



PASTA

Technique Guide

Multiple technique options for transtendinous rotator cuff repair utilizing the Y-Knot® Flex all-suture anchor system, PopLok® knotless anchor and ThRevo® fully-threaded suture anchor.



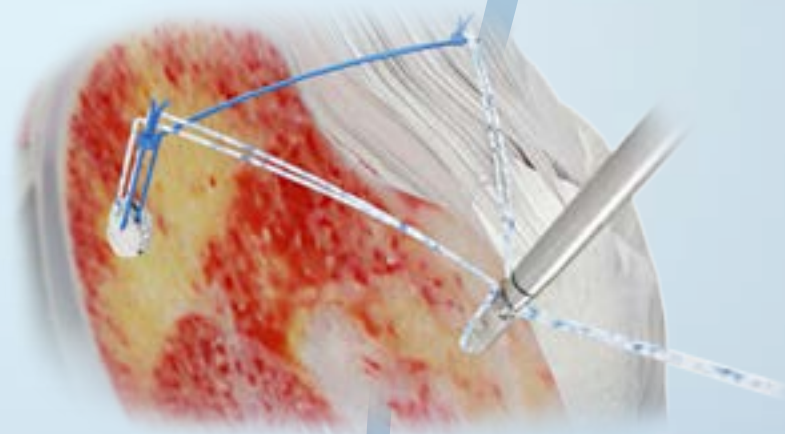
Techniques featured by:

Alessandro Castagna, MD, Milan, Italy

Jovan Laskovski, MD, Akron, Ohio

L. Pearce McCarty III, MD, Edina, Minnesota

John Randle, MD, Ontario, Canada



CONMED
**SURGICAL
TECHNIQUE**

Transtendinous PASTA Repair

Introduction by Alessandro Castagna, MD

The term PASTA, Partial Articular-sided Supraspinatus Tendon Avulsion, came from Steve Snyder, MD after he performed an arthroscopy in my painful right shoulder and observed a significant articular side partial tear of my supraspinatus.

Steve is very good in acronym creation and because I am Italian, he thought PASTA was a fitting name. Since then, almost 20 years ago, we understood that PASTA lesions are very prevalent in our patient population. Studies have shown that these articular-sided tears are two – three times more common than bursal sided tears.

Indications For Transtendon Repair. Although other treatment techniques are described, when addressing a PASTA lesion surgically, I believe we should preserve intact tendon where possible using a transtendinous repair approach. My indications for transtendinous repair are when a substantial portion of the undersurface of the rotator cuff tendon (> 50%) has been avulsed or torn from the footprint attachment with a normal bursal cuff component intact. It is very important that the bursal edges are healthy and still intact, giving a sound reason to preserve them and thus allowing a “tendon sparing anatomical repair”. When the partial lesion is both sided, completely taking down the tendon and making a standard rotator cuff repair is anyways my technical choice.

Repair Techniques. When doing a PASTA repair, I like to debride the edges of the tear and the bone with a shaver and reinsert the avulsed supraspinatus with a transtendon (also defined “in situ”) repair. This booklet presents four different techniques for reattaching a partially torn tendon to the bone without taking down the tendon. The technique that works well in my hands uses a triple-loaded metal suture anchor, the ThRevo® FT, that I introduce transtendinously through the deltoid, under guidance of a spinal needle and PDS to pass simple or horizontal mattress stitches. Some of my colleagues, Drs. Laskovski, McCarty and Randle, have other transtendon techniques they have had success with using products such as Y-Knot® Flex and PopLok®.

Clinical Results. In a study that I published in the American Journal of Sports Medicine in 2009, my colleagues and I conducted arthroscopic transtendon repair of PASTA lesions with 54 patients and a two year follow-up. My results proved that an arthroscopic transtendon PASTA repair is a reliable procedure that can be expected to produce a good outcome with significant pain relief. I had improved shoulder scores in 98% of the patients. In a more recent study (KSSTA, 2013) we randomly compared transtendon repair and complete-and-repair techniques and we did not notice any statistically significant difference in the outcome.

I hope you find the techniques provided in this booklet by Pearce McCarty, MD, Jovan Laskovski, MD, John Randle, MD, and myself helpful. Please visit Conmed.com/PASTA to see technique videos for PASTA repair. ■

Good Luck to you! Ciao.

Alessandro Castagna, MD

ALESSANDRO CASTAGNA, MD

Head of Surgery at Humanitas Research Hospital
Milan, Italy



Dr. Castagna is a world-renowned shoulder surgeon, educator, and is noted for his work on instability and rotator cuff repair for over 20 years. He has gained experience in arthroscopic shoulder surgery in the United States at the Southern California Orthopaedic Institute(SCOI) under the guidance of Stephen J.Snyder, MD. He has served as President of the European Shoulder and Elbow Society and President of the Italian Shoulder and Elbow Society. He is presently a member of the International Board of Shoulder and Elbow (IBSES) and affiliated and active with many other international societies.

He published many indexed scientific papers and is co-editor of several books and co-author of many book chapters in the field of shoulder surgery. He is very much dedicated in the field of education of surgical skills and in the development of new techniques and procedures.

Table of Contents

Single-Row using self-tapping ThRevo®FT anchors

Alessandro Castagna, MDpgs. 3 - 5

Performing transtendinous repairs using the titanium triple-loaded self-tapping ThRevo®FT anchor and passing sutures individually with a spinal needle is a tried-and-true method of repairing a partial-articular sided tear.

Single-Row, Double Pulley Technique using Y-Knot®Flex 1.8mm anchors

Jovan Laskovski, MDpgs. 6 - 8

The double-pulley technique is an efficient means of compressing the avulsed tendon back down to the bone that reduces the number of suture passing steps required to complete the repair. The transtendinous repair technique described here uses two 1.8mm double-loaded Y-Knot Flex All-Suture Anchors and the percutaneous delivery system for minimal tendon disruption.

Double-Row using Y-Knot Flex 1.8mm anchors and PopLok® 4.5mm knotless anchors

L. Pearce McCarty, MDpgs. 9 - 11

Similar to a double-row repair for full-thickness rotator cuff tear, the double-row transtendinous PASTA repair described here uses two 1.8mm double loaded Y-Knot Flex All-Suture Anchors medially, and two 4.5mm PopLok knotless anchors laterally.

PASTA Link™ Technique using Y-Knot Flex 1.8mm anchors and a PopLok 4.5mm knotless anchor

John Randle, MDpgs. 12 - 14

The PASTA Link technique is performed transtendinously and uses two double-loaded Y-Knot® Flex all-suture anchors medially and one 4.5mm PopLok® knotless anchor laterally for a quick and simple repair.

Single-Row PASTA Technique

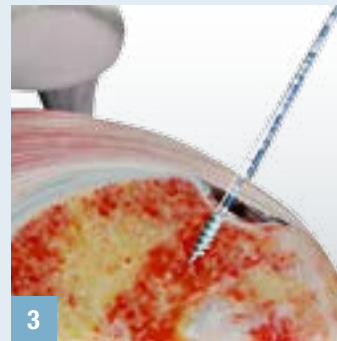
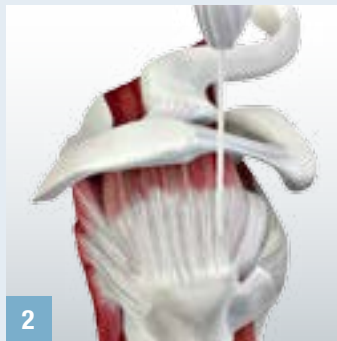
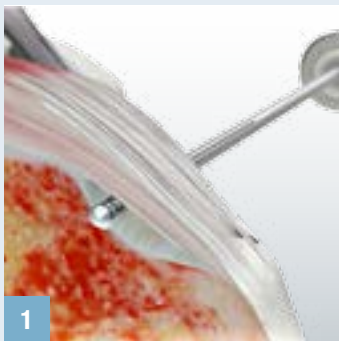
using ThRevo®FT suture anchors

Authored by Alessandro Castagna, MD

“Performing transtendinous repairs using the titanium triple-loaded self-tapping ThRevo®FT suture anchor and passing sutures individually with a spinal needle is a tried-and-true method of repairing a partial-articular sided tear.”

Alessandro Castagna, MD

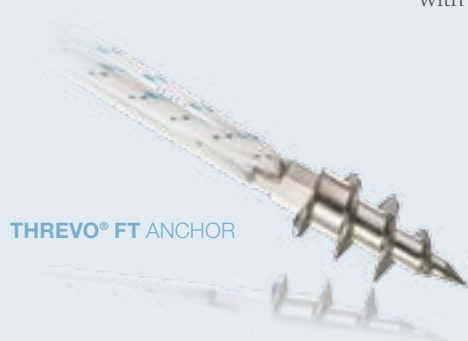
Head of Shoulder and Surgery at Humanitas Research Hospital
Milan, Italy



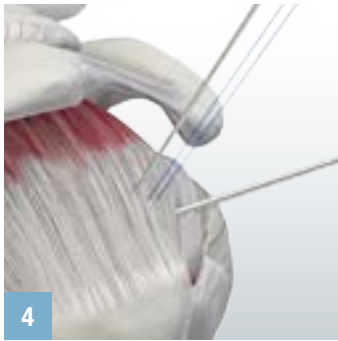
From the articular side, debride the edges of the tear using a shaver and abrade the bone to prepare the repair site. Then, insert a spinal needle through the supraspinatus to determine anchor trajectory. Insert a switching stick adjacent to the spinal needle to dilate the tissue for anchor insertion.

Withdraw the switching stick and screw the ThRevo®FT anchor through the tendon adjacent to the spinal needle, withdrawing the spinal needle after the first anchor thread is visible. When the tip of the anchor reaches the bone, mallet the self-punching tip of the anchor into the humeral head until the first thread reaches the bone surface, then screw the anchor into the bone until the laser line is flush with the bone.

Without removing the anchor inserter from the intra-articular space, unclasp the sutures from the anchor handle and advance the six suture limbs further into the joint. Insert a ring grasper through the rotator interval and grasp a black/white, blue/white, and blue suture limb. While holding those three suture limbs in place, withdraw the anchor inserter from the joint.



SINGLE-ROW PASTA TECHNIQUE



Select the first limb of suture to be passed through the rotator cuff and retrieve it through the rotator interval using the ring grasper. Use a spinal needle and PDS suture to shuttle the first suture limb through the cuff at the most anterior stitch location.



Pass the other two limbs of suture through the rotator cuff posterior to the first stitch using a spinal needle and PDS suture as in step 4. Retrieve the remaining three limbs of suture through the rotator interval using a ring grasper and pass them through the cuff adjacent to their corresponding limbs. If a second anchor is needed, follow steps 2-5 to complete.



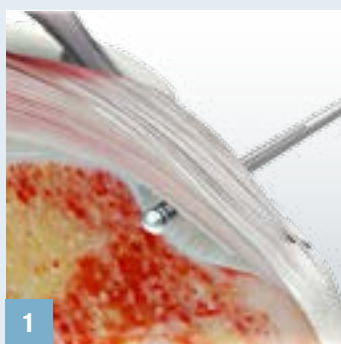
Tie all knots from the subacromial space to secure the tendon to the bone and cut the sutures to complete the repair. The security of the repair is checked from the underside of the tendon to ensure adequate compression.

Double-Pulley PASTA Technique

with 1.8mm Y-Knot® Flex

“Once the PASTA lesion is identified, follow these steps to complete the transtendinous repair using two 1.8mm double-loaded Y-Knot® Flex all-suture anchors in a double-pulley technique for an efficient means of compressing the avulsed tendon back down to the bone.”

Jovan Laskovski, MD



After proper preparation of the footprint and tendon, the transtendinous location of the first anchor is found using a spinal needle. The guide wire and cannulated switching stick are used to assist the insertion of the T-handle drill guide through the intact tendon and against the bone.



After drilling the pilot hole with the 1.8mm drill bit, the anchor is inserted through the drill guide and into the bone using a mallet. The sutures are uncleated and the anchor is set by pulling firmly on all four suture strands until the anchor is set.



This process is repeated for the second anchor.



DOUBLE-PULLEY PASTA TECHNIQUE



Use an RF ablator to have better visualization of the subacromial space for suture and knot tying for steps 4-5. To start the first pulley, a suture is selected from the first anchor and a suture of the same color is selected from the second anchor and pulled through the anterior lateral portal.



Once outside the joint, a mulberry knot is tied, and the remaining tails are cut. The mulberry knot is pulled into the joint by pulling on the two free sutures in a “see-saw” motion. Once the knot is visible inside the subacromial space, the mulberry knot is placed on the anterior or posterior anchor. A Revonon-sliding knot is then tied arthroscopically with the two free ends and placed on the opposite anchor from the mulberry knot.



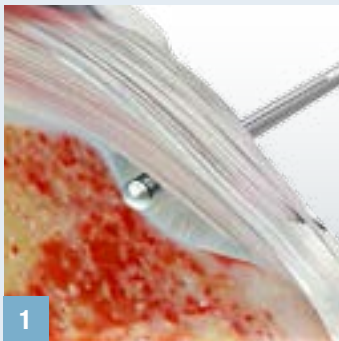
Steps 4-5 are repeated for the other color suture, thus completing the repair with the supraspinatus tendon compressed back down to bone.

Double-Row PASTA Technique

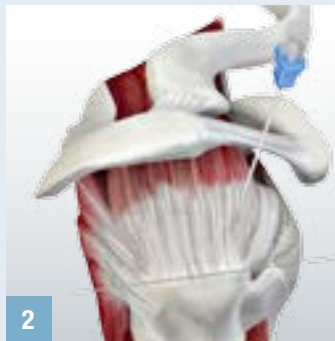
with 1.8mm Y-Knot® Flex and 4.5mm PopLok®

“Similar to a double-row repair for full-thickness rotator cuff tear, the double-row transtendinous PASTA repair described here uses two 1.8mm double loaded Y-Knot® Flex all-suture anchors medially, and two 4.5mm PopLok® knotless anchors laterally.”

L. Pearce McCarty III, MD

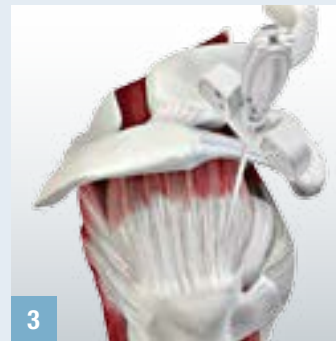


After proper preparation of the PASTA lesion and footprint, the subacromial space is prepared to ensure visualization.



A spinal needle is passed through the intact tendon to determine proper trajectory, then removed as the Y-Knot® Flex 1.8mm T-handle drill guide with sharp trocar obturator is inserted using the same trajectory.

NOTE: Careful consideration is taken to prevent inadvertent damage to the articular cartilage.



After the pilot hole is drilled with the 1.8mm drill bit, the anchor is inserted through the drill guide into the pilot hole. The sutures are uncleated, inserter removed, and the anchor is set by pulling firmly on all four suture strands until the anchor is set. These four suture limbs are transferred to the anterior portal.



DOUBLE-ROW TECHNIQUE



A spinal needle and Super Shuttle® is used to pass mattress stitches with all four suture limbs from each anchor.

Steps 2-3 are repeated for the second anchor.



All four knots are tied by viewing in the subacromial space. The suture from one knot on each anchor is cut, leaving four suture limbs total.



For the lateral row anchors, one suture from each knot is loaded into the 4.5mm PopLok® knotless anchor. After the pilot hole is punched, the anchor is inserted, suture tensioned, and anchor locked. This step is repeated for a second lateral row anchor using the two remaining suture limbs.



The security of the repair is checked from the underside of the tendon to ensure adequate compression.

POPLOK® ANCHOR



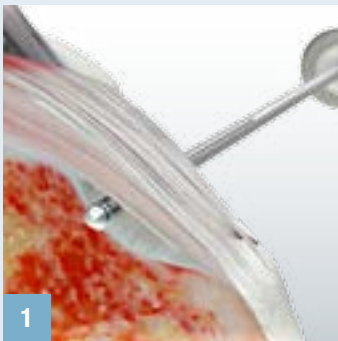
CONMED
**SURGICAL
TECHNIQUE**

PASTA Link™ Technique

with 1.8mm Y-Knot® Flex and 4.5mm PopLok®

“The PASTA Link technique is performed transtendinously and uses two double-loaded Y-Knot® Flex all-suture anchors medially and one 4.5mm PopLok® knotless anchor laterally for a quick and simple repair.”

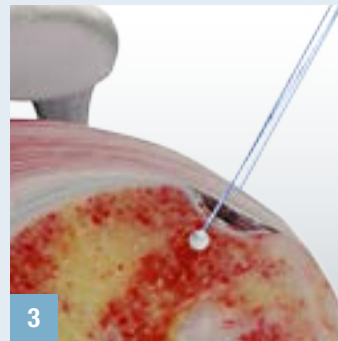
John Randle, M.D.



From the articular side, carefully debride the edges of the tear using a shaver and abrade the insertion site on the humeral head. Once the supraspinatus “footprint” has been prepared, use either a shaver or RF ablator to debride bursa in the subacromial space to facilitate better visualization of the sutures once they are passed. Next, put the scope back into the joint via the posterior portal.



The location of the first (anterior most) anchor is determined using a spinal needle. The guide wire and cannulated switching stick are used for insertion of the T-handle drill guide which is passed through the intact tendon and held firmly against the bone of the footprint.



After drilling the pilot hole with the 1.8mm drill bit, the Y-Knot® Flex all-suture anchor is inserted through the drill guide and into the bone using a mallet. The sutures are uncleated and the anchor is set by pulling firmly on all four suture strands.

This process is repeated for insertion of the second (posterior) anchor. Now, all four suture pairs are found outside the shoulder.



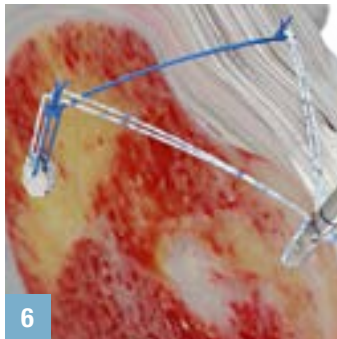
PASTA LINK™ TECHNIQUE



To start the link between the two Y-Knot anchors, a suture is selected from the first anchor and a suture of the same color is selected from the second anchor and pulled through the anterior portal. These sutures are then tied together using a double overhand knot. The remaining tails are then cut. The overhand knot is delivered into the joint by pulling on the two free sutures. Once the knot is visible inside the joint, the overhand knot is pulled to one side near one anchor.



The scope is then placed in the subacromial space and the corresponding "untied" free ends of the same suture pair are brought out the lateral cannulated portal. A Revo non-sliding knot is tied arthroscopically with this suture pair. The resulting knot is placed near the anchor opposite of the double overhand knot.



For the lateral row anchor, the pilot hole is punched and the remaining four limbs of suture are loaded into the 4.5mm PopLok® Knotless Anchor. The anchor is inserted, suture tensioned, anchor is locked by squeezing on the handle until you hear an audible "pop." The remaining suture tails are cut.



The final construct will look like a triangle with a single pulley linking the two medial anchors and remaining sutures locked into a PopLok knotless anchor laterally on the greater tuberosity. This construct ensures that there is both medial row compression and the elimination of any potential remaining "intrasubstance tear."

POPLOK® ANCHOR



CONMED
**SURGICAL
TECHNIQUE**

ORDERING INFORMATION

ANCHORS

1.8mm Y-Knot® Flex all-suture anchor, two #2 Hi-Fi® sutures	Y1802A
5.0mm Super Revo®, two #2 Hi-Fi sutures	C6140HB
5.0mm ThRevo®, three #2 Hi-Fi® sutures	C6160HB
5.0mm Super Revo®FT, two #2 Hi-Fi® sutures	CF6140HB
5.0mm ThRevo®FT, three #2 Hi-Fi® sutures	CF6160HB
4.5mm PopLok® knotless suture anchor.	CKP-4500
3.5mm PopLok® knotless suture anchor.	CKP-3500

INSTRUMENTATION ACCESSORIES

1.8mm Y-Knot Flex drill bit.	Y18D
1.8mm Y-Knot Flex percutaneous pack with T-Guide.	Y-PERC18
1.8mm Y-Knot Flex fishmouth drill guide.	Y-G005
Sharp trocar for fishmouth drill guide (metal, reusable).	Y-G004
Sharp trocar for fishmouth drill guide (plastic, disposable)	Y-OBT2
4.5mm PopLok punch	PKL-45M
3.5mm PopLok punch	PKL-35M

OPTIONAL

Katana® high strength suture cutter	GU1009
Suture retrieval forceps.	16.1018
Grasping forceps.	11.1001
Super Shuttle® relay (8/box)	C6005
4.2mm Ultra FRR dual purpose blade (6/box)	DPS-C010

Please visit ConMed.com, ConMed.com/PASTA.php or the [ConMed YouTube Channel](#) to view surgical technique videos and interactive e-surgical technique guide.



Shoulder Restoration System™

525 French Road
Utica, New York 13502

Local 727-392-6464
Toll Free 800-237-0169

ConMed.com
customer_service@conmed.com

CONMED
**SURGICAL
TECHNIQUE**