

# Spontaneous Rupture of Extensor Pollicis Longus Tendon: A Case Report

## Ekstansör Pollisis Longus Tendonunun Spontan Rüptürü: Vaka Sunumu

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### Summary

Rupture of extensor pollicis longus tendon (EPL) is rare. It can be caused by non-traumatic conditions as well as acute traumatic disorders. EPL tendon rupture has been reported as a sequela of chronic tenosynovitis secondary to rheumatoid arthritis and as a late complication of distal radius fracture. Here we present a case with acute spontaneous EPL tendon rupture with no obvious underlying etiological factor. Tendon rupture was repaired by transfer of extensor indicis proprius tendon. After a rehabilitation program including electric stimulation an excellent result was achieved. *Türk J Phys Med Rehab 2009;55:36-8.*

**Key Words:** Spontaneous rupture of tendon, rehabilitation

### Özet

Ektansör pollisis longus (EPL) tendonunun rüptürü nadirdir. Akut travmatik bozukluklara ek olarak non-travmatik durumlarda da görülebilir. EPL tendon rüptürü distal radius kırığının geç komplikasyonu olarak ortaya çıkabildiği gibi romatoid artritte kronik tenosinovite sekonder olarak da rapor edilmiştir. Bizim burada sunacağımız EPL tendon rüptüründe altta yatan herhangi bir neden tespit edilmemiştir. Rüptürün tedavisi ekstansör indis proprius tendonunun transferiyle gerçekleştirilmiştir. Sonrasındaki rehabilitasyon programında elektrik stimülasyonu kullanılmış ve tedaviye yanıt çok iyi olmuştur. *Türk Fiz Tıp Rehab Derg 2009;55:36-8.*

**Anahtar Kelimeler:** Spontan tendon rüptürü, rehabilitasyon

### Introduction

Rupture of the extensor pollicis longus tendon (EPL) is rare. The literature on this subject is poor and study groups are usually small. The rehabilitation program is important for these patients. The purpose of hand rehabilitation is to maximize the residual function of a patient who has had surgery to, or an injury or disease of, the hand or upper extremity. Hand rehabilitation requires team work. Most injuries to the upper extremity require hand therapy. These may include fractures, tendon injuries, crush injuries and amputations. Previous studies have reported that 70-90% of EPL repairs achieve excellent or good results, regardless of the rehabilitation technique and assessment method (1,2). Electrical stimulation (ES) increases the muscle strength and prevents the muscle atrophy (3). We found no report of a EPL tendon rupture rehabilitation program including ES in the literature. Here we present a case of spontaneous EPL tendon rupture treated by tendon transfer and a rehabilitation program including ES.

### Case Report

A 40 year-old, right-handed man who had worked as a petty officer in the army for 17 years, presented at our clinic with loss of extension in the inter-phalangeal joint of the left thumb. There was no history of trauma or inflammatory disease. Fifteen days previously he had realized that he was unable to extend the thumb of his left hand. Physical examination revealed no abnormalities other than the loss of extension in the interphalangeal joint of left thumb. Blood tests, roentgenogram, MRI and EMG were normal.

The patient was referred to orthopedic surgeons with the diagnosis of spontaneous rupture of EPL tendon. Exploration in the operation confirmed the diagnosis. The ruptured tendon was repaired by transfer of the extensor indicis proprius tendon. A short arm spica cast was applied with the thumb in extension position. After 14 days rehabilitation program was initiated. ES was applied from the window on the spica cast twice daily (Figure 1). One week later passive and active range

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of motion exercises were started. At the end of the second week of the rehabilitation program, the patient had regained the full range of motion and normal power in the thumb and wrist.

## Discussion

Here, we present an idiopathic EPL tendon rupture. After a postoperative immobilization period for fourteen days with a rehabilitation program lasting for 2 weeks and including only ES 2 twice daily for the first week and addition of exercise therapy for the second week, the patient regained full function of his thumb. We consider that the recovery period was shortened with no complications by the addition of ES to the rehabilitation program and no complication occurred.

Most of the authors have ignored the obvious anatomical, biomechanical and functional differences between the thumb and other digits, and have considered the thumb simply as another finger in respect of injury to its extensor system (2). Tendon rupture of the EPL can be caused by non-traumatic conditions as well as acute traumatic disorders accompanied by an open wound. EPL tendon rupture has been described as a sequel of chronic tenosynovitis secondary to rheumatoid arthritis and as a late complication of distal radius fracture (4-7). It has been speculated that EPL tendon rupture after distal radius fracture is caused by degeneration of the tendon, poor blood supply to the tendon, increased pressure within the non-ruptured tendon sheath, and repetitive mechanical stress at the Lister tubercle (4,6). The association of EPL rupture with use of systemic or locally injected steroids has also been reported (8).

Extensor indicis proprius (EIP) transfer is considered to be the standard procedure for reconstruction of EPL function in order to restore thumb extension after tendon ruptures or paralysis (9-13). Postoperative treatment usually consists of immobilization in a forearm splint with the thumb in the extension position (10,14). In a recent study Lemmen et al. (15) initiated active mobilization within three to six weeks after the surgery. EIP transfer is a synergistic procedure and coordination



Figure 1. Electrical stimulation technique.

problems for isolated extension of the thumb after tendon transfer is not seen (16). This is most likely due to the fact that, even in patients with immobilized thumbs micromotions may cause a reprogramming in the cortex (17). In a recent study patients in the early active motion group have demonstrated the ability for isolated thumb extension on the second postoperative day and authors have concluded that the reprogramming process was apparently initiated immediately after tendon transfer (18).

Adherence of the extensor tendon by scar tissue to the underlying bone and overlying skin, in association with thickening by scar tissue of the dorsal capsules of the joints, largely explains the loss of thumb movement after repair of the EPL tendon. Tendon tethering is the main pathology. Loss of thumb extension is not a common functional problem but scar tethering of the repaired tendon can result in loss of thumb flexion. Loss of or slowing of inter-phalangeal joint flexion in a thumb can cause important functional problems. The consequent tendon tethering is probably dependent on the method of rehabilitation and compliance with therapy which, in part, is dependent on the pain threshold of the patient (2).

Rehabilitation of tendon injuries has changed significantly over the last 30 years. The first change was from static splinting to partial active/partial passive mobilization using some form of a spring splint, of which rubber band traction is the most common. A second and equally dramatic change was to dispense with the elastic bands and allow active movement of the repaired tendon in both directions within the limitation of a splint (2). Usually, limitation appears at the range of motions after surgery or injury of the hand. To maintain the functions of the hand, range of motion exercises must be started as soon as possible (19,20).

Another technique which can be used in hand rehabilitation is ES. ES causes an increase in the muscle strength with changes in the muscle fibers and the capillary system. It also prevents muscle atrophy due to the prolonged immobilization (3). Besides improving muscle strength, ES also decreases the pain and increases the functional performance due to the gate-control theory of Melzack and Wall (3,21). There is variation in the content and duration of the ES treatment in the literature. The duration of the ES treatment ranged from 3 weeks to 12 weeks and the frequency ranged from 50 Hz to 85 Hz (22). In their study Valli et al. (23) investigated the effect of low intensity ES, and found an increase of muscle strength beginning at the third day. The amount and duration of our therapy were in agreement with previously published studies. In our study, we applied ES from the window on the spica cast. The asymmetric biphasic wave was applied with the frequency of 50 Hz and 100 microseconds of phase time. The stimulation was applied as 30 seconds of contraction and 10 seconds of relaxation. When the spica cast was removed after 2 weeks, muscle strength and the ROM of the interphalangeal joint were within normal limits.

We believe that early ES, which can be added to the exercise therapy, can prevent the complications such as scar formation and muscle atrophy in a short time and also can cause an immediate initiation of the reprogramming process. Further studies with a large group of patients are needed on this subject.

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