

Postoperative Complications in Patients with Trapeziometacarpal Joint Osteoarthritis Treated With Carpometacarpal Arthroplasty: Report of Two Cases

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Abstract

Osteoarthritis of the carpometacarpal (CMC) joint, specifically, of the thumb trapeziometacarpal (TMC) joint, is a common condition in older women. Complications associated with surgical treatment range from transient tendinitis to wrist instability. We present two patients in whom complications developed after undergoing CMC arthroplasty. In one patient, rupture of the flexor carpi radialis (FCR) was noted postoperatively after using a combination of ligament reconstruction and tendon interposition with complete trapeziectomy. The second patient presented with a flexor pollicis longus (FPL) tendon that was tethered with sutures, in which surgical release of the entrapped FPL tendon led to successful treatment. In the treatment of CMC osteoarthritis, one surgical method of treatment may not be more effective than other methods. Further studies on the long-term clinical impact of both techniques may help assess a standard method for treating TMC joint osteoarthritis.

Introduction

Osteoarthritis of the carpometacarpal (CMC) joint of the thumb, or the thumb trapeziometacarpal (TMC) joint, affects one in four women older than 45 years of age. Symptoms such as pain at the base of the thumb; decreased grip and pinch strength; “shouldering” of the thumb TMC joint in which the base of the metacarpal subluxates dorsally and radially; and adduction contracture of the first web space have been noted.¹ Although no standard method is used in TMC joint arthroplasty for treating osteoarthritis,²⁻⁶ surgeons have been noted to prefer using a combination of ligament reconstruction and tendon interposition (LRTI)

and complete trapeziectomy.⁷ However, use of the technique has been noted with complications, including weakness in wrist flexion and decreased levels of grip strength.^{8,9}

Subsequently, the technique of partial trapeziectomy with capsular interposition has been derived to avoid complications associated with trapeziectomy with LRTI. Use of partial trapeziectomy with capsular interposition has shown promising results with decreased risk of hyperextension of the first metacarpophalangeal (MCP) joint, decreased proximal migration of the thumb, and increase in strength of the hand.¹ We describe two patients with TMC joint osteoarthritis, one of whom underwent LRTI with complete trapeziectomy, and the second who underwent partial trapeziectomy with capsular interposition. Postoperative complications were noted in both patients.

Case Reports

Case 1

A 52-year-old woman presented to our clinic with tenderness and sensitivity over the volar aspect of the left distal forearm. At an outside facility, she had undergone CMC arthroplasty using ligament reconstruction and suspensionplasty with half of the flexor carpi radialis (FCR) tendon for treating intractable thumb basal joint pain. Decreased pain was noted until 4 months postoperatively, at which time the patient fell on an outstretched hand and re-injured her left thumb. She described feeling a pop in her wrist. The patient was evaluated at an outside emergency department after the fall, and radiographs indicated no fractures (Figure 1). A fullness developed over the volar and radial wrist region, which was very tender to touch.

Upon initial presentation to our clinic, the patient did not report hand numbness or tingling. Tenderness and sensitivity were noted over the volar aspect of the distal forearm radially. She stated that her left wrist seemed to “give out” occasionally, which caused her to drop held items. The patient also described weakness in wrist flexion. She was taking ibuprofen to help relieve pain and occasionally used a rigid brace that limited wrist movement and thereby provided some comfort.

Results of physical examination of her left wrist showed a healed incision over the first metacarpal base, without signs of infection. The grind test was negative for CMC joint osteoarthritis, and functional range of motion of the thumb was observed in the second through fifth digits. Hyperextension of the MCP joint was found with a shortened thumb compared to the uninjured thumb. Additionally, weakness in pinch and grip strengths were noted, with a fullness and tenderness to palpation over the volar aspect of the wrist on the radial side. The results of Finkelstein and Durkan carpal tunnel compression tests were negative for carpal tunnel syndrome. The hand was well perfused, with normal findings after the Allen test for arterial competency.

Magnetic resonance imaging (MRI) of the left wrist revealed complete rupture of the flexor carpi radialis, with retraction to the level of the wrist (Figure 2). The FCR tendon rupture was treated nonoperatively with observation. At final follow-up, the patient had continued weakness in pinch and grip strengths of the left hand. She described weakness of wrist flexion with less pain. The patient received anti-inflammatory medication intermittently. The fullness of the wrist and weakness persisted, but the swelling subsided. For further treatment, we recommended observation and continued use of the hand as tolerated without restrictions.



Figure 1. Postoperative radiograph at 4 months in case 1, showing anterior-posterior view of left wrist after the patient fell and re-injured her left thumb, before presentation to our clinic.



Figure 2. Postoperative magnetic resonance imaging at 4 months in case 1, showing left wrist after the patient fell and re-injured her left thumb, with complete rupture of the flexor carpi radialis and with retraction to the level of the wrist.

Case 2

A 56-year-old, right-handed woman presented to our clinic with painful degenerative osteoarthritis of her left thumb CMC joint. She had experienced worsening pain for 5 to 6 years, and her activities were limited owing to the severity of her discomfort. She reported pain when using twisting motions of the hand with force (eg, opening a jar) and putting direct pressure on the thumb (eg, holding a key). On physical examination, the patient had discomfort in the abducted position and tenderness to direct palpation of the area. She had notable shouldering of the MCP joint without numbness. Radiographs of her left hand revealed advanced arthritic changes of the thumb CMC joint (Figure 3).

After attempting nonoperative treatment, the patient returned with progression of symptoms and was scheduled for CMC joint arthroplasty with partial trapeziectomy. Postoperatively, a short-arm thumb spica splint was used, and no complications were noted. At 1-month follow-up, a short-arm thumb spica cast was applied. At 6 weeks postoperatively, the patient started using a thumb-spica brace and began receiving occupational therapy. At follow-up 8 weeks later, full active extension of the interphalangeal (IP) joint of the thumb was not possible. The thumb remained in a flexed position at about 40°. Passive range of motion in about a 20° arc of the thumb was intact, and she could oppose the thumb to the tip of each finger. Mild erythema of the incision site was noted but resolved with antibiotics.

At 3 months postoperatively, the patient presented with residual IP joint flexion contracture, with minimal improvement despite undergoing occupational therapy. She was able to flex and extend her thumb with the MCP joint hyperflexed. However, with the MCP joint extended, she could not fully extend the IP joint. Findings of MRI indicated an acutely angulated flexor pollicis longus (FPL) tethered at the carpometacarpal surgical site and the IP

joint held in a flexed position (Figures 4A and 4B).

Subsequently, the surgical site was investigated and we performed tenolysis of the FPL tendon. The FPL tendon was tethered using an ethibond suture (Ethicon, Somerville, NJ). After intraoperative release of the tethered tendon, the thumb could be extended (Figure 5). After tenolysis, she was able to actively flex and extend the IP joint of the thumb to neutral position. At 4.5-month follow-up after the revision procedure, the patient was very pleased with her progress, and results of physical examination indicated promising range of motion of the thumb IP joint.



Figure 3. Preoperative radiograph in case 2, showing anterior-posterior view of left thumb, with advanced arthritic changes of the CMC joint.



Figure 5. Radiograph after intraoperative release of the tethered tendon in case 2, showing anterior-posterior view of extension of thumb interphalangeal joint. After intraoperative release of the tethered tendon, the thumb could be extended.

Discussion

Many studies have reported complications associated with using a combination of trapeziectomy with LRTI, in which the FCR tendon is used as an autograft, in treating osteoarthritis of the thumb TMC joint.^{8,10-12} Furthermore, although open trapeziectomy with LRTI was cited to be the surgical treatment of preference, its complication rate has been shown to be 12% greater in comparison with a complete trapeziectomy alone.^{3,4,7} Although no technique in treating osteoarthritis of the thumb TMC joint has been significantly proven as the standard method, use of complete trapeziectomy with LRTI may be a more complicated procedure that can result in increased risks of complications in patients.^{2,3}

Partial trapeziectomy with capsular interposition does not require tendon harvest and therefore may avoid complications associated with tendon donor sites. The trapezium is not completely excised, negating the problem of proximal migration of the metacarpal.¹ The current report describes two cases of complications associated with surgical treatment of osteoarthritis of the thumb TMC joint. The first complication was an FCR tendon rupture after treatment with LRTI using half of the FCR tendon as an interposition graft. The second case involved a complication after use of partial trapeziectomy with capsular interposition, in which a revision procedure was prompted.



Figure 4. Results of imaging tests at 4 months postoperatively in case 2, showing acutely angulated flexor pollicis longus tethered at the site of operative treatment, with the interphalangeal joint held in a flexed position. (A) Magnetic resonance imaging showing angulated flexor pollicis longus (asterisk). (B) Radiograph showing anterior-posterior view.

Results of using LRTI with complete trapeziectomy or partial trapeziectomy with capsular interposition were not considerably different between our patients, with complications noted in both. Further, long-term research may help assess the postoperative clinical impact of using each method.

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Conflict of Interest

The authors report no conflicts of interest.

Informed Consent

The patients were informed that the data concerning the case would be submitted for publication, and they provided verbal consent.

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