

Rupture of the pectoralis major muscle in body-builders

W. J. Rijnberg and B. Van Linge

Department of Orthopedics, University Hospital Dijkzigt, Rotterdam, The Netherlands

Summary. Rupture of the pectoralis major muscle is rarely encountered. However, among body-builders this lesion, commonly called the “pec-tear”, is well known. The bench-press exercise is a common cause. In the following report the typical history, symptomatology, and treatment are discussed.

Case report

A 27-year-old professional top-level body-builder (Fig. 1) presented with a fresh rupture of the pectoralis major muscle. While he was doing the bench-press exercise with weights of 200 kg, he felt a sudden sharp pain and a tearing sensation in his right shoulder. There was immediate loss of strength. Training had begun with an adequate warming-up period, the patient's shoulder being free from complaints or symptoms beforehand. Immediately recognizing the nature of his injury, he had applied ice to the affected area and reported at the casualty department with the request to suture up his ruptured pectoral muscle.

On examination there was swelling and ecchymosis on the frontal side of the axilla (Fig. 2). Function was limited by pain.

Through a deltopectoral exposure a complete rupture at the musculotendinous junction was seen. The skin was unusually thin. Due to the enormous muscle bulk the incision had to be exceptionally large. The tendon was sutured to the muscle with three sutures Vicryl no. 2 and the shoulder was immobilized in a plaster-enhanced Velpeau bandage for 6 weeks. After this period there was 10 cm atrophy of the right upper arm compared to the left, and exercises were started gradually. Six months after the initial injury, a slight asymmetry was visible, but only when the arms were adducted against resistance (Fig. 3). The patient had already resumed his normal training program.

Discussion

During the bench-press exercise in body-building, excessive force is exerted by the pectoral muscles. Especially when the athlete is trying to prevent “going over” of the heavy weights he will rotate his upper body, exerting additional tensile force on the tendon. This may cause a

Correspondence to: W.J. Rijnberg, Department of Orthopedics, University Hospital Dijkzigt, Dr. Molewaterplein 40, 3015 GD Rotterdam, The Netherlands



Fig. 1. The patient

rupture within the muscle belly, at the musculo-tendinous junction or at the point of insertion of the tendon.

Normal tendons do not rupture [4]. However, muscle mass is increased by intensive training. The simultaneous use of steroids and growth hormone may further enhance the effect and facilitates muscle expansion. The tendon probably does not adapt fully to the increased demand and becomes incompatible with the hypertrophic muscle, increasing risk of rupture.

The rupture occurs without any warning. The severity of the injury is sometimes underestimated or the diag-



Fig. 2. Swelling and ecchymosis at the axilla on presentation

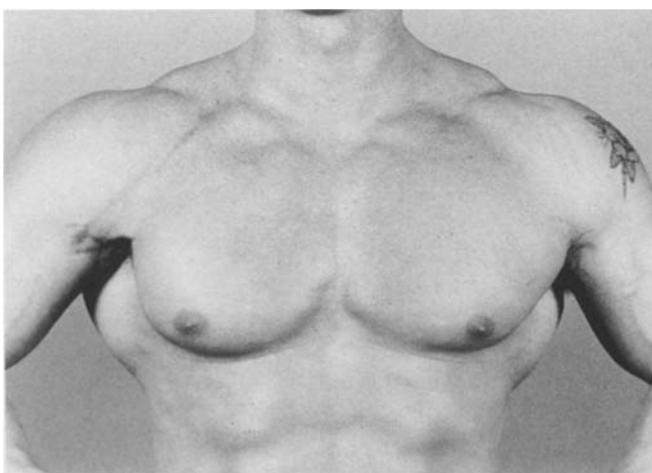


Fig. 3. Appearance 6 months after injury

nosis may be missed. Primarily, the gap in the anterior axillary fold is filled with hematoma, visible only when the arm is abducted or adducted to its point of resistance. The most important diagnostic criteria are: history, swelling and ecchymosis, interruption of the axillary fold, and muscle weakness in combination with a bulging mass like a woman's breast when the arms are pressed towards each other. X-ray and echography can be helpful diagnostic tools.

Virtually normal shoulder function is possible without the intervention of the pectoralis major muscle, although adductive and internally rotational powers are markedly decreased [2]. Conservative treatment of a total rupture at the point of insertion will never achieve a complete recovery of strength, though this loss of strength may be accepted in older or sedentary patients.

In the athlete, immediate surgery is recommended [1, 3], although good results have been recorded where surgery had been delayed [3]. In the case of a distal rupture



Fig. 4. The unacceptable cosmetic result after a similar injury caused the end of this body-builder's career

the tendon can either be fixed with a staple or sutured through drill holes, or a removable pull-out wire may be preferred. The arm is immobilized for 4–6 weeks in endorotated position.

During the operation upon this patient, the tendon and the part of the muscle belly from which the tendon was torn were closely approximated when the fingertips of the patient's right hand were laid on the ventral side of his left shoulder. We think that conservative treatment with the arm bandaged in this position might make suturing superfluous. It is difficult to obtain firm anchorage for a suture in the soft muscle tissue. This is in agreement with Tietjen [5] and Gudmundsson [2], who suggest conservative treatment in case of a musculotendinous rupture.

For the body-builder the cosmetic result is of prime importance. Figure 4 shows another professional with a pectoralis major rupture, which had been conservatively treated in the initial stage with surgical intervention some 12 months later. Cosmetically the results were unacceptable and his professional career was, unfortunately, terminated.

References

1. Egan TM, Hall H (1987) Avulsion of the pectoralis major tendon in a weight lifter: repair using a barbed staple. *Can J Surg* 30: 434–435
2. Gudmundsson B (1973) A case of agenesis and a case of rupture of the pectoralis major muscle. *Acta Orthop Scand* 44: 213–218
3. Kretzler HH Jr, Richardson AB (1989) Rupture of the pectoralis muscle. *Am J Sports Med* 17: 453–458
4. Marmor L, Bechtol CO, Hall CB (1961) Pectoralis major muscle. Function of sternal portion and mechanism of rupture of normal muscle: case reports. *J Bone Joint Surg [Am]* 43: 81–87
5. Tietjen R (1980) Closed injuries of the pectoralis major muscle. *J Trauma* 20: 262–264

Received December 6, 1990