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CLINICAL LECTURES ON DISLOCATIONS, DELIVERED AT THE CHARING - CROSS HOSPITAL.

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LECTURE VIII.

You may occasionally be consulted by individuals who, from violence done to the shoulder, suffer great pain, and are unable to raise the arm. On examining the part you will not discover dislocation, or any of the forms of fracture I have already described, but you may feel a distinct crepitus. In these cases you may have either fracture of a portion of the head of the humerus, or what Mr. Samuel Cooper considers not an uncommon occurrence, a small piece of the glenoid cavity of the scapula broken off. A few weeks since I was requested to examine a little child, an out-patient of this hospital, who had lost the power of moving her arm. Upon inquiry, the mother informed me that two or three days previously the child had fallen off her chair to the ground, that she screamed violently at the time, and had since been unable to move the arm, crying very much when it was touched. I examined the limb very carefully, but could discover nothing out of place, nor any fracture, till I pressed the head of the humerus firmly against the glenoid cavity, at the same time rotating it, when distinct crepitus was heard by all present. I could not feel any displacement, but I had very little doubt that a fracture had occurred in the glenoid cavity. I directed the elbow to be supported, a pad to be placed in the axilla, and the figure of eight bandage to be applied, two or three turns of it being first carried over the shoulders and under the axilla, and the arm to be bound to the side. The child did well.

DISLOCATION OF THE TENDON OF THE LONG HEAD OF THE BICEPS FROM ITS GROOVE.

There are probably few accidents falling under the notice of the surgeon which have met with so little attention, or of which the true character has been so entirely overlooked, as dislocations or displacements of the tendons of muscles. Volume after volume has been written upon dislocations in general, and especially upon those of the shoulder joint; but upon the displacement of the tendon of the long head of the biceps, an accident which, if overlooked, deprives the patient to a very considerable degree of the use of the limb, authors, with but one or two exceptions, have been silent, as they have also been upon the displacement of every other muscle in the body. We refer, but we

refer in vain, for any detailed or satisfactory account of these cases, previous to the year 1841, when Mr. John Soden, of Bath, published a paper upon the subject, in the "Transactions of the Royal Medico-Chirurgical Society of London," giving details of two cases which he had the opportunity of dissecting. It is but rarely that we have the advantage of examining these injuries by dissection, the accident producing them being seldom fatal; but Mr. Soden has availed himself of his opportunities, and the profession is indebted to him for a very good paper, which has dispersed the doubt and obscurity investing them. You will do well to read it and will be amply repaid thereby.

Mangetus, who died at Geneva in 1742, at the advanced age of ninety, has related a case, which you will find in the "Encyclopædie Methodique," at the end of the article on luxations. "A woman had, three days before she consulted him, as she supposed, luxated her humerus in wringing the linen she was washing. She told him, that whilst doing so, she felt something start from the shoulder. Upon examination he found there was no luxation, but a depression of the deltoid muscle, whilst the two inferior tendons of the biceps muscle were stretched, not allowing the arm to be extended. He supposed that the biceps tendon was dislocated, but, as the part was swollen, he recommended fomentations; and the following day he found he was right in his conjecture. He turned the arm forcibly in the opposite direction, the tendon returned immediately into its place, and the woman recovered."

In the second edition of William Cowper's "Anatomy of Human Bodies," published after his death by C. B. Albinus, at Leyden, in the year 1737, appears the following account of a case:—"An extraordinary case relating to this muscle (the biceps) has more than once happened in our practice. A woman, three days before she consulted us, had, as she suspected, dislocated her shoulder bone by wringing of linen clothes after washing, (which is commonly done to express the water,) adding, that in straining her arm in that action, she sensibly felt something, as she thought, slip out of its place, or her shoulder. After examining the part, we were well satisfied that there was no dislocation; but, observing a depression on the external part of the deltoid muscle, and finding the two inferior tendons of the bicipital muscle rigid, and the cubit thereby denied its due extension, we suspected that the external tendinous beginning, before taken notice of, was slipped out of its channel on the head of the os humeri. But finding the part at that time somewhat inflamed, we advised her to an emollient application and to give her arm rest till the next

day, at which time we found our conjectures true, for, by turning the whole arm to and fro, the tendon readily slipped into its place, she recovering the use of the part immediately."

No one can read these two cases without being struck with the extreme similarity one bears to the other; indeed, the resemblance as to expression and minute details, is so close, that we can have little, if any doubt, that the one is an unacknowledged and pirated version of the other. Which of these gentlemen was the thief, it is difficult to say; they lived and published about the same time; but as Cowper did not scruple to appropriate and publish Bidloo's Anatomical Plates as his own, to illustrate his work on Human Anatomy, I do not suppose he would hesitate long in appropriating another man's case.

Boerhaave has observed, that muscles often slip out of their places during violent efforts, when their sheaths are so relaxed as to offer but little resistance; and, he adds, when this happens to the shoulder, it produces swelling and pain, and is often mistaken for dislocation. He has not, however, related any cases.

Lientaud, in the "*Essais Anatomiques*," published in 1742, refers to the displacement and injury to the tendons of the lumbar muscles; and Claude Ponteau, in his "*Melange de Chirurgie*," published in 1760 a case, which he describes as being a displacement of one of the attachments of the splenius colli muscle. The patient recovered, and he had not the opportunity of verifying his conjecture by dissection. In 1773, Mr. Bromfield, in his "*Chirurgical Observations*," remarks, "I dare say many surgeons have seen a lameness of the shoulder from the tendon of the biceps muscle, which runs in the excavated groove, at the head of the os brachii, having by some turn of the limb slipped out of the sulcus, and resting on one of the exuberances of the upper part of the channel, which, till it has returned, has occasioned not only an immobility of the joint, but most violent pain. When the case is known, the reduction is very easy, for the cubit being bent, the muscle is relaxed, and while an assistant, holding the lower extremity of the os brachii, moves the head thereof sometimes outward, and sometimes inward, in the acetabulum scapulae, the operator, with his fingers, will easily replace it, and the patient presently becomes perfectly easy."

Mr. Stanley, in the third volume of the "*London Medical Gazette*," mentions having met with an instance in which the tendon of the biceps was dislocated, and rested on the great tuberosity. A membranous sheath attached to the humerus, and extending around the tendon, confined it in its new situation. This sheath was polished internally, it facilitated play of tendon, and Mr. Stanley remarks, that its formation may be presumed to have been analogous to that of the capsule enclosing the ends of a fractured bone, when free motion has been permitted, the cellular tissue in either case being condensed, and formed into a perfect bag, the inner surface resembling synovial membrane by its polish and by its secretion.

Mr. Gregory Smith, in the fourteenth volume of the same work, relates two cases of displacement which he met with, in his dissecting room; they were both taken from the same subject, who died from consumption. In the right shoulder, the bursa beneath the deltoid muscle was lacerated, and communicated with the

interior of the capsular ligament. The tendons of the supra-spinatus and subscapularis muscles were entirely separated from their insertions; the infra-spinatus and teres minor appeared to have suffered great tension; the long head of the biceps was not lacerated, but was displaced from its groove, which was nearly filled up with fibrous matter. There was also fibrous matter in the joint, but the capsule presented no signs of being ruptured elsewhere than above. In the left shoulder the bursa did not communicate with the capsular ligament; the latter was perfect, but very large, and thicker than usual, the tendon of the subscapularis was torn from its insertion, but the other tendons remained attached, though very much stretched. The large tendon of the biceps was entire, but displaced, and the groove filled up with fibrous matter, as in the arm. Mr. Smith does not appear to have seen this individual during life, therefore could not supply us with any information as to the symptoms.

This is all the information that I have been able to glean from the numerous writings to which I have referred. You will agree with me that it is extremely vague and unsatisfactory; and, indeed, that until Mr. Soden's paper appeared, we knew very little of the matter.

The principal signs of this accident, are pain and tenderness in front of the joint, corresponding to the bicipital groove; acute pain in the course of the biceps when it is thrown into action, the pain being referred more particularly to its two extremities; the patient is unable to raise his hand to his head, or his arm beyond an acute angle from his body; the appearance of the shoulder is somewhat altered, the head of the humerus being drawn upwards, and more forwards than natural, lying close beneath the acromion process, whilst the posterior and external part of the joint are somewhat flattened.

I will now relate to you the first of Mr. Soden's cases; the other being complicated with dislocation of the head of the humerus forwards, will be mentioned when we arrive at that section of our subject in which we treat of dislocations in that direction.—A man of the name of Cooper, in the month of May, 1839, in hastily rising from the floor, on which he was nailing down a carpet, slipped and fell backwards, receiving the whole weight of his body upon the elbow of his right arm, which he had, in the impulse of the moment, placed behind him to break his fall. He experienced no injury to the elbow, but the shock being transmitted immediately to the shoulder, the whole effects of the accident were sustained by that joint. Upon the occurrence of the accident he experienced such acute pain that he supposed he had suffered either a fracture or dislocation, but finding that he could raise the arm over his head, he felt reassured, and endeavoured to resume his work, the pain was however so great that he was obliged to desist, and he went home. Mr. Soden saw him the following morning, at which time the joint was greatly swollen, tender to the touch, and painful on very slight motion; there was then no power of placing his arm over his head, as he said he had done immediately after the accident. Having satisfied himself there was neither fracture nor dislocation, Mr. Soden treated the case as a severe sprain, adopting energetic measures to subdue the inflamma-

tion, until at the end of three weeks the swelling was much reduced, although the tenderness in front of the joint, and pains upon certain movements of the arm, were scarcely less than on the day of the accident. Upon comparing the joint with its fellow, a marked difference was observable; the injured shoulder was evidently out of drawing, but without presenting any glaring deformity. When the man stood erect there was a slight flattening on the outer and posterior parts of the joint, and the head of the bone appeared to be drawn up higher in the glenoid cavity than it should be. On moving the limb with one hand placed on the shoulder, a crepitating sensation was experienced under the fingers, caused by the friction of the head of the humerus against the under surface of the acromion, whilst the arm could not be raised beyond a very acute angle with the body, from the upper edge of the greater tubercle coming in contact with that of the acromion, and thus preventing further progress. The head of the bone projected more than natural in front, amounting almost to a partial dislocation. The man was unable to raise the smallest weight from the ground, on account of the severe pain caused by any exercise of the biceps muscle. In other respects, the underhand motions were not limited, the patient being able to swing his arm backward and forward, and to grasp any object firmly, without pain, so long as he did not endeavour to raise it. When the biceps was thrown into action, he described the pain as very acute, extending through the whole of the muscle, but referred chiefly to its two extremities; when the muscle was quiescent, the pain was referred to the front of the joint, confined to the space between the coracoid process and the head of the humerus, which spot was marked by extreme tenderness and some puffy swelling. The patient, who was of a rheumatic habit, suffered from attacks of this disease in the joint, until his death, which occurred six months afterwards, from fracturing his skull in falling through a trap door.

Mr. Soden made a *post-mortem* examination, and found that the accident to the shoulder, was a dislocation of the long head of the biceps from its groove, unaccompanied by any other injury; the tendon, which was entire, lay in its sheath on the lesser tubercle of the humerus; the capsular ligament was but slightly ruptured, the joint extensively inflamed; the synovial membrane being vascular, and coated with lymph, recent adhesions had formed between different parts of its surface, and ulceration commenced on the cartilage covering the humerus, where it had come in contact with the acromion process; the capsular ligament was very much thickened.

When we consider how much in appearance these accidents resemble partial dislocations of the head of the humerus upwards and forwards, we can entertain but little doubt that they have frequently been mistaken for them. We shall find, when we arrive at that portion of the subject, more than one case recorded of partial dislocation, in which, though the head of the bone was returned to its proper cavity, it quickly resumed its abnormal position. This is one of the characteristics of the accidents which now occupy our attention. The head of the bone may be drawn downwards and backwards into the glenoid cavity, but, cease the extension, and it will very soon be drawn up again by the combined action of the capsular muscles,

particularly of the supra-spinatus; these, as Mr. Soden has already pointed out, being antagonized and kept in check by the manner in which the long tendon of the biceps passes over the head of the bone to its scapular attachment. The patient was able to raise his hand to his head immediately after the receipt of the injury, although, when Mr. Soden saw him on the following day, he had lost that power. This is by no means improbable, for muscles, which are deprived of their antagonising forces, unless irritated, do not contract instantaneously, but by degrees. In a fracture of the neck of the thigh bone, for instance, if called immediately upon the accident occurring, you will observe but little, if any shortening; but if two or three hours have elapsed, you will probably find the limb drawn up to a considerable extent. The same obtained in the foregoing case, the patient being enabled to raise his arm to his head at first, because the biceps enters but little into that action, and sufficient time had not elapsed for the muscles antagonized by the biceps tendon, to take advantage of the abnormal state of parts. By degrees the head of the bone was approximated to the acromion process, until at length, when the man attempted to raise his arm to his head, the greater tubercle came in contact with the acromion, and prevented all but very limited motion, in that direction.

I have given you these cases at length, because they have hitherto been overlooked. How often do we meet with instances where the patient has lost the use of his limb, without any very ostensible signs being present; and, indeed, in the accident before us, there are scarcely any symptoms but what may arise from other causes. The great diagnostic signs of this accident appear to be, great pain in the course and attachments of the biceps, coupled with the undue approximation of the head of the humerus to the acromion process. I must, however, admit that these signs of diagnosis are anything but satisfactory; the approximation between the head of the humerus and acromion process takes place equally in some cases of fracture of the anatomical neck of the humerus, and also where the biceps tendon is ruptured; and we are also deprived of the advantage of there being crepitus in fractures of the anatomical cervix humeri, inasmuch as we find that crepitus existed in Mr. Soden's case from the friction of the head of the humerus against the acromion process.

You must remember that the tendon of the biceps may be thrown out of its proper groove, and it is of the more importance, as you must have observed that although the symptoms are very obscure, and mostly of a negative character, the consequences to the patient may be very serious should the nature of the accident be mistaken at first.

In the treatment of these cases you have three principal objects in view:—to overcome the action of the capsular muscles, to reduce the tendon, and to keep the tendon in its groove when you have reduced it. Through the kindness of Mr. Bainbridge, jun., I have been enabled to make some investigations on the dead subject, which may perhaps be of some service, as guiding us in the treatment of these cases. Assisted by this gentleman, I cut down and dislocated the long tendon of the biceps upon the lesser or inner tubercle. I first endeavoured to return it by flexing the forearm

and relaxing the muscle, whilst I rotated the humerus strongly inwards, but without success. I next straightened the arm, and holding it by the wrist, I rotated it inwards as far as I could, and then with a sweep carried it across the chest, whilst, with my left hand on the deltoid muscle, I pressed the head of the bone downwards and outwards, and the tendon returned to its groove with a very evident snap. I next displaced the tendon on to the outer or greater tubercle, when, by rotating the arm outwards with my right hand, and drawing the head of the bone downwards and outwards with my left, I reduced it, but I found it was more easily restored to its proper position by taking hold of the wrist with my right hand, and placing my left in the axilla; with the latter I pressed the head of the bone gently outwards, whilst with the former I supinated the hand and rotated the arm strongly outwards, at the same time bringing it to the side of the body, my left hand serving as a fulcrum in the axilla. By this means the deltoid was put upon the stretch, and its anterior fibres, upon the insertion of which the biceps tendon lay, evidently assisted the latter into its groove. I next endeavoured to ascertain in what position of the arm the tendon would remain most securely in its place. Accordingly, I flexed the forearm, and placed the hand in the position of pronation across the chest, when the tendon became again displaced, as it did immediately the head of the humerus was rotated inwards, although the forearm was extended; but when I extended the forearm, placed the hand supine, and separated the arm from the side, it remained properly in its place, being now bound down by the tendon of the pectoralis major. I am fully aware, in these experiments, that the subject being dead I did not encounter that opposition from the capsular muscles which I should in all probability have met with in a living patient; but, making every allowance for this, I am still in hopes that what I have here endeavoured to explain to you, may serve to place the treatment of these accidents on some surer basis than mere conjecture, and that henceforth you may have some rule to guide you.

We have seen that the head of the humerus is drawn up against the acromion process, and that the greater tubercle striking against that process, when the arm is separated from the side, prevents its being raised beyond a very acute angle. I should advise you to adopt the following method, should you find the plan, as recommended by Mr. Bromfield, fail. I am not aware of any particular symptom by which we can be guided with any certainty as to when the tendon is dislocated inwards, or when outwards; but, as a result of my experiments, I should imagine that it is more frequently dislocated inwards than outwards, the inclination of the head of the humerus, and the greater projection of the larger tubercle, being unfavourable to the latter displacement. Place your patient on a low chair, and let an assistant fix his scapula by pressing upon the superior angle and costa; then separate the patient's arm from his side, as far as you can; keep his hand in the prone position, and make extension downwards and outwards from the wrist, until you have somewhat withdrawn the head of the bone from the acromion process. Now let an assistant sit down on the floor, underneath the

injured arm, and clasping both his hands over the deltoid muscle, draw the head and neck of the bone downwards and a little backwards, whilst you rotate the head of the bone inwards and backwards in the glenoid cavity, by making the patient's arm describe a circle, carrying it backwards, upwards, forwards, and inwards, across the chest. Should you have reason to suppose that the tendon is displaced outwards, separate the arm as far as you can from the body, and let an assistant make extension in that direction best calculated to remove the head of the humerus from the acromial process, that is, downwards and outwards. Unless this be done, in either form of the dislocation the bicipital tendon remains pressed up by the head of the humerus against the acromial process, and is obviously prevented from returning into its natural position. Next place your left hand well up in the axilla, and direct your assistant, whilst he keeps up the extension, to rotate the arm strongly outwards, and at the same time to bring it to the patient's side. Having reduced it, gently separate the arm from the patient's side; keep it steadily rotated outwards, and the hand supine; place a long splint, which extends from the shoulder to the fingers, along the back of the arm and hand, and also a pad or compress in front, over the bicipital groove. Fix the whole with a roller evenly and carefully applied, and place your patient on his back in bed, where he had better remain until you consider that the parts have become sufficiently firm to prevent a recurrence of the accident.

The reason why I recommend you to separate the arm from the side after reduction, is, that by so doing you place the pectoralis major muscle upon the stretch, and consequently make its broad tendinous insertion press more closely and directly over the bicipital groove.

In my experiments, the difficulty was not so great in reducing, as in keeping the tendon in its place when reduced, and certainly the plan which I am now advocating appeared both to Mr. Bainbridge and myself to be the most efficacious.

DR. RADFORD ON THE OPERATION OF CRANIOTOMY.

TO THE EDITOR OF THE PROVINCIAL MEDICAL AND
SURGICAL JOURNAL.

SIR,

I observed in the last number of your journal that Mr. Knowles had kindly referred to the opinion I entertain on the subject of *craniotomy*, in which he says, "Dr. Radford, of Manchester, is of opinion that *craniotomy* should never be performed," &c. Now, Sir, my opinion on this subject is not so exclusively restrictive as Mr. Knowles has stated, although I consider that this *murderous operation* is had recourse to in this country very much too frequently; and I do think that the principles inculcated in the *Decalogue* should have their due weight on the minds of obstetricians, and that, instead of making it an operation of election, it should be had recourse to only as one of *necessity*. This subject is one of the greatest interest to the profession, and, in my opinion, to the public also. My views upon it are now well known in this