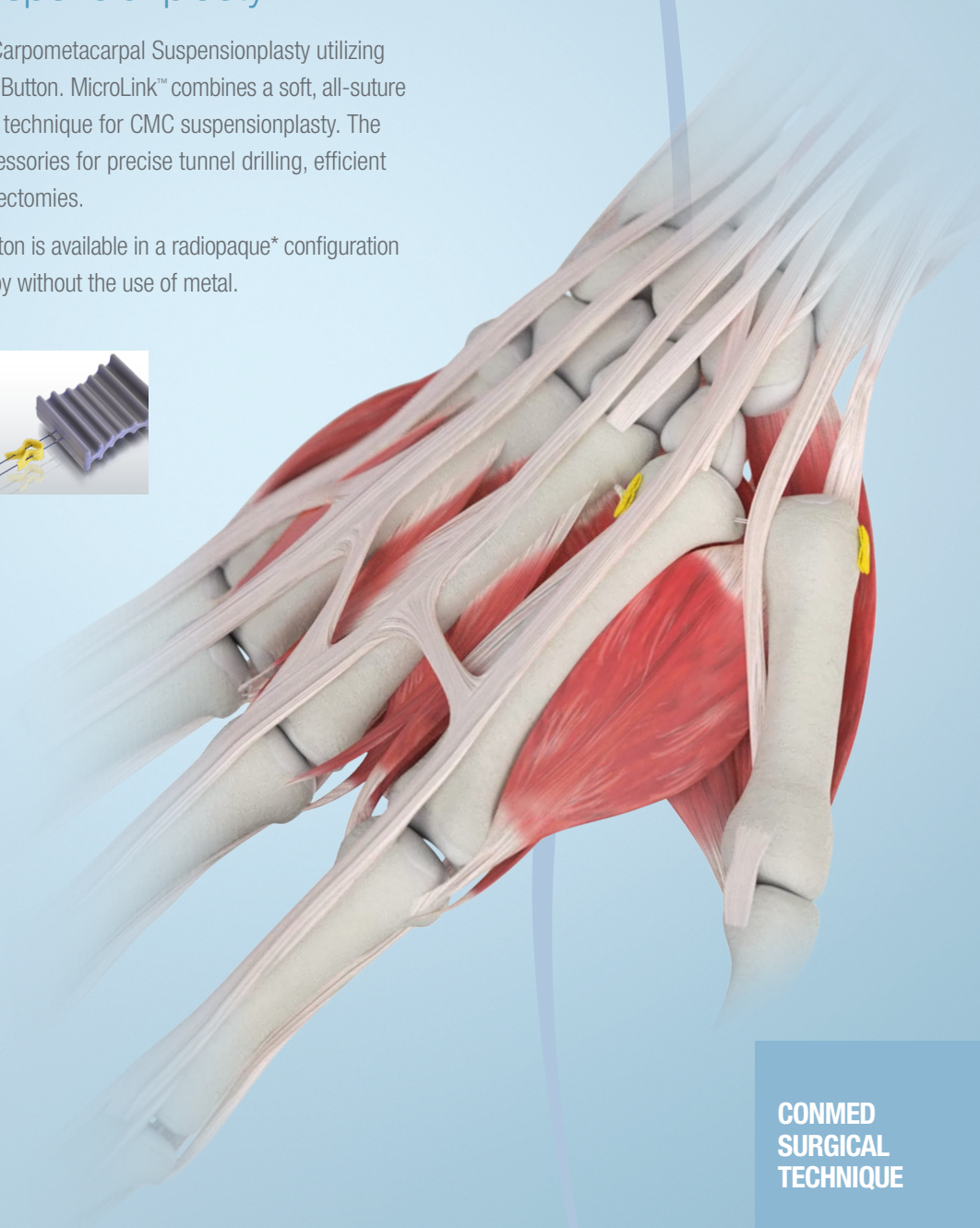




MicroLink™ All-Suture Button Carpometacarpal Suspensionplasty

A complete written technique guide to Carpometacarpal Suspensionplasty utilizing MicroLink™ – The World's First All-Suture Button. MicroLink™ combines a soft, all-suture construct with an efficient, reproducible technique for CMC suspensionplasty. The MicroLink™ System is comprised of accessories for precise tunnel drilling, efficient suture passing, and streamlined trapeziectomies.

In addition, the MicroLink™ All-Suture Button is available in a radiopaque* configuration for optimal visualization under fluoroscopy without the use of metal.



Technique featured by

Michael Shuler, MD –
Board Certified Orthopedic Surgeon
Athens Orthopedic Surgery Center
Johns Hopkins School of Medicine
Emory University, Hand and Upper
Extremity Fellowship

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* Radiopaque - Not for Sale. CE Approval Pending.

Carpometacarpal Suspensionplasty

Using MicroLink™ All-Suture Button

MICROLINK™
ALL-SUTURE BUTTON,
RADIOPAQUE



Authored by Michael Shuler, MD

Carpometacarpal Suspensionplasty is performed to address Basal Joint Arthritis while maintaining anatomical suspension of the first and second metacarpal.

Carpometacarpal (CMC) Suspensionplasty is a newer technique that has developed over the course of the past ten years. This technique is becoming increasingly popular due to the faster recovery time and less post operation pain compared to other surgical techniques such as Ligament Reconstruction Tendon Interposition (LRTI).

The immobilization period for CMC Suspensionplasty is typically shorter, approximately two weeks, than LRTI's immobilization period, approximately four to six weeks.¹ A shorter immobilization period may lead to an easier and faster recovery as physical therapy may begin sooner. In addition, CMC Suspensionplasty utilizing a button construct does not require any autograft harvesting or pins that may lead to additional procedural steps and patient dissatisfaction.

MicroLink™ All-Suture Button features a soft, low profile construct for reconstructing proper suspension and eliminating Volar Oblique ligament laxity between the first and second metacarpal after removal of the Trapezium. In addition to the button, the MicroLink™ System contains accessories, including a Trapezium Pin, McGlamry Elevator, CMC Drill Guide and Suture Passing Drill, designed to create an efficient, reproducible technique. ■

MICROLINK™
ALL-SUTURE BUTTON,
RADIOLUCENT



¹ Matullo, Kristopher et. al. "CMC Arthroplasty of the Thumb: A Review". Hand Journal. 2007 Aug. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2527221/>

MICHAEL SHULER, MD

Board Certified Orthopedic Surgeon, Athens Orthopedic Surgery Center
John Hopkins School of Medicine, Emory University,
Hand and Upper Extremity Fellowship.



Dr. Michael Shuler is a board certified orthopedic surgeon at Athens Orthopedic Surgery Center in Athens, Georgia with a subspecialty certificate in the Surgery of the Hand (CAQ).

Dr. Shuler completed a fellowship in Upper Extremity Surgery and Microsurgery at the University of Washington. He has published multiple publications pertaining to upper extremity and compartment syndrome.

In addition to his academic background, he is an active member of the American Society of Surgery of the Hand and is currently in charge of a Department of Defense grant for a non-invasive monitoring system for compartment syndrome. Dr. Shuler continues to research and perform Carpometacarpal Suspensionplasty in the interest of faster patient recovery and simplicity of the technique. ■



Athens Orthopedic Clinic

Carpometacarpal Suspensionplasty

Using MicroLink™ All-Suture Button

Authored by Michael Shuler, MD

INCISION AND SITE PREPARATION

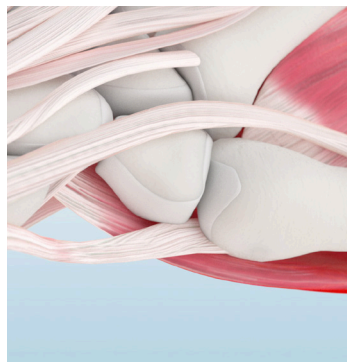


1

Make an incision centered over the Carpometacarpal joint located along the glabrous skin edge found on the radial aspect of the thumb metacarpal.

NOTE:

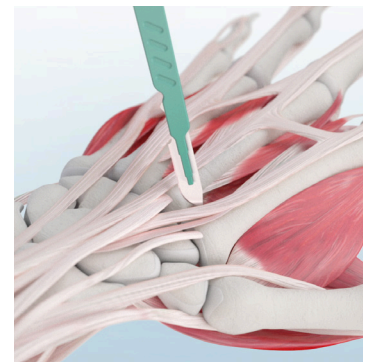
Moving the thumb up and down will help locate the base of the CMC joint line.



2

Dissection is made deep to the Thenar muscles.

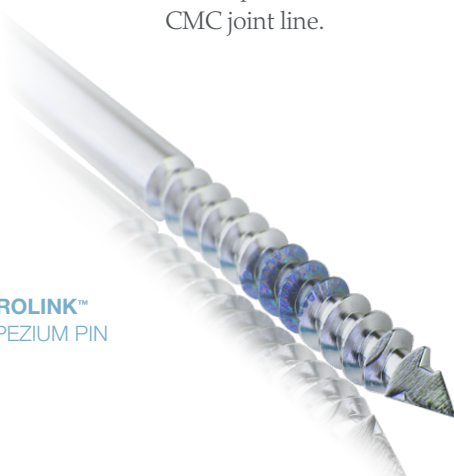
The extensor tendons are reflected dorsally to gain access to the trapezium.



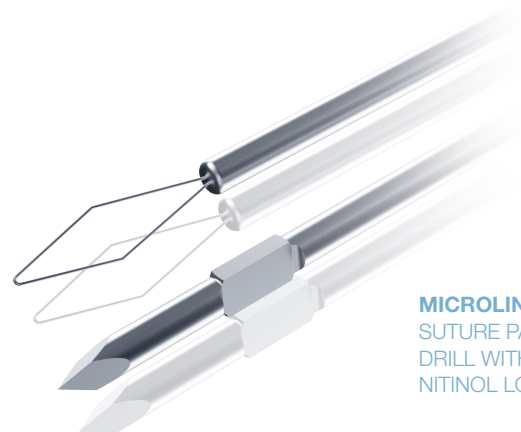
3

Perform a longitudinal capsulotomy to gain access to the CMC joint. Subperiosteal dissection is made on the proximal radial base of the index for drill guide placement. ■

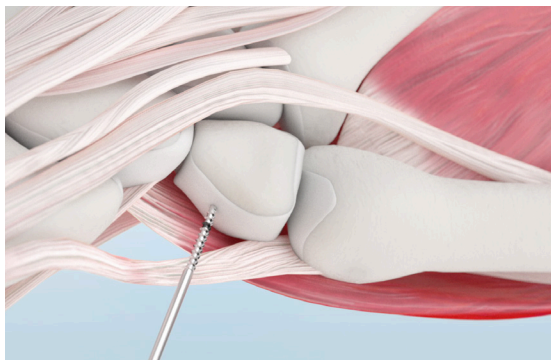
MICROLINK™
TRAPEZIUM PIN



MICROLINK™
SUTURE PASSING
DRILL WITH
NITINOL LOOP



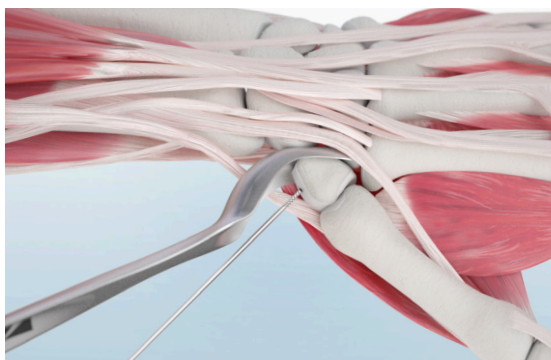
TRAPEZIECTOMY



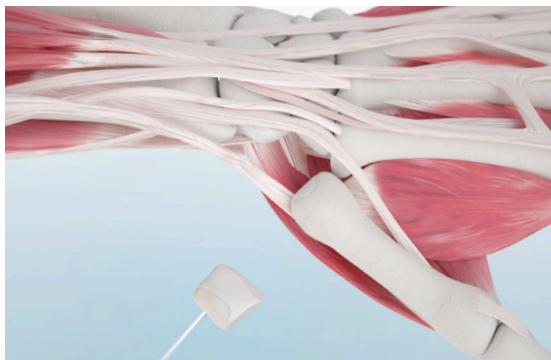
- 4** **Subperiosteal dissection** of the trapezium is performed. Care is taken to protect the Flexor Carpi Radialis deep/ volar to the trapezium. Dorsal to the trapezium lies a branch of the radial artery. Using a Pin Driver, drill the Trapezium Pin into the center of the trapezium for manipulation of the bone to remove in block.

NOTE:

The Trapezium Pin features a laser line mark signifying 10mm - 15mm of drill depth. It's recommended that you drill between 10 and 15mm of depth.



- 5** The McGlamry Elevator can be used to scrape soft tissue from the trapezium for easier removal.



- 6** **REMOVE or RESECT the diseased trapezium bone.**

NOTE:

If needed, the trapezium can be broken into pieces for easier resection by using an osteotome and mallet, or with a rongeur. ■

MICROLINK™
MCGLAMRY ELEVATOR



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TUNNEL PREPARATION



Carpometacarpal Suspensionplasty Using MicroLink™ All-Suture Button



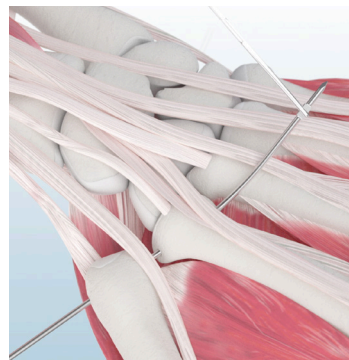
7

Prior to drilling, the extensor tendons should be manually manipulated to the ulnar direction to avoid piercing. The MicroLink CMC Drill Guide can be used to assist with tunnel trajectory and drilling with the Suture Passing Drill. Fluoroscopy should be used to confirm guide placement.

NOTE:

The MicroLink CMC Guide includes the option of a metacarpal paddle to stabilize the thumb.

If using the MicroLink Drill Guide with paddle, position the paddle so it lies volar to the base of the thumb. Traction on the thumb may be needed to obtain appropriate trajectory. Once the paddle is in place, position the drill guide's distal tip on the base on the index finger at the metacarpal flare just distal to the middle and index finger articulation.



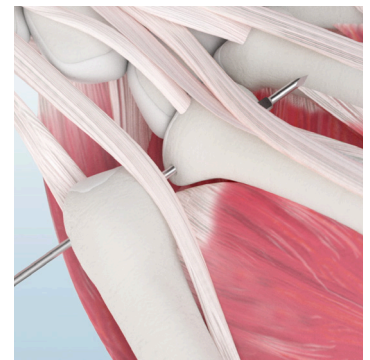
8

Insert the sharp tip of drill into the CMC Drill Guide and drill through the four cortices with the Suture Passing Drill.

NOTE:

The drill entry point on the thumb metacarpal should be at the proximal radial corner, and care should be taken to not drill too distally to avoid limitations of abduction. Adduction of thumb metacarpal assists proper trajectory. Distal angulation of the guide pin in the thumb metacarpal should prevent too shallow of a bone tunnel.

If performing technique free handed, surgeon's thumb is placed on the base of the thumb metacarpal with index and middle fingers on either side of base of the index metacarpal. The drill bit will be directed between the index and middle fingers. After drilling, the tip should protrude the dorsal aspect of the hand.



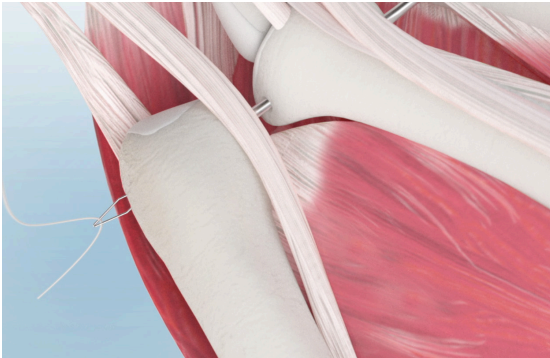
9

Once the Suture Passing Drill advances through the ulnar aspect of the index finger, a blade is used to make a small incision at the exit point of the drill bit large enough to allow passage of the MicroLink Backstop.

NOTE:

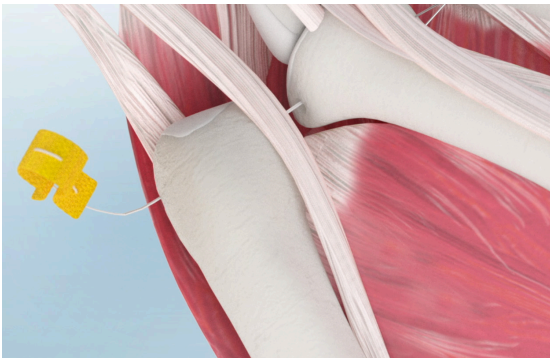
Blunt dissection of muscle and fascia is made down to the bone of the ulnar aspect of the index finger in preparation for the MicroLink Backstop to lie directly on the bone cortex. ■

SUSPENSION PLACEMENT: BUTTON

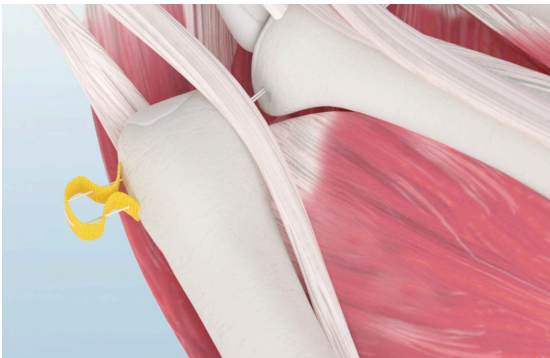


- 10 Pass 2cm of the #2 Hi-Fi® suture tail found on the MicroLink™ All-Suture Button through the nitinol loop found on the Suture Passing Drill.

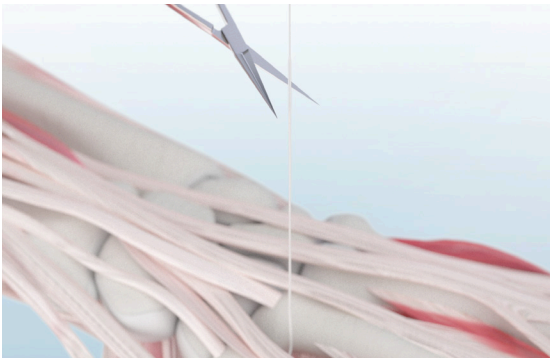
NOTE:
Loading more than 3cm of suture through the nitinol loop could result in inability to pass the drill bit and suture tail.



- 11 Manually pass the Suture Passing Drill through the first and second metacarpal tunnel until the drill is completely removed and the suture tail has been passed through both the thumb and index metacarpal on the dorsum of the hand.



- 12 Apply firm tension to the suture tail from the ulnar side of the index metacarpal to seat the MicroLink™ All-Suture Button firmly against the thumb metacarpal cortex.



- 13 Cut right below end of the splice found on the suture tail protruding from the ulnar side of the index metacarpal so that it becomes two separate tails of suture

NOTE:
Cutting as close as possible below the splice end optimizes the amount of working suture length available. ■



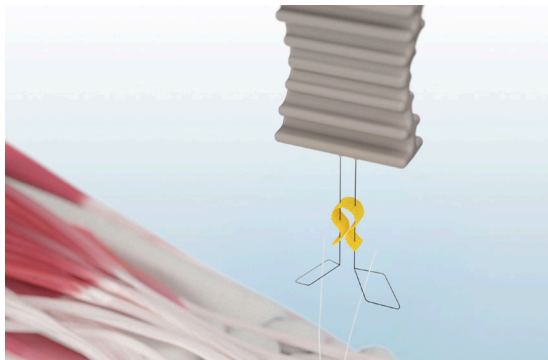
MICROLINK™
SUTURE PASSING
DRILL WITH
NITINOL LOOP



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SUSPENSION PLACEMENT: BACKSTOP

Carpometacarpal Suspensionplasty Using MicroLink™ All-Suture Button



14

Using the MicroLink Loader with Backstop, pass 3cm of one strand of suture through one of the nitinol loops found on the Backstop Loader.

Pass 3cm of the second suture strand through the second nitinol loop on the Backstop Loader. Hold the suture tails so they remain passed through the nitinol loops.

NOTE:

The suture strands can be loaded frontwards or backwards through the nitinol loops.



15

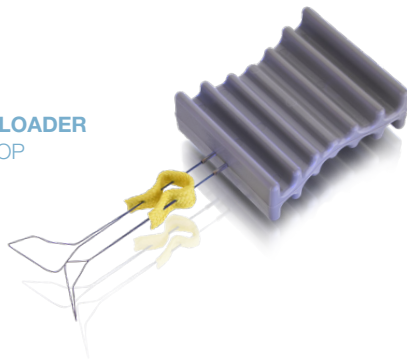
Hold the plastic loader with hand, and place other hand on nitinol wires between Backstop Loader and the Backstop.

Gently slide the Backstop off the Loader on to the suture limbs.

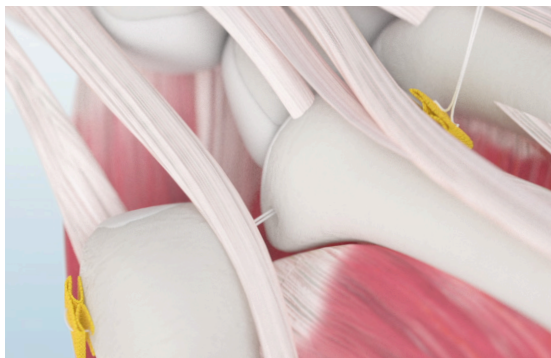
Ensure the Backstop has been removed completely off the Loader, and both suture tails are completely passed through Backstop. This may require help from an assistant.

Discard the Loader. ■

**MICROLINK™ LOADER
WITH BACKSTOP**



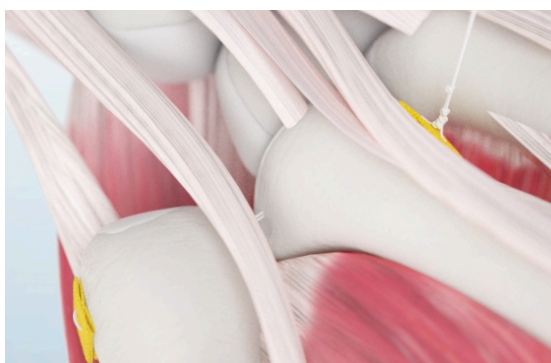
SUSPENSION PLACEMENT: BACKSTOP



- 16** Manually slide the Backstop down the suture tails to the skin edge of the index metacarpal. A half throw can be used to advance the backstop down to the ulnar cortex of the thumb metacarpal.

NOTE:

Fluoroscopy can be used to confirm positioning on the index metacarpal cortex. Imaging in line with the index and thumb metacarpal articulation should show 1-2mm of space for prevention of abutment. Over tensioning should be avoided. If abutment is seen on Fluoroscopy, loosening of half throw should be performed. Recheck fluoroscopy to confirm correct tensioning.



- 17** After appropriate tension and alignment is confirmed, tie a minimum of four additional knots. Additional sutures can be cut.

NOTE:

A minimum of 5 total knots is required to ensure fixation, (1 provisional knot plus an additional 4 half throws). ■

COMPLETING THE REPAIR

- 18.** Knot stack is tucked in between the index and middle metacarpals.
- 19.** Utilizing dissolvable suture, a buried figure eight construct is used to close the fascia over the knot stack to prevent extensor tendon irritation.
- 20.** Dissolvable suture is used to close the capsule after trapeziectomy is closed.
- 21.** The dorsal radial sensory nerve to the thumb should be identified and confirmed to be free of entrapment prior to skin closure. ■

AN ALTERNATIVE TECHNIQUE: MicroLink™ All-Suture Button

Below is an alternative technique involving placing the button on the index and the backstop on the thumb.

The steps presented on the following pages outline an additional approach to suspending the MicroLink™ All-Suture Button. This technique allows for the knot stack to be placed at the distal portion on the thumb, if preferred versus having the knot stack on the index finger.

Authored by Michael Shuler, MD

INCISION AND SITE PREPARATION

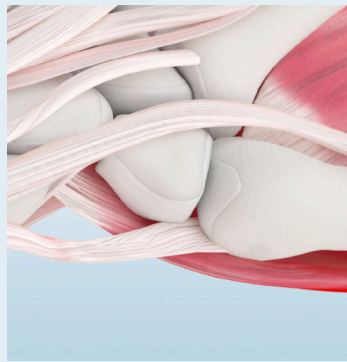


1

Make incision centered over the Carpometacarpal joint located along the glabrous skin edge found on the radial aspect of the thumb metacarpal.

NOTE:

Moving the thumb up and down will help locate the base of the CMC joint line.



2

Dissection is made deep to the Thenar muscles.

The extensor tendons are reflected dorsally.

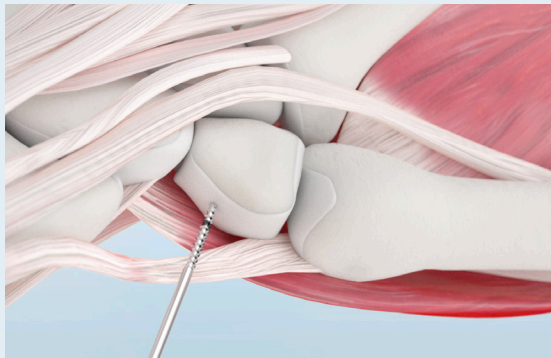


3

Perform longitudinal capsulotomy to gain access to the CMC joint. Subperiosteal dissection is made on the proximal radial base of the index for drill guide placement. ■

MICROLINK™
TRAPEZIUM PIN

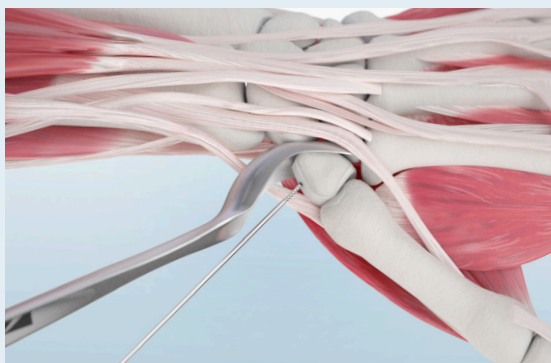
TRAPEZIECTOMY



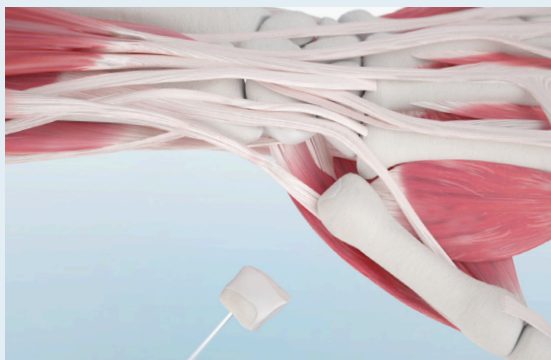
- 4** **Subperiosteal dissection** of the trapezium is performed. Care is taken to protect the Flexor Carpi Radialis deep/ volar to the trapezium. Dorsal to the trapezium lies a branch of the radial artery. Using a Pin Driver, drill the Trapezium Pin into the center of the trapezium for manipulation of the bone to remove in block.

NOTE:

The Trapezium Pin features a laser line mark signifying 10mm - 15mm of drill depth. It's recommended that you drill between 10 and 15mm of depth.



- 5** The McGlamry Elevator can be used to scrape soft tissue from the trapezium for easier removal.



- 6** **REMOVE or RESECT the diseased trapezium bone.**

NOTE:

If needed, the trapezium can be broken into pieces for easier resection by using an osteotome and mallet, or with a rongeur. ■

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TECHNIQUE**

TUNNEL DRILLING: BUTTON ON INDEX

7. Make incision centered over the carpometacarpal joint located along the radial base found on the thumb metacarpal. Moving the thumb up and down will help locate the base of thumb metacarpal.
8. Prior to puncturing skin, extensor tendons should be manually manipulated to the radial direction to avoid piercing.
9. The MicroLink™ CMC Drill Guide can be used to assist with tunnel trajectory and drilling with the Suture Passing Drill. The guide includes the option of a metacarpal paddle to stabilize the thumb in place. If using the MicroLink™ Drill Guide with Paddle, position the paddle so it lies volar to the base of the thumb. Traction on the thumb may be needed to obtain appropriate trajectory.
 - Once the paddle is in place, position the drill guide's distal tip on the base on the index finger at the metacarpal flare just distal to the middle and index finger articulation.
 - Fluoroscopy should be used to confirm guide placement.
10. Insert sharp tip of drill into the CMC Drill Guide and, begin drilling through the four cortices with the Suture Passing Drill starting at the ulnar aspect of the index.

NOTE: If performing technique free handed, the surgeon's thumb is placed on the base of the thumb metacarpal with index and middle fingers on either side of the base of the index metacarpal. The drill will be directed in between the index and middle fingers. After drilling, the tip should protrude the dorsal hand.
11. Once the Suture Passing Drill extends through the skin, a blade is used to make a small incision at the exit point of the drill large enough to allow passage of the MicroLink™ All-Suture Button.
12. Blunt dissection of muscle and fascia is made down to the bone again to allow for the MicroLink™ All-Suture Button to lie directly on top of the cortex. ■

SUTURE PASSING: BUTTON ON INDEX

13. Load 2cm of a passing suture loop through the nitinol loop found on the Suture Passing Drill. The suture loop should end up on the ulnar side of the index finger.
NOTE: Loading more than 3cm of suture through the nitinol loop could result in an inability to pass the Suture Passing Drill and the passing suture loop.
14. Manually pull the Suture Passing Drill through the index metacarpal tunnel until the Drill is completely removed and the passing suture's loop has been passed through the thumb and index metacarpal.
15. Load at least 2cm of the #2 Hi-Fi® Suture Tail found on the MicroLink™ All-Suture Button through the passing suture loop.
16. Pull the passing suture with the MicroLink™ All-Suture Button suture tail back through the index and out of the thumb metacarpal until the MicroLink™ All-Suture Button's suture tail is exiting out the radial aspect of the thumb metacarpal.
17. Apply firm tension to the suture tail from the radial side of the thumb metacarpal to set the All-Suture Button firmly against the index metacarpal cortex.
NOTE: Check fluoroscopy to confirm placement of the MicroLink™ All-Suture Button.
18. Cut proximal to the splice found on the suture tail protruding from the radial side of the thumb metacarpal so that it becomes two separate tails of suture.
NOTE: Cutting as close as possible below the splice end optimizes the amount of working suture length available.
19. Using the MicroLink™ Loader with Backstop, pass at least 3cm of one strand of suture through one of the nitinol loops and at least 3cm of the other strand through the other nitinol loop.
20. Hold the plastic loader with hand, and place other hand on nitinol wires between Backstop Loader and the Backstop. Gently slide the Backstop off the Loader on to the suture limbs. Ensure the Backstop has been removed completely off the Loader, and both suture tails are completely passed through Backstop. This may require help from an assistant. Discard the Loader.
21. Manually slide the Backstop down the suture tails to the skin edge found at the thumb metacarpal. A half throw can be used to advance the backstop down to the radial cortex of the thumb.
NOTE: Fluoroscopy can be used to confirm positioning on the cortex. Imaging in line with the index and thumb metacarpal articulation should show 1-2mm of space for prevention of abutment. Over tensioning should be avoided. If abutment is seen on Fluoroscopy, loosening of half throw should be performed. Recheck fluoroscopy to confirm correct tensioning.
22. After appropriate tension and alignment is confirmed, tie a minimum of four additional knots. Additional Sutures can be cut.
NOTE: A minimum of 5 total knots is required to ensure fixation, (one provisional knot plus 4 additional half throws). ■

ORDERING INFORMATION

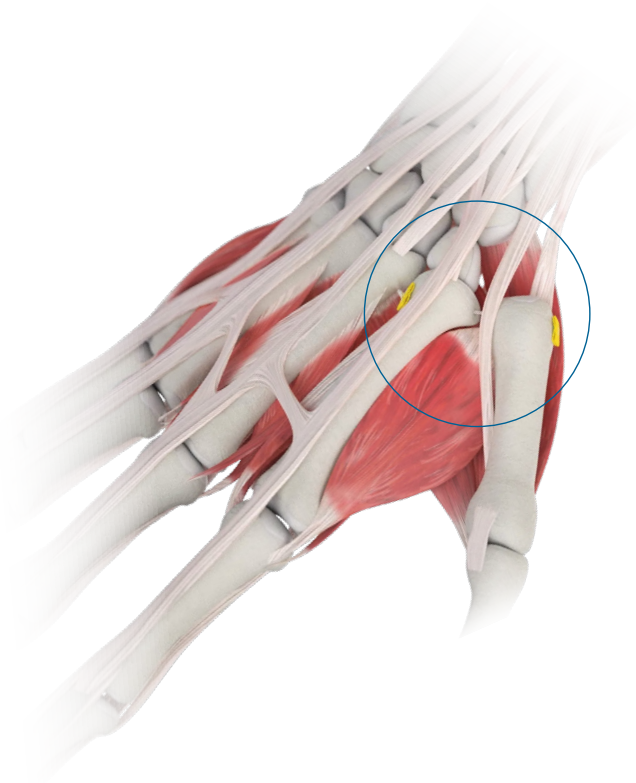
To order any of our MicroLink™ All Suture Button products including instrumentation other accessories please call CONMED Customer Service at: (US) **1-866-4CONMED** or, (Global) **727-392-6464**.

Ordering Information

Description	Qty	Catalog Number
MicroLink™ All-Suture Button Fixation Kit: Radiopaque - Coming Soon		ASBR-K
All-Suture Button, Radiopaque	1	
Backstop with Loader, Radiopaque	1	
Suture Passing Drill, 1.4mm	1	
Trapezium Pin, 3.5mm x 1.5cm	1	
MicroLink™ All-Suture Button Fixation Kit: Radiolucent		ASBNR-K
All-Suture Button, Radiolucent	1	
Backstop with Loader, Radiolucent	1	
Suture Passing Drill, 1.4mm	1	
Trapezium Pin, 3.5mm x 15cm	1	
MicroLink™ All-Suture Button with Backstop: Radiopaque - Coming Soon		ASBR-BB
All-Suture Button, Radiopaque	1	
Backstop with Loader, Radiopaque	1	
MicroLink™ All-Suture Button with Backstop: Radiolucent		ASBNR-BB
All-Suture Button, Radiolucent	1	
Backstop with Loader, Radiolucent	1	
MicroLink™ Instrumentation		
MicroLink™ CMC Suture Passing Drill, 1.4mm	1	ASB-PD
MicroLink™ CMC Trapezium Pin, 3.5mm x 15cm	1	ASB-TP
McGlamry Elevator, 9mm	1	ASB-ME
MicroLink™ CMC Drill Guide (without paddle) - Coming Soon	1	ASB-DG
MicroLink™ CMC Drill Guide (with paddle) - Coming Soon	1	ASB-DGP

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