

Clinical case

# Surgical reconstruction of an unstable rheumatoid thumb deformity. A case report

*Reconstruction en un temps d'une déformation déstabilisante étagée du pouce rhumatoïde.  
À propos d'un cas*

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## Abstract

The thumb is frequently impaired in rheumatoid arthritis. This leads to major disability in affected patients. Through a clinical case, we describe a reconstructive strategy for a three-joint adduction thumb deformity that caused instability of the interphalangeal and metacarpophalangeal joints, without cartilaginous lesion. Ulnar collateral ligament destruction was treated by a bone-ligament-bone graft at the interphalangeal joint and by a Littler ligamentoplasty at the metacarpophalangeal joint. The trapeziometacarpal lesion was treated by trapeziectomy in combination with suspension ligamentoplasty. Clinical and radiological assessments at 22 months of follow-up revealed good outcomes. This technique is a new option to include in the reconstructive treatment for thumb instability, particularly when caused by rheumatoid arthritis.

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*Keywords:* Rheumatoid; Thumb; Ligamentoplasty; Bone-ligament-bone

## Résumé

L'atteinte du pouce est fréquente dans la polyarthrite rhumatoïde ; elle est responsable d'un handicap majeur. À travers un cas clinique, nous présentons une technique de reconstruction en un temps d'une déformation étagée des trois articulations du pouce de type pouce adductus, prédominant sur l'instabilité de l'interphalangienne et de la métacarpo-phalangienne, sans lésion cartilagineuse. La destruction des ligaments collatéraux ulnaires a été traitée au niveau de l'interphalangienne par un greffon os-ligament-os prélevé au niveau de l'articulation trapézoïdo-métacarpienne, et au niveau de la métacarpo-phalangienne par une ligamentoplastie selon Littler. Une trapézectomie avec ligamentoplastie de suspension et d'interposition y a été associée. Le résultat clinique et radiologique est bon à 22 mois de suivi. La technique proposée est une nouvelle option à intégrer dans le traitement de l'instabilité du pouce, notamment dans la polyarthrite rhumatoïde dans le cadre d'une chirurgie conservatrice.

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*Mots clés :* Pouce ; Rhumatoïde ; Ligamentoplastie ; Os-ligament-os

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## 1. Introduction

The thumb is responsible for 50% of hand function [1,2], therefore any thumb lesion causes significant disability by limiting grip and pinch strength [3,4]. This situation is very common in rheumatoid arthritis (RA) as it affects 57 to 80% of patients [1,5–8] and precedes finger lesions. The growth of the

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synovial pannus stretches the ligaments, causing them to fail [3], which in turn causes joint instability and deformities [5].

In single-joint lesions of the thumb, the commonly recommended treatment is a trapeziectomy at the trapeziometacarpal joint [3,8] and an arthrodesis of the interphalangeal (IP) and metacarpophalangeal (MCP) joints [1,3,5,6,8]. However, combined involvement of these three joints requires a different treatment, which is determined by the extent of cartilage damage and instability at each level.

In this article, we present a solution for the simultaneous reconstruction of the three joints in a rheumatoid thumb by describing a case where ligament lesions were predominant, but the articular cartilage was intact.

## 2. Clinical case

A 45-year-old right-handed patient was diagnosed with RA at the age of 20. She presented with deformities affecting both hands, despite medical treatment including steroids (prednisone 5 mg per day), methotrexate (10 mg per week) and rituximab. We focus here on the treatment of her left hand.

Initially, ulnar deviation of the long fingers was treated by MCP arthroplasty with a Sutter silicone implant, associated with realignment of the extensor tendons and reconstruction of the radial collateral ligaments. During the second surgical procedure, arthrodesis of the proximal IP joint of the fourth finger was performed for a swan neck deformity.

She consulted thereafter for a deformity of the left thumb (Fig. 1), which combined a trapeziometacarpal dislocation (TM) that was responsible for an adducted thumb, compensatory hyperextension and significant valgus laxity of the MCP joint. We also noted a passively rectifiable radial deviation of 70° of the thumb IP joint, with the radiographic joint space preserved. The pain was evaluated at 7/10 on a visual analog scale (VAS) and the DASH-score was 76. Instability prevented

a prosthetic solution such as MCP arthroplasty. As the three joints were affected and the joint space was intact, ligament reconstruction surgery was preferred to a combined arthrodesis, as this will preserve useful mobility. It was decided to reconstruct the three joints in a single surgical procedure.

Trapeziectomy associated with partial trapezoidectomy and suspension ligamentoplasty using half of the flexor carpi radialis (FCR), as described by Eaton and Littler [9], was carried out by an incision in the back of the first web space, which corrected its contracture the same time. The incision was extended on the lateral ulnar side of the MCP and IP joints where no ulnar collateral ligament (UCL) remained. The presence of macroscopically healthy articular cartilage allowed for isolated treatment of the instability. A K-wire was inserted into the axis of the thumb to simultaneously maintain the IP and MCP in extension and make the following steps easier. At the MCP level, a part of the FCR transplant was used to reconstruct the UCL according to Littler's technique [10]. At the IP level, two tunnels were created, one in the head of the proximal phalanx and another in the base of the distal phalanx (Fig. 2), in which we impacted a bone-ligament-bone graft harvested from the distal portion of the trapezoid bone and the proximal and radial portion of the base of the second metacarpal. This graft was impacted and did not require additional fixation. It restored a fair LCU.

Finally, the remaining FCR transplant was confined to the scaphometacarpal space; this space was stabilized by intermetacarpal pinning, maintaining the opening of the first web space. Postoperative immobilization by a thumb spica splint was achieved, maintaining the thumb in extension for 5 weeks. The pins were removed 5 weeks after surgery.

At the last follow-up, 22 months after surgery, the patient reported diminution of pain (no pain at rest and 4/10 on the VAS during intense manual activity versus 7/10 before surgery). The DASH score was improved (19 versus 76 before the surgery). Pinch strength was measured at 9 kg (4 kg in the opposite side,



Fig. 1. Initial deformity (a, b). The joint space appears normal after reduction of the IP joint (c).

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