

Surgical Management of Acute Distal Biceps Rupture- A Case Report

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Abstract

Distal biceps tendon rupture is a rare condition occurring in young adults due to eccentric extension load applied to a flexed elbow. Patients usually present with pain, history of popping sound and bulge in affected arm. The diagnosis can be made with simple clinical tests and confirmed by ultrasonography (USG) or magnetic resonance imaging (MRI). The condition is a challenging entity to an orthopaedic surgeon due to proximity of neurovascular bundle. Different surgeons prefer different techniques each having its own merits and demerits. Results of reattachment of the distal biceps have been shown to be superior to conservative treatment. Our experience with a male adult is presented who came with clinical signs and symptoms of distal biceps tendon rupture. USG and MRI confirmed our diagnosis. Double incision technique was used and the retracted end of the tendon brought down and braided with heavy non absorbable suture. The tendon was then pulled through the posterolateral incision and buried in a trap door made over the radial tuberosity. Over subsequent follow up good range of elbow motion and pronation-supination was achieved without any complication. With early diagnosis and surgical intervention, an excellent functional outcome can be expected.

Keywords: distal biceps rupture, double incision.

Introduction

Management of acute distal biceps tendon rupture is a challenging entity to an orthopaedic surgeon. The incidence being about 1.2 ruptures in about 100,000 persons with 86 % of patients having involvement of their dominant arm [1].

The most common mechanism of injury is eccentric contraction of biceps causing rupture to occur at the insertion over bicipital tuberosity. Patient usually comes with complaints of popping sound, followed by pain. Diagnosis is done clinically by abnormal Hook test, which can be confirmed with MRI or ultrasound. Operative treatment is preferred over non operative management in adults to preserve the supination and flexion strength. Various approaches have been described in the literature with its pros and cons. Also various methods of attaching the torn ends of the tendon to the bone have been described. Our experience in the management of a case of acute distal biceps tendon rupture is herewith presented.

Patient has been informed that the case will be reported for publication and he has consented.

Case Report

A 57 year male presented with history of fall followed by a pop sound and then complaints of pain in left arm. Clinical examination was done and no obvious fracture noticed. Swelling, tenderness over left forearm was present with abnormal Hook test for distal biceps rupture [Fig 1]. Popeye sign was positive with abnormal contour of affected arm musculature [Fig 2]. Patient had weakness of flexion and

supination and was diagnosed as acute distal biceps tendon rupture. Initial radiographs taken to rule out any fracture. MRI was done and the diagnosis was confirmed. The patient was explained about the options of nonsurgical and surgical management with pros and cons of both. We went ahead with surgical management. Double incision technique was used.

The two incision technique consists of an L shaped incision over the cubital area and the other is the posterolateral incision over proximal forearm. We took a transverse incision over arm as the end of ruptured tendon was retracted proximally into arm. The end of the tendon was identified and brought down from the L shaped incision [Fig 3] and braided with non absorbable suture material. Following this the 2nd incision over previous marked area on the forearm is given, anconeus muscles is raised and a trap door made [Fig 4]. With the help of suture loop carrier the braided end passed through soft tissue tunnel and inserted into the trap door [Fig 5]. Two drill holes are made over dorsal surface through which the suture is brought out and tied securely with elbow in flexion and full supinated forearm [Fig 6]. The tautness of biceps tendon was confirmed after reconstruction [Fig 7].

Results

We followed up the patient for a year and found that there was good strength of pronation-supination and flexion [Fig 8] with reappearance of Hook test. Mayo Elbow Score being 90 (Excellent) and DASH score being 5 (Minimal Disability).

Discussion

Distal Biceps tendon rupture is rare and accounts for about 3% of all biceps tendon ruptures [2]. Distal biceps tendon rupture is usually seen in middle aged adults as a result of sudden extension of the actively flexed elbow or in older persons due to chronic degenerative process [3,4]. Operative and non operative management can be decided after discussing lifestyle and expectations of the patients. Elderly patients who live a

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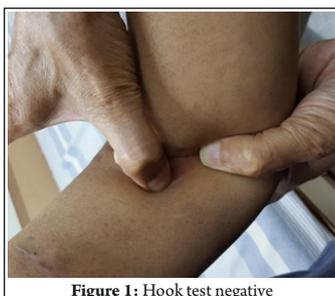


Figure 1: Hook test negative



Figure 2: Popeye sign positive



Figure 3: Retracted end of ruptured tendon identified from separate transverse incision over arm and brought out through L shaped incision



Figure 4: Trapdoor made over radial tuberosity

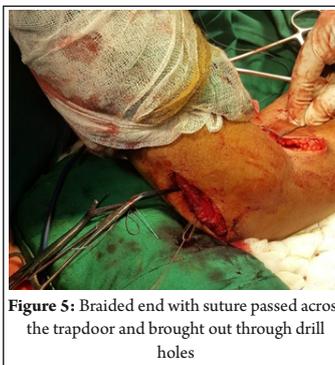


Figure 5: Braided end with suture passed across the trapdoor and brought out through drill holes



Figure 6: Sutures tied with elbow in flexion



Figure 7: Intraoperative picture of repaired tendon with tautness



Figure 8: Clinical picture of 1 year follow up showing complete flexion

sedentary lifestyle, nonsurgical management can be considered. Non surgical management can also be considered in patients with multiple comorbidities and who are high risk for surgical management.

Surgical management includes anatomic and non anatomic fixation. Nonanatomic attachment such as by tenodesis on the brachialis muscle tendon, results in weaker flexion and supination [5,6]. So, anatomic fixation is preferred over non anatomic fixation to obtain optimal function and strength of flexion and supination(7,8)

In patients who report late after injury, there occurs retraction and scarring which hampers the ability to achieve adequate length of tendon. Reconstruction in such cases carries a greater neurovascular risk. Many procedures for anatomic repair of the distal biceps tendon on the radial tuberosity have been described (9)

Various publications on different types of fixation methods of ruptured distal biceps tendon on radius have been described which include bone tunnels,interference screws, suture anchors, cortical buttons(10-15). Yet till today, there is no scientific evidence of superiority of one fixation method over another.

Complications commonly seen after biceps fixation are loss of strength, restriction of motion, heterotopic ossification,

rerupture, pain and nerve injuries (9).

Single incision and double incision approaches have been described. The single-incision approach has a higher incidence of nerve injury mostly neurapraxia commonly involving the lateral antebrachial cutaneous nerve. The double-incision approach has less incidence of neuropraxia but has more chances of stiffness(16).

In our case, we followed up the patient for a year and found out that the DASH score showed minimal disability and Mayo Elbow score was excellent. There was no nerve injury or heterotrophic ossification till follow up.

Conclusions

Distal biceps tendon rupture being rare entity, the operating surgeon must be well versed with the approach of management. Operative management advisable in active individuals to achieve excellent outcomes in terms of flexion and supination strength.

References

1. Safran MR, Graham SM. Distal biceps tendon ruptures: incidence, demographics, and the effect of smoking. Clin Orthop Relat Res. 2002 Nov;404:275-83.
2. D'Alessandro DF, Shields CL Jr, Tibone JE, et al. Repair of distal biceps tendon ruptures in athletes. Am J Sports Med. 1993; 21:114-119.
3. Sutton KM, Dodds SD, Ahmad CS, Sethi PM. Surgical treatment of distal biceps rupture. J Am Acad Orthop Surg 2010;18:139-48.
4. Bain GI, Johnson LJ, Turner PC. Treatment of partial distal biceps tendon tears. Sports Med Arthrosc 2008;16:154-61. <http://dx.doi.org/10.1097/JSA.0b013e318183eb60>.
5. Bell RH, Wiley WB, Noble JS, Kuczynski DJ. Repair of distal biceps brachii tendon ruptures. J Shoulder Elbow Surg 2000;9:223-6.
6. Morrey BF, Askew LJ, An KN, Dobyns JH. Rupture of the distal tendon of the biceps brachii. A biomechanical study. J Bone Joint Surg Am 1985;67:418-21.
7. Baker BE, Bierwagen D. Rupture of the distal tendon of the biceps brachii. Operative versus non-operative treatment. J Bone Joint

- Surg Am 1985;67:414-7.
8. D'Alessandro DF, Shields CL Jr, Tibone JE, Chandler RW. Repair of distal biceps tendon ruptures in athletes. *Am J Sports Med* 1993;21:114-9.
 9. Miyamoto RG, Elser F, Millett PJ. Distal biceps tendon injuries. *J Bone Joint Surg Am* 2010;92:2128-38. <http://dx.doi.org/10.2106/JBJS.I.01213>.
 10. Bain GI, Prem H, Heptinstall RJ, Verhellen R, Paix D. Repair of distal biceps tendon rupture: a new technique using the Endobutton. *J Shoulder Elbow Surg* 2000;9:120-6.
 11. Boyd HB, Anderson LD. A method for reinsertion of the distal biceps brachii tendon. *J Bone Joint Surg Am* 1961;43:1041-3.
 12. Citak M, Backhaus M, Seybold D, Suero EM, Schildhauer TA, Roetman B. Surgical repair of the distal biceps brachii tendon: a comparative study of three surgical fixation techniques. *Knee Surg Sports Traumatol Arthrosc* 2011;19:1936-41. <http://dx.doi.org/10.1007/s00167-011-1591-0>.
 13. El-Hawary R, Macdermid JC, Faber KJ, Patterson SD, King GJ. Distal biceps tendon repair: comparison of surgical techniques. *J Hand Surg Am* 2003;28:496-502. <http://dx.doi.org/10.1053/jhsu.2003.50081>
 14. Gregory T, Roure P, Fontes D. Repair of distal biceps tendon rupture using a suture anchor: description of a new endoscopic procedure. *Am J Sports Med* 2009;37:506-11. <http://dx.doi.org/10.1177/0363546508326985>
 15. Idler CS, Montgomery WH 3rd, Lindsey DP, Badua PA, Wynne GF, Yerby SA. Distal biceps tendon repair: a biomechanical comparison of intact tendon and 2 repair techniques. *Am J Sports Med* 2006;34:968-74. <http://dx.doi.org/10.1177/0363546505284185>.
 16. Chavan PR, Duquin TR, Bisson LJ. Repair of the ruptured distal biceps tendon: a systematic review. *Am J Sports Med* 2008;36:1618-24. <http://dx.doi.org/10.1177/0363546508321482>.

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