, and in which patience and perseverance are required by the patient and by all concerned. Disappointment is inevitable if this fact is not recognized and if the patient is unable or unwilling to cooperate. Re-education of muscles

and of function by means of exercise in the Guthrie-Smith suspension apparatus is of the greatest value after manipulation.

ARTHROTOMY AND LAVAGE: SYNOVECTOMY

An operation that the author has proved highly satisfactory is that of arthrotomy and lavage. It is particularly indicated in obstinate cases of pain and effusion in arthritis of the rheumatoid type affecting the knee-joint. At operation one often finds the joint to be full of thick masses of fibrinoid or necrotic material. The reason for the failure or only partial success following attempts to aspirate such joints is obvious, as the necrotic material cannot pass through the aspirating needle. Often a small incision suffices for the evacuation of the necrotic masses, and the joint is irrigated thoroughly with Dakin's solution or with some other non-irritating antiseptic solution such as an isotonic solution of flavine. Where necessary, the incision can be extended to deal with hypertrophied synovial fringes, loose bodies, etc., or converted into the author's patella-displacing operation if synovectomy, complete or partial, is deemed necessary.

The operation, even in its simplest form of evacuation of the necrotic material with lavage of the joint, may play an important part in preventing deformity, as the fibrinoid material, if allowed to remain, is converted into intra-articular adhesions. It is interesting to note also that pain and spasm are usually markedly alleviated, and an obstinately raised sedimentation rate may fall rapidly after operation. Among the author's cases is one of early rheumatoid type of arthritis of the knee associated with intermittent effusion showing periodicity. Partial synovectomy by this method was performed by the author through the patella-displacing approach 21 years ago and the joint irrigated with normal saline. A letter received three months ago stated that the patient had remained symptom-free since the operation.

OPERATION FOR PAINFUL OSTEO-ARTHRITIC JOINTS

Another type of operation that has been found of considerable value in chronic, mainly monarticular, forms of osteo-arthritis, particularly when involving the knee-joint, is a combination of cheilotomy with lavage and manipulation when limitation of movement by adhesions is also present. It is not a big operation and elderly patients stand it quite well (*ceteris paribus*). In many cases of osteo-arthritis of the knee-joint which remain painful in spite of prolonged physical treatment, the cause of the symptoms is in reality some form of internal derangement (a) by hypertrophied synovial fringes or pads or osteophytes, either loose or attached, at the periphery of the joint, in the intercondylar region, or elsewhere; (b) by detached fragments of the articular cartilage or necrotic debris; and (c) fibrinous degeneration and hypermobility of one or other semilunar cartilage, which, owing to alterations of alignment of the joint surfaces, may cause symptoms of internal

derangement. In some cases an old lesion of the semilunar cartilage due to trauma may be present and may have been the starting-point of the arthritis.

The osteo-arthritic knee of long standing which fails to respond to physical or other treatment is a feature of nearly every out-patient department, and in selected cases surgery can often do much for these patients. Intravenous pentothal, followed if necessary by gas and oxygen, is the anaesthetic of choice, and a tourniquet is used to create a bloodless field of operation. The knee is flexed over the end of the operating table. The knee-joint is usually approached by a vertical incision upon the antero-internal aspect of the joint between the patella and its ligament and the internal lateral ligament. Sometimes the signs and symptoms or the x-ray film indicate a similar type of incision upon the outer side of the joint; or both may be necessary. Any prominent osteophytes are chiselled away with a curved chisel from the articular margins, the intercondylar space, and the anterior tibial plateau. The state of the semilunar cartilages and of the infrapatellar pad of fat is ascertained and any hypertrophied fringes or loose bodies are removed. The joint is then thoroughly irrigated with Dakin's solution to wash out necrotic debris and any loose bodies that have escaped detection. If movement was limited, the joint is carefully manipulated, and sometimes it is possible to see and divide with the scalpel tight bands of intra-articular adhesions. The joint is closed without drainage.

In the after-treatment the patient is encouraged to flex and extend the knee a few degrees and to contract the quadriceps from the day after the

operation, and for several weeks no effort is spared to restore the wasted muscles and consolidate any increased range of movement obtained by an intensive course of re-educational exercises. In this connection exercises in suspension slings upon the Guthrie-Smith apparatus have proved to be of great benefit. The author has had twenty-five years' experience of this type of operation and can vouch for its great value in the majority of cases.

Summary and Conclusions

Far too many cases of crippling deformity in rheumatic disease occur even in modern times.

Such crippling involves much personal suffering and economic loss to the Nation and is largely preventable.

Reasons for this state of affairs are put forward which include: (a) lack of team work and of precise definition of the respective duties of the physician and orthopaedic surgeon with regard to the prevention and treatment of deformity; (b) ignorance, through no fault of his own, of the whole subject by the average general practitioner who sees the cases in the early and often critical phases; (c) acute lack of hospital and clinic facilities for sufferers from rheumatism; (d) prevailing ignorance concerning the causation of rheumatism.

Some suggestions are offered as to how these conditions might be rectified, many of which have been urged by others and of recent years by the Empire Rheumatism Council.

A short description is given of the principles of prevention of deformity and of its treatment in the earlier and more acute stages.

Lastly a short account is given of some lesser known but valuable methods of orthopaedic and surgical treatment suitable for the more chronic stages of rheumatic disease.