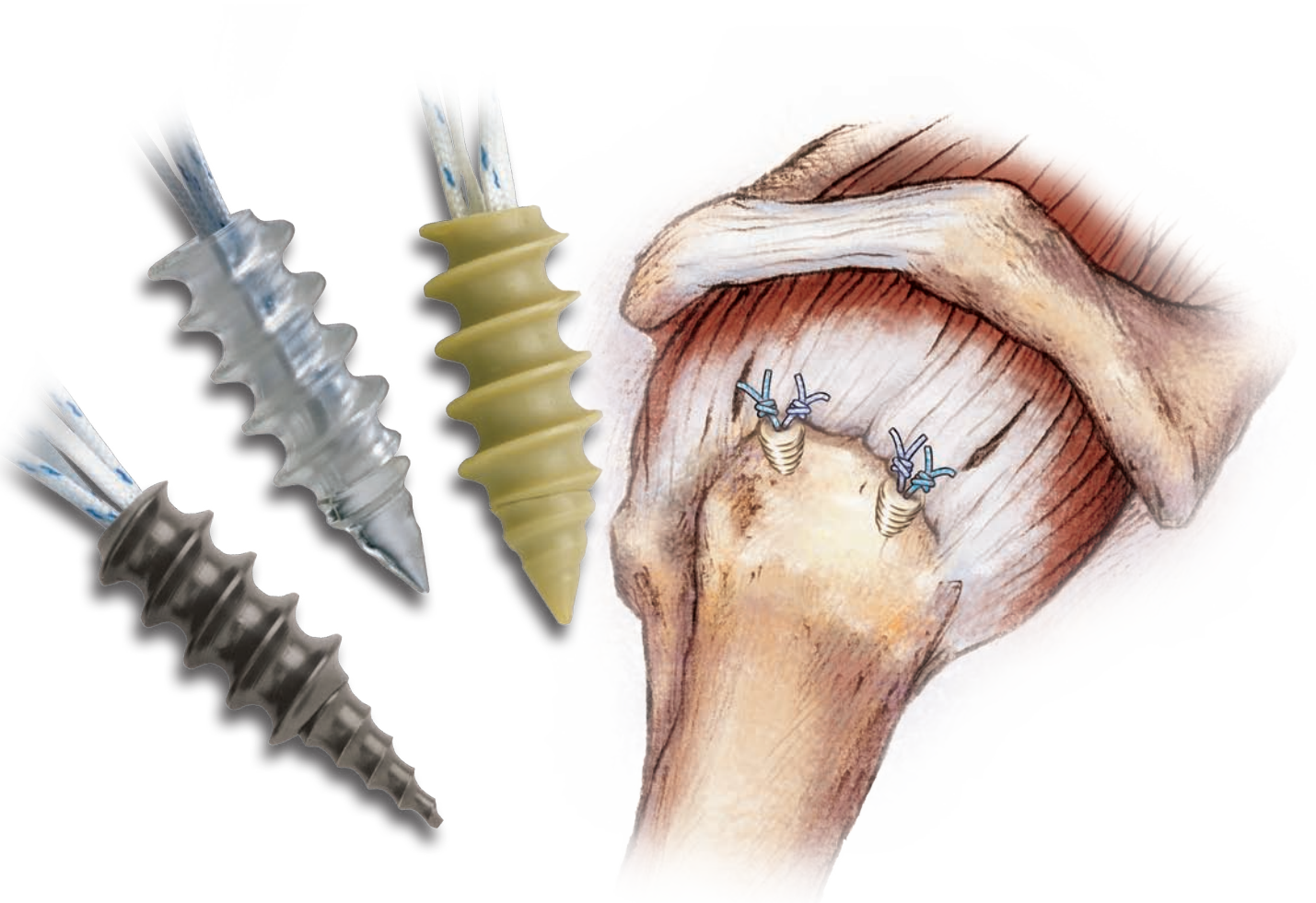
Rotator Cuff Repair

with ALLthread™ Suture Anchors

Surgical Technique
by Scott Kuiper, M.D.



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The Material Difference

Many times surgeons require different materials for different applications. These requirements may be dependent upon anatomic location, bone quality, or patient acceptance. Zimmer Biomet Sports Medicine is proud to offer a wide range of ALLthread Suture Anchors manufactured with innovative materials to meet your needs. The ALLthread Suture Anchors are fully-threaded to achieve fixation in cortical bone to maximize resistance to pullout and displacement. Dual eyelet configurations aid suture sliding during the knot tying process.

PEEK-OPTIMA® Polymer

LactoSorb® L15 Resorbable Copolymer

Titanium Dual Eyelet

Titanium Triple Eyelet

Features

- Fully-threaded to achieve cortical fixation
- Dual and triple eyelet configurations to aid suture sliding while knot tying
- Loaded with MaxBraid™ PE Suture

PEEK-OPTIMA Polymer

Zimmer Biomet Sports Medicine is proud to be one of the first to provide implants manufactured with PEEK-OPTIMA Polymer. This significant polymer advancement has provided benefits from both metal and resorbable technologies. PEEK-OPTIMA Polymer exhibits an optimal combination of strength, stiffness and toughness, while being radiolucent and revisable, making it ideally suited for suture anchors. PEEK-OPTIMA polymer provides physiological load sharing between the implants and the surrounding tissues.

LactoSorb L15 Resorbable Copolymer

LactoSorb L15 Copolymer is comprised of 85% Poly-L-lactic acid and 15% Polyglycolic acid. This formulation provides a balance of properties, *i.e.*, strength retention/loss timed to complement healing, complete mass loss and biocompatibility during degradation principally due to the lack of crystallinity. The elimination of future implant removal surgery, clear radiographs and physiological load sharing between the implants and the surrounding tissues are a few of the benefits of LactoSorb Technology.

Titanium

This traditional material is clinically proven for biocompatibility and strength. Titanium allows for fast and easy insertion techniques making it one of the easiest materials to use on the market. The high strength of titanium allows for design variations such as the ALLthread Ti III Suture Anchor—a triple eylelet suture anchor loaded with three sutures to provide additional fixation when necessary.

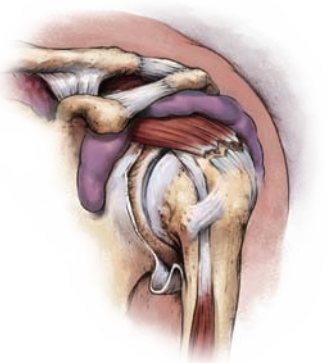
MaxBraid PE Suture

Suture plays a significant role in repairs made with suture anchors. Zimmer Biomet Sports Medicine's strength of the MaxBraid Suture is comprised of polyethylene, to help limit suture fray and breakage. MaxBraid Suture has high tensile strength, but also possesses great knot tying characteristics. The braided suture cinches on itself, providing confidence when tying knots.

Options

Rotator Cuff Repair

Repairing a torn rotator cuff can present a multitude of challenges. Zimmer Biomet Sports Medicine offers the ALLthread Suture Anchor in multiple sizes, suture configurations and options with needles to allow the surgeon to select fixation methods based on the needs of the patient.



Part No.	Size	Material	Suture		Needles
905940	5.5 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	Cutting
905942	5.5 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	No
905943	5.5 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	Tapered
905941	6.8 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	Cutting
905944	6.8 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	No
905945	6.8 mm	LactoSorb L15 Copolymer	Two #2	MaxBraid Suture	Tapered
905940P*	5.5 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	Cutting
905942P	5.5 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	No
905943P*	5.5 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	Tapered
905941P	6.8 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	Cutting
905944P	6.8 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	No
905945P	6.8 mm	PEEK-OPTIMA Polymer	Two #2	MaxBraid Suture	Tapered
904921P	5.5 mm	PEEK-OPTIMA Polymer	Three #2	MaxBraid Suture	No
904922P	5.5 mm	PEEK-OPTIMA Polymer	Three #2	MaxBraid Suture	Tapered
904923P	6.8 mm	PEEK-OPTIMA Polymer	Three #2	MaxBraid Suture	No
904924P	6.8 mm	PEEK-OPTIMA Polymer	Three #2	MaxBraid Suture	Tapered
902581	5.0 mm	Titanium	Two #2	MaxBraid Suture	Tapered
902582	6.5 mm	Titanium	Two #2	MaxBraid Suture	Tapered
902588	5.0 mm	Titanium	Two #2	MaxBraid Suture	Cutting
902589	6.5 mm	Titanium	Two #2	MaxBraid Suture	Cutting
902591	5.0 mm	Titanium	Two #2	MaxBraid Suture	No
902592	6.5 mm	Titanium	Two #2	MaxBraid Suture	No
902598*	5.0 mm	Titanium	Three #2	MaxBraid Suture	No
902610	5.0 mm	Titanium	Two #2	MaxBraid Suture	No
902611	6.5 mm	Titanium	Two #2	MaxBraid Suture	No
902612	5.0 mm	Titanium	Three #2	MaxBraid Suture	No
902613	6.5 mm	Titanium	Three #2	MaxBraid Suture	No
902614	5.0 mm	Titanium	Three #2	MaxBraid Suture	Tapered
902615	6.5 mm	Titanium	Three #2	MaxBraid Suture	Tapered

***Note: Part number is for International use only.**

Surgical Technique

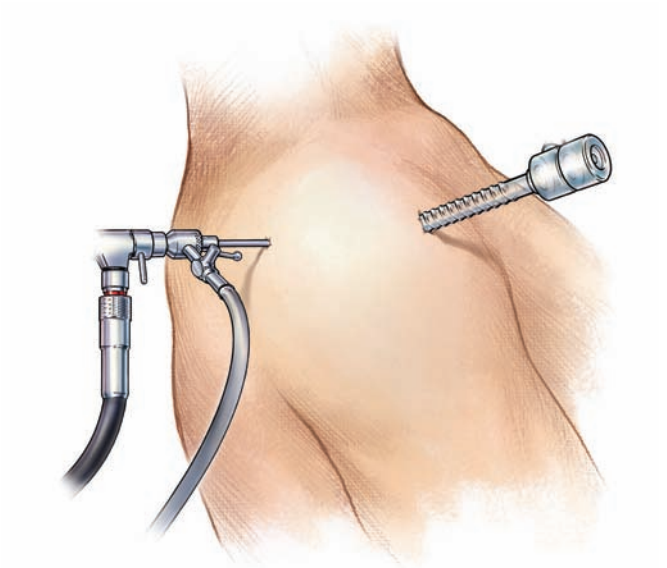


Figure 1

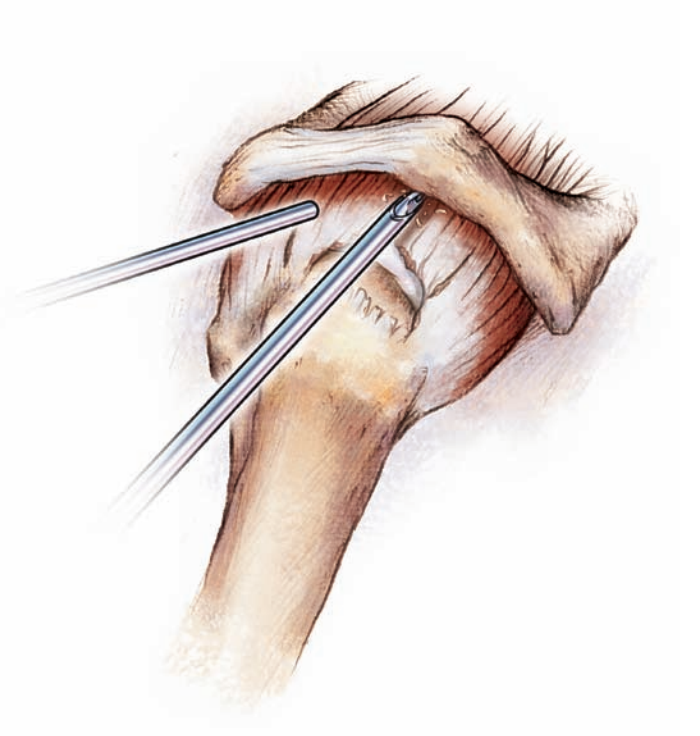


Figure 2

Portal Placement

Beach chair or lateral decubitus position is utilized per surgeon preference. A standard posterior portal is utilized along with a traditional anterior portal for instrument passage for diagnostic arthroscopy. Intra-articular pathology is addressed including, evaluation of the undersurface of the rotator cuff. The arthroscope is passed into the subacromial space via the posterior portal (Figure 1).

Visualization of the Subacromial Space

Bursectomy is performed using a combination of shavers and electrocautery to visualize the subacromial space, rotator cuff, acromion and coracoacromial ligament. Debridement is carried out with motorized instruments to remove any loose and devascularized flaps of rotator cuff (Figure 2).

An acromioplasty is performed with a high-speed burr until smooth and flat. The coracoacromial (CA) ligament is released and AC joint pathology is addressed.

The rotator cuff tear is visualized from the posterior and lateral portals to determine tear type, configuration, and size, as well as amount of retraction.

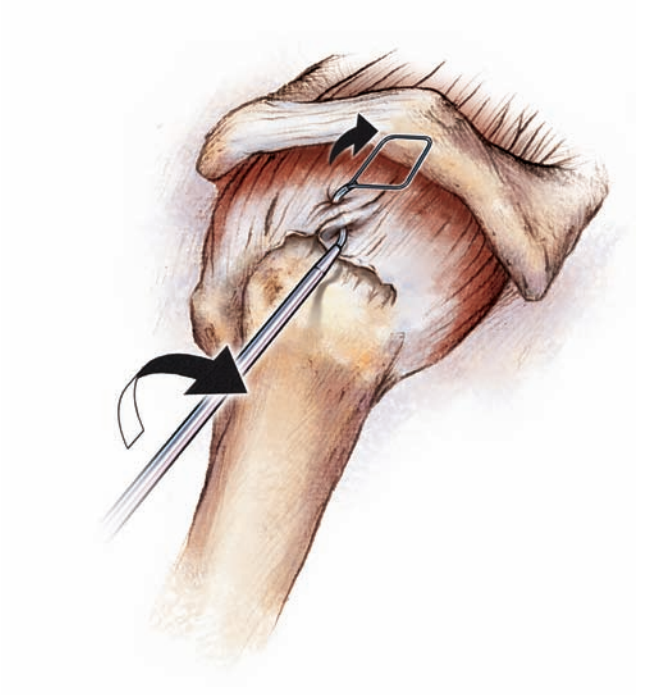


Figure 3

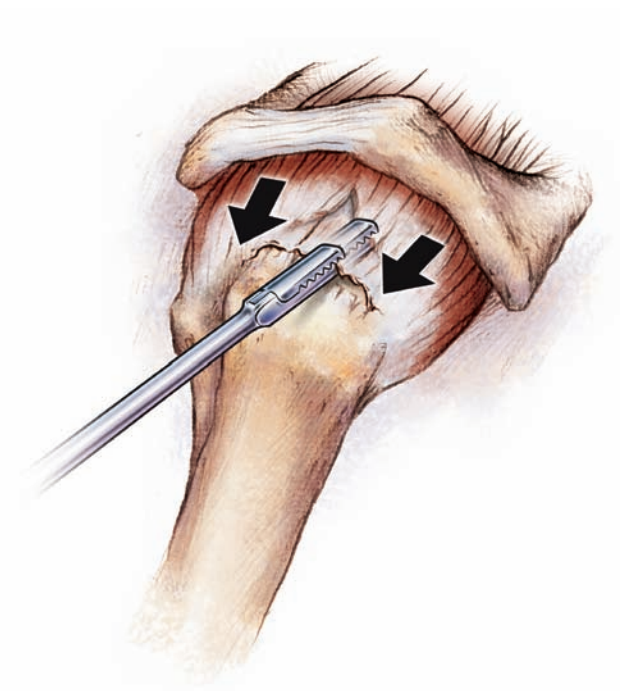


Figure 4

Mobilization of the Rotator Cuff

The rotator cuff, if retracted, is mobilized by freeing the rotator cuff both superiorly and inferiorly in the planes medial to the glenoid. Anterior and posterior slide procedures can be performed if the rotator cuff is severely retracted and scarred.

Margin-convergence techniques are then utilized to repair splits in the tendon anteriorly and posteriorly. Margin-convergence repair is performed by using the appropriate 45º left or right SpeedPass™ device passing MaxBraid Suture across the tear (Figure 3). When anterior and/or posterior splits in the tendon have been repaired, the remaining defect is evaluated for repair to the greater tuberosity.

A tissue grasper is utilized to make sure the tendon can be reduced to bone without any undue tension (Figure 4). Viewing posteriorly and working through a lateral portal, the greater tuberosity is lightly decorticated with a high-speed shaver.

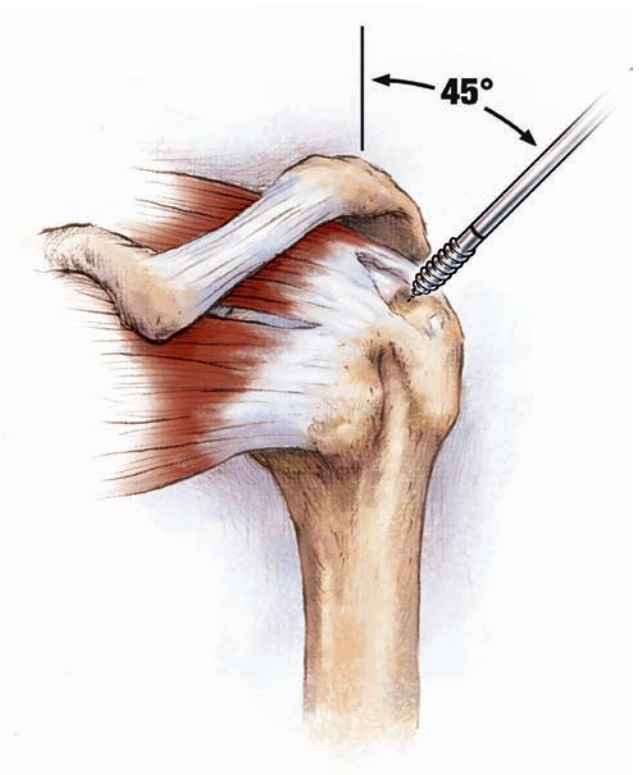


Figure 5

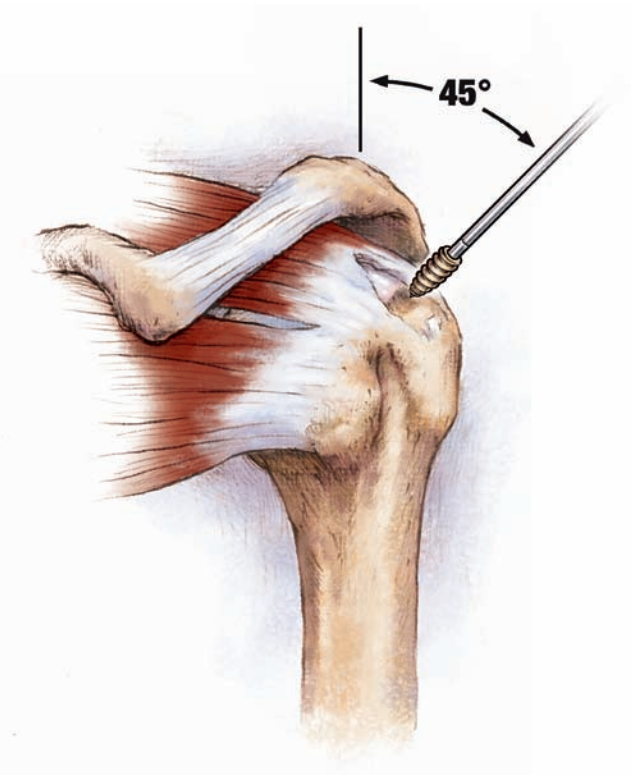


Figure 6

Position/Insert the ALLthread Tap

The ALLthread tap is used to create threaded holes for the ALLthread Suture Anchors.* To attain the proper angle for insertion, an accessory portal may be made slightly anterior or posterior to the traditional lateral portal. The tap is positioned at a 45˚ "dead man's" angle to increase the resistance of suture anchor pull-out (Figure 5). The tap is started with hand pressure, approximately 4 – 5 mm off the articular margin.

Note: The ALLthread Titanium Suture Anchors require pre-drilling prior to insertion.

Insert the ALLthread Suture Anchor

The ALLthread Suture Anchors are inserted in an anterior to posterior direction at the same angle of the threaded holes created by the tap (Figure 6). The anchor is advanced into the hole such that the proximal threads of the anchor are seated just below the cortical surface. The vertical laser-etched lines are in line with the suture anchor eyelets to assist with anchor orientation for knot tying.

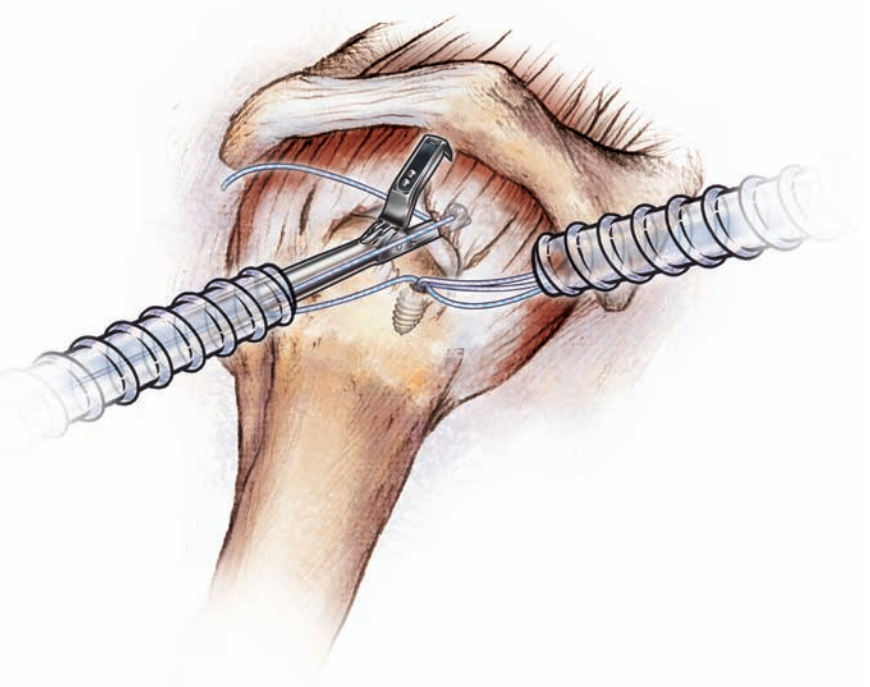


Figure 7

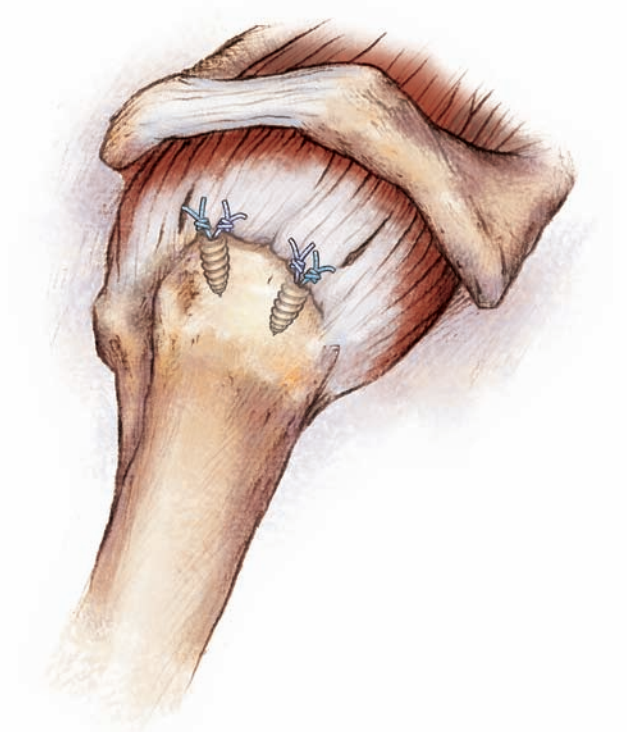


Figure 8

Pass the Suture Through the Rotator Cuff

Individual sutures from the anchor are passed out the lateral portal and the BiPass™ Suture Passer is then used for passing suture through the rotator cuff tendon (Figure 7). The MaxBraid Suture is loaded approximately 2 cm from the end of the suture, passed through the tendon, and then brought back out the lateral portal with the BiPass Suture Punch.

This suture is then passed back out either the accessory portal or anterior portal for suture management. This procedure is repeated until one limb of each suture has been through the tendon edge for simple suture repair of the rotator cuff to bone.

Repair the Tendon

After all sutures have been passed, repair of the tendon progresses from posterior to anterior. A secure sliding knot with multiple half-hitches using alternating posts secure the tendon to the tuberosity. A probe is used to check fixation. The rotator cuff repair is now complete utilizing the ALLthread Suture Anchors (Figure 8).

If a double row repair is to be utilized, an anchor is placed along the articular cartilage margin and sutures are brought through the tendon 1 cm medial to the lateral edge of the tendon using a horizontal mattress configuration prior to traditional anchor placement.

Ordering Information

ALLthread PEEK-OPTIMA Polymer Suture Anchors — Implants

Part Number	Size	Description
905940P*	5.5 mm	Two #2 MaxBraid Suture with Cutting Needles
905942P	5.5 mm	Two #2 MaxBraid Suture
905943P*	5.5 mm	Two #2 MaxBraid Suture with Tapered Needles
905941P	6.8 mm	Two #2 MaxBraid Suture with Cutting Needles
905944P	6.8 mm	Two #2 MaxBraid Suture
905945P	6.8 mm	Two #2 MaxBraid Suture with Tapered Needles
904921P	5.5 mm	Three #2 MaxBraid Suture
904922P	5.5 mm	Three #2 MaxBraid Suture with Tapered Needles
904923P	6.8 mm	Three #2 MaxBraid Suture
904924P	6.8 mm	Three #2 MaxBraid Suture with Tapered Needles

ALLthread LactoSorb L15 Copolymer Suture Anchors — Implants

Part Number	Size	Description
905940	5.5 mm	Two #2 MaxBraid Suture with Cutting Needles
905942	5.5 mm	Two #2 MaxBraid Suture
905943	5.5 mm	Two #2 MaxBraid Suture with Tapered Needles
905941	6.8 mm	Two #2 MaxBraid Suture with Cutting Needles
905944	6.8 mm	Two #2 MaxBraid Suture
905945	6.8 mm	Two #2 MaxBraid Suture with Tapered Needles

ALLthread Titanium Suture Anchors — Implants

Part Number	Size	Description
902581	5.0 mm	Two #2 MaxBraid Suture with Tapered Needles
902582	6.5 mm	Two #2 MaxBraid Suture with Tapered Needles
902588	5.0 mm	Two #2 MaxBraid Suture with Cutting Needles
902589	6.5 mm	Two #2 MaxBraid Suture with Cutting Needles
902591	5.0 mm	Two #2 MaxBraid Suture
902592	6.5 mm	Two #2 MaxBraid Suture
902598*	5.0 mm	Three #2 MaxBraid Suture
902610	5.0 mm	Two #2 MaxBraid Suture
902611	6.5 mm	Two #2 MaxBraid Suture
902612	5.0 mm	Three #2 MaxBraid Suture
902613	6.5 mm	Three #2 MaxBraid Suture
902614	5.0 mm	Three #2 MaxBraid Suture with Tapered Needles
902615	6.5 mm	Three #2 MaxBraid Suture with Tapered Needles

***Note: Part number is for International use only.**

Tap (for LactoSorb L15 and PEEK-OPTIMA Versions)

Part Number	Size
905958	5.5 mm
905959	6.8 mm

Awl (for LactoSorb L15 and PEEK-OPTIMA Versions)

Part Number	Size
905955	5.5/6.8 mm

Drill (for Titanium Version)

Part Number	Size
905961	5.0/6.5 mm

BiPass Suture Punch

Part Number	Description
902099	Handpiece
902092	Disposable Nitinol Pusher
902094	Disposable Nitinol Pusher (Package of 10)

AquaLoc® Cannula (Flexible)

Part Number	Size
900362	5 x 75 mm
900366	5 x 85 mm
900360	7 x 75 mm
900364	7 x 85 mm
900363	8.5 x 75 mm
900367	8.5 x 85 mm

AquaLoc Cannula (Rigid)

Part Number	Size
900362H	5 x 75 mm
900366H	5 x 85 mm
900360H	7 x 75 mm
900364H	7 x 85 mm
900363H	8.5 x 75 mm
900367H	8.5 x 85 mm

SpeedPass Suture Passers

Part Number	Description
904001	70˚ Right Hook
904002	70˚ Left Hook
904003	Medium Up
904007	Straight

SpeedPass Suture Lariats

Part Number	Description
904008	45˚ Up
904010	25˚ Left
904012	25˚ Right
904022	30˚ Up
904025	45˚ Dog Leg Up

ALLthread LactoSorb L15 Suture Anchor

INDICATIONS FOR USE

LactoScrew L15 Screw Anchor (85% PLLA/15% PGA) and the ALLthread LactoSorb Suture Anchor:

Shoulder
Bankart repair
SLAP lesion repair
Acromio-clavicular separation
Rotator cuff repair
Capsule repair or capsulolabral reconstruction
Biceps tenodesis
Deltoid repair

Wrist/Hand
Scapholunate ligament reconstruction
Ulnar/radial collateral ligament reconstruction

Ankle/Foot
Lateral stabilization
Medial stabilization
Achilles tendon repair/reconstruction
Hallux valgus reconstruction
Mid- and forefoot reconstruction

Elbow
Tennis elbow repair
Ulnar or radial collateral ligament reconstruction
Biceps tendon reconstruction

Knee
Medial collateral ligament repair
Lateral collateral ligament repair
Posterior oblique ligament repair
Joint capsule closure
liotibial band tenodesis
Patellar ligament/tendon repair

CONTRAINDICATIONS

1. Active infection.
2. Patients with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions.
3. Patient conditions including: blood supply limitations, insufficient quantity or quality of bone, or latent infections.
4. Pathologic soft tissue conditions, which would prevent secure fixation.

ALLthread Titanium and PEEK-OPTIMA Suture Anchor

INDICATIONS FOR USE

The Metal Screw Anchor and ALLthread PEEK Suture Anchor are indicated for use in soft tissue reattachment procedures in the shoulder, wrist/hand, ankle/foot, elbow, and knee. Specific indications are:

Shoulder
Bankart repair
SLAP lesion repair
Acromioclavicular separation
Rotator cuff repair
Capsule repair or capsulolabral reconstruction
Biceps tenodesis
Deltoid repair

Wrist/Hand
Scaphonlunate ligament reconstruction (not including ALLthread Ti Suture Anchors)
Ulnar/radial collateral ligament reconstruction

Ankle/Foot
Lateral stabilization
Medial stabilization
Achilles tendon repair/reconstruction
Hallux valgus reconstruction
Mid-and forefoot reconstruction

Elbow
Ulnar or radial collateral ligament reconstruction
Biceps tendon reconstruction
Lateral epicondylitis repair (ALLthread PEEK Suture Anchor Only)

Knee
Medial collateral ligament repair
Lateral collateral ligament repair
Posterior oblique ligament repair
Joint capsule closure
Iliotibial band tenodesis
Patellar ligament/tendon repair

CONTRAINDICATIONS

1. Infection.
2. Patient conditions including blood supply limitations, and insufficient quantity or quality of bone or soft tissue.
3. Patients with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions.
4. Foreign body sensitivity. Where material sensitivity is suspected, testing is to be completed prior to implantation of the device.

Notes

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