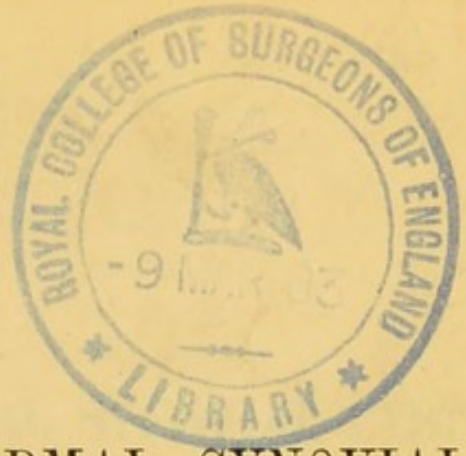
The formation of abnormal synovial cysts in connection with the joints / by W. Morrant Baker.



THE

FORMATION OF ABNORMAL SYNOVIAL CYSTS

IN

CONNECTION WITH THE JOINTS.

BY

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Reprinted from the Saint Bartholomew's Hospital Reports,
Vol. XXI.

[1885]

THE FORMATION OF ABNORMAL SYNOVIAL CYSTS IN CONNECTION WITH THE JOINTS.

(Second Communication.)

BY

W. MORRANT BAKER.

In the 13th volume of the St. Bartholomew's Hospital Reports I drew attention to the formation of synovial cysts in the leg as a consequence of disease, especially osteo-arthritis, of the knee-joint; and I ventured to deduce from an examination of the cases there related the following conclusions:—

1. That in cases of effusion into the knee-joint, and especially in those in which the primary disease is osteo-arthritis, the fluid secreted may find its way out of the joint, and form by distension of neighbouring parts a synovial cyst of large or small size.

2. That the synovial cyst so produced may occupy (*a*) the popliteal space and upper part of the calf of the leg, or may (*b*) be evident in the calf of the leg only, projecting most, as a rule, on the inner aspect of the leg as a small defined swelling, not approaching within three or four inches of any part of the knee-joint.

3. That however large the synovial cyst may be, fluctuation may not be communicable from it to the interior of the knee-joint; but the absence of such fluctuation must not be taken to contra-indicate the existence of a connection between the joint and the cyst.

4. That the synovial cyst may be expected to disappear after a longer or shorter period, without leaving traces of its existence, even on dissection of the limb.

5. That the cyst should not be punctured or otherwise sub-

jected to operation, unless there appear strong reasons for so doing, inasmuch as interference may lead to acute inflammation and suppuration of the knee-joint.

6. That most often the disease in the knee-joint will be found to have begun some time before the appearance of the secondary synovial cyst; but sometimes the patient's attention may be first drawn to the latter, or the cyst may seem for a long period the more important part of the disease.

In the course of the eight years which have elapsed since the publication of my paper, I have met with many other cases of these synovial cysts in connection with the knee, and have found the preceding conclusions amply confirmed by further experience.

With reference to the route taken by the synovial fluid when escaping from the interior of the joint, I suggested in my former communication that it is probably one determined in many cases by definite anatomical conditions, especially those connected with the tendons respectively of the semi-membranosus and the popliteus muscles, although in others the starting-point may be a "hernia" of the synovial membrane in some other situation.

The following account of two dissections, since made by Mr. D'Arcy Power, appears to show that the suggestions then offered were correct:—

The first case was that of a man (under the care of Mr. Thomas Smith), æt. 44, who had suffered from pain in the left knee-joint for a period of two years before its amputation. "At some time between March and October 1884 a swelling appeared in the calf of the leg, behind and below the head of the fibula. In October the swelling was punctured and a few drops of blood with some glairy fluid were removed, but there was no pus. He stated that many years before he had rheumatism in his shoulder. On admission into St. Bartholomew's Hospital his symptoms were recorded by Mr. Bowlby as follows:—'The knee is stiff, and, as the patient lies, the leg is at right angles with the thigh. The head of the tibia is enlarged and the patella is displaced outwards. A fluctuating swelling about the size of half an orange is situated behind and below the head of the fibula, extending into the popliteal space. A sinus in the middle of this swelling constantly discharges pus. The skin over it is red and inflamed.'

"On opening the knee-joint after amputation of the leg, about half an ounce of pus escaped.

"The cartilage covering the external condyle of the femur is ulcerated in patches." . . .

"The synovial membrane is much thickened, and in parts has grown over the upper portion of the femoral condyles. It is slightly pedunculated, the tufts of synovial membrane being well defined. The crucial ligaments are destroyed. There is no lipping or eburnation of the bones in any part, and the cartilage, upon microscopic examination, does not appear to be fibrillated.

"On the outer side of the spine of the tibia is a passage through which a probe can be passed downwards, backwards, and slightly inwards, through the posterior ligament, into a sac containing about four ounces of a thick curdy pus." . . .

"The cyst lies beneath the gastrocnemius muscle in the situation of the popliteus. It is, I believe, the popliteus muscle, which itself has been gradually distended until all traces of muscular substance have disappeared." . . .

"Near the outer edge of the plantaris, at the back of the joint, is a well-marked hernia or pouch of the synovial membrane, which has protruded between the fibres of the ligamentum posticum."

Mr. Power comes to the conclusion that in this case the formation of the cyst in the leg was preceded by that of a hernia of the synovial membrane of the knee-joint, and that "as the swelling increased in size its course was directed by the popliteus muscle."

In the second case, that of a girl, æt. 22 (under the care of Mr. Langton), "On the inner side of the leg, commencing at a point two inches below the inner condyle and extending downwards for about six inches, was a fluctuating swelling. This swelling, the patient said, had existed for about six weeks, and was getting larger. The skin over it was normal. No communication could be detected between the swelling and the knee-joint. The swelling was punctured, and three ounces of puriform viscid fluid were drawn off. Three weeks later the swelling was again punctured, and an ounce of very viscid fluid was with difficulty removed."

(The preceding note was made by Mr. J. L. Hewer.)

"The leg was amputated. Subsequent dissection showed that, as in the previous case, the joint was completely disorganised." . . .

"The bones showed no signs of rheumatoid change, and no history of rheumatoid or other affection could be obtained from the patient.

"On the posterior surface of the joint two openings are visible. The one situated at the back of the internal condyle, immediately above the inner head of the gastrocnemius, is large

enough to admit a lead pencil. The opening is part of a canal which led from a cyst into the connective tissue surrounding the muscles at the back of the thigh." . . .

"The second aperture is situated in the tendon of the inner head of the gastrocnemius; it is somewhat below and a little to the inner side of the preceding, and is in communication with the cyst. By an opening in communication with this channel a connection is formed between the cyst and the knee-joint, through which a probe can be passed beneath the internal condyle of the femur." . . .

"The cyst measures 4 by 3 inches. It appears to have been formed by an enlargement of the bursa which naturally exists beneath the semi-membranosus muscle, and in this instance may have communicated with the knee-joint. The enlargement has taken place in the connective tissue on the inner side of the gastrocnemius muscle, and some of the fibres of this muscle form its inner and posterior wall."[1]

My object in the present paper is to direct attention to the fact that abnormal synovial cysts are formed in connection with other joints than the knee; that, like those met with in connection with the latter joint, they may present many difficulties in diagnosis; and that these difficulties may lead a surgeon astray as to both prognosis and treatment.

At the time of my previous contribution on this subject to the Hospital Reports, I had not noticed the disease except in the neighbourhood of the knee. Since that period, I have seen it in connection with the shoulder, the elbow, and the hip joints. Regarding the wrist-joint and the ankle, I am not so sure. In connection with the former I can recall one case at least, which was probably identical in nature; but it occurred many years ago, and I have not preserved any detailed record of it.

Case I.

Disease, probably Osteo-Arthritis, of the Right Shoulder-Joint, with Consecutive Synovial Cyst in the Upper Arm.

A healthy-looking man (E. S.), æt. 24, was admitted, under my care, into St. Bartholomew's Hospital on September 26, 1883, on account of a fluctuating swelling, supposed to be an abscess, in the upper arm. He had applied at the surgery on the previous day, complaining of the swelling in the arm, and stating that three months ago he first noticed pain, which struck upwards to the shoulder. Soon afterwards he noticed the lump, of about

[1] Trans. Path. Soc. of London, vol. xxxvi., 1885.

the size, at that time, of a hen's egg, and this has gradually increased in size. The swelling, which at the time of his admission measured about 4 inches in length by 3 in breadth, was situated at about the middle of the upper arm in front, immediately over the biceps muscle, to which it seemed to be adherent. It fluctuated readily, and was formed obviously by a sac of some kind containing fluid. It had been punctured on the previous day in the surgery by a grooved needle, and a small quantity of thin straw-coloured fluid had escaped. There was slight redness of the skin over the swelling, but it nowhere "pointed" like an abscess. At this time no complaint was made regarding the shoulder-joint, and nothing regarding its condition was recorded in the notes.

[Three years previously the patient had undergone amputation of the thigh on account of "white swelling" of the knee-joint. Beyond this there was nothing apparently worth noting in his previous history, unless that he had had an abscess in each groin about four years ago, and that he had had small-pox.]

From the general character of the swelling, and the absence of complaint on the part of the patient of any symptom which might have guided one to a different diagnosis, I came to the conclusion that the tumour must be either a simple cyst or a chronic abscess, and gave directions that it should be again punctured. The house-surgeon accordingly punctured it with a tenotomy knife. About two ounces of straw-coloured fluid escaped first; then the fluid became blood-stained, and this was followed by the escape of about a dessert-spoonful of curdy lymph or pus.

On examination the fluid was found faintly alkaline, and became solid on boiling. Mixed with liq. potassæ it became slightly gelatinous. The pus (?) was slightly soluble in cold liq. potassæ, and completely so on boiling.

[The urine was normal. Sp. gr. 1025.]

Oct. 2, 1883.—To this date (four days after the puncture), the patient had had no pain in the arm; a good deal of clear fluid had escaped from the site of the puncture.

On the following day the patient complained of headache, and his temperature rose to 102° F. Pulse 100. In the evening the temperature was 104° F. A good deal of purulent fluid escaped from the wound.

Oct. 6.—The temperature was at this date 102° F. There had been less discharge from the wound.

At about this time the patient first complained of pain in the shoulder, and I began to suspect the true nature of the swelling of the arm. But unless I had previously known that a synovia

cyst in connection with the knee might appear in the middle of the calf of the leg, it is quite likely that even at this time the direct connection between the abscess and the shoulder-joint would not have been discovered. For, as before mentioned, the cyst or abscess was about half way between the shoulder and the elbow, and my attention had not been previously drawn to any affection of the former.

On questioning the patient, we found now that he had suffered from pain and stiffness about the shoulder-joint for many weeks, although the relation in time between the appearance of these symptoms and that of the cyst in the arm could not be clearly made out.

Oct. 13.—The discharge had now ceased, but there was increased pain in the shoulder-joint, and a slight grating was perceptible on rotating the head of the humerus.

Oct. 22.—At this date it is noted that there is again discharge from the wound in the arm, and that the patient suffers from pain in the shoulder-joint, especially in the evening. He gets up in the afternoon.

Nov. 5.—The patient is now much better. The pain in the shoulder is less, and he can move the arm much better.

Nov. 11.—There is now no pain in the shoulder. The patient can raise his arm. The wound still discharges.

Nov. 26.—There is still discharge of pus from the wound, and there is occasionally a good deal of pain in the shoulder-joint, which of late has been swollen and tender.

Dec. 10.—At this date the discharge from the arm had almost ceased, and there was little or no pain or swelling about the shoulder; but during the last few days the patient has suffered from pain in the head and sleeplessness. He has also frequently vomited. The temperature has varied from 99.8° to 101.6° F.

Dec. 11.—The patient was delirious this morning, and on the following day he became unconscious, taking no food, and passing his urine and fæces involuntarily.

On December 14 the patient was better, perspiring freely, and quite conscious; but no real improvement was maintained, and he died December 16.

(For the details of the preceding notes I am indebted to Mr. Aldous, surgical dresser.)

Post-mortem Examination.—Nothing abnormal was discovered in the brain, or in the thoracic, or abdominal viscera.

The cartilage had disappeared from the head of the right humerus and from the glenoid cavity, and pus was found tracking from the joint for some distance backwards beneath the latissimus dorsi muscle.

I regret that by some accident no account has been given in the surgical registrar's notes of any careful dissection of the specimen; but there can be no doubt (there was none at the time) that synovial fluid had found its way from the shoulder-joint to the middle of the upper arm by tracking along the course of the long tendon of the biceps muscle.

Case II.

Synovial Cyst in connection with the Shoulder-Joint—Puncture—Subsequent Suppuration—Amputation at the Shoulder-Joint—Recovery.

In August 1884 I was asked by Dr. Fred. F. Andrews to see, in consultation with him, a patient (F. H. P.), æt. 54, with abscess and several sinuses in the upper arm and about the shoulder-joint. He had suffered from aching pains, apparently rheumatic, in the shoulder since November 1883, and in February 1884 there was a large prominent fluctuating swelling at the upper part of the chest, at about the level of the shoulder, but which did not seem to have any connection with the shoulder-joint (although at this time the latter was somewhat stiff and painful), but rather, from its position, to be connected with the anterior and upper part of the thorax. In June 1884 the swelling, which was very tense and fluctuated readily, was punctured, when there escaped a quantity of thick yellowish fluid like serum or synovia. At the time it was considered possible that the fluid, if not cystic, might have come from the thorax; there were no symptoms attracting attention to any definite connection with the shoulder-joint. Soon afterwards, however, suppuration occurred in and about the site of the original swelling, and in the neighbourhood of the shoulder-joint. Various abscesses "formed," and were either punctured or burst spontaneously—one above the clavicle, and one or more in the upper arm.

The patient, notwithstanding the abscesses and the increasing stiffness of the shoulder-joint, was able to get about, and for a time to return to his business. Suppuration, however, never entirely ceased, and indications of disease of the shoulder-joint became more and more marked.

When I first saw the patient, he was in the condition just mentioned; able to get about, but with several sinuses leading for long distances beneath the skin and towards the shoulder-joint, with pus escaping rather profusely from some of them.

The joint was stiff, but at this time no symptoms of acute disease were present.

Some few months afterwards, in December 1884, the symptoms, both general and local, became much more serious. There could be no doubt that the shoulder was undergoing a process of acute inflammation and disorganisation; abscesses were extending from it in various directions, with profuse discharge from sinuses above the clavicle and in front of the shoulder and in the upper arm. The patient's health was much broken; he had a red, glazed, and aphthous tongue, and a hectic temperature, and was fast losing flesh and strength.

I performed amputation at the shoulder-joint in December 1884; the patient afterwards making a rapid and complete recovery.

The specimen, which was kindly dissected for me by Mr. D'Arcy Power, curator of the Museum at St. Bartholomew's Hospital, is figured in the 36th volume of the Path. Soc. Trans., plate xii., p. 336. It shows the effects of acute inflammation of the head of the humerus, with ulceration and destruction of the cartilage. In connection with it are the remains of a cyst, which was probably in connection with the bursa beneath the subscapularis muscle.

Case III.

Synovial Cyst in connection with the Elbow-Joint.

A post-office porter (W. H.), æt. 32, was admitted into St. Bartholomew's Hospital, under my care, in August 1884, on account of a swelling in the neighbourhood of the left elbow-joint.

The swelling, which had an oval outline, was about the size of a hen's egg, and was situated immediately above the internal condyle.

The skin over it was quite normal, and was not adherent to the tumour. There was slight fulness on each side of the triceps tendon, just above the olecranon, as if from the presence of fluid in the elbow-joint. The movements at the elbow-joint were painless, but the forearm could not be quite completely flexed or extended. The swelling was not tender, but a little pain was produced by free movements at the joint.

The swelling was first noticed two years and a half ago, when it was about the size of a small nut. It grew slowly, but for the last three or four weeks has rather rapidly increased.

A few days after the patient's admission into the hospital, the swelling was tapped, when some brownish viscid synovial fluid containing granular matter escaped.

The tumour almost entirely disappeared after the tapping, but rapidly re-filled; and the patient left the hospital in almost exactly the same condition as on admission.

I have seen the patient at intervals of a few weeks to the present time (November 1885).

But little alteration has occurred in the swelling, but gradually, under gentle pressure with a flannel bandage, the size has somewhat diminished, and the patient has been able to do his work; the pain and tenderness gradually becoming less, and the movements of the arm less restricted.

Case IV.

Synovial Cyst in connection with the Elbow-Joint.

(For permission to publish this case I am indebted to Mr. Savory, and for the notes to his house-surgeon, Mr. Lawrence.)

A man (H. D.), æt. 40, was admitted into St. Bartholomew's Hospital, November 25, 1884, under the care of Mr. Savory, on account of a swelling in the arm. The swelling is situated on the inner side of the left elbow, about an inch above the internal condyle, being somewhat larger than a pigeon's egg, fixed to the deeper textures, but, like the skin over it, freely moveable. There is fluctuation. The arm cannot be extended beyond an angle of 120°, and cannot be completely flexed.

The swelling was first noticed in the beginning of May last, and increased so rapidly that the patient came to the hospital as an out-patient about a week afterwards. At that time the swelling extended in front from the internal to the external condyle; full extension being impossible.

An angular splint was applied, with lotio plumbi dressing.

After about six weeks the arm had so much improved that in July the patient recommenced work; but about a week before his admission he again suffered from pain and swelling and inability to fully extend the arm.

A few days after his admission into the hospital the tumour was punctured with a grooved needle, and about three drachms of thin glairy and curdy, apparently synovial, fluid escaped. A pad and bandage were applied and the arm placed in a sling.

As a result of the treatment the swelling almost disappeared; but in a few days it "re-formed," though it did not become so large or tense.

January 10, 1885.—Another small incision into the tumour was made to-day, when some clear yellow glairy fluid escaped, with a small piece of what looked like thickened synovial

membrane. A pad was applied; and a few days afterwards the patient left the hospital wearing a plaster of Paris bandage.

I have seen one other case very like the two which have been just recorded.

Case V.

Synovial Cyst in connection with the Hip-Joint.

[I am indebted to Mr. Thomas Smith for an opportunity of seeing on several occasions the patient to whom the following account belongs, which has been published by Mr. Stephen Paget in the 36th volume of the Trans. Path. Soc. of London, p. 342.]

"William B., house-decorator, æt. 34. Father rheumatic; himself healthy, except for rheumatism. Four children, all very healthy; has lost none.

The history of his case is as follows:—

In 1874 he began to feel pain in the left hip and knee.

In 1876 these pains interfered with his work. He was in St. George's Hospital for four months, and then in the Royal Free Hospital.

In 1877 he was in St. Bartholomew's Hospital under Mr. Thomas Smith. The left hip was immoveable; the left knee was stiff; there was slight fulness below Poupart's ligament; and the note taken at this time puts "deep-seated fluctuation (?)." He was treated by extension of the limb with a weight of 10 lbs., and was sent out on crutches.

In 1883 he was again admitted, having managed to get about and do his work for the last six years. The movement of the left knee was now much impaired, and of the left hip still more. There was pain only after exertion. The limb was everted and three-quarters of an inch shortened. The trochanter was thickened. The whole of Scarpa's triangle, from Poupart's ligament to the middle of the thigh, and inward as far as the edge of the adductor longus, was occupied by a large hemispherical cyst, fluctuating throughout, measuring $7\frac{1}{2}$ inches vertically by 7 across. It was tapped, and 42 oz. of yellow alkaline fluid drawn off, of specific gravity 1028, containing much fat and cholesterine. Next month it was again tapped.

In 1884 it was again tapped, and 40 oz. of fluid, evidently synovial, were drawn off.

In 1885 (March) he can get about well enough to do his work, and can walk two miles. He has lately suffered from more pain. There are pain and creaking noises in both shoulders. He com-

plains of pain at the back of the head and at the epigastrium. Pupils normal; patellar reflex normal. The cyst is filling again. The veins of the limb are varicose. There is no œdema of the scrotum, such as followed the first tapping in 1883."

The following case of disease of the ankle-joint appears to be one of like nature to those previously recorded. But I do not remember seeing the case, and lighted upon it only by accident in the Hospital Records.

Case VI.

Synovial Cyst over and below the External Malleolus.

"E. B., æt. 13, was admitted into Darker Ward, March 22, 1879, under the care of Mr. Callender.

No history of injury.

In the last three years patient has noticed a swelling in the neighbourhood of the left ankle-joint, which has varied in size, nearly disappearing after prolonged rest, and getting much larger during exertion. It gives him no pain, but he states that the joint is weak, and inclined to yield under him.

24th.—At present there is a small, smooth, fluctuating swelling stretching along the anterior edge of the external malleolus, generally rounded in shape, and evidently containing fluid. The skin over it is natural, with the exception of having been discoloured by the application of some iodine. The top of the swelling slightly overlaps the surface of the malleolus, but does not extend either below its apex or under the anterior tendons. No alteration in size is noticed after short pressure upon it. The hollow behind the malleolus, between it and the tendo-Achillis, is not so well marked as it should be. The anterior tendons are rather more lifted up from their bed than those of the opposite side. There is no thickening of the bones round the joint, nor is there any pain on movement or pressure anywhere. Mobility (passive) of the joint appears, if anything, to be increased.

25th.—Trocar and cannula inserted into swelling, with the result of evacuating a clear, gelatinous, synovial fluid.

April 4.—The swelling has again increased.

9.—Swelling tapped, and lead foil strapped over the part where the fluid had been evacuated.

29.—Swelling much smaller than formerly, but still it gives a sense of fluctuation.

May 23.—Swelling nearly gone.

Discharged.

Readmitted into Abernethy Ward under the care of Mr. Savory, January 1, 1880.

In the last five months he has been in Bow Infirmary, and unable to walk.

He cannot now bear his weight upon his left foot. The foot he keeps extended, and cannot flex it more than to a right angle. The leg and thigh have wasted, and are conspicuously smaller than the right. There is uniform swelling round the ankle-joint. It is soft and tender on pressure.

The surface of the joint is hot, and when the foot is moved or the heel pressed upwards he complains of pain.

Back splint, swing cradle, lotio plumbi.

Jan. 8.—Ol. morrhuæ, syr. ferri phos. ℥i. ter s.

18.—Less tenderness.

26.—Gum and chalk bandage.

Discharged.

I have seen a case some few years since of an apparently bursal multilocular cyst on the back of the fore-arm and carpus, which I have no doubt was identical in its pathology with that of the synovial cysts here described. Unfortunately I cannot find any written notes of the case. The patient was a man about 30 to 40 years of age, a butcher from Smithfield Market, who attended as an out-patient for many months on account of a large fluctuating irregular swelling on the back of the hand and extending up the fore-arm for some little distance; the swelling being deep-seated and involving the region of the sheaths of the tendons, but without any indications of being produced by a regular thecal distension. On the contrary, the swelling was irregular in outline, as if more or less multilocular, with a general thickening of all the tissues in the neighbourhood of the wrist-joint, and I believe (although I cannot now speak positively on this point) with restricted movement of the latter.

With the help of elastic support to the wrist the patient was able to continue his work; and although the question of operation was often considered, I never felt justified in recommending any. After many months I lost sight of the case; but the last memory I have of it is distinctly that of a more or less thickened and crippled wrist-joint, and not that of thecal disease only.

In the *British Medical Journal*, vol. ii. 1884, p. 413, Mr. Arthur T. Norton describes cases of what he terms "gangliar disease of joints," which seem to me identical with the case just described, and which, like it, are probably identical in their pathology

with many of the cases which I have related in connection with other joints.

"In one case a woman, æt. 40, fancied she had sprained her wrist five years ago, but did not recollect the occasion. For four years there had been some swelling and pain, but she had not been prevented from continuing her employment as a domestic servant. For the last three months before admission to the hospital there was a so-called ganglion about four inches in length, extending upwards from the wrist-joint in the centre of the fore-arm. The ligaments of the wrist-joint were sufficiently loose to allow lateral gliding movement. The annular ligament was pushed forward by ganglionic enlargement, and there was evidently fluid within the wrist-joint. The hand hung down, and there was no power to raise it. The hand was quite useless, and the disease was increasing and had continued so to do for more than five years, regardless of treatment."

From a past experience of similar cases Mr. Norton concluded that the only treatment was amputation, which he accordingly performed. On examination of the hand after removal, he found the ganglion already mentioned filled with the usual jelly-like material, which on pressure separated into plates or melon-seed shapes. This ganglion extended into the wrist-joint. The wrist-joint contained a small quantity of fluid; the synovial membrane was villous; the ligaments were distended and allowed lateral gliding movement of the joint; and all the bones of the carpus were rarefied or softened, so that a pin or a knife could be easily pushed through their substance. Though there was no caries, the articular cartilages were thinned.

Mr. Norton relates other similar cases.

From the foregoing cases the following conclusions may be drawn:—

1. That abnormal synovial cysts may be formed in connection, not only with the knee, but in connection with the shoulder, the elbow, the wrist, the hip, and the ankle joints.

2. That the manner of formation of these synovial cysts probably resembles that which has been proved to occur in connection with the knee-joint, namely, that the synovial fluid on reaching a certain amount of tension by accumulation within the joint, finds its way out in the direction of least resistance, either by the channel by which some normal bursa communicates with the joint, or, in the absence of any such channel, by forming first a hernia of the synovial membrane. In both cases, should the tension continue or increase, the fluid at length escapes from the sac, and its boundaries are then formed only by the

muscles and other tissues between and amongst which it accumulates.

3. That in the case of the shoulder-joint the abnormal synovial cyst may be found either in front a little below the clavicle, or in the upper arm in the region of the biceps muscle.

4. That in connection with the elbow-joint the cyst is usually placed on the inner side, a little above the internal condyle of the humerus.

5. That in the case of the wrist-joint the synovial cyst may be either in front or behind.

6. In the only case in connection with the hip of which a note has been preserved, the swelling was in the upper part of Scarpa's triangle.

7. In the one case in connection with the ankle-joint the synovial cyst was in front and to the outer side.

8. That the apparent want of direct communication between the joint and the abnormal synovial cyst is frequently deceptive, and should not lead to the inference that no such communication exists.

9. That the caution given in the previous communication, not to interfere by operation with these synovial sacs without good reason, has been justified by increased experience.

Hitherto I have not discovered any relationship between the form of osteo-arthritis with which some of these synovial cysts are associated and locomotor ataxy, but I suspect that in some of them a relationship will be found to exist.