

Clinical Faceoff

Clinical Faceoff: Trapeziectomy Versus Trapezium Preservation in the Management of Basilar Thumb Arthritis

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Basilar thumb, or trapeziometacarpal (TM) arthritis, is a common and often debilitating condition affecting 8% to 12% of the general population, including more

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than half the people older than 70 [14, 16]. Symptoms range from minor discomfort to severe pain and disability, which may initially be treated nonoperatively with antiinflammatory medication, splints, and corticosteroid injections. Once these have been exhausted, many surgical options exist [13]. The mainstay of these approaches involves trapeziectomy with or without ligament reconstruction or interposition. However, there are concerns regarding proximal and lateral subsidence of the thumb [7]. This collapse can lead to weakness and recurrent symptoms at the base of the thumb, which is of particular concern in younger patients who may someday come to revision surgery [5, 15].

For good hand function, the thumb should be mobile, stable, and have a pain-free ROM. To offset the risks of thumb metacarpal subsidence, especially in the younger, high demand patient, trapezium-preserving procedures have been advocated, including TM arthrodesis and basilar joint arthroplasty when the scaphoid trapezoid trapezium (STT) joint is not arthritic. Fusion has compared well to trapeziectomy and ligament reconstruction, but has a higher complication rate including

nonunions and symptomatic hardware [6, 9]. By contrast, TM joint arthroplasty can be complicated by high rates of loosening, dislocation, revision procedures, and patient dissatisfaction [1, 10].

To add clarity to the treatment of TM arthritis, it is my distinct honor to invite two world-renowned experts in the field of hand surgery. Peter Stern MD is a Professor of Orthopaedic Surgery at the University of Cincinnati College of Medicine and Past President of the American Society for Surgery of the Hand. Marco Rizzo MD is a Professor of Orthopaedic Surgery at The Mayo Clinic, Rochester, Minnesota and past recipient of the Sterling Bunnell Traveling Fellowship awarded by the American Society for Surgery of the Hand.

Sanjeev Kakar MD: *Let us start the discussion with how one judges whether the STT joint is truly symptomatic. Dr. Rizzo, many patients with radio I > graphic evidence of Eaton Stage III > (Table 1) have clinical symptoms from the STT joint. How do you clinically decide whether this joint is involved?*

Marco Rizzo MD: I agree that many patients with Eaton Stage III disease have perceived symptoms at the STT

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Table 1 The Eaton classification of the four stages of articular degeneration of the basal joints of the thumb

Eaton Classification	
Stage I	Articular contours are normal. There may be slight widening of the joint space because of effusion or laxity of the ligamentous support of the TM joint.
Stage II	Slight narrowing of the TM joint. Minimal sclerotic changes of the subchondral bone. There may be joint debris not exceeding 2 mm in diameter in the form of osteophytes or loose bodies. ST joint should appear normal.
Stage III	Joint space markedly narrowed or obliterated with cystic changes, sclerotic bone, varying degrees of dorsal subluxation. Joint debris exceeding 2 mm in diameter. The ST joint appears normal.
Stage IV	Complete deterioration of the TM joint as in Stage III and, in addition, the ST joint is narrowed with sclerotic and cystic changes apparent.

TM = trapeziometacarpal; ST = scaphotrapezial.

Reprinted from Dela Rosa TL, Vance MC, Stern PJ. Radiographic optimization of the Eaton classification. *Journal of Hand Surgery (British and European Volume)* 2004;29B:2:173–177. (Table 1 on pg. 174), with permission from Elsevier.

joint. The STT and TM joints are geographically in close proximity, and this contributes to difficulties in discerning the source of pain. However, if they are truly disease-free at the STT interval, the patient would hopefully be free of pain at that space. On physical exam, the TM joint is examined best by palpating from the dorsum of the base of the metacarpal at its articulation with the trapezium. I think the STT can be best assessed by palpating the volar aspect of the distal pole of the scaphoid at its articulation with the trapezium. Radiographs are important, including Betz or Robert views, to optimize visualization of all the articulations of the trapezium. Less commonly, I will order a CT scan to better characterize the joint spaces.

Unfortunately, the presentation is not always so black and white. Some patients may have some pain coming

from each interval that contributes to their overall pain. I do favor selective injections as a diagnostic and therapeutic tool. Based on their response to these injections, we can determine how much of their symptoms come from that specific interval. I favor slightly less steroid/lidocaine, approximately 0.5 ml to 1 ml of (10 mg/ml) triamcinolone acetonide and 0.5 ml 1% lidocaine.

Peter Stern MD: I agree with Dr. Rizzo in that it is difficult to selectively locate the specific source of the pain, but I do not employ selective injections. Our group is completing a cadaver study and we have found that our ability to successfully inject the carpometacarpal (CMC) joint is only 50% to 60%. In the presence of advanced arthritis, the success rate for an intraarticular injection may be even

lower. I find the Betts view quite helpful in visualizing the STT joint. Having said that, North and Eaton pointed out many years ago that plain radiographs underestimate the presence of degenerative changes seen with pantrapezial arthritis [11]. I do not use CT or MRI. Ultimately, I make the decision intraoperatively by directly visualizing the STT joint. If there are degenerative changes, I will resect the proximal 2 mm to 3 mm of the trapezoid. I make no attempt to fill the resected space with collagen.

Dr. Kakar: *In the surgical management of Eaton Stage III basilar thumb arthritis, what are your thoughts about trapeziectomy alone?*

Dr. Stern: Trapeziectomy is reasonable, especially in the more senior, less active patients. I believe W. H. Gervis MB, BCh, FRCS described

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trapeziectomy in 1949 [4]. His report was a case series (including his own personal experience) and the majority of patients did well. The subsequent literature documents good results with trapeziectomy alone. More recently, Gangopadhyay and colleagues [3] conducted a Level 1 study comparing excision alone to suspension/interposition and reported comparable results. Gray and Meals [5] have also reported satisfactory results with excision alone with followup longer than 6 years.

Dr. Rizzo: I agree that it is a reasonable treatment and the literature supports its use. However, I have seen cases of failure with trapeziectomy alone. While I readily admit that similar failures can occur with interposition or suspensionplasty, I also believe that the decision of what we perform for our patients is based on a combination of: (1) How we trained, (2) our own comfort level and personal experience with a certain method or technique, and (3) the literature or science.

Dr. Kakar: *With trapeziectomy, there is a chance of thumb metacarpal subsidence. In your opinion, what is the role of adding a ligament suspension after trapeziectomy?*

Dr. Stern: I do not think a surgeon can be faulted for performing a suspension. There is little morbidity. Previously

published studies [2, 17] noted that approximately two-thirds of American Society for Surgery of the Hand members do some combination of suspension and interposition.

Dr. Rizzo: I agree wholeheartedly. My personal experience suggests that patients have little morbidity in adding a suspensionplasty/interposition. I do not think it is a coincidence that the surveys point toward us hand surgeons (as a group) going against the literature. We can use science to help reassure us, but if there is minimal morbidity with interposition/suspension and one's personal experience has been good with a certain procedure (eg, ligament reconstruction and tendon interposition), then it will take more convincing to have some of them change.

Dr. Kakar: *Intraoperatively, if the scaphoid trapezoid joint is involved, how do you address this?*

Dr. Stern: I excise the proximal one-third of the trapezoid.

Dr. Rizzo: I do exactly the same. I start with a little (2 mm to 3 mm) and assess for impingement by moving the wrist and hand. I will stop débriding when the impingement is gone. It usually is accomplished with resection of 20% to 30% of the bone.

Dr. Kakar: *If the patient has concomitant metacarpophalangeal (MCP)*

joint hyperextension, do you think this needs to be addressed at the same time as the CMC joint? If so, what procedures do you favor and what factors do you consider to help make those decisions?

Dr. Stern: I do address MCP joint hyperextension in many cases. My treatment algorithm is as follows: (1) If the hyperextension is less than 15°, I ignore it. (2) If it is between 15° and 30°, I pin the MCP joint in flexion for 3 weeks to 4 weeks (I am not sure if this does much). (3) If the MCP joint hyperextension is between 30° and 60°, I perform a MCP joint volar plate capsulodesis and pin the MCP joint for 3 weeks. (4) If there is evidence of MCP joint degenerative changes or hyperextension greater than 60°, I perform an arthrodesis.

Dr. Rizzo: I closely agree with Dr. Stern on this one as well. The only deviation is that my threshold for fusion is somewhat lower (50°), as my experience with volar capsulodesis has not been as consistent as I would like. However, fusion is a big decision and it is important to consider the interphalangeal motion, as well as the patient's specific needs/wants. In addition, a couple technical points I think that are worth mentioning regarding fusion include (1) cautioning against overly shortening at the MCP fusion, and (2) avoiding overly flexing

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at the fusion mass, if possible (I prefer 0°–15° at most).

Dr. Kakar: *Are there indications you would consider arthroscopic débridement of the trapeziometacarpal joint? What are your indications for prosthetic arthroplasty or trapeziometacarpal joint fusion over trapeziectomy?*

Dr. Rizzo: Certainly. While my experience with trapezium resecting procedures such as ligament reconstruction and tendon interposition (LRTI) generally has been favorable, I would consider a trapezium-preserving procedure in the younger population and/or patients who are heavy manual laborers or have hobbies that involve strenuous activities. I do this for two main reasons. First, the trapeziectomy procedures do not (in my experience) improve or preserve strength as much as trapezium-preserving procedures such as fusion. Second, a fusion has better salvage options should it fail or become symptomatic.

Dr. Stern: I rarely perform arthroscopic débridement and have no experience with arthroscopic trapeziectomy. Joint débridement (in the absence of mechanical symptoms) has not been successful in joints such as the knee and it is difficult for me to understand how it can be successful in the thumb CMC joint. At best, I see it as a temporizing procedure. I see no role for thermal shrinkage; it denatures

collagen and long term would increase joint instability. I do not believe there is a role for prosthetic arthroplasty in the thumb CMC joint. The literature supports this statement; in addition to higher failure rates compared to LRTI the implants are expensive. Finally, nearly all hand surgeons would agree that trapeziectomy with or without ligament reconstruction/interposition has an outstanding long-term track record. How many hand surgeons have undergone a prosthetic replacement of their own basal joint?

I like arthrodesis in young, active individuals. It maintains the length of the osteoarticular column and may preserve strength. We published a series a decade ago retrospectively comparing LRTI to arthrodesis and outcomes were virtually the same. Arthrodesis can result in nonunion but in my experience less than half of the nonunions are symptomatic [6].

Dr. Kakar: *Historically, arthroplasty and fusion have higher complication rates than trapeziectomy with possible ligament suspension arthroplasty. Given that, what are your thoughts about revision procedures if these fail?*

Dr. Rizzo: If an arthrodesis goes on to symptomatic nonunion or STT pain/arthrosis necessitating consideration for revision, I would use a LRTI as my salvage. To me, this is a significantly more attractive salvage than anything I

can come up with to salvage a failed trapezium resection procedure. Despite having done quite a few CMC fusions during the last 12 years, I have yet to have a symptomatic enough nonunion to require revision. In addition, while we have seen evidence of STT arthrosis develop in our review of longer-term outcomes, most have been clinically silent [12]. My own experience with the development of STT arthrosis has been more subtle; although, I suspect with time, it will become more common.

The most common complication associated with thumb CMC fusion has been hardware related (symptomatic, prominent, or loose) and the need for removal. I would say this has occurred approximately 10% to 15% of cases.

Dr. Stern: I agree with everything Dr. Rizzo has just said. I have several patients I have followed for more than 20 years following thumb CMC joint arthrodesis, and to date, few have had symptomatic STT arthritis despite the presence of radiographic STT arthrosis. In the presence of a solid fusion and symptomatic STT arthritis, I would resect the distal pole of the scaphoid through a volar approach. Malerich and colleagues [8] have noted largely satisfactory outcomes in the treatment of scaphoid nonunion advanced collapse wrist in long-term followup.

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I agree that the most common complication in patients who have undergone a CMC joint fusion is symptomatic hardware. If one uses plate fixation (as opposed to pins), the patient should be informed of the possible necessity for plate removal in the future.

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