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Management of Spontaneous 4th and 5th Digit Extensor Rupture in Rheumatoid Arthritis Using Tendon Transfer and Distal Ulna Debridement: A Case Report

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Abstract **Case Report**

Extensor tendon rupture is a disabling complication of rheumatoid arthritis (RA). We report a 57-year-old woman with RA and progressive loss of extension of the fourth and fifth fingers due to complete tendon rupture confirmed by MRI. Tendon transfer to the third extensor and distal ulna debridement restored function, underscoring the value of timely surgical management in these challenging cases.

Keywords: Rheumatoid Arthritis, Spontaneous Tendon Rupture, Tendon Transfer, Distal Ulna Debridement.

INTRODUCTION

Extensor tendon ruptures are a common and disabling complication of rheumatoid arthritis (RA) [1]. They may result from synovial invasion, ischemic tendon damage caused by proliferative synovium, or mechanical attrition over eroded bony structures such as the distal ulna [2]. Surgical management is frequently required, and tendon transfer has become a widely used technique offering good functional outcomes [3]. We report the case of a 57-year-old woman with long-standing RA who developed progressive loss of extension in the fourth and fifth digits over one year. Imaging confirmed ruptures of the extensor tendons, and she underwent reconstruction through tendon transfer to the extensor tendon of the third digit, combined with distal ulna debridement. This case highlights the multifactorial nature of tendon rupture in RA and underscores the importance of timely surgical intervention. Tendon transfer remains an effective option for restoring hand function in patients with advanced rheumatoid involvement.

CASE PRESENTATION

A 57-year-old woman with a nine-year history of rheumatoid arthritis presented to the orthopedic department with a one-year history of progressive difficulty extending the fourth and fifth fingers of her right hand (Figure 1). This functional decline significantly affected her daily activities. Clinical examination revealed marked impairment in active extension of both fingers, without deformity, swelling, pain, or tenderness. The remainder of the hand and wrist examination was unremarkable.

Radiographs of the right wrist and hand demonstrated osteoarthritic changes and a dislocation of the distal radioulnar joint (Figure 2). MRI was performed to assess soft tissue involvement and revealed extensive exudative inflammatory tenosynovitis, along with severe damage to the extensor tendons of the fourth and fifth fingers. Both tendons showed complete rupture with substantial loss of tendon substance (Figure 3).

A dorsal longitudinal approach between the fourth and fifth metacarpals was selected for surgical exploration, confirming complete rupture of both tendons with significant destruction (Figure 4). Tendon transfer was performed by attaching the ruptured extensor tendons to the intact third extensor tendon to restore active extension (Figure 5). Debridement of the distal ulna was added to prevent further tendon attrition. Postoperative immobilization was achieved with an intrinsic-plus splint for 15 days.

Physical therapy was initiated to improve mobility and strength. At the three-month follow-up, the patient demonstrated marked improvement in active

extension and flexion of the affected fingers (Figure 6), with full recovery of daily function. No complications or re-rupture were noted, and both functional and aesthetic outcomes were highly satisfactory.

Figure 1: Extension deficit of the right 4th and 5th fingers

Figure 2: Preoperative radiograph showing osteoarthritic changes and dislocation of the distal radioulnar joint (DRUJ)

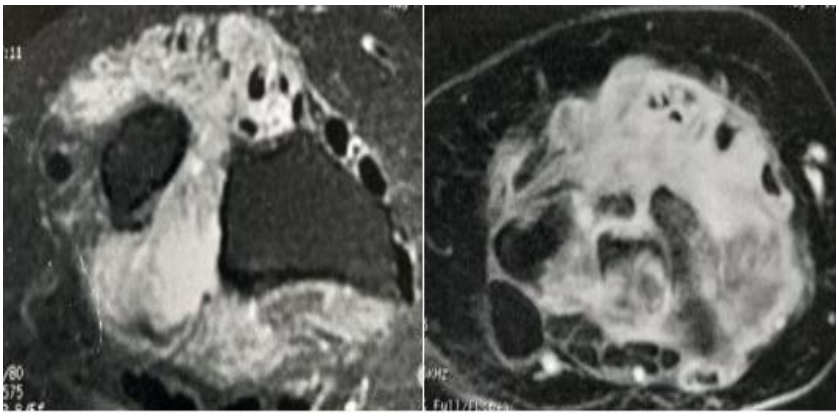

Figure 3: MRI revealing severe tenosynovitis and complete rupture of the extensor tendons to the 4th and 5th digits

Figure 4: Intraoperative view of ruptured extensor tendons before tendon transfer

Figure 5: Intraoperative view showing tendon transfer of the ruptured 4th and 5th finger extensors to the intact extensor of the 3rd finger

Figure 6: Clinical aspect of the hand at three months postoperatively, showing good recovery of both extension and flexion of the 4th and 5th fingers

DISCUSSION

Rheumatoid arthritis (RA) is a chronic, progressive autoimmune disease that affects the hands in nearly 90% of patients [4]. Spontaneous rupture of the extensor tendons is a well-recognized complication, typically associated with persistent synovitis, the scallop sign on radiographs, and dorsal subluxation of the distal ulnar head, also known as caput ulnae syndrome [5]. First described by Vaughan-Jackson in 1948 [6], these

ruptures may result from direct inflammatory infiltration or attritional wear over eroded bony surfaces [7].

In long-standing RA, synovitis and joint destruction destabilize the distal radioulnar joint, leading to dorsal subluxation of the ulna. Contact between the subluxated ulna and overlying extensor tendons, combined with repetitive motion over inflamed synovium, results in tendon attrition and rupture, most commonly affecting the extensor tendons to the small finger (EDC and EDQ) in the fourth and fifth dorsal compartments [8,9]. Ruptures typically begin in the ulnar digits and progress radially. Although joint destruction is a major contributor to functional impairment, untreated tendon rupture can result in severe hand dysfunction. Ruptures are often painless and may occur during routine activities, leading to delayed recognition [2,10].

Diagnosis requires a detailed history and physical examination, complicated by preexisting deformities and limited joint motion [3]. Advances in medical therapy have reduced the frequency of joint deformities and associated surgical interventions [2]. Primary end-to-end repair is rarely feasible; tendon transfer or coupling with an intact extensor tendon is generally recommended [1]. Tendon transfer is effective for restoring function, offering low donor-site morbidity, preservation of muscle function, and minimal surgical sites [3,9]. Surgical management should also address underlying causes to prevent recurrence, including ulnar debridement or a Darrach procedure, and may involve stabilizing the dorsal retinacular ligament to create a durable tendon bed [2]. Even isolated Extensor Digiti Quinty (EDQ) ruptures should be addressed surgically to prevent subsequent tendon involvement [2].

Although tendon transfer is widely accepted as first-line treatment [3], comparative studies with tendon grafting remain limited and show variable outcomes [2]. Optimal results are observed when one or two fingers are involved, and early intervention is critical to minimize metacarpophalangeal joint extension lag [2].

Conflict of Interest

No conflicts of interest.

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