Observations

ON

OSTEO-ARTHRITIS OF THE HIP.*

BY

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OSTEO-ARTHRITIS of the hip, though common, is so often overlooked or mistaken for sciatica or subacute rheumatism that it seems worth while considering its symptoms in detail, especially since its progress and successful treatment largely depend on its early recognition. I ask attention first to a tabular classification of joint diseases, so that I may make quite clear what type of disorder it really is. The confusion of names in chronic joint diseases is so great that even a tentative classification may be of use.

GROUP A.

- Traumatic arthritis.
- Haemophilic arthritis.
- Tabetic and syringo-myelic arthritis.
- True gout.
- Heberden's nodes.
- Acromegalic joints.
- Pulmonary osteo-arthritis.
- Spondylitis, Type A.
- Osteo-arthritis multiplex.
- Osteo-arthritis of the hip.

GROUP B1.

- Purulent arthritis—for example, streptococcal or pneumococcal joints.
- Arthritis due to typhoid and other fevers, to dysentery, diphtheria, etc.
- Syphilitic arthritis.
- Tuberculous arthritis.

GROUP B2.

- Rheumatoid arthritis and other chronic infectious forms.
- Gonococcal arthritis.
- Spondylitis, Type B.

GROUP B3.

- True rheumatism, acute and subacute, and fibrositis.

In the diseases in Group A we find some features common to all; for example, little or no affection of the fibrous or synovial structures beyond effusion, but great changes in the cartilage and bone, for both of them may show irregular destruction and abnormal overgrowths—that is, not adapted to the functions of the joints. The cause of most of these diseases is disputed, and as a rule there is no fibrous or bony ankylosis.

In Groups B1, B2, and B3 we find septic causes generally acknowledged. The chief incidence is on the fibrous and synovial tissues. In some the condition goes on to suppuration and its results, or the formation of specialized formations. In others it never does, but (in B2) to atrophy of all structures with fibrous overgrowth and ankylosis. In the third (B3) subdivision there are no permanent joint changes, but the tendency to fibrous affections outside the joints interferes for some time with perfect movement. Flat-foot and stiff joints may last for months, but the distinction due to the absence of permanent changes seems to me an absolute one. Again, in all of these diseases pyrexia and other so-called constitutional results of the septicæmia are prominent, but in none do we find hypertrophy or outgrowths of bone.

I must not discuss the endless names which have been lavished upon the affections in B2, such as rheumatic gout, arthritis deformans, etc., but would emphasize their septic, non-suppurative character. Spondylitis has been shown to be of different types, some belonging to Group A and others to B. I have seen specimens in the bones of the cave bear of the Mendips, and Elliot Smith found whole cemeteries of prehistoric men so affected that the wonder is how they could bury each other, and the population in the same sites is ravaged by the disease to-day. It is, perhaps, the most ancient disease known. It is so common in draught horses now that many of them can never lie down, and a broken back in them is often merely a fracture of the common lumbar ankylosis or ossified ligaments. I cannot learn that these animals ever suffer from hip-joint disease, though osteo-arthritis of the distal bones is common enough.

Cases of osteo-arthritis of the human hip form a clinical and perhaps a pathological group with a distinct character,

but this is true only if we exclude hip affections due to Charcot's disease, real gout, and the various infectious diseases of Group B2 with their constitutional symptoms such as fever. In this last type other joints are nearly always involved, though occasionally we find a gonococcal hip alone in its suffering; even true rheumatism may leave some hip trouble for a time, but this finally clears up, and is not usually difficult to diagnose if the history is considered carefully.

Adams in 1857, in his *treatise on Rheumatic Gout or Chronic Rheumatic Arthritis*, divided osteo-arthritis into polyarticular and monoarticular. Jones Llewellyn thinks it is always oligo-articular, asymmetrical, and usually confined to large joints. Adams gave to the hip-joint type the name of "morbus coxae senilis" as early as 1837, but afterwards found so many cases of it at 30 or 40 years of age that he tried to blot out the name. I have recently seen some twenty cases in patients varying from 29 to 70 years of age, and have been struck with the way in which they get labelled sciatica; with the little pain usually complained of, which is so unlike the classical accounts of morbus coxae senilis, where the pain is described as persistent and violent; and above all with the perfect good health of most of them. They may complain that they cannot lace their boots or put on their stockings, and that they have stiffness or limited movement in one or both hips with a feeling of fatigue or pain in the morning and after prolonged exertion. The disability may increase until little or no movement takes place in the joint, and if both hips are thus affected they can hardly separate their feet or move one foot in front of the other. Their helplessness and imprisonment becomes very serious and depressing and the outlook most gloomy.

Sometimes the limb presents an exact picture of an impacted fracture of the neck of the femur with rotation outwards and apparent or real shortening. This was the case with Matthews the comedian, who was thrown from his gig and lamed. Ten years later he died and his bones were shown at a medical meeting by Adams, who demonstrated that the supposed fracture was merely this disease.

Compared with these monoarticular cases, the instances of rheumatoid arthritis, where the hip is only one of the joints affected, are far more numerous, and the prognosis of the hip seems to be actually better. For the tendency in rheumatoid arthritis is to pass after years of suffering into a state of quietude with deformed and ankylosed joints. Now the hip being less disorganized than the small joints will sometimes recover surprisingly when the septic fire has burnt out.

I must confess that some authors think that osteo-arthritis of the hip may follow similar changes in other joints, or that an extension to other joints may follow it. Jones Llewellyn goes farther, and quotes Preiser as saying that fourteen cases of this hip affection have been found in children in Germany. However, I have never seen it in children, and I doubt whether it ever extends to other joints.

Symptoms.

I will now consider the symptoms commonly encountered.

1. There is *stiffness at the joint*. The patient sits down with difficulty and cannot as a rule cross the affected limb over the other or lace his boots easily. There is a sense of fatigue which, with the stiffness, passes off under gentle exercise, but the patients are healthy and well nourished.

2. *Pain* is absent at first, and when it begins it is deep-seated in the groin and behind the trochanter, and it may become severe. Referred pains along the neighbouring nerves are common and important. More frequently they run down to the knee and along the outer side of the thigh. Meralgia paraesthetica of the external cutaneous may appear. J. Llewellyn remarks, "Simultaneous pains in the anterior crural, obturator, and sciatic are very indicative of this disease," and "lumbar pain from strain of the ligaments is often secondary but not prior to the hip trouble, which is the reverse of what is found in sciatica."

3. *Tenderness* of the capsule in the groin and at the back of the limb is common.

4. *Pseudo-locking* may happen at times. Here a sudden pain with a feeling of something in the joint may come on, followed by lameness for some hours. This has been variously attributed to synovial nipping or to subchondral foci of inflammation.

5. *Attitude*.—The patient by choice stands on the sound limb, and resists the toe of the affected limb on the ground with bent knee and eversion of the leg—external rotation. The pelvis is drawn up and the lumbar column is curved, with

* A paper read before the Bath and Bristol Branch of the British Medical Association.

convexity towards the diseased side. The patient walks with a limp, moving the foot forward with difficulty.

6. *Tonic Flexion at the Hip.*—When the patient lies supine on a table there is lordosis and an arched knee. If the knee is pressed down the lordosis is increased. This is an important test.

7. *Passive movements are limited*, even at an early stage. Thus extension, flexion, internal rotation, and abduction are hindered or impossible.

8. There is *shortening*, though less than it seems, and in later stages this may increase from absorption of the neck of the femur.

9. *Wasting of the gluteal muscles*, which does not occur in sciatica, and also of the thigh, may be present.

10. In later stages loud *grating* in the joint is heard and felt, and *exostoses* and *obliteration of the outline* of the joint are seen in skiagrams.

It is important to remember that the stiffness of gait and limitation of movements may be present long before any evidence of bony change is shown in skiagrams or otherwise. We may call these two stages the functional and the organic ones.

Pathology.

In fully developed cases the cartilage becomes roughened and softened, fibrillated and thinned, especially at the centre, while at the periphery it is thickened. Nodules of overgrowth appear and become calcified. Where the cartilage has nearly disappeared a layer of ivory-like bone takes its place, and this is often grooved by friction. This process is quite unlike that seen in chronic infectious arthritis, where "ulceration," perforation, and fibrous ingrowths appear.

Below the cartilage atrophy and absorption of bone takes place. The trabeculae are changed into fibrous tissue, and even the marrow, but new bony outgrowths are formed in places. Thus simultaneous absorption and production of bone goes on. As R. Stockman says, the process does not resemble any known inflammatory condition. He adds that it is hard to say whether the changes commence first in the cartilage or in the bone. Absorption of the neck of the femur may follow, and either rarefaction or condensation of the shaft. At a late stage the synovial membrane degenerates, but it is doubtful whether there is at first any hypertrophy.

The Causal History.

Jones Llewellyn points out that the disease often follows a strain or blow on the great trochanter, and still more often supervenes on a state of flat-foot, genu valgum, or an inequality of length in the two limbs. Any of these causes, he says, may prevent the joint surfaces from corresponding, the capsules and ligaments are strained, the synovial fringes hypertrophy and multiply. The synovial arteries show thickened walls and often an obliterated lumen. Mr. T. S. P. Strangeways, of the Research Hospital, Cambridge, in a private letter, tells me that this form of osteo-arthritis is more commonly seen in better-class patients. He would prefer the name of "arterio-sclerotic joints," and considers that the condition is associated with overuse, that a large proportion of his cases have been athletes, and are men who have ridden on horseback a great deal. The changes he finds on microscopic examination are fibrosis of the capsule and distinct thickening of the vessel walls. He considers that these changes may bring about changes in the nutritive value of the synovial fluid, which, he holds, in normal circumstances, is a source of nourishment for articular cartilage (see BRITISH MEDICAL JOURNAL, May 15th, 1920). In his opinion it is the alteration in the nutritive value of the fluid which leads to degeneration, fibrillation, and loss of elasticity of articular cartilage, followed by disintegration and exposure of the bone covered by the affected area. Thus the weight of the body is thrown directly on the bone of the articulation. This causes a thickening and condensation of the exposed area, and if the movements of the joint are maintained, polishing and eburnation follows.

This connexion with arterio-sclerosis is supported by some few observations. I believe that in some forms of uterine disease a local arterio-sclerotic change is not uncommon. If such a cause is operative we might expect to find osteo-arthritis frequently in the subjects of generalized arterio-sclerosis, but fully developed cases are not very common, though minute patches of degeneration in joints without

clinical symptoms are frequently seen in skiagrams and at operations, the meaning of which is not clear.

There is no evidence of a neural origin of the disease such as is present in a Charcot's joint, and very little in favour of an endocrine source, though osteo-arthritis changes occur in acromegaly, and the closely allied knee disease seen in some menopause patients is often accompanied with myxoedematous changes. Garrod, too, has noted a brawny infiltration of the hands in some instances of multiple osteo-arthritis, of which I have seen cases. There is at first sight little to be said in favour of an infectious origin, but this theory has recently found much support in the researches of P. W. Nathan¹ and others. They claim to have shown that all the extraordinary changes in rheumatoid arthritis are due to the lodgement of streptococci and other organisms in the neighbourhood of joints where the circulation is least active. By the injection of haemolytic streptococci, pneumococci, and staphylococci into animals they assert that they have reproduced most of the joint changes found in man in rheumatoid arthritis (and, they add, in osteo-arthritis), both acute and chronic, inflammatory or degenerative, cases with general constitutional symptoms, or merely transient ones, followed afterwards by progressive joint disease, or by gradual recovery, or by recurring joint attacks. In these cases where the general symptoms are quite transient, the morbid process may be localized at a joint, if there is a focus of infection left near it, quiescent for a time perhaps but capable of fresh action long after the general health is perfect and the original wound or carious tooth has been sterilized. Thus in hip-joint disease they would postulate a transient general infection, an equally short infection of many joints, and a focus of infection left near one hip, which henceforward shows progressive changes, at first inflammatory and then degenerative.

We have, then, to compare two different views—the purely mechanical one of Strangeways from the cutting off of nutrition leading to the degeneration of cartilage and bones, and the irritation of bone by friction, on the one hand; with the infective theory, on the other, of continued inflammation and softening, followed by degeneration, all due to a local focus of septic organisms.

Certainly the large amount of bone destruction and softening spreading to a long distance is in favour of the latter view of a bacterial poison; but we ought, if this is true, to find frequently near the affected joints collections or foci of organisms like the nests of typhoid bacilli in the periostitis of typhoid, but this we do not do. Moreover, even in the earliest stages the morbid processes in osteo-arthritis and in rheumatoid or chronic infectious arthritis are so utterly different that it is difficult to accept a common cause. In the one there is an insanity or malignancy of growth, in the other an inflammatory poisoning and atrophy, followed by low form of fibrous repair. Both sides agree that organisms are not found in the joints, or indeed in the joints of true rheumatism. After all, interesting as the question is, the practical importance is perhaps small. Here is a joint which, whether or no there was once a primary bacillary infection, has none now, but owing to a strain or overwork has broken down and started on a degenerative course. Out of the many joints once exposed to a supposed infection, this one only has lost the power of resistance, or suffers from deficient nutrition. Could we on either theory prevent this, or can we check the process?

Treatment.

In the first place, we can endeavour to remedy any obesity, flat-foot, or original shortening of the limb which causes a strain. We can limit the amount of exercise or exertion, and when this is done in an early case the hip symptoms often clear up surprisingly. But this is not all. There is an increasing volume of opinion that if only cases can be diagnosed early enough, and at once given complete rest—for instance, by a long splint with a pair of crutches and a patten on the sound foot, complete cures may be obtained. Absolute immobilization of the joint is to be aimed at, though difficult to obtain even with confinement to bed. In fact, the patients may be treated, like those having tuberculous joints, with absolute rest from the beginning, before the joint becomes deformed and new outgrowths have developed. Hence the great importance of recognizing these cases at first and of avoiding any error, or mistaking them for instances of gout or sciatica.

¹ Journ. Med. Research, May, 1917, vol. xxxvi, p. 2.

We are apt to forget that there is not the tendency to ankylosis which exists in rheumatoid arthritis and makes immobilization so dangerous in that condition.

If we meet with cases already at an advanced stage or who refuse immobilization we can, besides correcting any deformity, apply a spica bandage or a leathern moulded splint, and then allow gentle exercise with the toes turned inwards. Radiant heat followed by massage is most helpful at all stages, and in advanced cases passive exercises may be added. Very great relief from pain is given by ionization with salicylates and iodides, hot sandbags, and inunction of salicylic acid 3ss, menthol gr. x, lanoline ʒiv, with paraff. mollis to an ounce, and some increase of mobility may follow. For drugs we should persevere with arsenic or thymus gland with or without the syrup of iodide of iron. Cheilotomy has been advocated by Sampson Handley, Wheeler, and others. It consists in disarticulating the head of the femur, cutting away the outgrowths, and adapting the head of the bone to the socket. Very good results have been obtained and a freely movable joint formed in young patients where bone changes are not active.

In other cases the joint has been excised and the head mortised to the pelvis with great advantage as to freedom from pain but with complete fixation of the joint.

RECURRENCE OF SYMPTOMS AFTER REMOVAL OF GALL STONES FROM THE GALL BLADDER.

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It is commonly asserted that the results of cholecystostomy are very satisfactory, that symptoms rarely occur after it, and that secondary operations seldom become necessary. My experience, however, is that although this operation is a valuable one, often saving life and giving great relief, symptoms do return after it in a good many cases, and that the demand for secondary operations is far from uncommon. Many patients whose symptoms recur are so very disappointed that they lose faith in operations and prefer to suffer much rather than undergo a further one. During the last six months I have been asked to operate on four patients whose recurrent symptoms had become so intolerable that they abandoned their natural prejudices. I give below brief notes of three of these cases.

Like the appendix, the gall bladder is a vestigial organ which many animals are luckily born without and numerous human beings have lost without detriment. It is admitted to be by far the chief, if not the only, factory of gall stones, whose power for evil is very great. The infection which is the main cause of cholecystitis and the formation of gall stones is known to settle in the wall of the gall bladder and, in many cases, to be incurable by mere drainage. Chronic irritation of the gall bladder sometimes leads to cancer, which is not uncommonly discovered at an early stage on examining the organ after its removal. The hope of cure in these early cases of cancer is very good; one of my patients thus treated over ten years ago is well now.

It is very difficult to find and to be quite certain of removing every gall stone from the gall bladder, and more especially from the tortuous and indurated cystic duct, where a small stone is easily overlooked. Removal of the gall bladder and its duct is the only certain way of getting rid of all stones in these circumstances. This is well shown in Case I. Even if all the stones are removed by cholecystostomy, with or without incision of the cystic duct, stricture of the duct may ensue, causing a mucocele or empyema of the gall bladder or mucous fistula. Sometimes a biliary fistula or chronic jaundice follows kinking of the common bile duct due to the contraction of the inflamed gall bladder. If the latter contains pus or other infective matter it is much cleaner and often easier to remove it and its duct without opening them, thus avoiding the risk of infection of the wound, with delay of healing and weakness of the abdominal wall with ventral hernia. The persistence or recurrence of cholecystitis is not uncommon after cholecystostomy, with or without the formation of fresh stones. This point is illustrated in Case II. Although there were no stones the symptoms had closely simulated those of cholelithiasis. Secondary infection of the

bile ducts and pancreas may ensue in these circumstances, causing jaundice or acute or chronic pancreatitis. It has been a common but mistaken belief that draining is always safer than excising a diseased gall bladder, but experience proves that, with a proper selection of cases and a good surgeon, the reverse is true. Thus the mortality of 2,493 cases of cholecystectomy performed at the Mayo Clinic between 1907 and 1916 was 1.3 per cent., and that of 2,854 cholecystostomies was 1.5 per cent.

It is clear that, for disease limited to the gall bladder and its duct, cholecystectomy is more radical than cholecystostomy. It is, however, not invariably the easier and safer operation. Much depends, as I have said, on the wise selection of suitable cases and upon the skill and experience of the surgeon. In acute cases, when the patient is very ill, old, or feeble, when the gall bladder is very inflamed, distended, and adherent, when inflammatory oedema makes it difficult to identify the bile ducts, the surgeon—especially if he is not very experienced in this branch of surgery—will be wise to choose cholecystostomy as the safer operation in the circumstances. It will probably save life, and, if care be taken to remove all stones, the ultimate result may be satisfactory. If serious symptoms recur a secondary cholecystectomy can be performed, in a quiet period, under more favourable conditions.

It must not be forgotten, however, that these secondary operations may be very difficult owing to the disturbance and confusion by adhesions of the normal anatomy of the complicated biliary apparatus. It is very clear that the surgery of the bile apparatus, like that of the stomach and duodenum, is not to be lightly undertaken by the amateur or the novice. The interests of the patient, as well as the good name and honour of surgery, demand special skill and experience from the surgeon who undertakes this work, for it is impossible to tell what difficult and unexpected problems may present themselves and have to be promptly solved when the abdomen is opened. These operations, sometimes so easy, may, on the other hand, be among the most difficult and hazardous in surgery. When medical men realize these facts we may hope to see fewer bad results and secondary clearing-up operations, such as cholecystectomy and choledochotomy, for the removal of stones left in the common bile duct, and the repair of fistulae or strictures following injuries of the bile ducts. To avoid the last named, constant vigilance and an accurate knowledge of the anatomy of the bile ducts are required. It is necessary to identify the common bile duct quite clearly before proceeding to remove the gall bladder.

There is more room for doubt about the indications for cholecystectomy when the disease (especially cholelithiasis) has extended into the main bile ducts. It is evident that the gall bladder should not be removed unless it is certain that the common bile duct is patent and likely to remain so. It is also clear that it is too risky to be undertaken when the patient is very ill, old, or feeble, and especially in the presence of jaundice which has lasted long enough to diminish the coagulability of the blood—as shown by a previous estimation of the clotting period—thus adding the possibility of uncontrollable bleeding to the dangers of the operation. No one, again, would suggest the removal of the gall bladder when infective cholangitis exists, for in this grave condition the only justifiable operation is the removal of stones and the drainage of the common bile duct, and even this should, if possible, be deferred to a quiescent period, when the risk is much less. Under favourable conditions, however, when the bile ducts are patent, it is very advantageous to the patient to have the diseased gall bladder removed, and thus to be saved from the probable recurrence of symptoms, with or without a subsequent radical operation.

CASE I.

A. C., aged 53, a powerful, stout man, had had cholecystostomy performed for acute cholecystitis in August, 1921, through a long vertical incision made below the ninth right rib cartilage. The operation was said to have been a difficult one, but it was thought that all the stones had been removed. Recovery was slow, but ultimately the man returned to work. He was readmitted into hospital before Christmas for return of symptoms, but these abated, and he was sent out without further operation. A few days later he was laid up with fever (? influenza, probably cholecystitis). Another attack came on soon after, with violent pain in the right hypochondrium and slight jaundice. The gall bladder could not be felt, but there was general rigidity and dullness in the right hypochondrium. An immediate operation was advised, but the patient would not undergo it until he was promised that every endeavour would be made to make it final and radical.

Operation (January 16th, 1922).—Kocher incision. Very dense adhesions were found between the liver (lower edge) and the