

Ruptured pectoralis major tendon

A case report on delayed repair with muscle advancement

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A total rupture at the humeral insertion of the pectoralis major tendon was repaired 3 months after the injury by sutures through 3 pairs of drill holes in the crest of the greater tubercle. To unload the sutures and to facilitate early mobilization, the mus-

cle was advanced by fascial detachment in the medial-inferior origin of the muscle. Full mobility was achieved in 1 month and full activity was allowed 1 month later.

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A 28-year-old male boxer was lifting a 110 kg weight for the 10th time in bench press when he experienced a pop and acute pain in front of the left shoulder. Although he noticed bulging of the pectoralis muscle and weakened shoulder function, the importance of the injury was not appreciated until 3 months later. On inspection, asymmetric bulging of the left pectoralis major muscle was obvious. The consistency of the anterior axillary wall was doughy. Internal rotation and adduction strength of the shoulder was reduced. The tendon injury could not be seen by MRI.

An incision was made starting in the deltopectoral groove and extending laterally. The ruptured end of the pectoralis major tendon was adherent to the inner surface of the anterior deltoid muscle. Fibrous tissue connected the ruptured end to the humerus which explains the finding of an apparently intact anterior axillary wall. The tendon was 5 cm wide and 2 cm long. In a neutral position of the humerus and with the muscle stretched with 2 clamps, a defect remained, 2 cm in length. It was felt that the sutures would be exposed to too much tension and that the humerus would have had to be immobilized in a disadvantageous adducted position. Therefore, a second incision was made along the medial and inferior margins of the muscle belly (Figure). By gradually incising the pectoralis fascia inferiorly and medially, the tendon could easily be advanced for 2 cm with appropriate tension. 3 pairs of drill holes, 2.5 mm in diameter, were drilled in the crest of the greater tubercle (outer lip of the bicipital groove), and 3 nonresorbable no. 1 Ethibond® sutures were driven through the holes and the ruptured tendon and then tied. In the reinsertion, twisting of the muscle was

kept in mind: the clavicular and upper sternal fibers were attached distally to the crest, while the lower sternal and thoracic wall fibers were attached posterior to them, the lowest fibers having the highest insertion.

Immediately after the operation, pendulum exercises were started, otherwise the arm was immobilized in a mitella allowing 30° abduction. 1 month after the operation he could abduct 100° and had a full range of active rotation. Full activity was allowed 2 months after the operation. During a follow-up at 9 months, full strength of the pectoralis major function was restored.

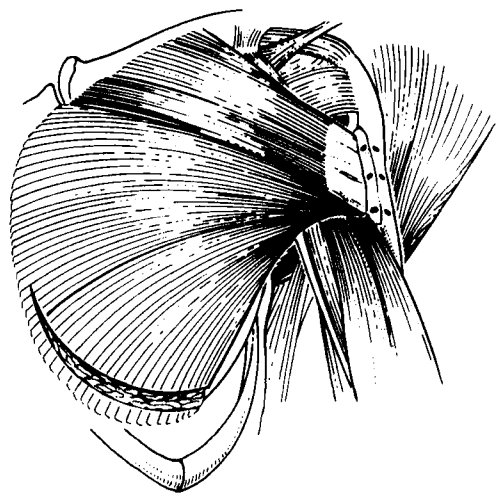


Figure. Through a medial-inferior detachment of the pectoralis fascia, the muscle could be advanced to cover a 2 cm defect. The ruptured tendon was reinserted through 3 pairs of drill holes in the crest of the greater tubercle.

Discussion

Rupture of the pectoralis major muscle, a rare injury, may occur through the muscle by direct trauma or on any part of the tendon by excessive tension (McEntire et al. 1972) including the crest of the greater tubercle (Mackenzie 1981). The most common single mechanism seems to be excessive loading of a contracted muscle in bench press (Kretzler and Richardson 1989). The majority of ruptures occur in the 3rd and 4th decades. The patient feels a sudden pain with an audible pop and with weakness, pain, and deformity later. In a total rupture, the medially retracted muscle bulges distinctly. Hematoma, some retained fibers, or fascia may mask the defect of the anterior axillary wall.

For most of the activities of daily life the pectoralis major muscle is not absolutely essential (Marmor et al. 1961, Zeman et al. 1979).

Closed treatment may be preferred, if the patient accepts reduced strength or if the rupture occurs in the muscle (Marmor et al. 1961, McEntire et al. 1972, Zeman et al. 1979). According to most reports, surgical repair is needed to restore full strength and for continuation of athletic activities (Bakalim 1965, McEntire et al. 1972, Zeman et al. 1979). After closed treatment, a 26 percent peak torque deficit and 40 percent work deficit were found in Cybex testing, and in a bilateral injury, the repaired side had one third more peak torque (Wolfe et al. 1992).

The repair is easier and the results are better after an early operation, within 1 week, than after a

delayed procedure (McEntire et al. 1972, Zeman et al. 1979, Orava et al. 1984). Kretzler and Richardson (1989) repaired 16 ruptures from an acute stage up to 6 years. However, in my case it was necessary to relieve the sutures from tension by gradually releasing the muscle fascia through a medial-inferior incision.

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