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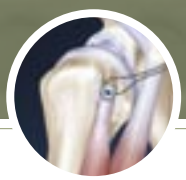
# Arthroscopic Biceps Tenodesis with MILAGRO™ Bioreplaceable Interference Screw

**SUMANT G. "BUTCH" KRISHNAN, M.D.**
*Shoulder & Elbow Service, The Carrell Clinic*
*Clinical Assistant Professor,*
*University of Texas Southwestern Medical Center*
*Dallas, Texas*



# *Arthroscopic Biceps Tenodesis with MILAGRO™ Bioreplaceable Interference Screw*

*Sumant G. "Butch" Krishnan, m.d, Donnis K. Harrison, m.d.*

## *TECHNIQUE OF BICEPS TENODESIS*

When long head of biceps pathology exists requiring tenodesis, arthroscopic biceps tenodesis with the DePuy Mitek MILAGRO Bioreplaceable Interference Screw tenodesis is the preferred technique. The preferred location for interference screw tenodesis is 1cm inferior to the top of the intertubercular groove, where humeral bone has its highest cortical strength and where the tenodesed biceps will avoid any intra-articular impingement.

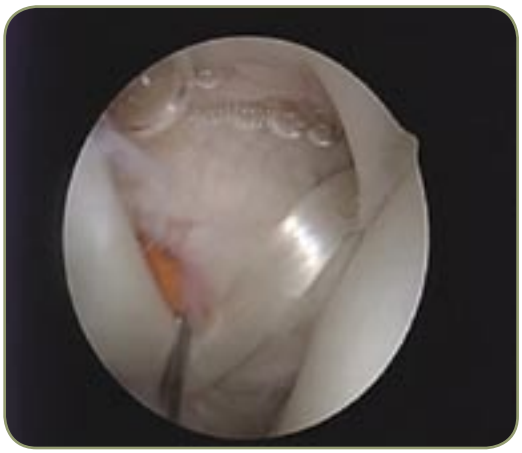
Indications for tenodesis include tendon instability (subluxation or dislocation), biceps pulley lesions, partial tearing of the tendon greater than 25%, and biceps anchor disinsertions in patients greater than 45 years of age.

## *POSITIONING AND PORTALS*

Shoulder arthroscopy is performed in a modified beach chair position with the acromion parallel to floor. A "high" posterior viewing portal is established 1cm inferior and 1cm medial to the posterolateral corner of the acromion, an anterior working portal is established through the rotator interval, and a complete arthroscopic examination of the glenohumeral joint is performed.

## *SUBACROMIAL SPACE*

An anterolateral working portal is established 2-3cms distal to the anterolateral corner of the acromion, within the raphe between the anterior and middle deltoid. The arm is now placed in approximately 30° of shoulder flexion and 10° of internal rotation to facilitate anterosuperior subacromial bursoscopy. An accessory anteroinferior portal is then created directly anterior to the transverse humeral ligament allowing all work to be performed on the biceps tendon in a perpendicular fashion. A blunt trocar is inserted through this accessory anteroinferior portal and used to strip any remaining bursa from the anterior humerus and bicipital groove down to the reflection of the pectoralis major tendon.



***Figures 1, 2.*** *The long head of the biceps is examined and transfixed with an 18-gauge spinal needle at its entrance into the intertubercular groove.*

***Figure 3.*** *An arthroscopic biting device is used to release the biceps from its superior labral attachment, and the arthroscope is redirected into the subacromial space.*

***Figure 4.*** *After bursectomy and subacromial decompression, the spinal needle transfixing the biceps is located in the subacromial space with the arthroscope placed in the anterolateral portal.*

***Figure 5.*** *The lateral portion of the bicipital groove is now opened using either the DePuy Mitek VAPR S90 or VAPR Hook electrode to expose the tendon and release the transverse humeral ligament.*

***Figure 6.*** *The entire groove is opened, and the the spinal needle is removed and the tendon lifted out of the groove to release any adhesions. It is critical not to cause iatrogenic damage to the tendon and open the lateral portion of the groove to avoid the vascular leash.*

***Figure 7.*** *Grasp the tendon at its most proximal end and exteriorize it thru the accessory anteroinferior portal.*

***Figure 8.*** *A vascular clamp is used to minimize damage and maximize exteriorization of 4cm of the biceps. Resect proximal part of tendon, and double (fold) upon itself and whipstitch with #2 ORTHOCORD™.*

***Figure 9.*** *A pin driver is utilized to drive a standard drill guide pin at a perpendicular angle into the humerus to just engage the opposite cortex at the preferred location for intertubercular interference screw tenodesis.*

***Figures 10, 11.*** *At this point a standard 7 millimeter DePuy Mitek "acorn" reamer is placed over the guide pin and used to create a humeral socket to a depth of approximately 28 millimeters.*

*A standard arthroscopic burr is used to "chamfer" the inferior portion of this humeral socket, to allow for a smooth coaptation where the biceps will exit the socket inferiorly. The exteriorized biceps is grasped at its ORTHOCORD suture knot with an arthroscopic grasper and delivered into the humeral socket and "press-fit" to the depth of the socket to create an interference fit within the socket similar to a keyhole tenodesis.*

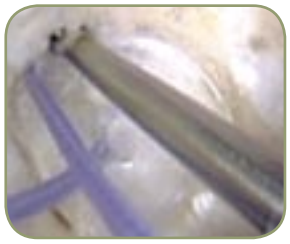


***Figure 12.*** *A nitinol guide wire for the MILAGRO Interference Screw is placed between the superior surface of the socket and the biceps tendon.*

***Figure 13.*** *A 7X23 mm MILAGRO Interference Screw is placed on a nitinol wire and "screwed" through the skin portal until it contacts the biceps and humeral socket under direct visualization.*

***Figure 14, 15.*** *The screw is "engaged" in the socket with one or two gentle turns, taking care to insure that the biceps does not escape from the humeral socket. As the screw is delivered into the socket, the shoulder is gently flexed and the elbow is slowly extended while the screw is placed to appropriately tension the biceps tendon and prevent iatrogenic tendon damage from the screw. Once the screw is completely flush with the humeral socket, the elbow is flexed and extended to confirm stable fixation of the tendon. The ORTHOCORD Sutures are cut with a sliding DePuy Mitek Cord Cutter.*

# MILAGRO™ Bioreplaceable Interference Screw

### *POSTOPERATIVE MANAGEMENT*

Postoperative protocol is dictated by the presence or absence of a rotator cuff tear requiring repair. For all biceps tenodeses, the proximal arm (shoulder to elbow) is wrapped with an ace wrap for 2 weeks to help maintain the contour of the biceps muscle belly. If an isolated biceps tenodesis is performed, a simple arm sling is used as needed for 1 week for comfort only. Active and passive shoulder and elbow range of motion is begun immediately after surgery. At 6 weeks postoperatively, cord resistance is initiated with full unrestricted activity (including heavy manual labor and contact sports) at 12 weeks after surgery. If a rotator cuff repair was also performed, the postoperative course follows the rotator cuff repair protocol.

| **MILAGRO™ INTERFERENCE SCREWS** | | | | |
|---|---|---|---|---|
| | size: 7 X 23 | size: 8 X 23 | size: 9 X 23 | |
| MILAGRO Bioreplaceable Screw | 231800 | 231810 | 231820 | |
| **MILAGRO™ INSTRUMENTATION** | | | | |
| Ratchet Handle w/ Jacobs Chuck | 219215 | | | |
| Modular Driver 23mm | 229957 | | | |
| Utility Bin-1/4 | 215140 | | | |
| **ORTHOCORD™ HIGH STRENGTH ORTHOPAEDIC SUTURE** | | | | |
| CordCutter | 214646 | | | |
| | *with MO-6 Tapered Needles* | *w/MO-7 Tapered Needles* | *w/OS-6 Reverse Cutting Needles* | *without needles* |
| ORTHOCORD Violet | 223102 | 223104 | 223103 | 223105 |
| ORTHOCORD Blue | | | | 223111 |
| ORTHOCORD Violet /Blue | 223115 | 223114 | 223116 | 223113 |
| **OTHER INSTRUMENTATION** | | | | |
| Shoulder Procedure System | 215431 | | | |
| Acorn Reamer Sterile 6mm | 232400 | | | |
| Acorn Reamer Sterile 6.5mm | 232401 | | | |
| Acorn Reamer Sterile 7mm | 232402 | | | |
| Acorn Reamer Sterile 7.5mm | 232403 | | | |
| Acorn Reamer Sterile 8mm | 232404 | | | |
| Acorn Reamer Sterile 8.5mm | 232405 | | | |
| Acorn Reamer Sterile 9mm | 232406 | | | |
| Guidewire, Nitinol 1.1mm (.042" x 15") 6/box | 254514 | | | |
| Guidewire Kit | 232300 | | | |
| **VAPR® SYSTEM** | | | | |
| VAPR S90 | 225370 | | | |
| VAPR SIDE ELECTRODE | 225301 | | | |



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