Newest Advances in the Operative Treatment of Basal Joint Arthritis

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Abstract

Osteoarthritis of the basal joint of the thumb is common, particularly in postmenopausal females, and can cause considerable pain and disability. Incompetence of the volar beak ligament is thought to be the inciting event that eventually leads to joint degeneration in a predictable pattern. The clinical history and examination can reliably lead to the diagnosis. Radiographs are used to stage the severity of the arthritis. Conservative treatment can be effective in early disease. Operative treatment has been shown to be successful in relieving pain and restoring thumb function in advanced disease. The majority of reconstructive procedures include partial or complete trapeziectomy with beak ligament reconstruction and tendon interposition. Secondary metacarpophalangeal joint hyperextension and associated carpal tunnel syndrome must be diagnosed and addressed to prevent poor outcomes.

The carpometacarpal (CMC) joint of the thumb is a distinguishing, yet notorious feature of the human opposable thumb. On the one hand, it is fittingly also known as the basal joint, since it is the "base" from which the thumb has a large range of motion, and therefore, permits the hand to perform many functions. On the other hand, its unique anatomic configuration, which allows this vital motion, also predisposes the basal joint to degenerative disease. Following the distal interphalangeal joint, it is the second most common site in the hand afflicted by osteoarthritis.[1] However, due to the basal joint's lack of bony stability, its profound impact on hand function, and the disabling symptoms of osteoarthritis, it is the most common site for which surgery is sought.[2]

Basal joint arthritis is a common condition. Radiographic evidence of basal joint degeneration has been found to occur in approximately one in three postmenopausal females. One-third of these patients with positive radiographs are symptomatic.[3] Fortunately, nonsurgical management can provide sustained relief, especially in early disease. Furthermore, when surgery is indicated, there are a variety of procedures that can reliably improve thumb function and engender high patient satisfaction, usually exceeding 90%.

Surgical Anatomy and Biomechanics

The basal joint is comprised of the articulation between the trapezium and the first metacarpal base. It has also been defined by some as consisting of all four trapezial articulations – with the trapezoid, scaphoid, and index metacarpal, as well as the first metacarpal. The first definition is the most commonly used. The articular surfaces of the trapezium and the first metacarpal have reciprocal concave surfaces. This configuration is often referred to as either a "saddle joint" or concavoconvex. Motion at this joint is derived from the differing radii of curvature of the articular surfaces, with that of the metacarpal being 33% larger than that of the trapezium. However, the differing radii of curvature also make the joint incongruous except for at the extremes of motion, subjecting the joint to increased contact stresses.[4] Functions such as grasping and pinching involve three arcs of motion at the thumb CMC joint: flexion-extension, abduction-adduction, and opposition-reposition. Because of the lack of bony congruity, the stability of the joint must rely on static ligamentous restraints. The original description of the trapeziometacarpal (TM) ligaments dates back

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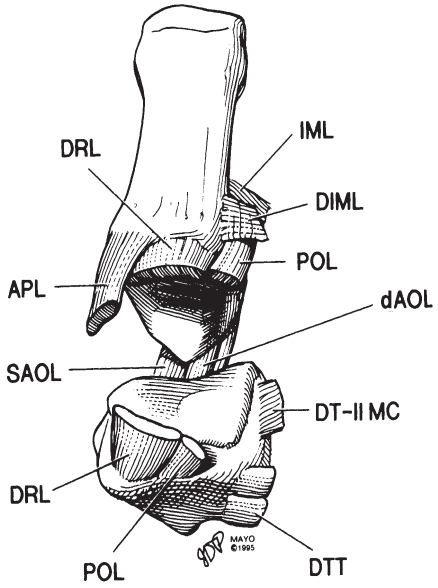

Figure 1 The trapeziometacarpal joint has been hinged open from the dorsum to reveal the deep anterior oblique ligament (dAOL) (beak ligament) lying within the joint just ulnar to the volar tubercle of the metacarpal. Other structures include the superficial anterior oblique (SAOL), dorsoradial (DRL), posterior oblique (POL), dorsal trapeziotrapezoid (DTT), dorsal trapezio-II metacarpal (DT-II MC), intermetacarpal (IML), dorsal intermetacarpal (DIML), and abductor pollicis longus tendon (APL). (From Bettinger P, Linscheid R, Berger R, Cooney W, An K. An Anatomic Study of the Stabilizing Ligaments of the Trapezium and Trapeziometacarpal Joint. J Hand Surg [Am] 1999;24:786-98. With permission.)

to Weitbrecht in 1742.

Recently, as many as 16 ligaments have been identified as stabilizing the trapezium and basal joint.[5] The palmar oblique ligament is considered to be the primary stabilizer of the basal joint. It is also known as the deep anterior oblique ligament or beak ligament, since it inserts at the first metacarpal volar tubercle, which is shaped like a beak (Fig. 1). This ligament is intracapsular and runs in a proximal/radial to distal/ulnar direction. It is shorter in length than the superficial anterior oblique ligament, and, therefore, in palmar abduction, becomes taut first to act as the pivot point allowing pronation of the thumb. Although there is not complete agreement, most believe the beak ligament is the primary stabilizer against dorsoradial subluxation. This belief is supported by the clinical success of reconstructive procedures that include reconstruction of this ligament.[6-9]

Loss of the beak ligament support moves the pivot point for metacarpal flexion distally, which increases metacarpal translation and, thereby, increases shear forces. Others feel that the dorsoradial ligament is the primary stabilizer against dorsal translation, as demonstrated in a cadaver study simulating acute dorsal CMC dislocations.[10] Though it is the shortest of the ligaments; it is also the widest and thickest, second to the transverse carpal ligament. Since the sagittal diameter of the first metacarpal articular surface is 34% greater than that of the trapezium, force analysis shows that with dorsal translation of the metacarpal the dorsal ligaments become taut, while the anterior ligaments become lax.[11] In supination, the dorsal expansion of the abductor pollicis longus (APL) is the major stabilizer of the basal joint. Since few functional postures place the thumb in supination, it is less important than the beak ligament in joint stability. However, the anterior capsule recess between these two structures provides an excellent surgical window to the joint that does not disturb stability.

Operative Treatment

The indication for operative intervention for the degenerative basal joint is a failure of conservative care to provide sufficient relief of symptoms and preserve functional ability. The specific types of surgical procedures are usually broken down between those for stage I disease and those for stages II-IV disease, depending primarily whether the cartilage of the basal joint is yet unaffected or already has evidence of degeneration. Procedures for stage I disease include volar ligament reconstruction, thumb CMC arthroscopy, and metacarpal extension osteotomy.

Initially described by Eaton and Littler, in 1973, volar ligament reconstruction with a strip of autogenous flexor carpi radialis (FCR) tendon remains the procedure of choice by which the basal joint can be most effectively stabilized in stage I disease.[12] This procedure has well established effectiveness, as long as there is only early chondromalacia and no frank cartilage eburnation found intraoperatively. It has been shown to be successful in halting the radiographic progression of the disease. Lane and Eaton[13] reported 100% without radiographic progression at average 5-year follow-up, and Freedman and colleagues[14] reported 65% without an increase in radiographic stage at an average 15-year follow-up. Pinch strength was adequately restored at the early follow-up, with 76% having strength equal or greater than the contralateral thumb, 16% with greater than 90% contralateral strength, and 8% between 70% to 90% contralateral strength. However, results regarding pain relief were not as impressive; 72% had complete pain relief at 5 years and 66% of those who had not progressed at 15 years, in terms of radiographic stage, were noted to be symptomatic.

Technique: Volar Ligament Reconstruction

An incision is made extending over the thumb metacarpal along the radial insertion of the thenar muscles, curving proximally and ulnarly along the distal wrist crease to the FCR tendon. Care is taken to preserve the palmar cutaneous branch of the median nerve and the superficial branches of the radial nerve and artery. The thenar muscles are elevated off the metacarpal shaft and dissected radially to ulnarly until the metacarpal base and volar capsule of the CMC joint are exposed. The tendinous slip of the APL into the thenar muscles often must be detached. A transverse arthrotomy is performed between the beak ligament and APL and re-

flected to inspect the articular surfaces to confirm cartilage eburnation is not present. Supination of the thumb allows visualization of the metacarpal beak. Next, the metacarpal base is prepared to allow passage of the FCR tendon graft. Progressively larger gouges are passed from dorsal to volar, entering the cortex 4 to 5 mm distal to the articular surfaces, with an orientation perpendicular to the thumbnail. This hold can be made either parallel to the CMC joint surface, as recommended initially by Eaton and Littler,[12] or oblique, as recommended by Pellegrini, in order for the volar exit to be adjacent to the margin of the metacarpal beak. A 28-gauge stainless steel wire can be passed through the hole to facilitate the passage of the FCR tendon. Through two short 1 cm transverse incisions on the volar forearm, one-half of the FCR tendon is harvested.

The most proximal incision is placed at the musculotendinous junction, usually 8 cm to 10 cm proximal to the wrist flexion crease. As it courses from the musculotendinous junction toward its insertion on the second metacarpal base, the FCR tendon rotates 180° along its longitudinal axis. Therefore, the ulnar half, proximally, becomes the radial half, distally. The ulnar half of the tendon is cut proximally and split distally to the distal aspect of the trapezium. The free end is then affixed to the wire and drawn from volar to dorsal through the metacarpal base hole. Initial tension is set with sutures through the graft and the dorsal metacarpal periosteum. During tensioning, the thumb metacarpal is pronated, abducted, and reduced volarly, relative to the trapezium. The remaining tendon is then passed deep to the APL tendon and brought ulnarly to pass deep to the other half of the unharvested FCR tendon. The graft is looped around, brought radially, and sutured back onto itself. The CMC joint arthrotomy is closed and the thenar musculature reattached to the thumb metacarpal (Fig. 2).

Thumb CMC arthroscopy has recently been reported for treatment of stage I disease. Arthroscopy is a less invasive method to examine joint surfaces and ligament integrity, as well as perform debridement of synovitis. Other procedures performed through arthroscopy have included thermal shrinkage of the beak ligament, and hemi- or complete trapeziectomy using a burr. With the patient supine and a tourniquet applied, a countertraction strap is applied around the arm and table, while a single fingertrap for the thumb is used to apply 5 lbs to 7 lbs of vertical traction. Two ar-

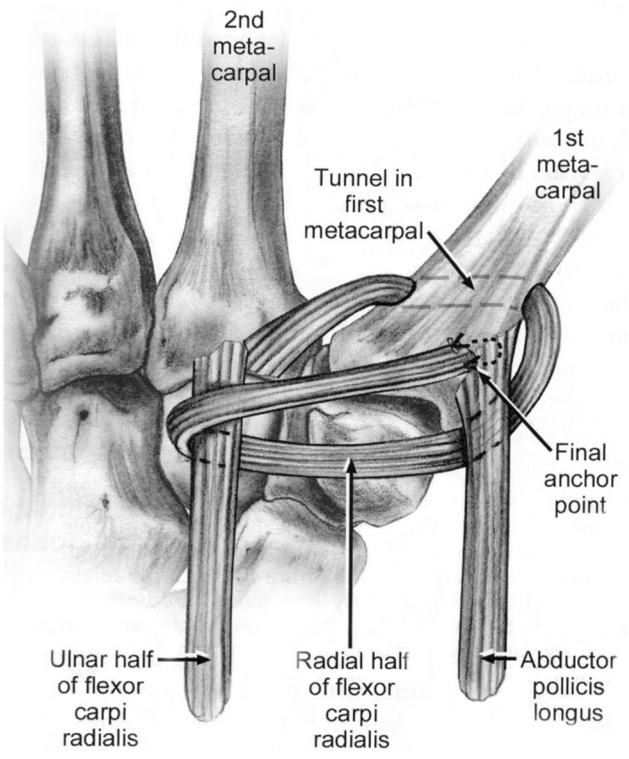

Figure 2 Volar beak ligament reconstruction (From Bednar MS. Osteoarthritis of the hand and digits: Thumb. *In:* Berger RA, Weiss APC (eds): *Hand Surgery*. Philadelphia: Lippincott Williams & Wilkins, 2004, pp 1279-1288. (Copyright © 2004 Lippincott Williams & Wilkins, with permission from Wolters Kluwer.)

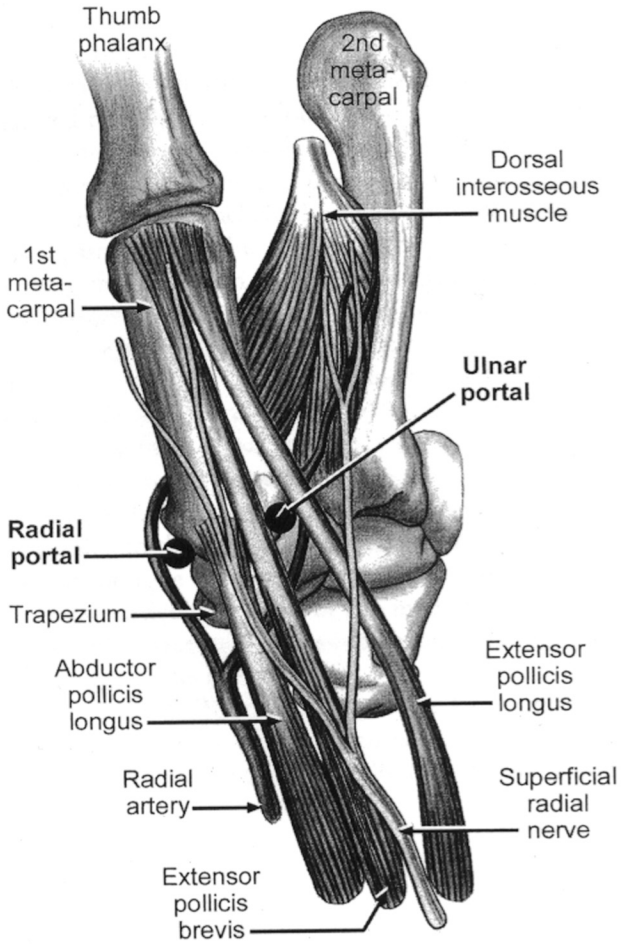

Figure 3 CMC arthroscopy portals. First radial (1-R) portal located just volar to the APL tendon and first ulnar (1-U) portal just ulnar to the EPB tendon. (From Bednar MS. Osteoarthritis of the hand and digits: Thumb. *In:* Berger RA, Weiss APC (eds): *Hand Surgery*. Philadelphia: Lippincott Williams & Wilkins, 2004, pp 1279-1288. (Copyright © 2004 Lippincott Williams & Wilkins, with permission from Wolters Kluwer.)

throscopic portals are used. The first radial (1-R) portal is located just volar to the APL tendon. The first ulnar (1-U) portal is just ulnar to the EPB tendon (Fig. 3). A short barrel, 1.9 mm arthroscope is used. Culp and Rekant reported 88% good or excellent results at 1.4 years follow-up.[15] Although some subsidence was noted, pinch strength increased 22%, and some patients preferred the outcome of the arthroscopically treated hand over the contralateral treated by open technique.

Lastly, a metacarpal extension osteotomy can be used to treat stage I disease. Performing a dorsal, closing wedge osteotomy of the thumb metacarpal is thought to unload the volar compartment of the CMC joint (Fig. 4). An advantageous by-product of the osteotomy can be correction of an adduction contracture. A study by Pellegrini showed that a 30° osteotomy was biomechanically optimal.[16] At 2.1 years follow-up, Tomaino reported that 8 out of 12 were very satisfied with the result of metacarpal osteotomy, and all osteotomies healed.[17] Grip strength improved 300% compared to preoperative and was 79% of the contralateral hand, while pinch strength improved 200% and was 86% of the contralateral hand

Figure 4 Lateral radiograph of the thumb shows the anticipated wedge of bone to be resected from the metacarpal to afford a 30° extension osteotomy. (From Tomaino MM. Treatment of Eaton stage I trapeziometacarpal disease with thumb metacarpal extension osteotomy. J Hand Surg [Am] 2000;25:1100-6. (Copyright © 2000 The American Society for Surgery of the Hand, with permission from Elsevier.)

For stage II to IV disease with clearly established basal joint degenerative articular changes, surgical treatment has evolved significantly over the past 50 years. Trapeziectomy alone was first described by Gervis in 1949.[18] Proponents of simple trapeziectomy claim that the advantages of the procedure include good pain relief comparable to the more complicated procedures, that it is a very straightforward method with decreased operative time, that it avoids problems from implants or donor site morbidity from harvesting a biological implant, and that there is no possibility of developing arthritis between the first and second metacarpal bases, as can occur with reconstructions. The latter reconstructions result in an abnormal abutment between these two base structures. However, simple trapeziectomy was shown to present a significant functional problem in loss of pinch strength and a significant cosmetic problem with loss of thumb length.[19,20] More recent reports have stated that the pain relief of simple trapeziectomy, modified to include temporary K-wire stabilization of the thumb metacarpal in wide abduction, opposition, and distraction, is indeed comparable to that obtained with the more involved procedures.[21,22] Kuhns and coworkers[21] reported that a pain free, stable thumb could be achieved with this hematoma and distraction arthroplasty, with 92% completely pain free at 2 year follow-up. Though some believe simple trapeziectomy should only be limited to the low-demand elderly patient without significant subluxation or as a salvage procedure after a failed or infected arthroplasty, these recent results beg to differ.

At the same time Gervis described simple trapeziectomy, Muller presented his work of CMC arthrodesis.[23] The success of other arthroplasty procedures has relegated arthrodesis principally to the heavy laborer, posttraumatic arthritis in the young patient, and salvage of a failed reconstruction. The optimal position for arthrodesis is approximately 20° of radial abduction and 40° of palmar abduction. CMC fusion is thought to result in preservation of strength. In a comparative study of arthrodesis versus ligament reconstruction with tendon interposition (LRTI) arthroplasty, the arthrodesis group had a 98% patient satisfaction rate and significantly stronger key and chuck pinch.[24] Fusion, however, comes at the expense of mobility. Arthrodesis precludes one from motions such as laying the palm flat on a table or from bringing the digits into a conical shape to fit narrow openings, such as tight shirt sleeves. In addition, nonunion and transfer of reactive forces to neighboring joints leading to degenerative changes have been shown to be complications of CMC arthrodesis. In a compilation of 13 fusion studies, the overall nonunion rate was 13%.[25] Hartigan and associates[24] reported fewer nonunions after switching from K-wire fixation to a minicondylar blade plate. Development of degenerative changes in neighboring joints after fusion has ranged from 17% to 25%.[24,26]

Pioneered by Swanson,[27] silicone implant arthroplasty surfaced, but its popularity diminished by reports of technical difficulties leading to instability and problems with foreign body synovitis, cold flow, and wear debris.[28-30] At the longest follow-up in the literature to date, van Cappelle and colleagues reported a 40% dislocation rate and a 27% revision rate at a mean of 13.8 years.[30]

Other implant arthroplasty results have not been encouraging. The Orthosphere® (Wright Medical, Arlington, Tennessee, USA), a Zirconia spheric prosthesis, was reported by Athwal and coworkers to have unacceptable results.[31] At a mean follow-up of 33 months, patient satisfaction was 0%, with 6 of 7 implants subsiding into the trapezium resulting in pain, weakness, and stiffness, and 5 of 7 implants undergoing revision.

In 1970, Froimson described fascial arthroplasty of the CMC joint, in an attempt to reduce shortening and improve pinch strength after simple trapeziectomy.[32] After a standard trapeziectomy, half of the FCR tendon was harvested and rolled up in an anchovy-like fashion to fill the void left by the trapezium. He later modified the procedure to a hemiresection of the trapezium in an increased effort to decrease shortening and improve outcomes.[33] Combining the volar ligament reconstruction of Eaton and Littler with Froimson's space-filling concept, the LRTI arthroplasty was described by Burton and Pellegrini in 1986.[34] In this procedure, the entire FCR tendon is passed through a drill hole in the thumb metacarpal to reconstruct the beak ligament. Then the remaining tendon is made into an "anchovy" and placed into the space left by the trapeziectomy to act as a fascial arthroplasty. Although complete trapeziectomy was initially described only for stage IV disease with ST degenerative changes, it is currently recommended in stages II-IV to simplify the procedure. The investigators followed their patients at 2-, 6-, and 9.4-year intervals. At 9.4-year follow-up, 95% reported excellent pain relief. There was an overall 92.5% increase in grip strength and 50% increase in pinch strength compared to preoperative values.[35] With high patient satisfaction and preservation of function at long-term follow-up, this procedure has spread in popularity and is considered by many to be the standard to which other procedures and outcomes should be measured.

Technique: LRTI Arthroplasty

Preoperative assessment must include verifying competency of the flexor carpi ulnaris and performance of an Allen's test. A volar or dorsal approach can be used. The volar approach is similar to that described for the volar ligament reconstruction technique. Advantages of this approach include avoidance of the dorsal sensory branches of the radial nerve and full visualization of the FCR tendon during trapeziectomy. Disadvantages include not visualizing the radial artery during trapeziectomy and an incision on the glabrous skin of the thenar eminence can develop a tender or hypertrophic scar.

In the dorsal approach popularized by Burton and Pellegrini, an inverted Y, or triradiate, incision is made in line with the EPB tendon, with the volar limb of the Y in the wrist flexion crease and the dorsal limb toward the anatomic snuffbox. A straight incision can also be used. The EPB tendon is transected from its insertion at the base of the proximal phalanx. A longitudinal capsulotomy of the CMC joint is performed. The diseased base of the thumb metacarpal is excised, with more bone taken dorsally than volarly. The trapezium is then excised, taking care to protect the FCR tendon and preserve the deep volar capsule. Either one-half or the entire FCR tendon is harvested through a transverse incision on the volar forearm over the musculotendinous junction. The need for multiple incisions for harvesting can be avoided by proper placement of just one incision. Two nonabsorbable sutures are placed into the deep volar capsule of the trapezial fossa for later use. An oblique drill hole through the metacarpal base is made beginning on the dorsoradial surface approximately 1 cm from the joint, perpendicular to the thumbnail, and progressively larger as to accommodate the graft. A Kirschner wire is then placed antegrade in the dorsoradial corner of the metacarpal intramedullary canal to exit the metacarpal head dorsally, so as to prevent MCP joint hyperextension. Alternatively, a K-wire can be placed from the first metacarpal into the second metacarpal while the thumb is reduced with pronation, abduction, and volar forces. The FCR tendon graft is passed through the drill hole from proximal/ulnar to distal/radial. It is then sutured to the dorsoradial metacarpal periosteum. The tendon is then sutured to itself in the trapezial fossa, thereby creating a sling to support and stabilize the thumb metacarpal base. The remaining tendon is rolled on itself like an accordion, threaded onto two Keith needles, and then passed into the trapezial void and secured with the previously placed deep sutures. The capsulotomy is closed and the EPB tendon is transferred proximally to the proximal metacarpal, sutured both to the periosteum and the FCR tendon exiting the radial metacarpal. This is performed to eliminate MCP hyperextension (Fig. 5).

The LRTI technique of Burton and Pellegrini was believed to counteract the tendency of the thumb metacarpal to migrate proximally. In their series, there was an average 13% loss of the arthroplasty space postoperatively.[35] Other studies, however, have shown that LRTI arthroplasty does not maintain the trapezial height as well as originally reported. Lins and associates[36] reported a 33% decrease and Kadiyala and colleagues[37] reported a 27% decrease of trapezial space, compared with preoperative values. In an effort to minimize the proximal migration of the thumb metacarpal, procedures were devised to preserve as much of the osseous foundation of the basal joint as possible, and thereby, improve thumb strength and stability compared to other forms of basal joint arthroplasty. Eaton and coworkers[9] first described a procedure for stage III disease in which only the "horns of the trapezial saddle" are removed before resurfacing the joint

with a tendon graft. In 1998, Barron and Eaton[38] reported the results of a conservative joint resection and trapezium-retaining interposition arthroplasty (TRIA) for stage IV disease. Their results showed an average loss of only 5.3% of the basal joint space, an improvement on those previously mentioned series in which complete trapezial excision had been carried out. A more recent study has supported this finding that TRIA more successfully maintains trapezial height while still yielding patient satisfaction rates comparable to other forms of basal joint arthroplasty.[39] However, no correlation has been shown between height of arthroplasty space and overall satisfaction, pain relief, or improvements in

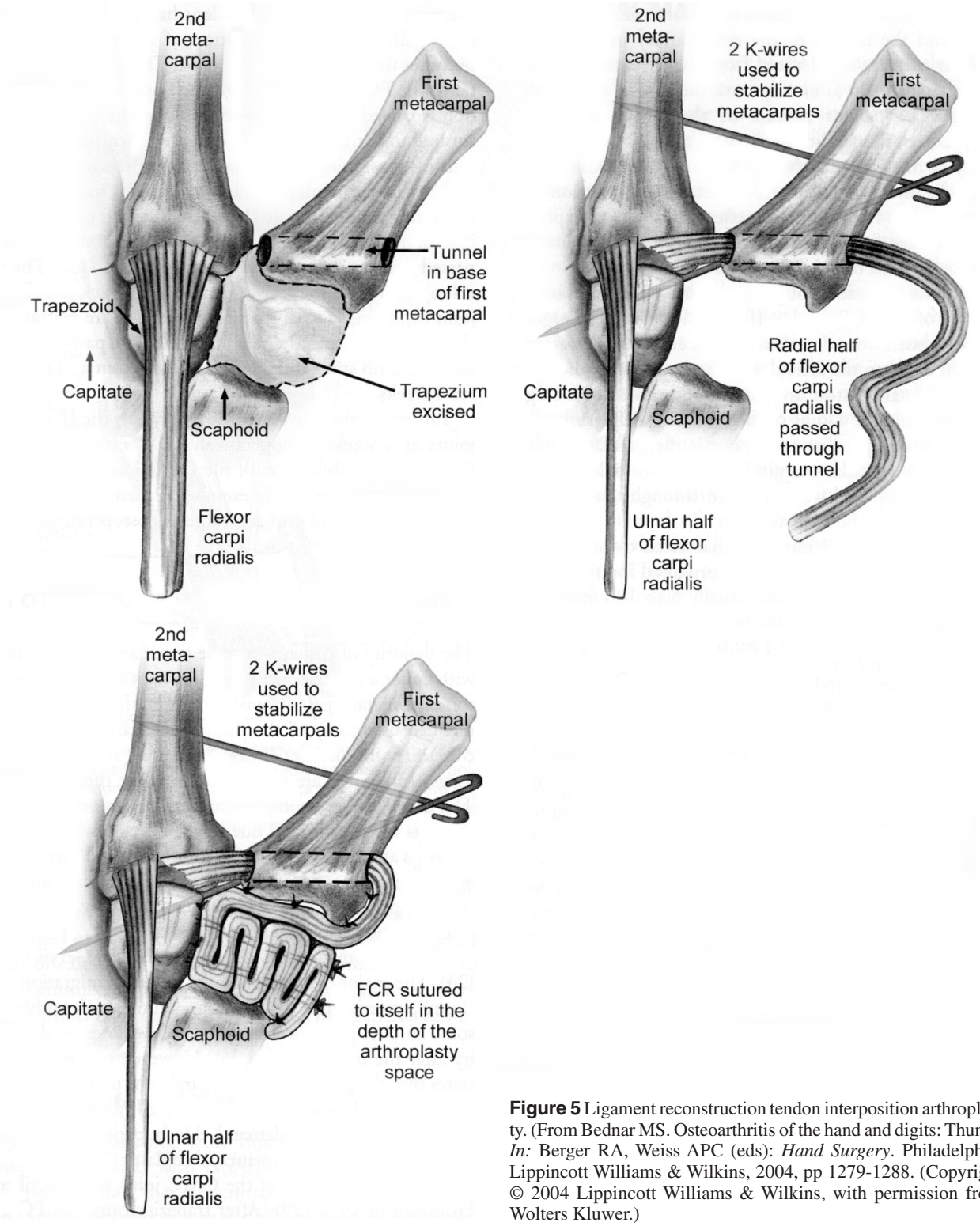

Figure 5 Ligament reconstruction tendon interposition arthroplasty. (From Bednar MS. Osteoarthritis of the hand and digits: Thumb. *In:* Berger RA, Weiss APC (eds): *Hand Surgery*. Philadelphia: Lippincott Williams & Wilkins, 2004, pp 1279-1288. (Copyright © 2004 Lippincott Williams & Wilkins, with permission from Wolters Kluwer.)

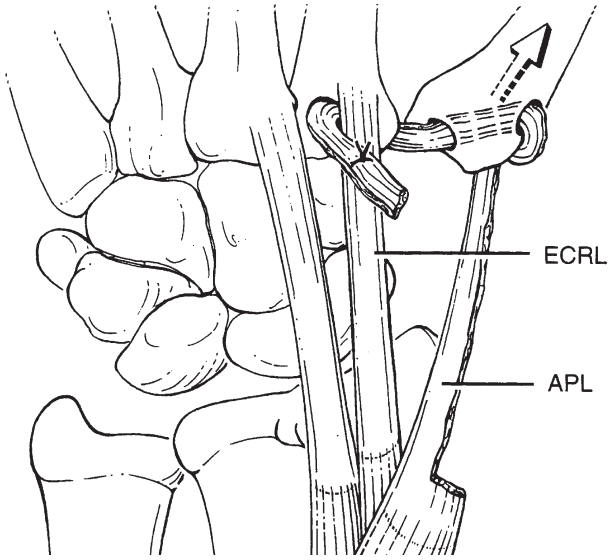

Figure 6 Suspensionplasty. A dorsal slip of the abductor pollicis longus (APL) tendon is detached proximally, passed through the bone tunnel in the first metacarpal, through a drill hole in the base of the second metacarpal, and then either sutured or weaved into the extensor carpi radialis longus (ECRL) tendon. (From Hentz VR, Chase RA (eds): *Hand Surgery: A Clinical Atlas*. Philadelphia: W.B. Saunders, 2001, p 699. (Copyright © 2001 W.B. Saunders, with permission from Elsevier.)

thumb function or strength.[36,40,41] In fact, a recent prospective randomized study of ligament reconstruction, with or without tendon interposition, showed that not only does proximal migration of the metacarpal have no apparent influence on the functional outcome, but that tendon interposition does not affect the outcome either.[42]

Thompson reported on his suspensionplasty in 1986.[8] It was initially developed as a salvage procedure after failed implant arthroplasty, but is also readily applicable to primary basal joint arthritis, especially when the FCR is not available due to fraying or degeneration from the disease process or iatrogenic laceration intraoperatively. After a trapeziectomy, a dorsal slip of the APL tendon is detached proximally. This tendon is then passed from the dorsal cortex of the thumb metacarpal and out the articular surface of the proximal metacarpal, opposite to the direction of passage for the volar ligament reconstruction or LRTI. Next, the tendon graft is placed through a drill hole in the base of the index metacarpal, and finally, weaved into the extensor carpi radialis longus (ECRL) tendon (Fig. 6). Advantages over LRTI include: it is an easier procedure, the first dorsal compartment can be released, the tendon is harvested through the same incision, the deforming force of the APL is removed, the FCR is preserved, and most importantly, the point from which the first metacarpal is suspended is more distal. Diao modified the original location for the drill hole in the index metacarpal base to a more distal location to optimize this suspension.[43] Disadvantages include possible injury to the superficial radial nerve during tendon harvest and a cosmetically unappealing bump from the tendon weave. While early results are equivalent to the LRTI, no long-term studies have been reported.[44] Other procedures beyond the scope of this paper include the costochondral allograft interposition,[45] based on Littler's "life saver" technique, and the weaves described by Weilby,[46] and Sigfusson and Lundborg.[47]

The postoperative course for all of the above mentioned procedures are generally similar. For the first month, the thumb is immobilized with a short arm thumb spica cast or splint, and patients can begin immediate range of motion exercises of the IP joint. In the second month, immobilization is discontinued; active mobilization of both the CMC and MCP joint is begun, as well as thenar musculature strengthening. Finally, in the third month, pinch and grip strengthening and resistive exercises can commence. Grip and pinch strength can be expected to improve for up to 1 year postoperatively.

Complications

There are two main complications after surgical treatment of the arthritic thumb CMC joint. The first is persistent pain. Although long-term studies have shown surgical treatment to be very successful regarding pain relief, for the first 3 to 6 months postoperatively, thumb pain is not uncommon. Pain that persists beyond this point should receive more careful evaluation. A hypertrophic scar, especially on the glabrous skin of the thenar eminence during a volar approach, can cause considerable pain. Cutaneous neuromas, exhibited by either a burning pain or hypersensitivity, are frequent causes of pain. Irritation or damage to sensory nerves can lead to the development of complex regional pain syndrome. If this diagnosis is considered, early aggressive desensitization and/or pain management intervention should be pursued. Deep pain localized to the thumb metacarpal can usually be attributed to either excessive proximal migration of the metacarpal or arthritic degeneration between it and the index metacarpal. If excessive proximal migration occurs, the integrity of a ligament reconstruction must be questioned. The pain between the thumb and index proximal metacarpals is usually due to an overtightening of a ligament reconstruction, which is more of a risk in a suspensionplasty compared to other procedures and can be a very difficult problem to treat.

The other significant complication is failure to adequately address the secondary MCP joint hyperextension that occurs with basal joint arthritis. Treatment of the MCP joint is principally based on the degree of hyperextension during examination. No treatment is necessary if hyperextension is 30° or less and asymptomatic. If extension is 30° or less and symptomatic, the MCP joint should be temporarily pinned in neutral and the EPB tendon transferred from the proximal phalanx to the metacarpal—steps commonly performed in routine arthroplasty procedures. If hyperextension is greater than 30°, options include MCP joint fusion or volar plate capsulodesis.[48] Arthrodesis is recommended in arthritic joints, UCL instability, or joints with little passive

motion. To perform a capsulodesis, either the metacarpal neck is roughened to promote healing of the volar plate to a more proximal position or the volar plate is imbricated in a "pants over vest" fashion. Complications such as wound dehiscence, delayed wound healing, and infections are rare, especially outside the realm of the rheumatoid or immunocompromised patient. Reported infection rates after use of tendon interposition techniques have been less than 1%.[44]

Summary

Osteoarthritis of the basal joint is common, particularly in postmenopausal females. It is usually due to incompetence of the beak ligament, with subsequent predictable degeneration starting in the volar compartment of the joint, Splint immobilization has long been a critical component of conservative treatment, and along with other modalities, can be very effective in early disease. When conservative care is insufficient, surgical treatment has been shown to be reliable and predictable, with excellent objective results, high patient satisfaction, and few complications. The majority of operative procedures include partial or complete trapeziectomy, reconstruction of the beak ligament to stabilize the first metacarpal base, and some form of autogenous tendon to resurface the arthritic joints or fill the void left by their removal. Associated MCP joint hyperextension and carpal tunnel syndrome must be diagnosed and addressed to prevent poor outcomes.

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