

Trapeziectomy and Suspensionplasty

John R Fowler, MD
Assistant Professor
Department of Orthopaedics
University of Pittsburgh



Ideal Arthroplasty

- Pain relief
- Stability
- Retains/improves strength

Simple Trapeziectomy

- First described in 1949 by Gervis
 - satisfactory relief of pain
- Longterm retrospective case review by Gervis and Wells
 - Weakness
 - Instability
- Loss of ligamentous support from trapeziometacarpal ligaments
 - Metacarpal subsidence into the arthroplasty space
 - Changes the mechanical relationship of the thumb
 - Pinch
 - Grip

Gervis WH. Excision of the trapezium for osteoarthritis of the trapezio-metacarpal joint. J Bone Joint Surg Br 1949;31(4):537–9.

Gervis WH, Wells T. A review of excision of the trapezium for osteoarthritis of the trapezio-metacarpal joint after twenty-five years. J Bone Joint Surg Br 1973;55(1):56–7.

Ligament Reconstruction

- Eaton and Littler 1973
- Ligament reconstruction without excision of trapezium
 - Did remove visible osteophytes
- Radial half of FCR
- Sagittal bone tunnel at the base of the thumb
 - Reconstruct volar oblique ligament

TABLE 1. Radiological Staging of CMC1 Osteoarthritis According to Eaton and Littler⁶

Stage	Characteristics
I	Synovitis phase, slight widening of the joint space (joint capsule distension due to effusion), normal articular contours, and less than one-third subluxation in any projection.
II	Significant capsular laxity, at least one-third subluxation of the joint. Small bone or calcific fragments less than 2 mm in diameter are present, usually adjacent to the volar or dorsal facets of the trapezium.
III	Greater than one-third subluxation is present. Fragments greater than 2 mm are present dorsally or volarly, usually in both locations. There is slight joint-space narrowing.
IV	Advanced degenerative changes are now present. Major subluxation is apparent, and the joint space is very narrow, with cystic and sclerotic subchondral bone changes. The margins of the trapezium show lipping and osteophyte formation, and there is significant erosion of the dorsoradial facet of the trapezium.

Eaton Ligament Reconstruction

- Initial series of 18 patients
- Stage II
 - 100% excellent results:
 - no pain
 - postoperative grip strength within 10% of the nonoperative hand
 - no further radiographic changes at follow-up of at least 1 year
- Stage III patients demonstrated
 - 63% excellent and 37% good results
 - occasional pain with pinch
 - strength less than 90% of nonoperative side
 - minor radiographic deterioration.
- Stage IV disease
 - 60% good or excellent and 40% fair results
 - pain with regular use
 - joint deterioration at or worse than preoperative state

Ligament Reconstruction and Tendon Interposition

- Eaton et al 1985
- 25 Stage III CMC joints
 - 92% good or excellent results
 - 56% completely pain free
 - Average f/u 37 months
- Resection of the metacarpal base
- Planing of the trapezium
- FCR tendon interposition

Eaton RG, Glickel SZ, Littler JW. Tendon interposition arthroplasty for degenerative arthritis of the trapeziometacarpal joint of the thumb. *J Hand Surg Am* 1985;10:645–54.

Modern LRTI

- Burton and Pellegrini
 - Partial thickness FCR autograft to reconstruct the volar oblique ligament
 - FCR tendon interposition mass, or anchovy, is used to stabilize the arthroplasty space

Burton RI, Pellegrini VD Jr. Surgical management of basal joint arthritis of the thumb. Part II. Ligament reconstruction with tendon interposition arthroplasty. *J Hand Surg Am* 1986;11(3):324–32.

Tomaino MM, Pellegrini VD, Burton RI. Arthroplasty of the basal joint of the thumb. Long-term follow-up after ligament reconstruction with tendon interposition. *J Bone Joint Surg Am* 1995;77:346–55.



Does interposition matter?

- Gerwin et al
- LRTI vs suture anchor/k-wire and no interposition
- No difference
 - Grip and pinch strength
 - Functional testing
 - Satisfaction
- Radiographic evaluation
 - No difference in proximal migration

Does interposition matter?

- Kriegs-Au et al
- Prospective, randomized clinical trial
 - Average 48 month follow-up
- LR vs LRTI using $\frac{1}{2}$ FCR
 - LR had better palmar abduction and radial abduction
 - LR better Buck-Gramko score
 - No difference in metacarpal subsidence

Kriegs-Au G, Petje G, Fojtl E, et al. Ligament reconstruction with or without tendon interposition to treat primary thumb carpometacarpal osteoarthritis. J Bone Joint Surg 2005;87:78–85.





Hematoma Distraction

- Kuhns et al
 - Metacarpal head in distraction for 6 weeks with .062" K-wire
- 26 patients
 - Complete resolution of symptoms
 - 74% at 6 months
 - 92% at 2-years
 - Grip improved 47%
 - Key pinch improved 33%
 - Tip-pinch strength improved by 47%
 - Proximal migration of the metacarpal into the trapezial space averaged 60% on 2-year follow-up stress radiographs



Hematoma Distraction

- Senior author (RM)
 - Performing the hematoma and distraction arthroplasty for approximately 20 years while practicing in the same location and with the same phone number. During that time, the senior author has not personally revised a hematoma distraction arthroplasty or heard that a revision was needed or performed elsewhere.





Suture Button Suspensionplasty

- Yao et al
- 21 patients with average 2.8 year follow-up
- DASH 10
- Pinch 86% contralateral side
- Grip 89% contralateral side
- Average trapezial height 74%







Comparison of techniques

- Davis et al
- Prospective randomized trial of 183 CMC joints
- Three groups
 - Simple trapeziectomy
 - Trapeziectomy with palmaris interposition
 - Trapeziectomy with split FCR suspensionplasty and interposition

Comparison of Techniques

- No difference in pain levels
- No difference in ROM
- No difference in pinch/grip strengths





Watch out for

- Concurrent DeQuervain's
- Thumb MP hyperextension of > 30 degrees
- Valgus instability of thumb MP joint