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Complete osseous avulsion of the adductor longus muscle: acute repair with three fiberwire suture anchors

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Abstract

Background: An acute tear of the adductor longus tendon is a seldom injury. A proximal osseous avulsion of this tendon has never been reported in literature.

Methods: Acute repair (refixation) of the osseous avulsion with three suture anchors.

Results: Physical examinations 3, 6 and 24 months following the injury revealed no evidence of tenderness over the adductor muscle group, and range of motion was equal to the contra lateral hip. Manual muscle strength testing was 5/5 with resisted adduction and identical to the opposite side. The patient returned to his previous level of sports.

Conclusion: This case seems to be the first description of a proximal tendon rupture of the adductor longus muscle with an isolated osseous avulsion. Surgical treatment of this injury with the use of three fiberwire suture anchorsTM was successful.

Study design: Case report.

Keywords Adductor longus muscle · Tendon · Osseous avulsion · Proximal · Suture anchor

Introduction

The adductor longus muscle arises from the ramus superior ossis pubis and inserts onto the middle part of the linea

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aspera. The muscle is narrow proximally and expands for a broad insertion on the femur. The adductor longus is innervated by the ramus anterior of the nervus obturatorius and is involved in the adduction, the external rotation and in the anteversion.

An acute tear of the adductor longus tendon is a seldom-described injury in literature. In most of these cases the distal adductor longus tendon is involved [2]. Three cases of a proximal adductor longus rupture have been reported [3, 5]. To our knowledge an isolated proximal osseous avulsion of its origin from the pubis has never been reported yet.

Treatment of adductor longus lesions ranges from non-operative procedures to complete excision of the muscle [1]. A typical mechanism of injury is an eccentric overload when forced abduction of the lower limb occurs during contraction of the adductor muscle group.

Case report

A 43-year-old well-trained amateur triathlete did an unmeant exceeding abduction during skiing. After that he felt an acute pain in the groin and the proximal thigh. He had no history of groin pain or adductor problems prior to this injury. Following the injury, he was unable to continue skiing. Swelling, tenderness and an extensive haematoma were noted in the right groin, the thigh, the scrotum and the penis (Fig. 1). Passive abduction and resisted adduction resulted in pain. Manual strength testing indicated weakness of the adductors.

Radiographs and MRI examination revealed a complete osseous avulsion of the adductor longus muscle from the insertion on the pubis to a distance of 3 cm (Fig. 2). He underwent an acute repair of the adductor longus muscle as described in the surgical technique.



Fig. 1 Haematoma in the right groin, the thigh, the scrotum and the penis after injury



Fig. 2 MRI of the pelvis and proximal thigh. Complete osseous avulsion of the adductor longus tendon. Distinct edema and liquid in the muscle. TSE sequence, fat suppressed, coronal plane

Surgical technique

The patient was placed supine on the operating room table. The groin and lower limb were washed and covered in a sterile manner. An 8-cm longitudinal incision starting distal of the medial part of the inguinal ligament was made and the adductor muscle group was prepared by blunt dissection. An osseous fragment in association with an intact adductor longus tendon was found 3 cm retracted distal to the symphysis origin (Fig. 3). The osseous fragment and the pubis-origin were prepared with a burr to create a bleeding cancellous bone. Two titanium-corkscrews with Fiberwire No. 2™ (Arthrex, Naples, Florida, USA) were then placed antero-lateral in the pubis-origin of the tendon. The third titanium-corkscrew with Fiberwire No. 5™ (Arthrex, Naples, Florida, USA) was set antero-medial. The sutures were then passed through the osseous fragment and in a baseball technique through the tendon and secured in adduction and 45° flexion of the hip after reposition of the fragment (Fig. 4). The wound was irrigated, and the subcu-

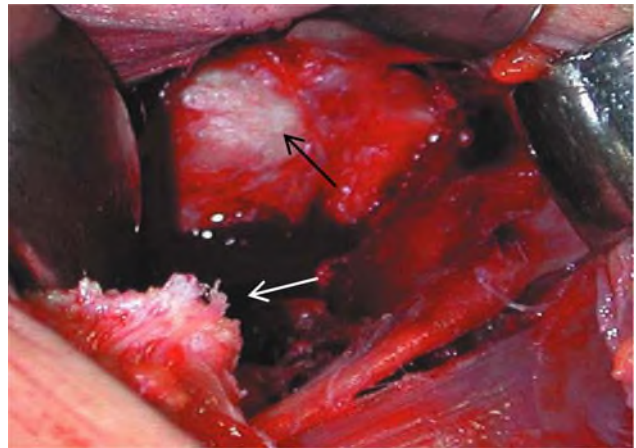


Fig. 3 Intraoperative situs. Osseous fragment of the adductor longus origin (white arrow). Musculus adductor longus origin (black arrow)



Fig. 4 Intraoperative situs. Re-fixation of the osseous fragment with three suture anchors

taneous tissues were closed in layers using absorbable sutures. The skin was closed with non-absorbable sutures. A dry sterile bandage was applied. Postoperatively the patient was immobilized in 45° flexion and 0° abduction in a Newport 3 hip orthosis (Orthomerica) for 6 weeks.

Follow-up

After 6 weeks, efficient transition to full flexion and staged increase in abduction started and strengthening exercises began. The patient returned to full activity without pain in 8 weeks. Physical examinations, 3, 6 and 24 months, following the injury revealed no evidence of tenderness over the adductor muscle group, and range of motion was equal to the contra lateral hip in flexion, extension, abduction, adduction, and rotation. Manual muscle strength testing was 5/5 with resisted adduction and identical to the

opposite side. The patient returned to his previous level of sports.

Discussion

An acute tear of the adductor longus tendon is an uncommon incident. Only a handful of acute ruptures have been reported and only in three cases the proximal tendon was torn.

Treatment of these injuries has included non-operative and operative procedures. The operative procedures range from surgical repair up to excision of the complete muscle.

To our knowledge an isolated osseous avulsion from the proximal adductor longus origin has never been reported in literature.

Two cases of a proximal tendon rupture, which has been reported, included a histological evaluation of the tendon at the time of surgery [3, 5]. Histological evaluation uncovered mucinous, degenerative changes consistent with a chronic overuse injury. The torn adductor tendon in the first report was repaired back to the periosteum using sutures, in the other case suture anchors were used. At three respectively, in 2 years follow-up, the patients were free from pain and resumed their sports at previous levels.

In literature, only one case of a proximal adductor longus tendon rupture with no history of groin pain was described. The torn adductor tendon was repaired with suture anchors and in a 2-year follow-up the patient was free from pain and resumed his sport at former levels.

In our case there was no history of groin pain or any adductor problem prior to the injury. The decision to treat this injury with acute repair was based on the character of the lesion. It was a complete osseous avulsion of the complete intact proximal tendon. Healing as *restitutio ad integrum* for this kind of injury is in contrast to an isolated tendon rupture probable after operative treatment. A conservative procedure in the presented case may lead to a persistent defect with a possible weakness of the adductors.

Akermark et al. [1] described in their study on muscle strength data following tenotomy of the adductors for chronic groin pain this possible problem. The authors showed significantly decreased adductor muscle strength after tenotomy of the adductor longus muscle. The adductor strength was controlled by isokinetic muscle testing. Only

63% of the athletes in this series were able to resume their previous level of play.

In contrast, an acute repair in two professional football players in the article by Rizio et al. [5] led to return to full activity within 3 months without pain. There is no other available literature on the subject of acute adductor tears and the effects of non-operative treatment on residual muscle strength.

Ruptures of the distal tendon from the linea aspera appear to be more frequent with 14 cases reported in the literature [2, 4, 6]. In these studies an acute repair was recommended but was described as difficult and the repair was subjectively inadequate. In all three series, most patients were free from pain and could resume normal activity. However, objective strength testing was not performed on any of these patients, and whether they participated at their previous level was not indicated.

Conclusion

The obviously very rare case of a proximal tendon rupture of the adductor longus muscle is reported. This case seems to be the first to describe this injury with a proximal isolated osseous avulsion. Further, surgical treatment of this injury with the use of three fiberwire suture anchors™ was successful.

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