

# CORR Insights®: What Are the Patient-reported Outcomes of Trapeziectomy and Tendon Suspension at Long-term Follow-up?

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## Where Are We Now?

Basal joint arthroplasty is the second most common procedure performed by hand surgeons in the United States. The most common techniques today involve resection of the trapezium with some type of suspension arthroplasty. Historically, simple resection of the trapezium followed by early motion, as described by Gervis in 1949 [5], has stood the test of time and continues to yield good results. Despite this, surgeons continue to look for a better

mousetrap. Motivated by the fact that we think function and pain relief are compromised when the thumb metacarpal migrates proximally, we continue to pursue and create new procedures to suspend the thumb metacarpal and prevent proximal migration following resection of the trapezium.

In the current study, Wolf et al. [13] pose the question of whether there is a loss of pinch strength with subsidence of the thumb metacarpal. Their results conclude, as have others [3, 6, 14], that there is no loss of pinch strength with proximal migration of the thumb metacarpal. The Thompson technique [11] used in this study or modifications thereof involves suspending the thumb metacarpal with a slip of the abductor pollicis longus distally through the extensor carpi radialis longus. This technique is one of the more common ligament reconstructions performed today along with ligament reconstruction with tendon interposition, as originally described by Burton and Pellegrini [1]. Some surgeons use the original technique of taking half of the flexor carpi radialis and passing it through a bone tunnel at the base of the thumb metacarpal and then weaving it through the remaining half of the distal flexor carpi radialis. Others use a later modification

that involves taking the entire tendon using half to be woven through the thumb metacarpal and sutured to itself distally while the remainder of the tendon is woven into an anchovy and used to fill the space previously occupied by the trapezium. Perhaps the most recent modification to basal joint arthroplasty is the so-called Weilby [12] technique weaving a slip of the abductor pollicis longus side to side through the flexor carpi radialis creating a sling to suspend the thumb metacarpal. This approach was modified further [2] by suturing the flexor carpi radialis side-to-side to the abductor pollicis longus. This procedure seems to be as effective as any other, while taking less operating time [2].

The procedure that requires the least time of all is simple resection of the trapezium and capsular closure [6]. But there is a perception among surgeons that this leads to a higher rate of subsidence of the thumb metacarpal and potential for impingement of the thumb metacarpal on the distal trapezium with secondary pain, even though there are no studies to verify this. Anecdotally, however, most surgeons have experienced poor results after basal joint arthroplasty in patients who have continued pain either from residual arthritis between the distal scaphoid and trapezoid, between the trapezoid and index metacarpal, or between the trapezoid and thumb metacarpal. In some instances of proximal migration of the thumb metacarpal, impingement between the

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thumb metacarpal and distal scaphoid may result in pain.

The current study supports the hand surgeon favoring traditional suspensionplasty. The authors provide long-term follow-up on 96 living patients and compare their results to those from the Swedish National Registry all treated with traditional resection of the trapezium and suspension using a slip of the abductor pollicis longus through the extensor carpi radialis longus (Thompson approach). All patients experienced no pain or minimal pain with good functional results. The findings of this study provide very useful, important data to support the hand surgeon in deciding on the index procedure to perform on his/her patients with basal joint arthritis. The principles of resection arthroplasty with or without and irrespective of the type of suspensionplasty should be the benchmark for primary surgical treatment of basal joint arthritis. Salvage procedures should focus on treatment of residual arthritis between the index metacarpal and the trapezoid or the distal scaphoid and trapezoid, which are the more likely cause of residual pain.

### Where Do We Need To Go?

Some might argue that current techniques are adequate and that no further research is needed. Particularly based on the results of this study, no further clinical research is needed. Surgeons, however, by their very nature are perfectionists and continue to pursue options for a better implant or implant material to replace the trapezium.

Ladd et al. [7] studied ligamentous anatomy, innervation, and wear characteristics of the joint with the premise that a better understanding of these structures might lead to better

prosthetic design, better soft tissue procedures, and potentially better preservation of normal structures based on sound biomechanical principles. Tissue engineering offers potential development of an off-the-shelf decellularized bone-ligament-bone construct that could heal to the base of the thumb metacarpal or potentially replace the entire joint with regenerated tissue [4]. Research in the genetics of tissue growth and engineering make such a construct believable in this century.

Finally, long-term studies to evaluate alternative procedures such as implant arthroplasty are necessary. An equally novel approach is the so-called “Tight Rope” procedure, where the thumb metacarpal is suspended to the adjacent index metacarpal with fiber wire secured to the bone by an EndoButton™ (Smith & Nephew). Both procedures may have a role in some patients treated primarily, or as a salvage procedure for failed soft tissue arthroplasty. More clinical research is needed in both areas.

### How Do We Get There?

Better understanding of the pathophysiology of osteoarthritis could certainly lead to prevention of the disease altogether. All healthcare professionals involved in the care and treatment of osteoarthritis can participate. For example, the effect of stabilization exercise early in the course of the disease prior to onset of radiographic symptoms may potentially play a role in prevention of osteoarthritis of the thumb. Currently, hand therapy journals are replete with studies [8-10] suggesting success in minimizing symptoms with early onset dynamic stabilization exercises. Long-term follow-up of patients enrolled in these studies who stick with their exercise

programs will provide the necessary information on just how effective these treatments really are.

While difficult to organize and perform, studies like that of Wolf et al. [13] are extremely valuable in evaluating the efficacy of trapeziectomy and tendon suspension as well as the post-operative rehabilitation and follow-up. This study basically proves that suspension arthroplasty is the gold standard treatment for basal joint arthritis. Basal joint arthroplasty is the second or third most common procedure performed by hand surgeons in the United States. Therefore, reconstruction of the basal joint with an implant or fiber wire suspension with or without tendon augmentation may play a role in revision arthroplasty but are too costly for routine use in primary procedures.

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