

Habitual or recurrent dislocation of the shoulder / by Herbert L. Burrell and Robert W. Lovett.

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BY

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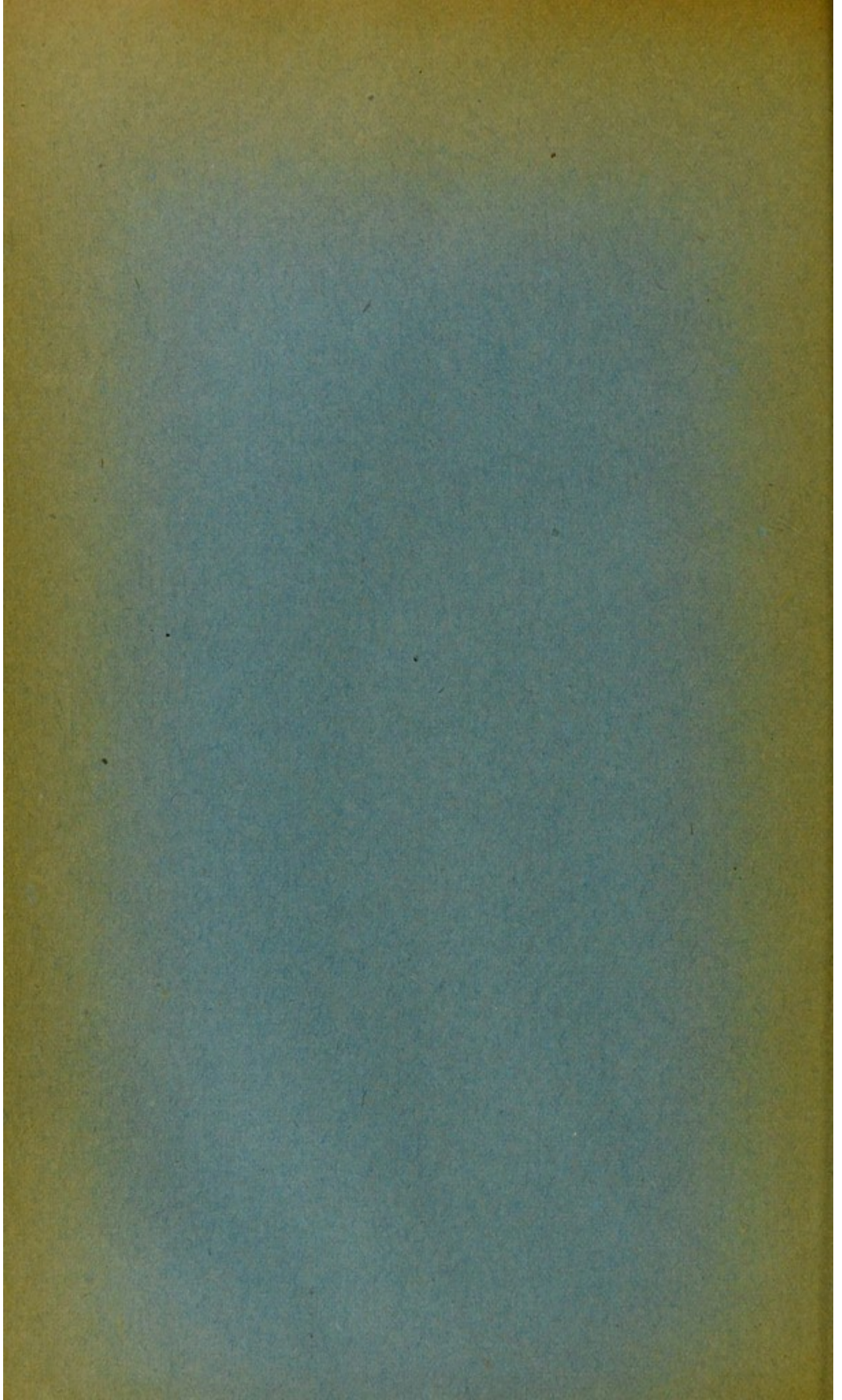
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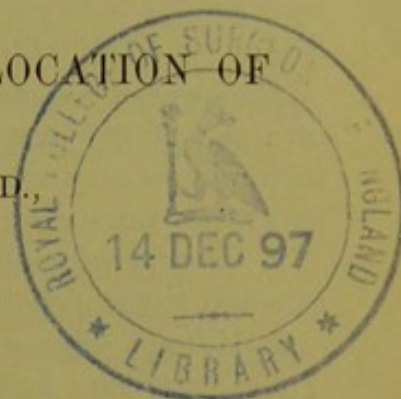


HABITUAL OR RECURRENT DISLOCATION OF THE SHOULDER.

BY HERBERT L. BURRELL, M.D.,

AND

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HABITUAL or recurrent dislocation of the shoulder, although on the whole a surgical rarity, occurs often enough to have attracted to itself a certain amount of theoretical and practical consideration. The name "habitual dislocation" is intended to refer only to those cases where dislocation occurs from causes too slight to displace the normal joint. A person may dislocate one shoulder two or three times from a succession of severe accidents without falling into this special pathological class.

PATHOLOGY AND ETIOLOGY. The pathological condition present varies widely; certain abnormalities have, however, been demonstrated, chiefly in the head of the humerus, where it has been removed by excision for relief of the disability.

Cramer (*Berl. klin. Woch.*, 1882, p. 21) excised the head of the bone in an epileptic woman, thirty years old. The head of the humerus showed a depression in the posterior part of its articular surface. This was 4 cm. long, 2 cm. broad, and $\frac{3}{4}$ cm. deep. There was also found in the joint a loose body with a smooth surface, composed of bone, fibrous tissue, and cartilage, and this loose body was attached by a long pedicle to the back of the glenoid fossa. It seemed to be a piece broken out of the head of the humerus. Dislocation was apparently favored by this abnormality in the shape of the head of the bone.

Volkman (*Cent. für Chir.*, 1883, p. 28), quoted by Popke, resected the shoulder-joint in a man thirty years of age, an epileptic, whose shoulder slipped out with such ease that the arm was almost useless. The posterior third of the head showed a smooth surface not covered by cartilage, and the glenoid cavity was narrower below than above. The capsule was torn away from the glenoid cavity, and the joint, therefore, communicated with the bursa under the subscapularis muscle. A loose body was also found in this joint, evidently of bony origin, and apparently due to a fracture of the glenoid cavity.

Küster (*Beil. zum Cent. f. Chir.*, 1882, p. 73) excised the shoulder in a young man whose original dislocation was produced by the fall of a heavy box on the shoulder. The head of the humerus showed a similar loss of substance, but no loose body was found in the joint.

In the discussion following the report of these cases Kraske reported a case operated on at Halle, where the changes in the head of the bone were similar to those mentioned above, and a loss of substance existed also in the glenoid cavity.

The cases of Cramer and Küster, at least, point plainly to a fracture of a part of the joint as a cause of the recurrent dislocations, and that such injuries may occur in simple dislocations of the shoulder is attested by at least three cases (quoted by Cramer):

1. Cooper: subspinous dislocation, subscapularis muscle torn off and attached to the glenoid fossa.
2. Hilton: subglenoid dislocation—greater tuberosity torn off.
3. Deuterlich: both tuberosities torn off and implanted lower down on the humerus.

Löbker (*Beil. zum Cent. f. Chir.*, 1886, p. 90) reported a case, the specimen being obtained post mortem, which seems to belong to another category, and with this goes a similar case resected by Vogt. In each case the anterior part of the head was normal. The posterior half, however, was flattened and showed a depression 1 cm. deep extending from top to bottom. This surface was covered by cartilage, and neither here nor in the glenoid cavity could any evidence of a previous fracture be found. The long tendon of the biceps had been torn from its insertion and was adherent in its groove, and the muscles had apparently been torn from the greater tuberosity.

It does not seem possible to attribute these malformations to fracture, as in the other cases.

Injuries to the muscles and tendons have been demonstrated by Joessel (*Deutsch. Zeitschr. f. Chir.*, 1880, xii. p. 167). He had the opportunity of examining post mortem the bodies of three patients (one with a double habitual dislocation), which furnished four specimens. Analysis of these showed in all cases that the supra- and infra-spinatus muscles had torn loose from the greater tuberosity and had retracted and wasted. By the retraction of the tendons of these muscles the capsule was drawn upon and pulled open so that it communicated with the subacromial bursa. The joint-cavity, therefore, was bounded above by the under surface of the acromion. In one the long tendon of the biceps was ruptured and was adherent to the groove. The cavity of the joint was much enlarged, having in one case a capacity of 90 c.cm., where it should have been only 28 c.cm.

In the two cases operated on by Ricard (*Bull. de l'Acad. de Méd.*, 1894, p. 330) the capsule was found to be thin, flaccid, and lax; no rent was found, nor was the joint-sac opened.

In the case operated on by Gerster (*Rules of Aseptic and Antiseptic Surgery*, p. 8, note 2), and in the two cases operated on by Burrell, no abnormality beyond laxity of the capsule was detected; but it must be remembered that in these five cases the joint could not be so thoroughly

explored and inspected as in the examination of a post-mortem specimen of a resected joint.

A consideration of this pathological evidence (Stimson : *Dislocations*, p. 265, quoting also Gurlt : *Path. Anat. der Gelenk-Krankheiten*, p. 250 ; Cushing : *Med.-Chir. Trans.*, 1837, p. 336) establishes the probability that in some cases, at least, the cause of the frequent dislocations may be

1. Laxity of the capsule of the joint.
2. Partial fracture of the head of the humerus.
3. Partial fracture of the glenoid cavity.
4. Tearing away of muscular insertions and rupture of tendons.
5. Abnormality in the shape of the head of the humerus not demonstrably due to fracture, but probably the result of chronic, non-suppurative inflammation.

It would seem as if in certain instances the cause of the recurrence of the dislocation was insufficient immobilization of the arm after a primary dislocation. The arm should be immobilized for at least ten days in order that the rent in the capsule of the joint may close.

SYMPTOMS AND DIAGNOSIS. Six cases are here presented for analysis, and of these, four have been carefully observed with regard to certain symptoms not heretofore recorded. The other two cases occurred earlier, and were not recorded in these especial symptoms.

In the four cases closely observed, three of the right arm and one of the left, the right shoulder has in all cases drooped.

Muscular Atrophy. Certain of the muscles of the affected side have been so notably atrophied and flabby that they have at once attracted attention on examination. The other muscles have not been notably smaller than those of the other side. The group of muscles affected in these cases has been uniform and constant.

The atrophied muscles are

- Coraco-brachialis.
- Triceps.
- Deltoid, especially the posterior part.
- Supra- and infra-spinatus.
- Rhomboids.
- Levator anguli scapulæ.
- Latissimus dorsi.

In a case observed by Lovett, where three dislocations of the right shoulder had occurred inside of a year, each from a sufficiently heavy fall, there was no marked atrophy of these muscles one week after the third accident.

Electrical examination in Cases III. and VI. showed no reaction of degeneration and no qualitative change except in the deltoid, which was more irritable on the affected side (Case VI.).

Limitation of motion was present in all cases to a slight extent, and

this limitation was not due to pain nor to fear of displacement, but apparently to some lesion in the joint-mechanism. This was noticed chiefly when the arm was abducted by the patient to a right-angle with the body, and upward swinging of the forearm was attempted. Such rotation in this position was not so free as on the other side. In three of the cases abduction of the arm was limited.

Examination by the fluoroscope showed that the kathode rays penetrated the affected shoulder with more difficulty than the other, and at no time was the picture so clear. It could be seen that the head of the humerus was further from the acromion in the affected shoulder. It could be replaced and made to look like the other by raising the point of the elbow. (Cases IV. and VI.)

It should be noted that a large proportion of epileptics are found in all reported cases. Another point of interest is that, although reduction is, as a rule, easy, and inflammatory reaction in the joint is notably slight or even wholly absent after reduction, these patients have a constant and exaggerated dread of dislocation. The condition of "panic" when recurrent dislocation does occur seems to be an analogous mental condition to that of patients with hæmoptysis.

PROGNOSIS. In a shoulder-joint where a dislocation has once or twice occurred from insufficient cause it is not likely that the liability will become less frequent as time advances, if no treatment is undertaken. As a rule, the dislocations will occur with greater frequency and from slighter causes as time progresses.

TREATMENT. The methods of treatment may be classified under four heads :

1. By apparatus.
2. By massage and exercises alone.
3. By temporary fixation and massage.
4. By operation.

1. *Apparatus.* The use of apparatus confining the arm to the side is to be condemned. It weakens the muscles by causing their disuse. It is uncomfortable and partially disabling, and its use can only be considered justifiable temporarily or under exceptional conditions.

2. *Massage and exercises without apparatus.* This treatment is based on the advisability of improving the circulation and nutrition of the shoulder and strengthening the atrophied muscles. From the observations made as to the atrophy of the muscles surrounding the joint, and the relaxation of the capsule of the joint, it is clear that any improvement in the strength of these muscles is logically called for. The shoulder is allowed perfect freedom during this treatment. Case II., treated in this way three times a week for some months, improved in outward appearance, and the muscles, although not regaining their full tone as contrasted with those of the other side, grew much firmer. Disloca-

tions, however, occurred as frequently as before this treatment was undertaken.

Case III., on the other hand, treated for six months by the same method, has had no dislocation, having gone longer than his usual period, and the muscles of the shoulder have improved in appearance.

Exercises should be made against resistance, and should be directed to the development by special training of the atrophied muscles. Examples of such exercises would be abduction of the affected arm to contract the deltoid, backward movements from the shoulder, forcible extension of the arm for the triceps, and similar movements.

3. *Fixation in connection with massage and exercises.* Prolonged fixation is called for when a second dislocation has occurred from slight cause. The arm is lifted by applying a sling, which supports the forearm and point of the elbow. The arm is held to the side by a swathe, thus preventing all motions of the joint. This removes as much weight as possible from the joint-capsule.

In connection with this treatment daily massage to the shoulder-muscles should be employed, and especially to the muscles found atrophied in such cases. After some weeks of fixation motion should be progressively allowed along with massage and exercises for the muscles ordinarily affected in these cases. This treatment should continue at least three months. Electricity is of help also in causing special contractions of the atrophied muscles. The faradic current of medium strength should be used.

4. *Operation.* The operative measures advocated have been few. The earliest method advised was to cause an extensive scar in the axilla, thereby binding the arm to the side.

Malgaigne (*Traité des Fractures et Luxations*, vol. ii.) advocated subcutaneous incision of the capsule of the joint by a tenotome introduced anteriorly, in the hope of producing inflammatory contraction.

Removal of the head of the humerus has been done several times, with surprisingly good results as to the restoration of motion and in the matter of usefulness of the arm. Excisions for the relief of this condition are recorded¹ by Cramer, Löbker, Küster, Volkmann, Kraske, and Vogt.

Excision of the head of the humerus is a mutilating operation, and will rarely be necessary. It is conceivable that after an exploration of the joint abnormalities might be found which would demand an excision.

Cramer is recorded as referring to an open incision of the joint as a possible operation in this condition in 1882 (*Berl. klin. Woch.*, p. 21).

Gerster (*Rules of Aseptic and Antiseptic Surgery*, p. 8, note 2) in 1883

¹ *Cent. f. Chir.*, 1883, p. 28; *Beilag. z. Cent. f. Chir.*, 1882, p. 73, and 1886, p. 90; *Deutsch. Zeits. für Chir.*, 1880, xiii. p. 167; *Pitha and Billroth*, ii. p. 652.

operated upon a recurrent dislocation where the weight of the arm alone was sufficient to displace the joint :

“ The joint was freely opened by an anterior longitudinal incision, when it became evident that the tendency to dislocation was due to laxity or redundancy of the anterior part of the capsular ligament. By two semi-elliptical incisions a piece of the capsule one inch long and half an inch in width was removed. The capsular wall as well as the muscular and the skin-wound was united by three tiers of interrupted catgut sutures.” Suppuration occurred from improperly kept catgut; the wound was reopened and packed with gauze. No further complication interrupted the course of healing. The habitual luxation was also cured.

In 1892 Ricard (*Bull. de l'Acad. de Méd.*, 1894, p. 334) exposed the capsule of the shoulder-joint by dissection, in the case of a young man, twenty-seven years old, the subject of frequent dislocations of the left shoulder. He did not open the joint-sac, but reefed it anteriorly by stitches passed through its whole thickness about 2 cm. apart. Absolutely normal mobility was secured, and eighteen months later no recurrence of the dislocation had occurred.

A second case was operated on by Ricard a few months later in 1892. The patient was an epileptic, and had had some twenty-eight dislocations. The same operation was performed; restoration of joint-motion resulted, and a year after operation the shoulder had not again been dislocated.

On February 19, 1895, Burrell, through an anterior incision, opened the joint, explored it, removed an elliptical piece of the capsule, and sutured the capsule, thereby shortening it. The history of this case is appended in Case V.

He operated upon a second case February 16, 1897. The history is appended in Case VI.

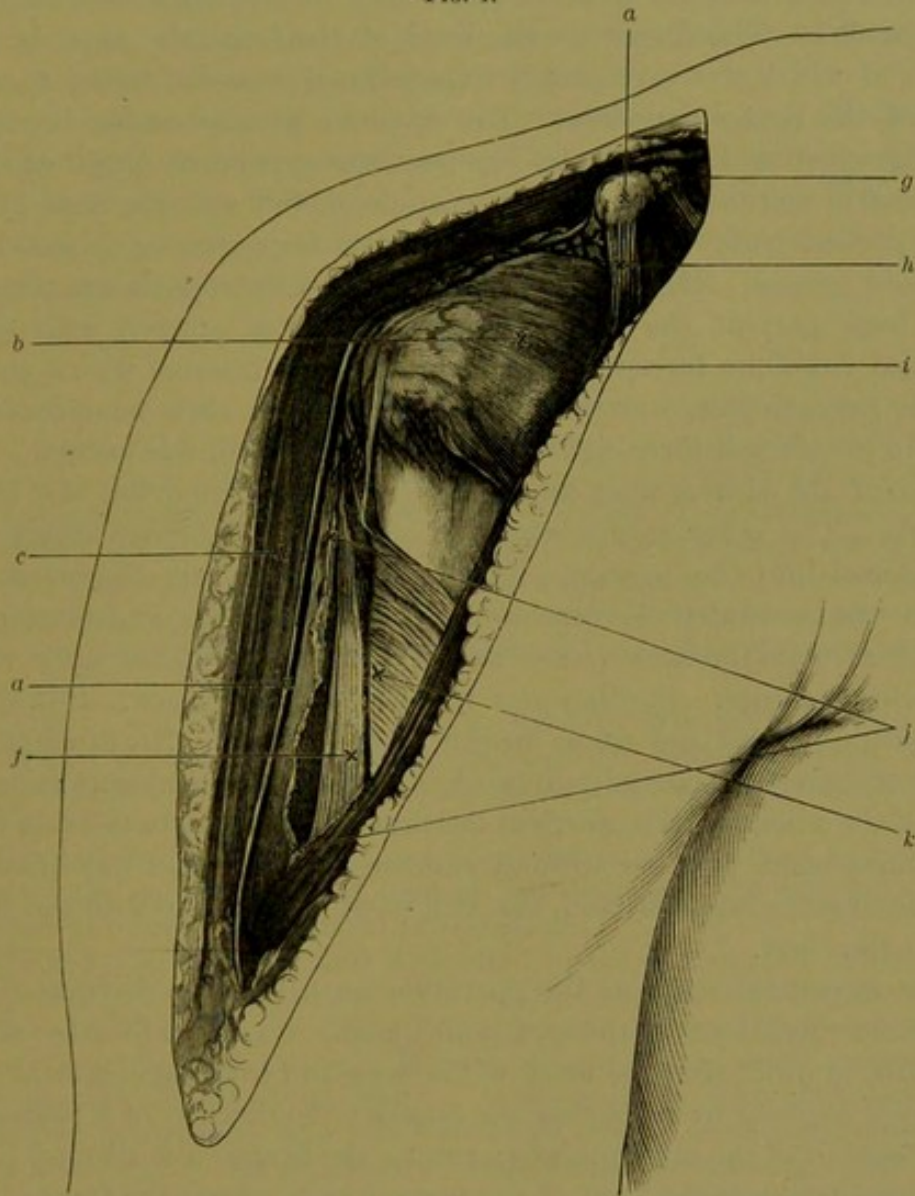
Fig. 1, which shows the field of operation, is a drawing from a dissection kindly made to demonstrate this operation by Dr. F. B. Lund. The important detail which is shown in the cut is the divided tendon of insertion of the pectoralis major. This allows the retraction inward of this muscle, uncovering the capsule of the joint. In order to gain access to the joint the subscapularis muscle should be partially divided. Then with hooked retractors a piece of the capsule can be excised.

The following description gives in detail the operation :

The patient was etherized and the arm slightly abducted. An incision was made from the coracoid process downward and outward, following the line of the cephalic vein to below the upper border of the tendon of insertion of the pectoralis major. The cephalic vein was then recognized, drawn outward, and the intermuscular septum between the deltoid and the pectoralis major was separated with the handle of the scalpel and by a few touches of the blade.

This exposed in the upper part of the wound the coraco-brachialis and short head of the biceps, and in the lower angle of the wound the upper part of the insertion of the pectoralis major.

FIG. 1.



a, coracoid process; *b*, subscapularis muscle covering capsule; *c*, deltoid; *d*, cephalic vein; *f*, long head of biceps; *g*, pectoralis minor; *h*, tendon of coraco-brachialis; *i*, pectoralis major; *j*, edge of divided tendon of insertion of pectoralis major; *k*, tendon of latissimus dorsi.

The acromio-thoracic artery was identified; the upper three-quarters of the insertion of the pectoralis major was divided in order to allow the muscle to be retracted inward and thoroughly to expose the head and neck of the bone. These now came into view, and in front of the head and neck of the bone could be seen and felt, through its sheath, the long head of the biceps.

It was found necessary to clear the tendon of the coraco-brachialis

and short head of the biceps quite up to the coracoid process, and to carry the incision in its whole depth up to the coracoid process.

By externally rotating the arm and dropping it backward the insertion of the subscapularis muscle could be distinguished; its tendon was stretched over the head of the bone. A portion of this insertion was divided. The finger felt the head of the bone, the anterior two-thirds of which was very plainly exposed, and it tended to slip forward toward the coracoid process. The coracoid process could be plainly distinguished, and the capsular ligament was apparently lengthened.

The arm was then abducted to an angle of 45° , and the head of the bone pressed backward to prevent the head from coming up under the coracoid process. By these means the front of the capsule was relaxed. The loose part of the front of the capsule was grasped with three-pronged vulsellum forceps. Three sutures were inserted with a curved needle beneath this, and this fold of the capsule, three-quarters of an inch in length and three-eighths of an inch in width, was excised.

Two of the sutures were cut out at the time of removing the bit of capsule. The other suture was held and tied. Another suture was introduced into the capsule. After these sutures were tightened and tied it was found that the capsule was distinctly tighter and shorter.

The acromio-thoracic artery was divided, and was the only vessel requiring ligation. Sterile water was used for irrigation. Silkworm-gut sutures closed the whole length of the wound. No attempt was made to unite the partially divided insertions of the pectoralis major and of the subscapularis, as when the arm was brought to the side these structures came together without suturing. The wound was dried, an aseptic dressing applied, and the arm fixed to the side with the hand across the chest.

The important steps in the operation are: the free division of the tendinous insertion of the pectoralis major for three-fourths of its breadth, in order that the head of the bone and capsular ligament may be freely exposed by retracting the muscle; the division of a portion of the insertion of the subscapularis; raising the arm to a horizontal plane and pressing back the head of the bone, which relaxes the front of the capsule so that it can be grasped and a bit removed.

A clear differentiation should be made of the anatomical structures, and, with this accomplished, the operation is feasible. The use of a broad retractor, without sharp points, on the inner side of the wound to retract the coraco-brachialis and the vessels is of great importance.

The result of the operation in the first case (Case V.) is that a year and ten months after operation the patient, when seen, stated that there had been no recurrence of the dislocation; that he had been fishing on the Grand Banks during the summer of 1896, and that the motions of the joint were perfect. In the second case (Case VI.), at the end of two

months, the patient is using the arm freely and has had no recurrence of the dislocation.

The first operation took one and three-quarters hours. The second operation took thirty-five minutes. It is purely an anatomical operation, and each anatomical structure must be recognized as carefully as in the ligation of an artery. So far as one can generalize from these two operations it is simple, efficient, and curative.

CONCLUSIONS. The treatment of recurrent dislocations of the shoulder-joint should be by massage and exercise, combined with primary fixation. If this fails after ten weeks' trial, an operation is advisable. This operation should be the exposure of the anterior part of the capsule of the joint, its partial resection, and shortening by sutures.

HISTORIES OF CASES.

CASE I.—A man, aged thirty years, subject to epilepsy, was seen by Dr. Lovett in 1889. The dislocation was subcoracoid, and could not be reduced without ether. It recurred frequently, and was generally caused by epileptic paroxysms at night. The patient only remained under operation for a short time, during which time a bandage was applied, holding the arm to the side. The dislocation was apt to occur whenever the arm was raised from the side. The condition gradually grew worse, and the patient disappeared from observation, being very remiss about treatment.

CASE II.—The patient, a young, healthy, but nervous man, aged thirty-two years, of fair muscular development, was seen by Dr. Lovett October 3, 1896. He had originally dislocated his arm by a heavy fall, and had been treated by an eminent surgeon.

The arm had been kept at rest about ten days, and then he had been allowed the use of it. When seen he had dislocated the arm four times, the last two being upon slight provocation.

He was seen with the arm dislocated in the subcoracoid position; it could not be reduced without ether. The arm was fixed for two weeks, at the end of which time the patient became restive and was unwilling to continue fixation longer. He was warned of the consequences, and was allowed the use of the hand. A few months later he dislocated it in falling down-stairs, and this time he refused to have it done up more than a few days. He experienced little discomfort from the dislocation. He was given massage and electricity, but after a few weeks felt better, and discontinued all treatment. During the summer he went abroad, and dislocated it by a fall of moderate severity.

In the fall of 1896 dislocations became more frequent, and were more easily reduced. He was treated by massage, exercise, and faradic electricity. In spite of efficient massage, given every other day for several months the arm continued to be dislocated at short intervals and on very slight provocation when the arm was in a position of abduction. Fixation for some weeks with daily massage was advised, but declined, and no treatment was pursued.

CASE III.—A well-built and well-developed man, aged twenty-three years, medical student, consulted Dr. Lovett November 19, 1896. Right arm had been dislocated previously at football; it was fixed for a few

days, and then motion allowed. The dislocation was subglenoid, and was reduced without ether. A little later dislocation was produced by football again, and was reduced without ether. At intervals of a few months dislocations were produced by such causes as reaching up, pitching hay, throwing a stone overhand, and the last dislocation occurred in February, 1896, reaching out over a horse. No dislocation has occurred for over a year, but the patient has carried his right hand in his pocket, and tries not to lift it above the level of his shoulder. At present he is being treated by massage three times a week. The muscular condition has improved and a wider usefulness of the arm has been obtained. Except for the continual and characteristic dread of another dislocation, the patient is but little bothered. The muscles show no change in an electrical examination, and the patient can now reach above his head.

FIG. 2.

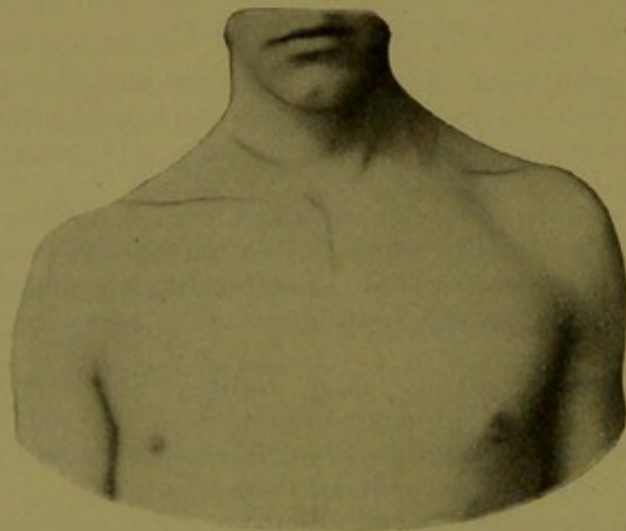
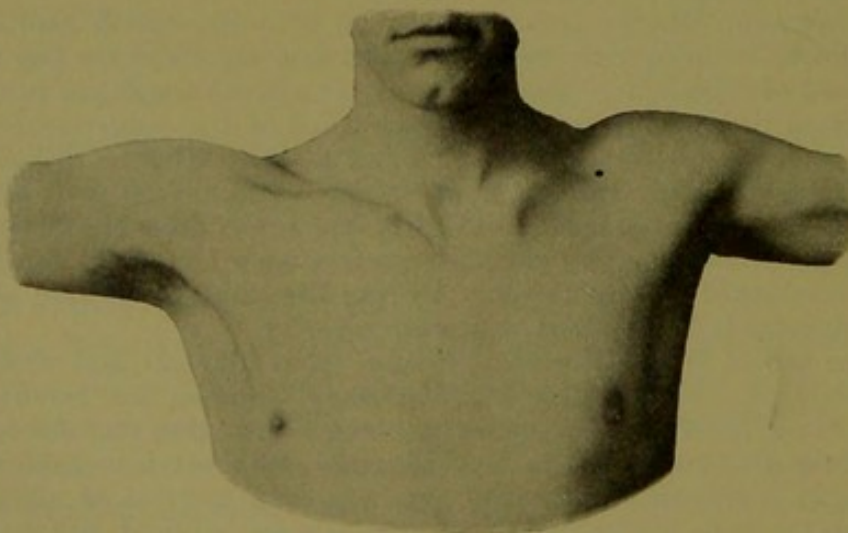


FIG. 3.



Case IV.—Showing the atrophy of certain muscles of the left arm.

CASE IV.—Seen by Dr. Lovett February 23, 1897. A professional ball-player. Dislocated his left shoulder October, 1894, in playing foot-

ball, being kicked in the axilla. The dislocation was subcoracoid, and was reduced under ether. The arm was fixed for a few days; two weeks after he began using it, and used it as well as ever.

In April, 1896, he dislocated the arm again in swinging for a standing jump; the dislocation was reduced without ether. Fixation for ten days. The first of February, 1897, he fell on ice, again dislocating the arm—a subglenoid dislocation. He kept the arm quiet for ten days, and three weeks later the arm was still sore.

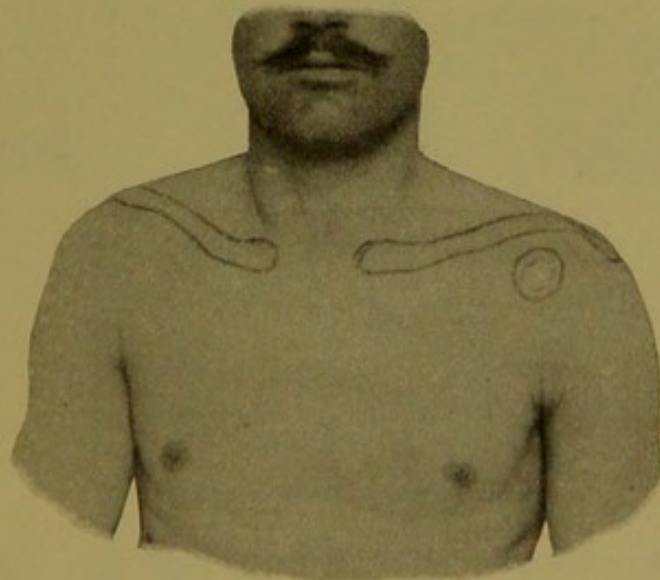
An x-ray examination showed that the head of the humerus was not as near the acromion as on the other side. It could be restored to place by pressing the arm upward. The capsule was obviously lax, and the humerus “dropped.”

The atrophy of the muscles was characteristic. The arm was at once fixed by a sling and swathe for six weeks. Daily massage was given along with faradic stimulation of the atrophied muscles. Then the use of the arm was gradually resumed, and vigorous exercises, both special and general, were given to restore mobility and usefulness. The muscles improved much in appearance and feeling, and by the middle of April he was able to fill his place as catcher of a baseball nine.

CASE V.—Was seen by Dr. Burrell. The patient was twenty-seven years of age, a fisherman by occupation, whose history was as follows:

In August, 1893, fell from a staging and struck on the elbow and shoulder-joint. The dislocation was reduced by a fellow-workman, and

FIG. 4.

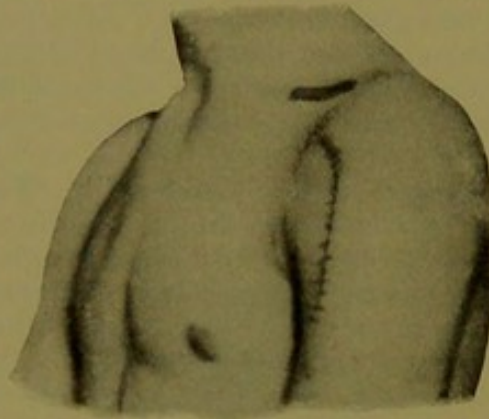


Case V.—Before operation, showing the apparent “dropping” of the left humerus.

the patient remained at his work that day. There was no subsequent treatment. There have been numerous recurrent dislocations ever since the accident. At first he used to reduce the dislocation himself and continue work, but of late the joint will not remain reduced for any length of time. Can reduce it more easily than at first. There is some pain in the shoulder.

The patient is well developed and nourished. There is a history of epilepsy. The head of the humerus can be felt apparently in its normal position. There is some atrophy of the deltoid muscle. The sulcus between the deltoid and pectoralis major is very marked, and there is some flattening of the posterior scapular muscles.

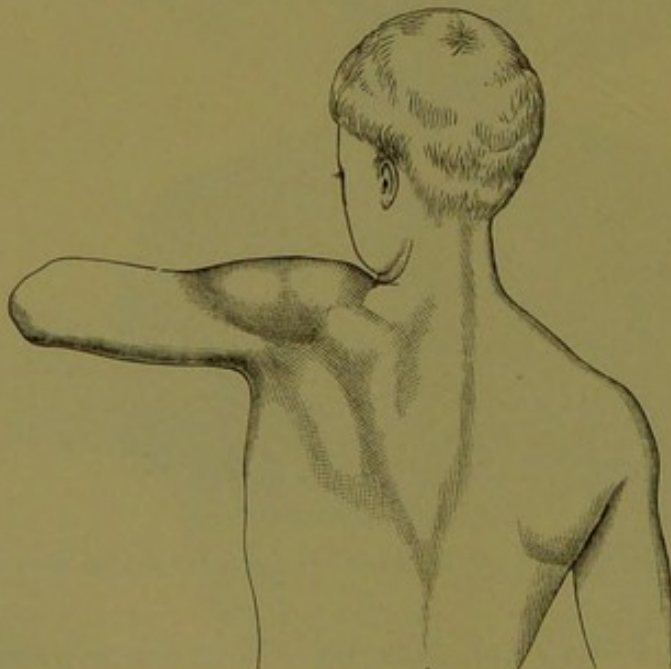
FIG. 5.



Case V.—After operation.

The patient requested that the arm be amputated, as it interfered so seriously with his work. The dislocation has taken place so frequently that he cannot remember the number of times it has occurred. Recently while turning in bed he has frequently dislocated the shoulder-joint.

FIG. 6.



Case V.—Showing atrophy of the left scapular muscles and latissimus dorsi.

On February 19, 1895, an incision was made over the deltoid muscle, beginning at its insertion and extending up about six inches. The fibres of the deltoid were separated, and three-fourths of the tendon of the

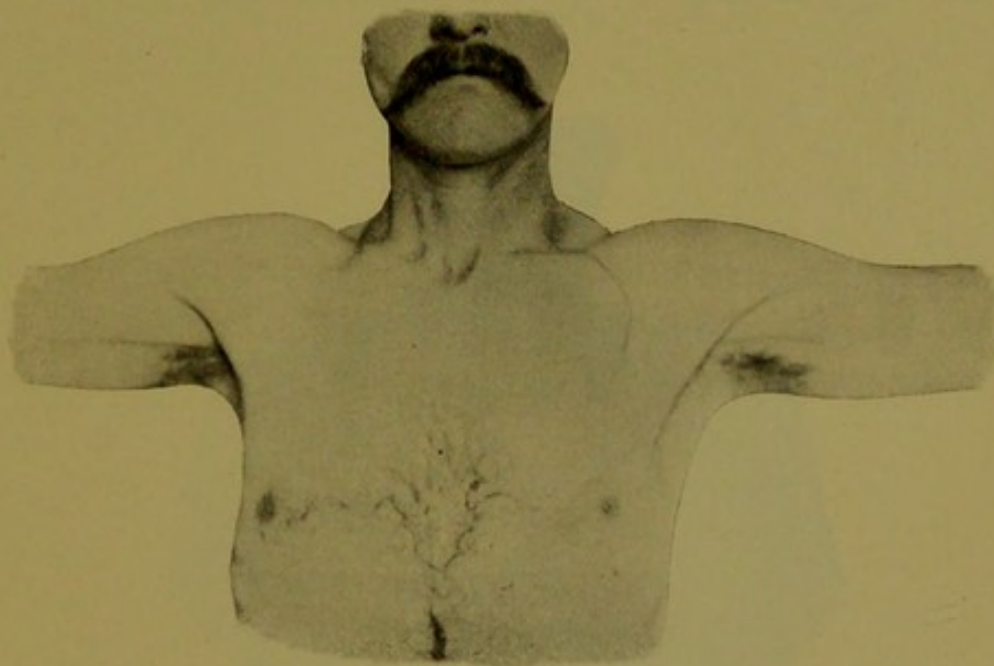
insertion of the pectoralis major was slit down to permit access to the joint. The capsule of the joint was found intact, but very loose. From the inner and anterior aspect of the capsule a piece was removed 4 cm. long and 1 cm. broad. This opened the joint. It was explored, and so far as could be felt was normal.

The capsule was closed by catgut sutures, and the wound was closed by silkworm-gut sutures. A sterile dressing was applied, the arm being put up with the forearm flexed and the point of the elbow raised and carried inward toward the median line.

There was considerable pain after the operation, but it was controlled by morphine. Aseptic healing occurred. The arm was dressed and all the sutures removed in twelve days, but the arm was restrained by a Velpeau bandage. Massage was carried out in this case for four weeks, and the patient returned to his full work at the end of eight weeks from the time of operation.

CASE VI.—Applied at Outpatient Department of the Boston City Hospital in February, 1896, and was operated upon by Dr. Burrell on February 16, 1897. Patient is a well-developed man of medium height, thirty-six years of age, a roofer by trade. During his life has given evidence of "petit mal."

FIG. 7.

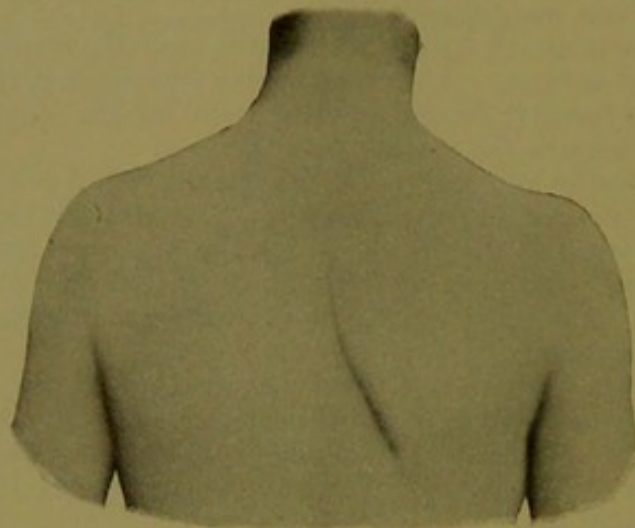


Case VI.—Before operation; front view.

About a year ago, while learning to ride a bicycle he fell off and dislocated his shoulder. It was easily reduced and he continued his ride. Twenty minutes later he ran into a fence and dislocated his arm again. It was again reduced without ether, and was lame for some time, although no surgical treatment was adopted. Since that time he has dislocated the arm thirty-five times. It dislocates with the greatest readiness and from very slight causes. While under observation at the hospital he was asked to raise his hands to the level of his shoulder, which he did, and in lowering them the right humerus slipped and was dislocated into the subcoracoid position; it was easily reduced by the Kocher manipu-

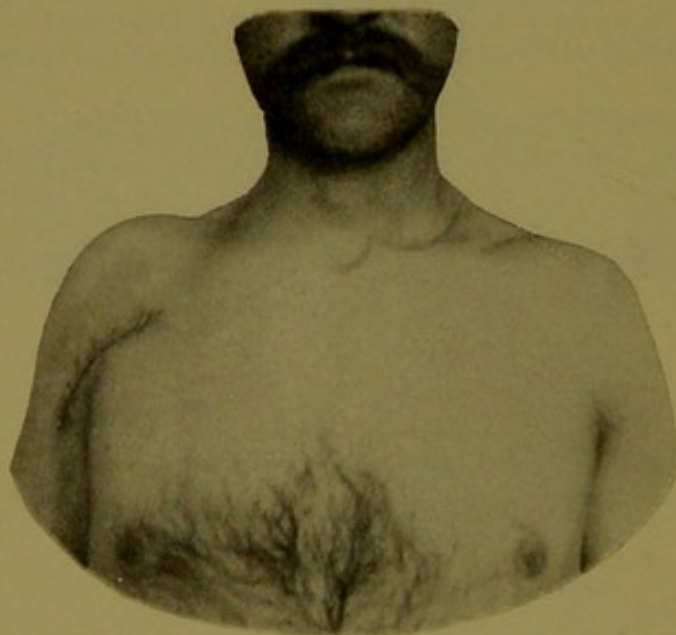
lation. During the past two months he has found that on raising his arm above his head the shoulder would slip out of place. He usually reduces it himself.

FIG. 8.



Case VI.—Before operation, showing the atrophy of the scapular and other muscles of the right side.

FIG. 9.



Case VI.—After operation, showing the cicatrix.

His right shoulder droops. There is a moderate and characteristic atrophy of the muscles about the shoulder-joint. An x-ray examination showed that the tissues over the affected shoulder did not transmit the x-rays as easily as the other. A small amount of dropping of the head of the humerus could be seen. In this second operation a good deal of care was taken to record the various steps in order that it could be presented for publication; *vide* description of operation.



