TIE-IN™

TRAPEZIUM IMPLANT

SURGICAL TECHNIQUE

WRIGHT.™

TIE-IN™
trapezium
IMPLANT

surgical technique

presented by
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and Mark T. Jobe, MD

TIE-IN™ TRAPEZIUM IMPLANT

as described by James H. Calandruccio, MD
and Mark T. Jobe, MD

INTRODUCTION

The TIE-IN™ Trapezium implant was developed to restore function to the CMC joint that has been disabled by degenerative arthritis and/or traumatic arthritis.

It is a single stemmed, flexible implant that replaces the trapezium and is inserted in the first metacarpal. This implant is made of a silicone elastomer.

GENERAL PRECAUTIONS

Proper surgical procedures and techniques are the responsibility of the medical professional. Each surgeon must evaluate the appropriateness of the procedure used based on personal medical training and experience. Wright Medical Technology, Inc. cannot recommend a particular surgical technique suitable for all patients.

INDICATIONS

- Pain and palpable crepitation localized at the base of the thumb
- Motion, grip strength, and pinch decreased
- Arthritic changes evident on X-ray

CONTRAINDICATIONS

- Conservative treatment possible
- Inadequate skin, bone, or neurovascular structures
- Irreparable tendon system

PREOPERATIVE EVALUATION

Ideally Suited Patients:

- Pantrapezial arthritis
- Poor bone quality
- MP joints with less than 20° of dynamic hyperextension
- Limited thumb adduction deformity

INCISION AND EXPOSURE

FIGURE 1 |

Incision of choice is an extended volar curvilinear. Distally between the glabrous and non-glabrous skin over the thenar eminence, curving slightly volar at the distal wrist flexion crease and extending proximally for 3.0cm along the radial side of the FCR tendon.
| FIGURE 1

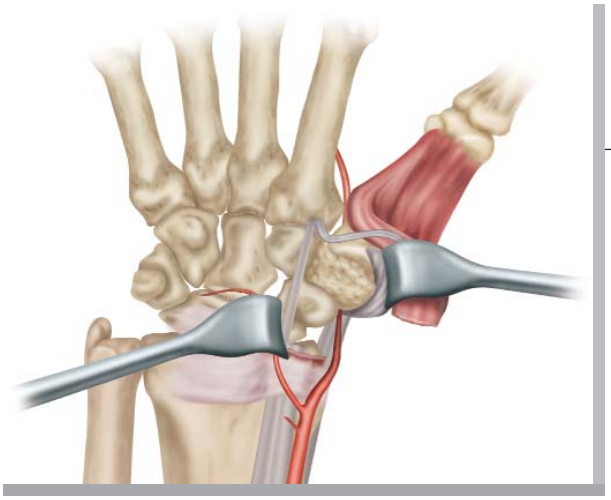

FIGURE 2 |

Identify and protect the radial artery coursing obliquely over the dorsal body of the trapezium. Sharply dissect the FCR free of soft tissue attachments from a proximal to distal direction. Unroof the FCR tendon from the overlying trapezial ridge and follow it distally. Expose and inspect the scaphotrapezialtrapezoid (STT) joint. Deterioration of the STT joint or poor bone quality of the trapezium will necessitate complete trapezial excision.
| FIGURE 2

TRAPEZIUM REMOVAL

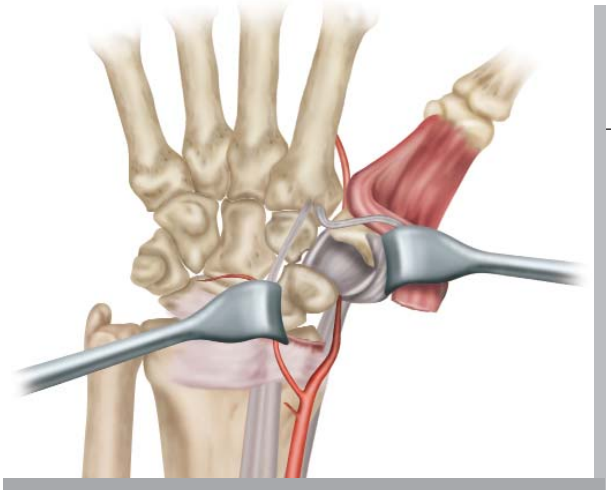

FIGURE 3A |

Expose 2.0cm of the thumb metacarpal base by sharp reflection of the thenar muscles. Save as much of the soft tissue around the trapezium as possible by sharp subperiosteal dissection as far as safely possible.

Identify and protect any sensory nerves crossing the area. Cauterize and divide venous and volar carpal arterial branches as necessary to permit deeper dissection.

Freeing of the deeper fragments by sharp dissection will lessen the trauma incited by aggressive traction or rongeurs. The trapezium is removed.
| FIGURE 3A

TRAPEZIAL RESECTION

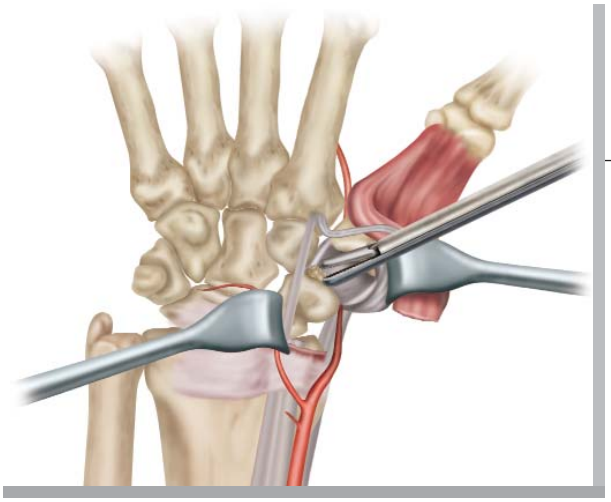

FIGURE 3B |

Trapezial resection can usually be accomplished with a small pair of rongeurs. Piecemeal fragmentation with a small osteotome may facilitate this process. Additional freeing of the deeper fragments by sharp dissection will lessen the trauma incited by aggressive traction or rongeurs. Loose bodies or an osteophyte in the thumb-index base recess should be identified and removed when present. Irrigate the trapezial void to make sure all bone fragments are removed.
| FIGURE 3B

METACARPAL PREPARATION

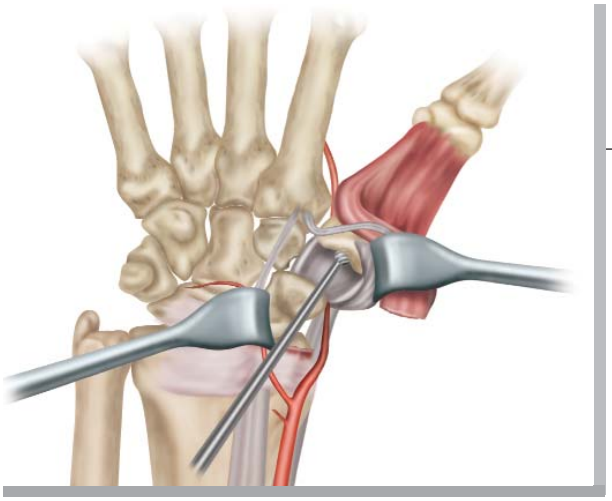

FIGURE 4 |

Remove any osteophytes around the periphery of the metacarpal base, especially the beak region. Use the 5mm coarse burr to prepare a hole in the base of the metacarpal. This starting hole should allow the implant stem to fit in the metacarpal canal. The geometry of the metacarpal should be assessed on the preoperative lateral X-ray film to guide the proper starting position. **| FIGURE 4**

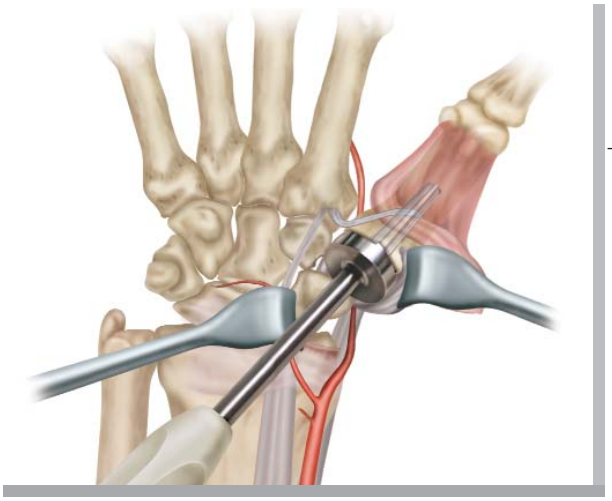

FIGURE 5 |

In general, the starting hole should be dorsal to the center of the metacarpal base to prohibit the reamer from striking the volar cortex of the metacarpal stem.

Insert the trumpet reamer into this hole and ream the metacarpal until the base sits flush. Protect the soft tissue from the teeth of the reamer.

NOTE | *If the shaft base angle exceeds 15°, leveling of the base with a saw prior to reaming will speed up the metacarpal preparation. Soft bone may be prepared with hand reaming. Harder bone may be best prepared with power reaming. Continue reaming in line with the metacarpal shaft until the reamer sits flush on the metacarpal base. Further smoothing of the metacarpal base can be achieved by counterclockwise reaming with the trumpet reamer.* **| FIGURE 5**

EVALUATION OF THE SCAPHOTRAPEZOID JOINT

The scaphotrapezoid may still provide a site of continued joint degeneration. The lower 5mm of the trapezoid should be sculpted to permit the lower portion of the TIE-IN™ implant body to sit atop the scaphoid.

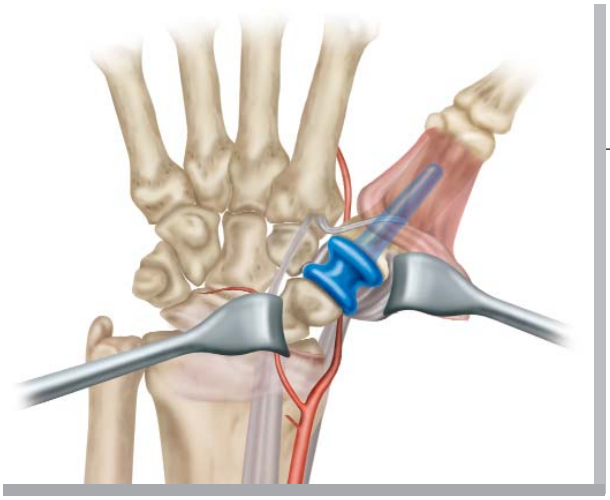

FIGURE 6 |

Insertion of trial dictates size.
| FIGURE 6

IMPLANT STABILIZATION AND WOUND CLOSURE

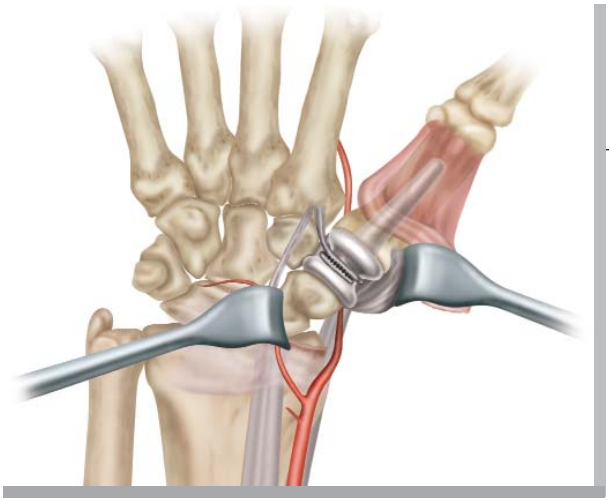

FIGURE 7 |

A tendon loop around the waist of the TIE-IN™ Trapezium implant body should enhance the early stability of the implant. However, some patients will have capsular tissue of sufficient quality to suture over the waist recess to provide implant stabilization during the encapsulation stage (first 3 weeks).
| FIGURE 7

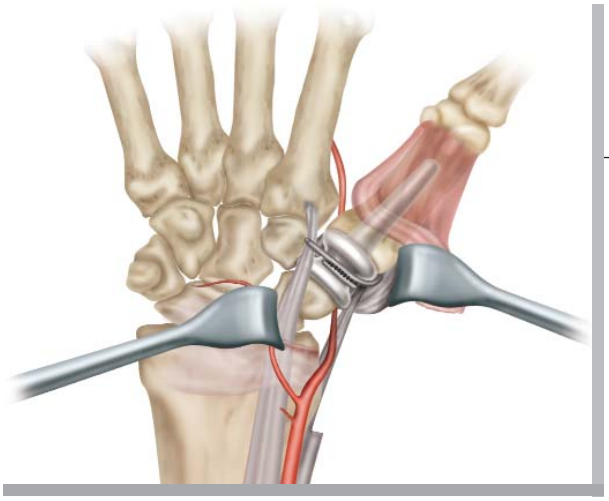

FIGURE 8 |

Should the capsule be insufficient or poor quality, a distally-based local tendon slip should be developed to loop around the implant waist. An accessory APL slip is ideally suited for this purpose.
| FIGURE 8

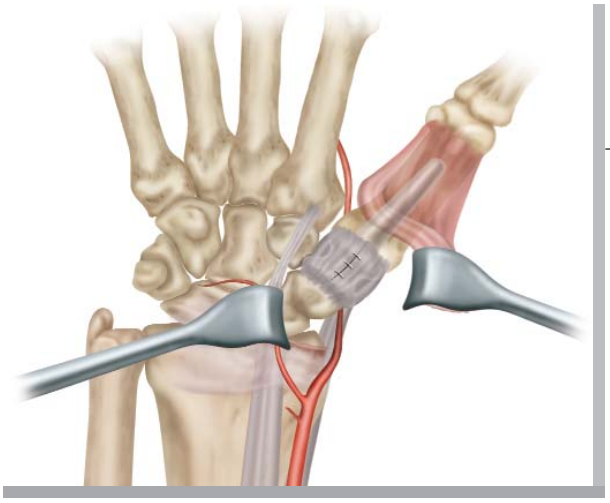

FIGURE 9 |

To harvest an accessory tendon, a first dorsal compartment release is routinely performed. Elevate the soft tissues overlying the first dorsal compartment carefully by blunt dissection to protect the sensory nerves from injury. Divide the first dorsal compartment retinaculum in line with the EPB and leave the retinaculum volarly based to prevent volar subluxation of the EPB and APL tendons. Look for and divide when septum is present between the EPB and APL tendon groups. Multiple APL tendons in the first dorsal compartment are common. An accessory APL tendon with good insertion into the thumb metacarpal base is selected and divided approximately 2-3mm wide and transected at its insertion.

FIGURE 10 |

The free tendon end is taken around the implant waist, FCR tendon, and back to itself. Multiple interrupted nonabsorbable braided 4-0 sutures are used to secure this fixation. Additional capsular soft tissue from the subperiosteal trapezial resection is then sutured over and to this tendon loop construct for additional fixation. | **FIGURE 9 & 10**

The skin is closed with interrupted 5-0 monofilament suture. The wound is infiltrated with 10cc of a local anesthetic mixture (5cc of 2.0% lidocaine and 5.0cc 0.5% Marcaine with epinephrine).

A well-padded, forearm-based thumb spica splint is applied with the thumb positioned in 40° palmar abduction and 20° of radial abduction (fist position).

AFTERCARE

The patient's first postoperative visit should be approximately 3 weeks. The thumb spica splint and sutures are removed. Interval splint wear may be necessary. Often the splint used by the patient during the non-operative management is suitable for this purpose and the patient is encouraged to bring that splint for their first postoperative visit. The splint may be of benefit for the next several weeks, but is not required if initial soft tissue stability is good and the thumb base appears stable at the first postoperative visit.

If the thumb base stability is questionable or if the patient is uncomfortable, then a thumb spica splint may be applied for an additional 2 to 4 weeks. The encapsulation period (first 3 weeks) should allow sufficient soft tissue stabilization to obviate the need for long-term splint wear.

Activity resumption is permitted as comfort and thumb stability allows. The second postoperative visit should be 4-6 weeks later (approximately 2 months postoperative) to evaluate the patient's subjective and objective result. Should the patient be satisfied with the outcome, no additional follow up is required. Physical therapy for desensitization and strengthening may be prescribed as necessary on an individual basis.

ORDERING INFORMATION

ITEM NUMBER	DESCRIPTION	
8563001	TIE-IN™ Trapezium Implant	SIZE 1
8563002	TIE-IN™ Trapezium Implant	SIZE 2
8563003	TIE-IN™ Trapezium Implant	SIZE 3

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