

The Classic

Pathological Appearances of Seven Cases of Injury of the Shoulder-Joint: With Remarks

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To the Editor of the Medical Gazette.

Sir,

I beg to inclose you an account of the Pathological appearances observed in seven cases of the shoulder-joint, which appear to have suffered from severe injuries at some former period. I am sorry I am unable to give any previous history of the different cases; the whole of them occurred in bodies brought to my theatre for dissection.

I have the preparations in my possession, and they shall be accessible to any gentleman who may wish to see them.

If you esteem this communication worthy a place in your valuable Journal, I shall be obliged by its early insertion.

Case I.—In the body of a man brought to the dissecting-room, under the old system of violation of the grave, in the month of February 1832, the following pathological condition of the left shoulder-joint was observed:—

On making a transverse section in the centre of the deltoid muscle, for the purpose of reflecting it, the bursa situated beneath was observed to be much larger than usual, very much thickened, and communicating with the general cavity of the shoulder-joint by a large irregular opening. On further examination, it was noticed that the

tendinous insertion of the subscapularis muscle had been entirely torn away from the lesser tubercle; the supra spinatus, infra spinatus, and the teres minor muscles, had likewise been completely detached from the greater tubercle. The tendon of the long head of the biceps had been torn away from the upper part of the glenoid cavity, and entirely withdrawn from the joint: it was found to be firmly attached to the anterior margin of the bicipital groove.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 head of the humerus moved freely in all directions on the glenoid surface of the scapula, and the size of the cavity of the joint was much increased, from the extensive laceration of the capsular ligament; it included the whole of the neck of the bone and both tubercles. The appearance of thickening of the capsule below would seem to indicate that it had likewise suffered laceration in this situation at the time of the injury. 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. There was a fracture of the humeral extremity of the

clavicle, which extended into its articulation with the acromion.

Case II.—Mary B * * * * æt. 30, died of consumption in St. George's Workhouse, and was removed to the theatre for dissection, in November 1832, under the new regulations provided by the Anatomical Bill.

The left shoulder-joint presented the following appearances:—The bursa beneath the deltoid muscle communicated, by a large irregular opening, with the general cavity of the joint: the tendon of the subscapularis muscle was partially torn from the lesser tubercle of the humerus, but the insertions of the supra and infra spinatus muscles and the teres minor, remained perfect. The round tendon of the long head of the biceps muscle was ruptured, leaving a portion, about half an inch in length, attached to the upper part of the glenoid surface: 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: small bands of fibro-ligamentous structure were observed, but none of that peculiar enamel-like secretion noticed particularly in the preceding case.

Case III.—Ann D * * *, æt. 38, died January 1, 1833: removed from St. George's Workhouse, for the purpose of dissection, under the new regulations.

The following account of the appearances of the right shoulder-joint is extracted from the notes entered at the time, in the dissecting-room journal,¹ by Mr. G. Knox, who dissected the extremity. 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 supra spinatus, infra spinatus, 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 had become attached to the upper part of the bicipital 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. The capsular ligament appeared unusually thick at the lower part, which

¹ We have been in the habit for some time past of keeping a dissecting-room journal, in which every thing is entered that occurs out of the regular course, or differs from the natural appearance; the consequence has been, that we have already collected a few interesting examples of varieties in the distribution of arteries and nerves, the absence of certain muscles, &c. If this plan were generally adopted in the dissecting-rooms in London, in the course of every session, a very curious and valuable collection might be made; the most interesting examples of which might be selected, and annually published in one of the medical periodicals.

gave rise to the idea it had been lace-rated at the time of the injury, and had become re-united by the effusion of coagulable lymph.

Cases IV. and V.—Catherine S * * *, æt. 56, died February 1833; was removed from St. George's workhouse, under the new regulations, with a medical certificate signed "sudden death." She was a short, stout, muscular subject, and, upon inquiry, proved to have been a hard-working woman at the wash-tub up to the time of her death. The shoulder-joints presented the following appearances:—

In the right shoulder.—The bursa beneath the deltoid muscle communicated with the general cavity of the joint, by a jagged irregular opening about the size of a half-crown. The tendon of the subscapularis muscle was torn from the lesser tubercle, and the tendon of the supra-spinatus muscle detached from the greater tubercle; both having become united with the common capsule. The tendon of the long head of the biceps had been torn from the upper part of the glenoid cavity, withdrawn from the joint, and found to be firmly attached by ligamentous structure to the margin of the bicipital groove. There were a number of small exostoses on the tubercles, covered with the enamel-like secretion, which corresponded to a similar appearance on the under surface of the acromion process.

There was an oblique fracture of the acromion process of the scapula, which had separated about an inch of its expanded extremity; it had not united by bone, but had formed an artificial joint through the medium of cartilage, and was further strengthened by a fibro-ligamentous capsule.

The appearance of the biceps muscle was very remarkable, and first directed the attention to the condition of the joint; the portion of the belly of the muscle appertaining to the long head, was remarkably short, and the short head, unusually developed, appeared in great measure to supply the place of the other.

In the left shoulder.—On dividing the deltoid muscle, the bursa at its under surface was found very much thickened and enlarged, and an opening observed which communicated with the articulation. On further examination, this opening was found to be caused by a partial separation and detachment of the supra-spinatus and subscapularis muscles, from the larger and lesser tubercles; the surfaces from whence they had been torn being within the capsular ligament. The inner surface of the capsule presented a very rough fibrous appearance, occasioned by the portions of the lacerated tendon; the synovial membrane presenting small villous productions, the result, apparently, of organized lymph.

The tendon of the biceps was wanting in the joint, having been torn through and divided into a number of fibres, which were attached to the upper part of the bicipital

groove; small bony exostoses had been thrown out on the tubercles, and the cartilaginous surfaces of the humerus and scapula were here and there covered by small patches of the enamel-like secretion.

The acromion process of the scapula had been fractured precisely in the same situation as that of the opposite side, and formed a similar artificial joint.

Cases VI. and VII.—Thomas K * * *, æt. 40, died April 1834; removed from the Islington Infirmary, with a medical certificate signed “Consumption.”

In the right shoulder.—The bursa beneath the deltoid muscle communicated by an irregular opening with the general cavity of the joint. The tendon of the subscapularis muscle was entirely detached from the lesser tubercle, and the fibres of the muscle itself were drawn downwards from the ventres of the bone, presenting a small cavity beneath, lined by an irregular fibro-ligamentous structure, and communicating with the articulation. The tendon of the supra-spinatus muscle was torn from the greater tubercle, the infra-spinatus and teres minor muscles remained attached; but the muscles appear, at some former time, to have suffered severe tension.

The tendon of the long head of the biceps muscle was not separated from its origin, but displaced from the groove, and lay loose in the inner part of the cavity of the joint; it is expanded, and bears evidence of having been subjected to pressure and friction; one surface, which corresponds to the head of the bone, is smooth and polished, the other presents a bundle of silvery cords, which may be spread out upon the finger three quarters of an inch in width; the bicipital groove, is nearly filled with a fibro-ligamentous substance, similar in structure to numerous small bands, which extend across the joint in different directions, from one point of the synovial membrane to another.

The capsular ligament had been much stretched, and will readily allow the head of the humerus to be displaced under the coracoid process of the scapula, resting upon the inner margin of the glenoid cavity. There is no distinct evidence of the capsule having been ruptured in any other situation than that already mentioned, communicating above with the bursa beneath the deltoid muscle. There were small bony deposits about the tubercles of the humerus, which were within the general capsule, and here and there small patches of that peculiar porcelain secretion.

In the left shoulder, the bursa beneath the deltoid muscle was found very large, and its parietes thickened, but it did not communicate with the general cavity of the joint, being separated by a thick layer of lymph. The capsular ligament was perfect, but very capacious, and apparently thicker than natural. The head of the humerus moves very freely in its socket, and may be easily drawn beneath the inferior margin of the glenoid cavity. The tendon of the

subscapularis muscle is torn from the lesser tubercle, and the fibres are drawn from a considerable part of the venter of the bone. The tendons of the supra spinatus, infra spinatus, and the teres minor muscles, remain attached to the greater tubercle, but their fibres have evidently been, at some former time, very much stretched.

The tendon of the long head of the biceps, as in the preceding case, was permanently displaced from the bicipital groove, and lay at the inner and lower part of the joint, playing over a smooth part of the lesser tubercle; one surface is perfectly smooth and glistening, the other is a flattened band of silvery fibres. There are a number of fibro-ligamentous bands of organized lymph stretching across from one point of the capsule to another. The bicipital groove is nearly obliterated by the same structure, and portions of ossific matter have been deposited.

Remarks.—There are several points of extreme interest in the foregoing cases, connected with the pathological condition of the shoulder-joint consequent upon severe injuries, which present themselves for consideration; and I conceive might be attended with a very useful lesson, if we are careful to avoid all hasty opinions, and only select such practical inferences which may be essential in accounting for many circumstances attending accidents of the shoulder-joint.

It may assist us in forming a right judgment of the case, point out the most rational method of treatment, and enable us to prevent many bad consequences which frequently follow injuries of this important articulation.

The first point which suggests itself is, that a severe blow, strain, or dislocation, is more frequently accompanied with severe local injury of the muscles and tendons, in the immediate neighbourhood of a joint, than we should be otherwise inclined to suppose.

I have formed this opinion from the circumstance, that the seven cases of severe injuries of the shoulder, described above, occurred in the comparative small number of dissections, not exceeding forty individuals; and I think I may therefore safely infer, that these effects consequent upon severe accidents more frequently happen than are suspected, and from inadvertency or other causes are entirely overlooked in the ordinary dissection of bodies.

It is a curious fact, that in two instances both joints of the same individual should have presented nearly similar appearances, and that the same cause should probably have produced exactly similar results.

The frequency, in these cases, of the rupture, or tearing away from its origin, of the tendon of the long head of the biceps muscle, and its subsequent withdrawal from the joint into the bicipital groove, and its complete and permanent displacement in two instances, are facts in themselves of great practical importance.

The separation of the tendon of the subscapularis muscle from the lesser tubercle (excepting in one case), where it was only partially torn away, may be looked upon as the common result of the accident which produced these appearances; not so, however, with the tendons of the supra and infra spinatus, and the teres minor muscles, from the greater tubercle, which appear to be more uncertain. In two instances all three tendons were torn away; in three cases only the tendon of the supra spinatus; and in the remaining two cases, the whole of the tendons preserved their natural attachments.

The capsular ligament appears in all cases to have been extensively lacerated at the upper part, and to have communicated with the bursa beneath the deltoid muscle, with only one exception, which hardly deserves to be excluded, from the very evident thickening, which implies that a communication had existed, but that union had afterwards taken place. In only two instances could any thing like a laceration be detected in the lower part of the capsule; and even in these it could only be suspected from the thickness of the capsule in this part. In all the cases the capacity of the general capsule was much increased, and included within it more of the upper part of the humerus than natural. In two cases it distinctly allowed the head of the bone to be displaced from the glenoid surface of the scapula without the least difficulty.

The fibro-ligamentous bands must be considered as the result of the organization of fibrine thrown out during the inflammatory stage consequent upon the first effects of the injury. The enamel-like or porcelain secretion may probably be traced to a similar cause, or looked upon as one of the resources of nature, to prevent parts subjected to unusual friction from being materially injured by such a process. In all the cases (excepting case II.) the joints presented more or less of the fibro-ligamentous bands, and the enamel-like secretion immediately decides the question, which might otherwise have arisen as to the probable data of the injuries.

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, which, according to the opinion of Sir Astley Cooper, is by no means to be considered a common circumstance, or generally attendant on this accident. It would seem to have been produced by a severe blow on the top of the shoulder, from the appearance of injury and fracture of the humeral extremity of the clavicle.

The second case is probably one shewing the effects of 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 dislocation into the axilla or on the dorsum of the scapula: it exhibited the most serious injuries; the whole of the tendons of the muscles were torn away from their attachments.

The fourth and fifth cases occurred in the same individual. I am at a loss to say in what manner the bone had been forced to produce the appearances observed, but I am inclined to think it probable that they are both examples of the dislocation upwards. I find that Sir Astley Cooper says, in his valuable work on Dislocations, "It has been supposed that a dislocation of the os humeri upwards might occur, but it is obvious it could only happen under fracture of the acromion: it is an accident I have never seen." In strength of the opinion I venture to offer in these examples, I find that the humerus may be readily displaced upwards when the acromion is fractured; so that the head of the bone rests on the superior margin of the glenoid surface, but immediately returns to its natural situation.

It has been suggested, that the accident might have happened from the individual falling down stairs while the arms were half extended, or by any violence that would tend to throw the head of the bone forcibly upwards. It is a remarkable fact, that the appearances in one shoulder-joint should be nearly a counterpart of the appearances in the other; they would seem to have been produced at the same time, and both to have been followed by severe inflammatory symptoms, as evinced by the fibro-ligamentous bands and the secretion of enamel on the processes of bone. The motion between the fractured ends of the acromion was considerable, and each surface is invested with a layer of cartilage.

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. The curious coincidence, that both the long; tendons of the biceps muscle should have remained displaced, and that both should present the same remarkable character, are facts worthy of being remembered; and the question occurred to me, whether the pain and inconvenience a patient feels in some cases for a considerable time after the reduction of a dislocated arm, may not be owing to the long tendon of the biceps muscle having been displaced from its groove, which would not only give pain by stretching that muscle, but very considerably affect the action of the fore-arm? In this case I should think it right to give the arm a gentle rotatory motion after reduction, that the parts might thereby be properly replaced and adjusted to their wonted situations.

There are a few other observations I might take the liberty of offering, if I had not already extended my communication to a very considerable length: I shall therefore conclude by assuring you that I have been induced to draw up the account of these cases in the hope and expectation that they might lead to some practical remarks from others who may have had opportunities of witnessing similar appearances resulting from severe injuries of the shoulder-joint.

It will afford me great pleasure at any time to exhibit the preparations which are in my possession, to any gentleman who may be desirous of seeing them.—I remain, sir,

Your obedient servant,

John Gregory Smith.

Hunterian Theatre of Anatomy,
Great Windmill-Street, Haymarket,

May 15, 1834.