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RUPTURE OF THE PECTORALIS MAJOR MUSCLE

A Case Report

By

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While the biceps muscle tendon shows the highest rate of rupture of all tendons, this lesion is very infrequent in the tendon of the pectoralis major. According to *Pulaski & Chandler* (1941), the first case was published in 1822 by Patassier. In this, septic infection developed in a haematoma arising in connexion with the damage, and the patient died. *Borcher & Tontscheff* (1932) found that only 10 cases had been described by the beginning of this century. These authors reported one case of their own, and *Pulaski & Chandler* (1941) likewise reported one. In addition, the latter authors analysed the 19 cases previously published and suggested a classification according to the mechanism of the injury, *i.e.* 1) exceptionally strong contraction of the muscle, 2) a direct blow on the muscle, 3) a combination of these two mechanisms. In two cases children had performed very heavy work. In another two cases there was no history of trauma. In these, the damage was attributed to marked atrophy of the tissues due to old age. *Kingsley* (1946), too, reported one case and surveyed the previous literature. In his textbook, *Bunnell* (1964) describes a case in which the patient had been run over by a lorry, and the obvious cause was thus direct trauma. *Danielsson* (1964) describes this rupture as a typical lesion in athletes, mainly in wrestlers. This does not appear to be generally recognized, since I have not been able to find any mention of it in the available literature on injuries sustained by athletes. My own case belongs to this group.

Summarizing the cases described in the literature, it may be stated that the majority have been untreated and have later been diagnosed

incidentally. They have exhibited varying degrees of limitation of adduction and inward rotation, movements which are performed solely by the pectoralis major. It appears that the rupture mostly did not occur at the insertion into the humerus. Since in many cases the loss of function has not been described as total, it may be assumed that a partial rupture was involved, or that some kind of adhesion with adjacent tissues had formed. Apart from the insertion, the pars clavicularis, sternocostalis and abdominalis may be the site of the rupture.

The present patient was a 24-year-old salesman, who had practised weight-lifting for many years. He was of typical athletic build, and in very good condition and had mostly been in good health. He had not regarded himself as fit for top results owing to certain difficulties he had with his foot muscles. When the accident happened, he was lifting 190 kg supine on a bench. For some reason or other, the weight swerved in a way that affected the right arm. He felt a sudden pain high up medially in the arm. People at the other end of the hall heard a dull snap, as when a thick rope breaks in two. Then the patient himself noticed that the right arm could not be moved in the direction of the contralateral shoulder.

The next day when the patient presented himself at the Outpatients' Department, active inward rotation and adduction of the right arm were impossible, while other movements were normal. Passive mobility was intact. No contraction of the pectoralis major was visible or palpable at the anterior axillary fold, which appeared to be softer and limper than that of the unaffected side. On contraction, the sterno-costal part of the muscle appeared to bulge forward somewhat, though not conspicuously. A large haematoma extended from the site of the insertion of the pectoralis to the middle of the medial part of the forearm (Fig. 1). A roentgenogram of the shoulder joint showed nothing noteworthy. The soft-part shadow appeared to be normal, but the investigation was hampered by the strong development of the musculature.

All signs were indicative of rupture of the pectoralis major. The problem was to decide whether the rupture was partial or total. The site of the haematoma and the tenderness suggested a rupture near the insertion into the humerus. Operation was regarded as indicated, particularly owing to the patient's interest in weight-lifting. It was necessary to restore muscular function as completely as possible.

At the operation a longitudinal incision was made along the insertion of the pectoralis major to the humerus. A total rupture of the tendon was revealed in the immediate vicinity of the posterior bicipital

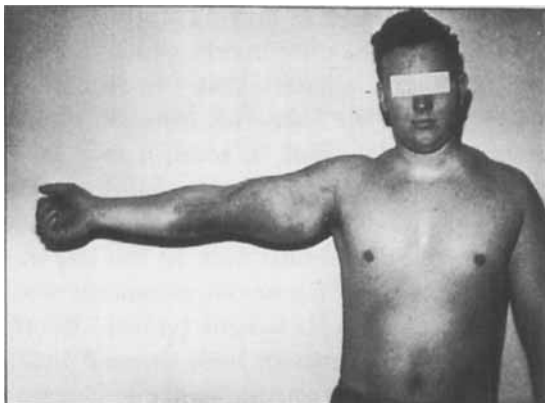


Fig. 1.

The condition one day after the accident and before operation. The outline of the pectoralis muscle at the anterior axillary fold was not so conspicuous as usual and not what might be expected in an athlete. A large haematoma had developed, which extended as far as the middle of the forearm.

ridge. The rupture surface was very smooth; it looked almost as if it had been incised. Distally, a remnant of the insertion, the size of a finger-tip, was detected. The rupture had occurred practically at the bone surface, and the muscle had retracted a few centimetres. The problem was to establish a strong reinsertion of the muscle to the bone surface. For this purpose two holes were drilled perpendicularly into the posterior bicipital ridge. Through each hole two silk sutures were drawn, and a further two through the small, remaining insertion stump attached to the humerus. Thus, at total of six strong sutures were applied. After the operation, the arm was immobilized with an elastic adhesive bandage for three weeks. During the first two weeks the arm was kept in adduction with the hand directed towards the contralateral shoulder. Exercise was commenced after six weeks. After eight weeks the joint had regained normal mobility in all directions. Later, it was found that the patient had secretly taken up weight-lifting as early as eight weeks after the operation. Obviously this had no untoward effects. Three months after the operation he reported that he had been able to lift 100 kg. The arm was practically painless. By then he had not yet resumed supine exercises, however, and in general he had tried not to strain the operated arm unduly. The observation time is now two years (Fig. 2). Muscular function is completely restored, and the mobility of the shoulder joint is normal.



Fig. 2.

The patient is seen lifting 50 kg three months after the operation. In fact, he had by then already lifted 100 kg.

DISCUSSION

The majority of cases described in the literature have been conservatively treated. They have not come under treatment until a long time after the lesion was sustained, and many have been diagnosed incidentally. The result has been limitation of function varying in degree. In the present case the rupture was total. Spontaneous restitution of muscular function seemed very improbable.

Rupture of the pectoralis major muscle has previously been regarded as very infrequent. In its more or less partial form it does, perhaps, occur in athletes more often than has been presumed. Total rupture must still be considered a rarity, however. Obviously the symptoms

may be very pronounced. In uncertain cases an exploratory operation, which is a minor procedure, may be indicated. It is readily understandable that a lesion of this kind is a great handicap to certain athletes, in particular, wrestlers, boxers and weight-lifters.

SUMMARY

A case of total rupture of the pectoralis major muscle is described. The patient was a 24-year-old salesman, who had sustained his lesion during weight-lifting supine on a bench. The weight of the bar bell was 190 kg. Inward rotation and adduction of the arm was rendered impossible. A haematoma developed from the site of the rupture as far as the middle of the forearm. The patient was operated on without delay. Total rupture had occurred immediately at the insertion of the muscle into the posterior bicipital ridge. The muscle was attached to the bone by sutures drawn through holes drilled through the humerus. Complete function was restored. After eight weeks the patient had resumed weight-lifting.

Rupture of the pectoralis major muscle has been regarded as very infrequent. Only a few cases have been described. The majority have come under treatment very late or been diagnosed incidentally. In untreated cases a limitation of function varying in degree results.

RESUME

Un cas de rupture totale du muscle grand pectoral est décrit. Le malade était un vendeur âgé de 24 ans chez lequel la lésion s'était produite au levage d'un poids en position couchée sur un banc. Le poids de la barre de cloche était de 190 kg. La rotation en dedans et l'adduction du bras avaient été rendues impossibles. Un hématome s'est développé du côté de la rupture jusqu'au milieu de l'avant-bras. Le malade fut opéré sans délai. La rupture totale s'est produite à l'endroit de l'insertion du muscle dans la gouttière bicipitale postérieure. Le muscle a été attaché à l'os par sutures, tirées par des trous perforés à travers l'humérus. Une fonction complète a été restaurée. Au bout de 8 semaines, le malade était à nouveau capable de soulever un poids.

La rupture du muscle grand pectoral a été considérée comme très rare. Quelques cas seulement ont été décrits. La majorité des cas ont été mis en traitement très tardivement ou ont été diagnostiqués incidemment. Dans les cas qui ne sont pas mis en traitement, une réduction de la fonction à des degrés variables en résulte.

ZUSAMMENFASSUNG

Ein Fall von vollständiger Zerreißung des m. pectoralis major wird beschrieben. Der Patient war ein 24 Jahre alter Verkäufer, der diese Verletzung erlitt während er auf einer Bank lag und ein Gewicht hob. Das Gewicht der Barglocke war 190 kg. Einwärtsdrehung und Adduktion des Armes war unmöglich. Ein Haematom entwickelte sich von der Rupturstelle bis zur Mitte des Unterarmes. Der Patient wurde sofort operiert. Vollständige Ruptur war direkt an der Insertion des Muskels an der Crista tuberculi majoris entstanden. Der Muskel wurde mittels Suturen befestigt die durch Bohrkanäle im Humerus geführt wurden. Vollständige Funktion wurde wiederhergestellt. Nach acht Wochen hat der Patient das Gewichtstemmen wieder aufgenommen.

Ruptur des m. pectoralis major ist als ein sehr seltenes Ereignis angesehen worden. Nur wenige Fälle sind beschrieben worden. Die Mehrzahl davon ist sehr spät zur Behandlung gekommen oder wurde nur zufällig diagnostiziert. In unbehandelten Fällen bleibt eine verschiedengradige Einschränkung der Funktion zurück.

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