



Acute traumatic brachialis rupture in a young rugby player: a case report

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Acute tear of brachialis muscle is rare and has been infrequently reported. We present a case of acute rupture of the brachialis muscle in a young rugby player. A brief review of literature is also presented.

Case report

A 17-year-old boy, who played fullback for a local rugby club, was referred with pain and swelling in the front of his left elbow after being injured while playing. The mechanism of injury suggested a hyperextension injury to his elbow. While tackling, the opponent's knee hit his extended forearm, and he felt severe pain in the front of his elbow and had a dead-arm feeling. Since then, he had been unable to move his left elbow and had severe pain.

The patient did not receive any treatment immediately and presented to us a week after his injury with marked bruising and swelling around the antecubital area of his left elbow. The elbow was held in 20° flexion, and there was pain on any further active or passive movement. The biceps tendon was difficult to palpate because of the swelling. There was no distal neurovascular deficit.

The patient had undergone an ultrasound examination of the elbow before he was referred. It showed a normal biceps tendon (Fig. 1) and suggested a possible rupture and hematoma of brachialis muscle measuring about 60 mm in length, 13 mm in breadth, and 29 mm in width, just below the midpoint (Fig. 2). Owing to the unusual nature of this injury, a magnetic resonance image (MRI) of the elbow was ordered to confirm the diagnosis. The MRI, which was done about 2 weeks after the injury, showed

an area of heterogeneous fluid collection with hematoma at the myotendinous junction of the brachialis muscle (Fig. 3). The intramuscular hematoma was about 6 cm from the muscle insertion (Fig. 4). Although there was mild edema at the myotendinous junction of the biceps brachii, the tendon was intact.

The patient was advised rest and active range of movement as tolerated. Strengthening exercises were started 2 months after the injury. The patient regained full range of movement and strength by 3 months and returned to active sport by 4 months. At the 1-year follow-up, the patient was asymptomatic. He had normal power of elbow flexion on both sides as measured by the Isobex dynamometer (Medical Device Solutions AG, Oberburg, Switzerland) and scored 100 of 100 on the Mayo Elbow Performance Index.

Discussion

Acute rupture of brachialis muscle is uncommon. Only 4 patients with rupture of the brachialis muscle have been reported in the literature. Van den Bergh et al⁵ reported a 67-year-old man with gradually progressing pain and swelling over his nondominant elbow. The diagnosis was made after an MRI scan. The mechanism of injury in this patient was unknown, but he had been lifting heavy weight the day before the swelling occurred. The injury responded well to conservative management. He was followed up by serial clinical examinations and MRI at 6 weeks, and the tear essentially healed in 10 months.

Nishida et al⁴ reported 2 patients with brachialis tear, both referred on the suspicion of a neoplastic mass in the brachialis. One was a 16-year-old Judo player who presented with a 7-day history of swelling and pain in his elbow, with no single specific traumatic event. The other patient was a 67-year-old man, an active golfer, who

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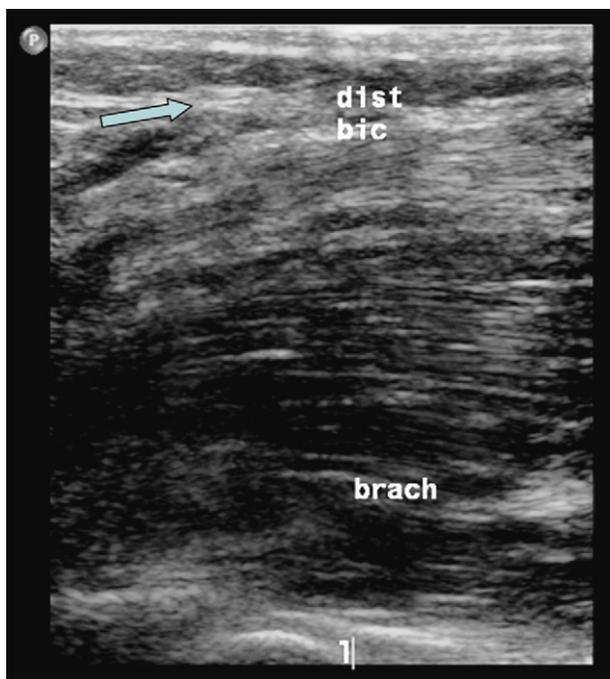


Figure 1 An ultrasound image of the elbow shows the normal biceps tendon (*arrow*) and the brachialis underneath.

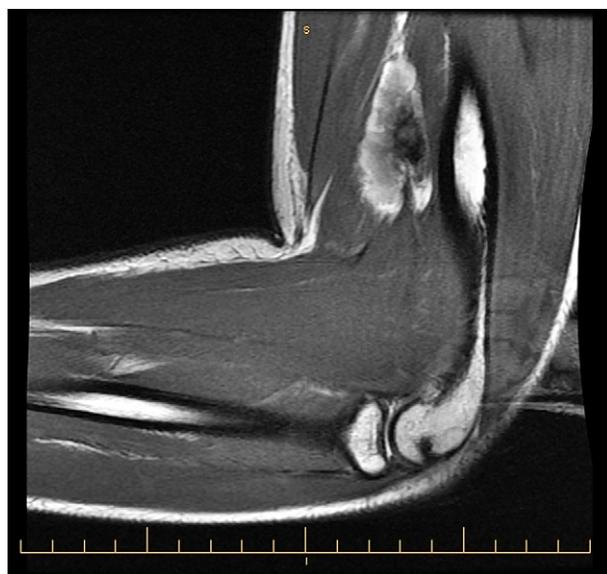


Figure 3 A sagittal section magnetic resonance image of the elbow shows a hematoma in the brachialis muscle belly.

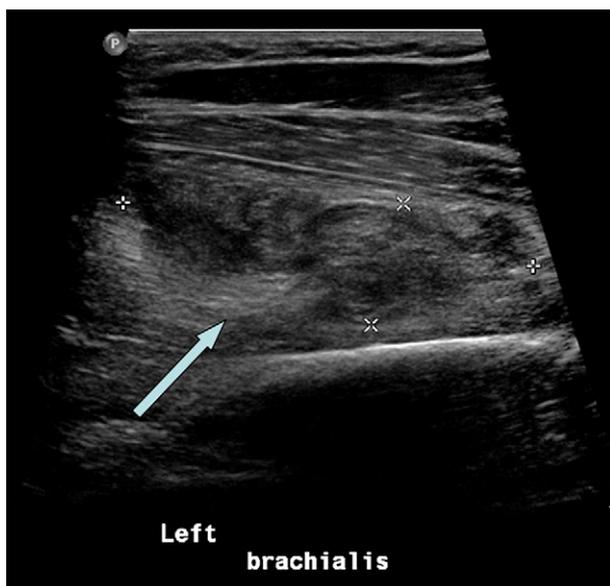


Figure 2 An ultrasound image of the elbow shows the ruptured brachialis (*arrow*).



Figure 4 A coronal section magnetic resonance image of the elbow shows the brachialis muscle rupture.

noticed gradually increasing pain and swelling. MRI helped in the diagnosis of muscle tear, and conservative treatment was successful in both patients.

The fourth patient was a 17-year-old high school football player⁶ who was tackled and sustained a hyperextension injury of his elbow. He presented with severe pain and swelling, and MRI showed an intramuscular hematoma measuring 31.2 mm in its maximum diameter with normal brachialis tendon insertion. A repeat MRI 19 days after the

injury showed a decrease in the hematoma size and no underlying lesion.

Kulig et al² has shown that the brachialis muscle is preferentially recruited over the biceps brachii when undergoing eccentric contraction. Nishida et al⁴ suggested that an eccentric brachialis contraction in an extended elbow with simultaneous forearm pronation might cause an injury to the brachialis muscle. Our patient probably had a resistance to flexion of a hyperextended elbow, which

could have caused the eccentric contraction of the brachialis and its subsequent injury.

Of the 4 patients already reported, only the last patient had an immediate significant injury preceding the onset of symptoms. The other patients were subacute presentations. Suspicion of a mass needed to be ruled out in 2 patients because the mechanism of injury was not clear. All patients had an MRI to confirm the diagnosis. None of the previous 4 patients had ultrasound imaging of the elbow, probably due to differences in the preference of imaging modality and availability of trained musculoskeletal sonologists. Nevertheless, ultrasound is a simple and quick modality to rule out a distal biceps rupture and point toward the diagnosis of a brachialis muscle rupture. It is useful especially in the event of a large swelling and bruising when palpating the biceps tendon is difficult.

Elbow injuries are common in rugby and football. In one study of National Football League players, elbow injuries were the most common injuries to the upper limb.¹ Hyperextension injuries were the second most commonly reported injury, accounting for 24% of all elbow injuries. About 53% of all tackling injuries and 63% of all blocking injuries occurred at the elbow. Elbow injuries led to an average of 22 days lost. Tackling was the activity most often (24%) implicated as causing injuries to the elbow, forearm, and wrist. Offensive and defensive linemen were most commonly injured. Although brachialis muscle injuries have not been reported among football players, triceps injuries seem to be common among these athletes.³ The treatment of brachialis muscle rupture is conservative, and all the patients have responded very well to conservative management.

Conclusions

Tear of the brachialis should be on the list of the differential diagnoses in elbow pain and swelling after

an injury. Ultrasound imaging is a simple diagnostic modality to point out the tear, although an MRI may be needed to confirm the diagnosis. A high index of suspicion is needed for the correct diagnosis of this injury. Conservative treatment with rest and physiotherapy leads to good outcome with regards to return to sport.

Disclaimer

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References

1. Carlisle JC, Goldfarb CA, Mall N, Powell JW, Matava MJ. Upper extremity injuries in the National Football League: part ii: elbow, forearm, and wrist injuries. *Am J Sports Med* 2008;36:1945-52. doi:10.1177/0363546508318198
2. Kulig K, Powers CM, Shellock FG, Terk M. The effects of eccentric velocity on activation of elbow flexors: evaluation by magnetic resonance imaging. *Med Sci Sports Exerc* 2001;33:196-200.
3. Mair SD, Isbell WM, Gill TJ, Schlegel TF, Hawkins RJ. Triceps tendon ruptures in professional football players. *Am J Sports Med* 2004;32:431-4. doi:10.1177/0095399703258707
4. Nishida Y, Tsukushi S, Yamada Y, Hosono K, Ishiguro N. Brachialis muscle tear mimicking an intramuscular tumor: a report of two cases. *J Hand Surg [Am]* 2007;32:1237-41. doi:10.1016/j.jhsa.2007.06.002
5. Van den Berghe GR, Queenan JF, Murphy DA. Isolated rupture of the brachialis: a case report. *J Bone Joint Surg Am* 2001;83:1074-5.
6. Winblad JB, Escobedo E, Hunter JC. Brachialis muscle rupture and hematoma. *Radiol Case Rep [Online]* 2008;3:251. doi:10.2484/rer.v3i4.251