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PART I.  
ORIGINAL COMMUNICATIONS.

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ART. I.—*Observations upon Chronic Rheumatic Arthritis of the Shoulder.* By ROBERT W. SMITH, M.D., M.R.I.A., Professor of Surgery in the University of Dublin; Surgeon to the Richmond Hospital; Fellow of the Royal Medico-Chirurgical Society of London; Secretary to the Pathological Society of Dublin, &c. &c.

In the month of April, 1852, I exhibited, at a meeting of the Pathological Society of Dublin, the shoulder-joints of a man about sixty years of age, each of which presented an example of congenital luxation of the head of the humerus backwards upon the dorsum of the scapula, and in which chronic rheumatic arthritis had been established. In the following pages I purpose, in the first place, to give a description of these very remarkable specimens, and afterwards to analyze the cases which, under various appellations, have been, from time to time, recorded as examples of injuries of the shoulder-joint from external violence, but which, in my opinion, are rather to be looked upon as instances of the effects of chronic rheumatic arthritis.

With respect to the first part of the subject, it will be sufficient to give a detailed account of one of the articulations, so closely did they resemble each other, both in external configuration and in anatomical characters.

Upon the right side, the head of the humerus, placed much farther back than natural, and elevated so as to be in contact with the under surface of the acromion process, formed upon the dorsal region of the scapula a conspicuous tumour, which moved with the shaft of the bone. The acromion and coracoid processes, more especially the latter, were unusually prominent. The shoulder was flattened anteriorly, and the axis of the humerus passed somewhat inwards.

Upon removing the deltoid muscle, and laying open the capsular ligament, it was found that no articular surface existed in the normal situation of the glenoid cavity; but upon the external aspect of the neck of the scapula<sup>a</sup>, there had been formed a glenoid-shaped, concave surface, for the reception of the head of the humerus. It measured two inches and a quarter in its vertical, and one inch and three-quarters in its transverse, diameter; totally destitute of cartilage, it was covered by a texture as hard and dense as enamel, and as smooth as polished ivory. A glenoid ligament, much broader than natural, surrounded the greater part of its margin; it adhered intimately to the capsular ligament, but had become in several places detached from the circumference of the socket.

The tendon of the biceps muscle arose from the summit of the articular cavity; there was no interruption of continuity in any part of its course, but its intra-articular portion was remarkably short; it passed from its origin almost at once to the bicipital groove. At the point where it arose, however, from the glenoid cavity, its texture was unravelled, and its fibres separated from one another.

The acromion process, about an inch from its anterior extremity, was divided into two portions; the detached fragment rested upon the summit of the great tuberosity, and the solution of continuity corresponded to the sulcus which separates the tubercle from the head of the humerus. There was no deposition of bone along the line of separation, nor displacement of the detached portion, which was closely connected with the remainder of the process by the fibrous tissues derived from the muscles which are here attached.

The head of the humerus had lost completely the globular form which it possesses in the normal state; it was flattened from within outwards, and its axis appeared continuous with that of the shaft of the bone; its inferior border was prolonged downwards, so as to conceal a portion of the anatomical neck of the humerus, between which and the elongated margin of the head there existed a deep sulcus or fissure, which was

<sup>a</sup> See Plate I. Fig. 1.

occupied by vascular productions from the synovial membrane. The articular surface, the outline of which had become quadrilateral, was fully an inch broader than the socket in which it moved, and was smooth and polished to the same extent as the glenoid cavity. The lesser tuberosity was enlarged, and had become articular, and irregular osseous growths surrounded the head of the bone.

The tendons of the capsular muscles were perfect, with the exception of that of the subscapularis, the attachment of which to the rough and scabrous lesser tubercle had, to a certain extent, disappeared. The capsular ligament was somewhat thicker than natural.

Upon the left side the condition of the articulation was similar to that just described as existing upon the right. In the form, situation, extent, and polish of the glenoid cavity<sup>a</sup>; in the broad and partially detached glenoid ligament; in the unravelled condition of the tendon of the biceps at its origin; in the enlargement, flattening, and polish of the head of the humerus; its elevation to the acromion process; the nodulated state of its circumference; its prolongation downwards;—in all these respects there existed a perfect similarity between the two articulations. There was also upon both sides an osseous growth from the margins of the bicipital grooves, by which their depth was increased. Upon the left side, however, the acromion process was perfect, but the surface for articulation with the clavicle was enlarged. Upon this side, also, osseous depositions had taken place in the capsular ligament, near its attachment to the inner margin of the glenoid cavity.

It must, I think, be obvious to those acquainted with the external signs and anatomical characters of congenital luxations of the shoulder backwards, and who are also familiar with the morbid appearances which chronic rheumatic arthritis presents when established in this articulation,—that in these remarkable specimens two distinct classes of phenomena existed: the one manifestly indicating original malformation; the other as clearly denoting the super-addition of a disease of a peculiar character. To the former belong the absence of any vestige of a glenoid cavity ever having existed in the situation which it naturally occupies; the accurate resemblance to one another of the abnormal sockets in position, shape, and dimensions; the shortness of the intra-articular portions of the bicipital tendons, and the existence of glenoid ligaments. These phenomena indicate, in my opinion, that the deformities originated neither in disease nor accident; and when I compare them with those

<sup>a</sup> See Plate I. Fig. 2.

observed in the case of double, congenital, sub-acromial luxation, described in my work on Fractures<sup>a</sup>, I feel more strongly convinced that, in the rare and remarkable case just described, the malformations were also congenital.

Among the appearances which demonstrate that chronic arthritis had long existed in each of these malformed joints, are to be placed;—the removal of the articular cartilages; the enamelling of the osseous surfaces thus exposed; the bony growths around the bases of the heads of the humeri; the deposition of bone in the capsule; the unravelling of the fibres of the bicipital tendons; the growth of the numerous vascular bunches of synovial fimbriæ; and the solution of continuity in the acromion process.

In confirmation of this view of the case, it may be mentioned, that in the body of the person in whom these specimens were found, all the fingers and toes were webbed, and that one of the hip-joints presented a well-marked example of chronic rheumatic arthritis, evidenced by the disappearance of the ligamentum teres, the removal of the articular cartilage, the existence of an ivory-like deposit, and, finally, shortening of the neck of the femur, and an alteration in the angle which it naturally forms with the shaft.

The only specimens with which I am acquainted, similar to those above described, are contained in the Museum of St. Bartholomew's Hospital. In his valuable memoir upon the "Abnormal Conditions of the Shoulder-joint"<sup>b</sup>, Mr. Adams has thus alluded to these preparations: "Finally, the head of the humerus may be not only displaced partially upwards, as the result of this chronic rheumatic disease, partially inwards, and, as we have just proved, also partially downwards, but the most remarkable abnormal appearances the writer has witnessed from this chronic disease have been, in two specimens, contained in the Museum of St. Bartholomew's Hospital, in which it will be found that the head of the humerus, which had been affected by this chronic disease, was thrown completely backwards on the dorsum of the scapula. In this case the displacement was double, and two new glenoid cavities had been formed for the reception of the enlarged heads of the humeri, beneath the bases of the spines of the scapulæ, just where the head of the humerus has been found to rest in the ordinary dislocation backwards from accident; but in this case, although the history was unknown, that these appearances were not the result of accident is almost certain, as similar abnormal appearances are observable on each side." The notice of this preparation in the Catalogue of the

<sup>a</sup> Treatise on Fractures in the Vicinity of Joints, p. 206.

<sup>b</sup> Todd's Cyclopædia.

Museum is as follows<sup>a</sup>: "The bones of both the shoulder-joints of an adult. In each joint there has been ulceration, or such absorption as occurs in chronic rheumatism of the articular surface of the head of the humerus, and the glenoid cavity. The heads of the humeri are flattened and enlarged by growths of bone around their borders; and the glenoid cavities, enlarged in a corresponding degree, and deepened, extend backwards and inwards to the bases of the spines of the scapulæ. The articular surfaces, thus enlarged, are mutually adapted, and are hardened, perforated, and, in some parts, polished and ivory-like. The changes of structure are symmetrical, except in that the articular surfaces of the right shoulder-joint are more extensively polished than those of the left."

Although I have never had an opportunity of examining these preparations, I am, nevertheless, convinced, that they are not to be considered simply as examples of displacement of the heads of the humeri backwards, produced by the ravages of chronic rheumatic arthritis, but that they should rather be looked upon as instances of the supervention of this disease in a case of double congenital luxation of the shoulder backwards. It is true that when Mr. Adams, who is so well acquainted with this rheumatic disease, examined the preparations in question, they did not strike him in this point of view; but now that he has seen those which are in my possession, he feels perfectly satisfied, he has assured me, that the two cases are identical in their nature, and that they both present examples of the two-fold lesion that I have mentioned. The occurrence, therefore, of displacement of the head of the humerus backwards, as a result of chronic rheumatic arthritis, remains to be demonstrated.

I shall now direct attention to the displacement upwards, which is so frequently seen as a consequence of this disease; and, in doing so, it will be necessary to notice, analytically, the cases which have been from time to time recorded as examples of the effects of injuries upon the component parts of the shoulder-joint; but which, in my opinion, are to be looked upon as resulting from chronic rheumatic arthritis. It is true, that many of them were published at a period when but little was known of this remarkable affection; their authors are, therefore, to a certain extent excusable for having fallen into error respecting the nature of the morbid appearances which they have described; but it is also true that very many have been recently placed upon record, although we now possess full information respecting the symptoms, diagnosis, and patho-

logy of chronic rheumatic arthritis, no matter in what articulation it may be seated. In proof of this statement, it is only necessary to refer to the various memoirs upon the abnormal conditions of the joints published by Mr. Adams in Todd's Cyclopædia, and to the numerous communications upon the subject which have been made to the Pathological Society of Dublin, and which are to be found recorded in the volumes of this Journal.

The most remarkable series of specimens, illustrative of the subject under consideration, is that published by Mr. John Gregory Smith in the fourteenth volume of the London Medical Gazette. He has there described the appearances observed in seven shoulder-joints, supposed to have suffered from severe injuries. The previous history of the different cases was unknown,—all the specimens having been found in bodies brought to the Hunterian Theatre of Anatomy. The following abstract from the author's account of this valuable series will suffice for my present purpose:—

No. 1.—The subdeltoid bursa was found to communicate with the general cavity of the shoulder-joint by a large irregular opening in the capsular ligament. The tendinous insertions of the subscapularis, supraspinatus, infraspinatus, and teres minor muscles, were detached from the tubercles of the humerus. The tendon of the long head of the biceps had been *torn* away from the upper part of the glenoid cavity, and entirely withdrawn from the joint; it was found to be firmly attached to the anterior margin of the bicipital groove; the size of the cavity of the joint was much increased. A small portion of the outer margin of the glenoid cavity had been *fractured* off, and with the under surface of the acromion process and the tubercles of the humerus, were partially covered with portions of enamel-like or porcelain secretion, and numerous bands of organized fibro-ligamentous substance extended across the cavity of the joint in different directions.

No. 2.—The subdeltoid bursa communicated, by a large opening in the capsule, with the interior of the joint, and the tendon of the subscapularis was partially *torn* from the lesser tubercle of the humerus. The tendon of the long head of the biceps was *ruptured*, leaving a portion, about half an inch in length, attached to the upper part of the glenoid cavity; the lower portion of the tendon had been drawn from the cavity of the joint, and lay firmly attached to the margin of the bicipital groove. The *ruptured* extremities of the tendon were perfectly smooth and rounded, and the superior portion had become much flattened.

No. 3.—On removing the deltoid muscle, the head of the

humerus came into view, presenting a larger surface of bone than usual. On further examination, it was found that the tendon of the subscapularis muscle had been partially *torn* away from the lesser tubercle, and the original insertions of the supraspinatus, infraspinatus, and teres minor muscles, had been completely separated from the greater tubercle. The tendon of the long head of the biceps had also been *torn* from its origin, and become attached to the upper part of the bicapital groove.

The under surface of the acromion process was found hardened by the friction of the head of the humerus, and covered by a peculiar enamel-like secretion.

Nos. 4 and 5.—These specimens were found in the body of a female aged 56. In the right shoulder, a jagged, irregular opening, as large as a half-crown, existed in the capsular ligament, so that the subdeltoid bursa communicated with the general cavity of the joint. The tendons of the subscapularis and supraspinatus muscles, *torn* from their respective tubercles, had become united with the capsule; the tendon of the biceps, *torn* from the glenoid cavity and withdrawn from the joint, was fixed firmly to the margin of the bicapital groove. There was a number of small osseous growths connected with the tubercles of the humerus, and an ivory-like deposit covered both them and the under surface of the acromion. A *fracture* of this process had separated about an inch of its expanded extremity; it had not united by bone.

In the left shoulder, similar conditions were observed, viz., the opening in the capsular ligament; the separation of the tendons of the supraspinatus and subscapularis muscles; the deficiency of the intra-articular portion of the tendon of the biceps; the adhesion of the remainder of the tendon to the groove of the humerus; the osseous growths upon the tubercles; the ivory-like deposit; and finally, the solution of continuity in the extremity of the acromion process.

Nos. 6 and 7.—Here, also, both articulations were similarly altered. In that of the right side, an irregular opening existed in the capsular ligament, and the tendons of the supraspinatus and subscapular muscles were separated from their tubercles. That of the long head of the biceps remained connected with the glenoid cavity, but was displaced towards the inner part of the joint; it was expanded, and appeared to have been subjected to pressure and friction; the surface which corresponded to the head of the bone was smooth, but the other presented a bundle of silvery cords, which could be spread out upon the finger three-quarters of an inch in width. The capsule had become so large as to allow of the head of the humerus being placed

under the coracoid process. There were small bony deposits about the tubercles, and here and there patches of ivory deposit.

In the left shoulder the capsule was entire, but was greatly increased in size and thickness. The tendon of the subscapularis was *torn* from the lesser tubercle, but the attachments of the other capsular muscles were preserved; the tendons, however, appeared to have been very much stretched. The tendon of the biceps was displaced towards the inner and lower part of the joint, and played over a smooth part of the lesser tubercle.

It would be difficult to lay before the reader any more striking examples of the anatomical characters of chronic rheumatic arthritis of the shoulder than those furnished by the preceding group of cases, gratuitously described by the author (for their history was unknown) as instances of the effects of accidental violence. The absorption of a portion of the capsule; the detachment of the tendons of the capsular muscles from the tubercles of the humerus; the separation of the acromion into two portions; the ivory-like deposit upon the surfaces of the bones; the loss of the tendon of the biceps; its adhesion to the bicipital groove; its separation into distinct fibres; its displacement inwards from the summit of the humerus; the osseous nodules about the tubercles; the conversion of these processes into articular surfaces; the enlargement of the capsule; the deposition of bone in the capsule, at the margin of the glenoid cavity (described by the author as a fracture); the symmetrical development of the disease—all these well-known results of chronic rheumatic arthritis upon the structures of the shoulder-joint are elucidated in the clearest manner, by the series of specimens (valuable and instructive as far as they speak for themselves) described by Mr. John Gregory Smith.

According to this gentleman, however, the preceding cases furnish examples of every known luxation of the shoulder, as appears from the following extracts from his observations:

“It is likely that the first case was an example of the effects that may be expected to follow the dislocation into the axilla, with the addition of a rupture from its origin, of the round tendon of the biceps muscle.

“The second case is probably one showing the effects of a partial dislocation, in which the head of the humerus is drawn forwards against the coracoid process of the scapula, but quickly slips back again into its natural socket. It is an example of a rupture of the round tendon of the biceps muscle, instead of the tendon being torn away from its origin.

“The third case, I am inclined to think, has been a dislo-

cation *into the axilla or on the dorsum of the scapula.*" It is difficult to imagine what resemblance could exist between the effects of these two opposite luxations, or how, in the case of that on the dorsum of the scapula, the tendons of *all* the capsular muscles, as well as that of the biceps, could have been torn from their attachments. In this rare displacement of the head of the humerus, the tendons of the infraspinatus and teres minor are relaxed, and in the dissection of this accident recorded by Sir A. Cooper, those of the supraspinatus and of the biceps were on the stretch, but not torn.

"The fourth and fifth cases occurred in the same individual." "I am inclined to think it probable that they are both examples of the dislocation upwards." "They would seem to have been produced at the same time."

"The sixth and seventh cases likewise occurred in the same subject. The appearances in the right shoulder, I think, clearly indicate that it is an example of the effects of a dislocation under the pectoral muscle. The appearances of the left shoulder result, perhaps, from a dislocation under the pectoral muscle or into the axilla."

When we consider the fertility of imagination displayed in the preceding extracts, it certainly appears strange, that with regard to the fourth and fifth specimens, as well as the sixth and seventh, the mere circumstance of the morbid appearances in one shoulder-joint being "nearly a counterpart" of those in the other, did not strike the author as constituting strong presumptive evidence of their having originated in disease, for symmetry is as frequent in diseases and original malformations as it is rare in injuries from external violence; and this observation holds good in an especial manner, as regards chronic rheumatic arthritis, wherever situated. It is difficult, indeed, to conceive how external violence could either rupture or dislocate the tendon of the biceps in both shoulders at the same time.

In the last edition of his valuable work on Surgery, Professor Fergusson, of London, has made some observations upon partial luxations of the shoulder upwards from external violence, which I deem it right, upon the present occasion, to give in full; and as I am of opinion that he has not given the true explanation of the phenomena which he has described, I shall devote some space to their consideration; for it is obvious that the promulgation of an erroneous doctrine is the more calculated to mislead, and therefore the more dangerous, the higher the authority from which it emanates. It need scarcely be said that I have no desire to undervalue the labours of one who has worked so efficiently to advance our knowledge of surgery as

the distinguished Professor of King's College, but truth compels me to say that, *as far as his published writings can guide us* in forming an opinion, he does not appear to be familiar with the symptoms and anatomical characters of that remarkable disease of the shoulder, which is so well known here by the name of "Chronic Rheumatic Arthritis," and which, in other countries, has proved itself so fruitful a source of errors in diagnosis.

"It is customary," says Professor Fergusson, "to suppose that the head of the humerus cannot be luxated directly upward; but I have long been of opinion that such an event, to a partial extent, may, and indeed does, occur pretty frequently. I have met with various examples in the dissecting-rooms, in which the end of the bone has been in close contact with the acromion process and spine of the scapula, or with the coraco-acromial ligament; lying, in the one instance, a little above and behind the upper part of the glenoid cavity; in the other, somewhat above and in front, between the natural articular surface and the coracoid process; both, however, coming strictly under the title of partial luxation upwards. Whether these effects were the result of immediate violence, or of gradual change, I cannot decide. The capsular ligament seemed entire, but elongated, in some of the examples, whilst in others the articular surface of the humerus was in contact with the parts above, the capsular ligament being attached to the surrounding textures, which, thickened and infiltrated with lymph, bore all the marks of former inflammation. Within these few years, the occurrence of rupture of the long head of the biceps has been noticed by Mr. Stanley, Dr. Knox, and others; and Mr. John Soden, Jun., of Bath, has related<sup>a</sup> the particulars of a case of supposed sprain in the shoulder, which dissection afterwards proved to be a partial displacement of the humerus upwards, and luxation of this tendon forwards on the lesser tuberosity. That this tendon is displaced in the luxation forwards or backwards (or perhaps, to speak more correctly, that the head of the bone in such instances is displaced from the tendon), there can be little doubt; I have seen the change more than once in the dissecting-room. In some shoulders, I have found the tendon partially torn and elongated, lying either in the natural groove, or in a new one formed by friction; in others, I have observed the tendon torn across about an inch from its upper extremity, which floated free within the capsule, whilst the other end was adherent to the groove between the tuberosities. In some of them, old unreduced luxa-

<sup>a</sup> Transactions of the Medical and Chirurgical Society, 1841.

tions existed; in others, every mark bore evidence that this injury had at one time occurred. There is now in my collection, in the Museum of King's College, a preparation strongly corroborative of the above observations. On a subject, I noticed that one shoulder was more prominent than the other, and, in the progress of the dissection, the head of the humerus was found lying immediately under the deltoid muscle, in contact with the acromion, and surrounded by a very thin capsule of cellular texture. On raising the head of the bone, it was ascertained that the long tendon of the biceps was torn, the under end being adherent in its natural groove, and that, in addition, a dislocation of the head of the humerus (forwards, in all probability) had been in a manner reduced; but, instead of passing again into the capsule, had been thrust between this texture and the deltoid muscle. Only a small portion of the glenoid cavity was visible at its lowermost point, the greater part being covered by the flattened capsule. Doubtless, in this case, the original opening in the ligament had been only sufficient to let the head of the bone escape, and not free enough to permit of proper reduction"<sup>a</sup>.

It must be manifest to every person who reads, even in a cursory manner, the preceding extract from the recently published work of this justly distinguished surgeon, that no evidence whatever of any description has been adduced to prove the occurrence of partial luxation of the head of the humerus as the result of accident or external violence. The opinion which the author has advanced, viz., that this is an event of pretty frequent occurrence, is evidently grounded upon the phenomena which he has observed in shoulder-joints found in the dissecting-room, and with the previous history of which he was unacquainted. In the remarks which he has made upon the subject, he has, unknowingly, described many of the leading features of chronic rheumatic arthritis of the shoulder, although he looks upon them as resulting from accident: indeed this generally happens whenever a specimen, such as that to which he alludes as being preserved in the Museum of King's College, is found in the dissecting-room by those unacquainted with the pathological characters of this disease.

In the instance mentioned by Professor Fergusson, as one of partial luxation upwards from accident, there existed the following evidences, showing that chronic rheumatic arthritis had long been established in the articulation, viz.: the aperture in the capsular ligament; the contact of the head of the humerus with the deltoid muscle, and with the acromion pro-

<sup>a</sup> Practice of Surgery, p. 252, 1852.

cess; the disappearance of the intra-articular portion of the tendon of the biceps, and the adhesion of the remainder of it to the bicipital groove. In endeavouring to explain these phenomena, as well as the concealment of the glenoid cavity by the capsule, the author has evidently experienced some difficulty: for he has been obliged to have recourse to the hypothesis, that a dislocation of the head of the humerus forwards had occurred, and had been imperfectly reduced; and that, owing to the original aperture in the capsular ligament not having been free enough to permit the return of the head of the bone (although sufficient to allow it to escape), this latter had, in the efforts made to accomplish the reduction, been pushed up between the capsule and the deltoid muscle.

Upon the insufficiency of this explanation, it is scarcely necessary to make any remark, as the author himself seems to be aware of it, for he adds, "such an occurrence I believe to be exceedingly rare, almost all evidence going to prove that the capsular ligament is in general so extensively torn open, that the head of the bone cannot possibly be obstructed by it in its backward course; yet the preparation confirms the opinion of Delpech, who, though he suspected such an occurrence, had himself met with no anatomical proof of the fact." It might, I imagine, be safely added, neither has any one else.

The following account of a specimen of chronic rheumatic arthritis of the shoulder-joint, which is in my own collection, will, I think, illustrate the true nature of that described by Professor Fergusson. It was taken from the body of a woman of advanced age, who for many years before her death suffered from the usual symptoms of this disease, and who, it was known, had never sustained any injury of the shoulder.

Upon removing the deltoid muscle, the naked head of the humerus, elevated to the acromion process, came into view; the centre of its summit was devoid of cartilage over a space as large as a shilling, and covered with ivory-like deposit. An aperture of a circular form, with a fringed margin, and so large as to have permitted of the exit of the entire of the head of the humerus, existed in the upper and anterior part of the capsular ligament, the attachment of which to that portion of the anatomical neck of the bone, which lies above the greater tubercle, had disappeared; the tuberosity thus became articular; it was covered with ivory-like deposit, and in certain motions of the joint played against the under surface of the acromion; the sulcus which in the normal state separates it from the articular surface of the head of the bone was obliterated. The remains of the upper portion of the capsule, or that part of it which is related to the tendon of the supra-

spinatus muscle, was compressed, and, as it were, folded on itself between the upper portion of the glenoid cavity and the posterior inferior region of the elevated head of the humerus. The tendons of the four capsular muscles had lost their attachments to the tubercles, the lesser of which processes had become nodulated, and so much enlarged as to have obliterated that portion of the bicipital groove, of which, in the normal state, it forms the internal boundary. The intra-articular portion of the tendon of the biceps had nearly altogether disappeared; about a quarter of an inch of it, however, still remained connected to the glenoid ligament; its extremity was smooth and rounded off, like that of the bone of a stump; it was larger than natural, and, along with the corresponding portion of the glenoid ligament (which was loosened from its attachment), was laid down, as it were, upon the upper part of the glenoid cavity, between which and the head of the humerus (with the intervention of the capsule), it was compressed. The lower portion of the tendon was adherent to the inferior part of the bicipital groove, and to the remains of the neighbouring portion of the capsular ligament.

The acromion, about three-quarters of an inch from its extremity, was divided into two portions, which were held together solely by the fibrous structure which invests the upper surface of the process; but this tissue was so much stretched, that the detached portion was separated from the remainder of the acromion by an interval of three-quarters of an inch. The under surface of the entire process was denuded of periosteum and covered with an ivory-like structure, which was also found investing the articular surfaces of the acromio-clavicular joint. The lower part of the glenoid cavity (which was still covered with cartilage) was completely abandoned by the head of the humerus. The remainder of the socket presented the appearance of ivory, which manifestly must have been established before the head of the bone had perforated the capsule<sup>a</sup>.

The resemblance which this case bears to that detailed by Professor Fergusson cannot fail to strike the reader. In each he will remark the elevation of the head of the humerus; its contact with the inferior surface of the acromion process; the deficiency in the capsular ligament, in consequence of which the head of the bone was found lying immediately under the deltoid muscle; the adhesion of the tendon of the biceps to the bicipital groove; the disappearance of its intracapsular portion, and the interposition of the capsule between the upper part of the glenoid cavity and the head of the humerus. We

<sup>a</sup> See Plate II.

must, therefore, refer them to the same category, and as the one was known to have been a case of chronic rheumatic arthritis, uncomplicated with injury, and as the history of the other was totally unknown, it appears to me that we cannot avoid looking upon Professor Fergusson's specimen as a well-marked example of that disease.

In the fifth volume of Guy's Hospital Reports Mr. Hilton has published a case of dislocation of the right humerus into the axilla, with an account of the dissection of the parts, thirteen weeks after the accident. The injury was caused by the falling of a load of gravel upon the man while at work in a stooping position. When he had been extricated, his left femur, and some of his ribs, were found to be broken, and his right humerus dislocated into the axilla. The luxation was easily reduced, but great difficulty was subsequently experienced in maintaining the head of the bone in its proper position. The patient died of disease of the chest thirteen weeks after the accident.

The external form of the joint resembled very much the configuration of a shoulder which had been the subject of ulceration, or rupture of the tendon of the long head of the biceps, or what is termed the partial dislocation inwards of the humerus. The rotundity of the shoulder was diminished, as compared with that of the opposite side; the acromion and coracoid processes were very distinct; the head of the humerus was elevated to the acromion; the posterior surface of the joint flattened, and the deltoid muscle atrophied.

On dividing the attenuated deltoid transversely, and retroverting it, the head of the humerus was immediately brought into view, uncovered by its capsule, and without its greater tubercle, which had been broken off. A portion of the capsule, with the greater tubercle of the humerus attached to it, was found interposed between the articular surfaces of the humerus and the scapula. Two considerable openings existed in the capsule. The upper, somewhat circular in outline, was nearly an inch in diameter, and its edges were much thinned and well-defined; this opening corresponded with the surface of extreme pressure between the humerus and scapula. The lower opening was opposite the inferior edge of the glenoid cavity; it was angular in outline, and its edges were thick and irregular. Through this opening the head of the humerus escaped at the time of the accident.

The greater tubercle of the humerus had become retracted by its muscles with the capsular ligament, towards the outer part of the glenoid cavity. The tendon of the long head of the biceps had been separated from its origin at the scapula,

and divided vertically into two portions; one of them had become fixed to the inner edge of the bicipital groove; the other had acquired an adhesion to the tubercle of the humerus in its new position, and encircled the outer half of the neck of the humerus.

To any one who reflects for a moment upon the description given by the author of this interesting case, it must be apparent that two classes of phenomena existed, distinct in their nature, and originating in causes essentially different; one, produced by the injury which occurred thirteen weeks before the death of the patient; the other, resulting from the pre-existence of chronic rheumatic arthritis.

The results of the recent injury were, the angular rent in the lower part of the capsule, through which the head of the bone had passed into the axilla; the fracture of the greater tubercle of the humerus, and the interposition of the capsule between the articular surfaces of the humerus and scapula; while to the effects of pre-existing disease are to be ascribed—the circular aperture in the upper part of the capsule; the detachment of the tendon of the biceps from the glenoid cavity; its adhesion to the bicipital groove and adjoining portion of the tuberosity; the disappearance of its intra-articular portion; and the contact of the head of the bone with the deltoid muscle, and with the acromion and coracoid processes and coraco-acromial ligament.

The splitting of the remains of the tendon of the biceps was, I conceive, an effect of the injury; the broken tubercle, retracted by the muscles attached to it, drawing forcibly with it that portion of the tendon which previous disease had rendered adherent to it, where it forms the outer margin of the bicipital groove. It is obvious that the circular aperture in the upper part of the capsule could not have been the result of absorption from pressure exercised upon it *after* the receipt of the injury; for it is distinctly mentioned that great difficulty was experienced in maintaining the head of the bone in its natural position; that it had a constant disposition to fall again into the axilla, almost by its own weight; and that the action of three of the capsular muscles was annulled by the fracture of the greater tubercle. Under these circumstances, it is impossible to believe, with the author, that “the pressure of the humerus upon the capsular ligament had induced its progressive attenuation and absorption,” *after* the receipt of the injury. The case must, therefore, in my opinion, be considered as an example of dislocation and fracture occurring in a joint previously the seat of chronic rheumatic arthritis.

In the first volume of the *Lancet* for the year 1845, Mr.

Alfred Smee has given the particulars of the dissection of a case of partial dislocation of the shoulder upwards; the specimen was found in a body brought to the Aldersgate School of Medicine. He describes the upper part of the greater tubercle of the humerus as having been converted into an articular surface, which corresponded to another smooth surface, formed, partly on the inferior aspect of the acromion, and partly by new bony matter, extending about half an inch into what he terms the *tendon* of the deltoid muscle. The tendons of the supraspinatus and infraspinatus, together with the adjoining portions of the capsule, were *torn* from the tuberosity. The tendon of the biceps was *ruptured*, and the lower portion adhered firmly to the bicipital groove. He also alludes to the presence of several tendinous bands, which he considers to be a new formation, and destined to strengthen the capsule.

“From the above dissection,” the author observes, “we are in a condition to infer the nature of the *accident* at the time of its occurrence, and it is apparent that the tendons of the spinati and capsular ligament were *torn* from the tuberosity, and the tendon of the *biceps* ruptured.” This mode of dealing with the question will scarcely, be deemed satisfactory by those who have carefully studied the diseases of the shoulder-joint; for, in the deficiency of the capsule, the detachment of the capsular tendons, the adhesion of the remains of that of the biceps to the groove of the humerus, the conversion of the greater tubercle into an articular surface continuous with that of the head of the bone and in contact with the acromion, they will not fail to recognise the familiar features of chronic rheumatic arthritis of the shoulder. Nor can I avoid expressing my conviction, that the bony matter, which the author has spoken of as extending from the acromion into the *tendon* of the deltoid, and as forming part of the surface which articulated with the greater tubercle, was not in reality a new formation, but the detached extremity of the acromion, that process being traversed by the usual solution of continuity, with which we are now so well acquainted as one of the anatomical characters of the disease under consideration, but which we may conclude Mr. Alfred Smee to have been totally ignorant of, when he published the preceding case.

As to the tendinous bands observed in the capsule, had the author been acquainted with the morbid appearances noticed in the advanced stages of chronic rheumatic arthritis of the shoulder, he would have known that they were, in reality, the unravelled fibres of the capsular tendons.

(To be continued.)