

FRACTURE OF THE CORACOID PROCESS OF THE SCAPULA CAUSED BY MUSCULAR ACTION.*

WITH REPORT OF CASE.

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The following is my record of the case :

A man, 57 years of age, a trolley car conductor by occupation, while trying to forcibly put a drunken man off of his car, experienced a sudden and severe pain in his right shoulder, which practically rendered his right arm useless. He is sure that he neither fell, nor that his shoulder was struck in any manner. At the onset of the sudden and severe pain he was steadying himself by holding to the hand rod on the rear platform of the car with his left hand, the passenger being on the same level as the conductor, and was pulling with all his strength through his right arm trying to expel the disorderly passenger. During the several hours following the accident that he remained at work, he experienced severe pain in the right shoulder and an inability to use his right arm in ringing up fares or signalling the motorman.

The patient is a well developed, powerfully muscled man. When he presented himself to me, October 15, 1906, he was unable to raise his right arm from his side. He could elevate his shoulder but could not shrug it forward, although he could, with little discomfort, throw his shoulder backward, after it had been pushed forward.

The function of his forearm and hand was unimpaired. Examination revealed nothing wrong in the shoulder joint, clavicle, or acromion process, but severe pain was induced when pressure was applied over the coracoid process, and bony crepitus was elicited in this area.

* Read before the Philadelphia Academy of Surgery, December 3, 1906.

A fracture of the coracoid process being evident, the right arm was dressed in the Velpeau position, and later in the evening Dr. Fussell saw the case with me and confirmed the diagnosis. As the patient experienced great inconvenience from the Velpeau position, the dressing was changed, binding the right arm to his side, and leaving his forearm free.

Two or three days later, Dr. Pancoast of the University of Pennsylvania Hospital, took a skiagraph of the injured shoulder, and it revealed a fracture at the middle portion of the coracoid process, with a tipping downward and inward of the distal portion of the process. Dr. Pancoast said there had been many patients referred to him with a clinical diagnosis of uncomplicated fractured coracoid, but that this was the first case to be confirmed by the X-ray findings.

Result.—About the middle of the sixth week, crepitus having disappeared and the fracture apparently firmly united, the shoulder was treated by light massage and passive motion. He returned to work at the end of the seventh week. He is still unable to raise his right arm high above his head.

Fracture of the coracoid process of the scapula is not common, and an uncomplicated fracture of this process is a rare condition, while of its fracture by muscular force I could find but three cases mentioned. One of these was evidently discovered in the cadaver during dissection, another observed by Hulme, and the third a brief reference to a case of Stimson. These reports will be fully referred to later in this paper.

It is interesting to note the opinions of the earlier authors upon this fracture.

MALGAIGNE says: "This fracture is excessively rare, and does not occur except in company with other fractures and enormous contusion of the soft parts, so the case is generally of the gravest nature."

In S. D. GROSS'S *System of Surgery*, 1864, we find the following comment: "The coracoid process is sometimes broken in consequence of a severe fall or blow, generally a short distance from its tip, the fracture being usually accompanied with great contusion of the soft parts."

ASHHURST, in *Science and Anatomy of Surgery* in 1869, says: "The coracoid process is seldom broken, there not being more than ten or twelve unequivocal cases of this accident on record. It cannot

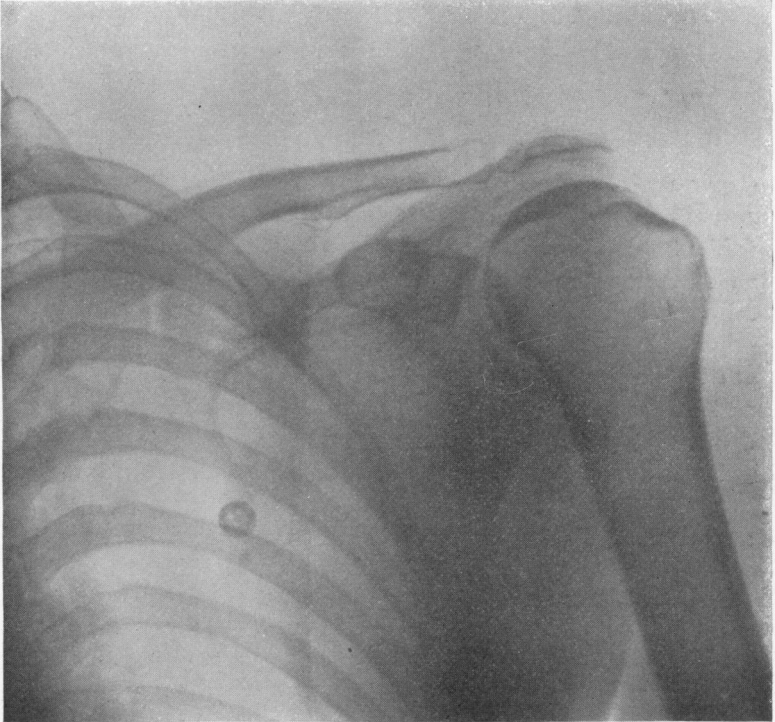


FIG. 1.—Fracture of coracoid process of scapula. Tip tilted inward.

happen except by direct violence." And even in a work as late as Scudder's "Treatment of Fractures," second edition, the coracoid process of the scapula is not mentioned as ever being the seat of a fracture.

Prof. EDWARD BENNETT of Trinity College, Dublin, in 1873, in reporting a case of epiphyseal separation of the coracoid process in a child of 6 years of age, caused by a crushing force, concluded with the following: "This specimen is of particular interest in as far as it completes the series of coracoid fractures in our collection, which contains already several specimens of the fracture associated with the dislocation of the humerus, a specimen of fracture from muscular action and fractures from direct injury in the adult."

J. Wellington Byers, of North Carolina, reviewed the fractures of the coracoid process up to 1885, and collected a score and a half of authentic cases of coracoid fracture but found none caused by muscular action. The following are his remarks on the etiology of the condition: "To class these injuries according to the manner of causation, it will be found that nearly half of them result from falls upon the shoulder, the others resulting from direct blows."

Byers either discredited or overlooked a case of fracture of the coracoid process by muscular action, reported in the *Lancet* in November, 1873, and thus described by HULME:

"T. H., æt. 57, miner. Three weeks previously he was on a bank in the act of passing through a wire fence when he slipped and in falling his left arm caught in one of the wires. He instantly felt a severe pain in the fingers, followed by loss of power in the arm and inability to raise the arm from the side. On examination it was found that the coracoid process of the left scapula was fractured and drawn downward."

R. CLEMENT LUCAS in Guys Hospital Reports, 1890, gives five methods of fracture of the coracoid process of the scapula.

(1) Direct violence. (2) By dislocation of the humerus. (3) By extreme flexion of the shoulder joint, when the coracoid process is thrown into forcible contact with the under surface of the clavicle. (4) By downward crushing of the clavicle upon it. (5) By sudden muscular action.

Mr. ARBUTHNOT LANE in 1887 first called attention to the extreme flexion of the shoulder joint as a probable cause of fracture of the coracoid and cited as instances two cases quoted by HULKE in Holme's System of Surgery. They are thus described :

"Two cases of fracture of the coracoid process have come under my notice. In both the fracture was caused by a fall forward from a slight height, with the arms stretched forward. There was mobility of the tip of the process with crepitus and pain, but not displacement."

The comments of LUCAS are: "If this account be correct, Mr. Lane's explanation would appear to be the only possible one."

If the opinion of Mr. Lucas explains the two cases observed by Hulke, I think the theory of Lane, that extreme flexion may be the cause of the fracture, applies equally as forcibly to the case I have just quoted, which Hulme attributes to muscular action, for Hulme says that in falling the patient caught his left hand in one of the wires of the fence; this it seems to me would cause extreme flexion of the shoulder. The specimen referred to by Bennett, as being caused by muscular action, is in the museum of Trinity College, Dublin. There being no record of an examination at the time of accident and no history of the case, its etiology can hardly be considered unequivocal.

Stimson, in his work on fractures and dislocations, speaks of the fracture of the coracoid process of the scapula in this manner:

"This may be caused by muscular action or by direct or indirect violence. In the former the causative effort is sometimes comparatively slight, wringing of wet clothes in one case, but more often is a powerful effort made with the arm.

In reviewing the literature I have carefully read all the reports and reviews of the cases that I could find and found no case caused by muscular action, that had a full history of the accident and physical examination confirmed by skiagraph.