Deeper Trochleoplasty System

Instruments
Marking Hook for Trochleoplasty, 3 mm Offset (a) AR-1510TP-03
Marking Hook for Trochleoplasty, 5 mm Offset AR-1510TP-05

Additional Instrumentation
BioComposite PushLock Suture Anchor, 3.5 x 19.5 mm AR-1926BC
BioComposite PushLock Punch, 3.5 mm PushLock AR-1926P
BioComposite PushLock Drill Guide AR-1510H

Disposables (AR-300-B301S)
Drill Sleeve for Trochleoplasty, inner ø 4.5 mm AR-1510S
Burr, straight, 2.9 mm x 162 mm AR-1510D

References:

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One of the most frequent causes for patellofemoral dysfunction is habitual patella dislocation or subluxation. This technique guide shows one method of how to solve structural causes of patella instability by doing a deepening trochleoplasty.

Positive apprehension flexion greater than 40˚ and a positive J-sign at flexion greater than 30˚, as well as the examiner’s inability to manually keep the patella in a central position during flexion, are indications for trochleoplasty. Radiologically, a trochlea with a massive bump, causing a 2-stop during extension, flexion and a convex trochlea also indicate the need for trochleoplasty. Should there still be doubt about the trochlea’s faulty morphology, and more precisely its extent, a diagnostic knee arthroscopy prior to surgery can give clarity.

Using a scalpel, the proximal and lateral periosteum is separated/incised from the synovium and detached with a periosteal elevator. Using a curved osteotome, the proximal trochlear cartilage flap is detached, while the proximolateral part is detached using a curved chisel, leaving 1–3 mm of adherent subchondral bone. The cartilage flap is carefully chiseled off the lateral femoral condyle in one piece from proximal to distal until the proximal 5 mm of the flap is mobilized.

Fix the chondral layer onto the bone with three parallel Vicryl #2 sutures and three 3 mm x 3.5 mm PushLock® suture anchors. Start by placing one PushLock at the distal end of the groove. Guide the #2 sutures through the groove towards the proximal end and place another PushLock proximal to the chondral border. While the flap is gently pinned into the new groove with a blunt instrument. Finally, fix the suture “V” at the lateral side with a third PushLock at the highest point of the lateral condyle.
SpeedWhip Rip-Stop Graft Preparation Technique

Sharply separate the two lateral retinacular layers from each other. Create a Z-plasty to enable the possibility of reclosing the lateral structures in an elongated way at the end of the trochleoplasty. The lateral capsule is opened and the patella retracted medially to fully expose the trochlea.

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By using the RetroConstruction™ Drill Guide, the drill sleeve and the Burr (without the offset hook), the subchondral modeling is performed. In this step the proximal bump is reduced down to the level of the distal diaphysis. Additionally, the subchondral bone under the cartilage layer is thinned out with the same tool in order to facilitate the modeling and readapting of the flap.

Assemble the RetroConstruction™ Drill Guide with the single use drill sleeve, the 3 or 5 mm Offset Marking Hook and the 2.9 mm Burr. Take the RetroConstruction handle in your guidance hand. Forward the Burr through the sleeve until it reaches the depth stop. Now the cutting thread of the Burr is right below the marking hook disk. The chondral layer is released from lateral to medial. Stop distally when the natural trochlea (or the notch) is reached.

Using a scalpel, the proximal and lateral periosteum is separated/incised from the synovium and detached with a periosteal elevator. Using a curved osteotome, the proximal trochlear cartilage flap is detached, while the proximolateral part is detached using a curved chisel, leaving 5–8 mm of adherent subchondral bone. The cartilage flap is carefully chiseled off the lateral femoral condyle in one piece from proximal to distal, until the proximal 5 mm of the flap is mobilized.

With care and a blunt instrument, recontour the chondral layer into the new groove.

Determine the new direction of the trochlea groove from proximal to distal with a serration and create it with a curved osteotome.

Reclose the lateral retinaculum by stitching the two released layers together. To lower patellofemoral contact pressure, a lateral lengthening can be achieved by a widened Z-plasty. In order to give a final stability to the patella close to extension, an anterior MCL-reconstruction is required since a physiological shape of the trochlea cannot stabilize the patella close to extension where there is no bony guidance.

Fix the chondral layer onto the bone with three parallel Vicryl #2 sutures and three 3 mm x 3.5 mm PushLock® suture anchors. Start by placing one PushLock at the distal end of the groove. Guide the K-wires through the groove towards proximal and place another PushLock proximal to the chondral border, while the flaps are gently pinned into the new groove with a blunt instrument. Finally, fix the suture “V” at the lateral side with a third PushLock at the highest point of the lateral condyle.

With care and a blunt instrument, recontour the chondral layer into the new groove.

Deepening Trochleoplasty Surgical Technique

Sharply separate the two lateral retinacular layers from each other. Create a Z-plasty to enable the possibility of reclosing the lateral structures in an elongated way at the end of the trochleoplasty.

Positive-apprehension flexion greater than 40˚ and a positive J-sign at flexion greater than 30˚, as well as the examiner’s inability to manually keep the patella in a central position during flexion, are indications for trochleoplasty. Radiologically, a trochlea with a mass of bone, causing it to “step” during extension/flexion and a convex trochlea also indicate the need for trochleoplasty. Should there still be doubts about the trochlea’s faulty morphology, and more precisely its extent, a diagnostic knee arthroscopy prior to surgery may give clarity.

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With care and a blunt instrument, recontour the chondral layer into the new groove.

Determine the new direction of the trochlea groove from proximal to distal with a serration and create it with a curved osteotome.

Reclose the lateral retinaculum by stitching the two released layers together. To lower patellofemoral contact pressure, a lateral lengthening can be achieved by a widened Z-plasty. In order to give a final stability to the patella close to extension, an anterior MCL-reconstruction is required since a physiological shape of the trochlea cannot stabilize the patella close to extension where there is no bony guidance.
Sharply separate the two lateral retinacular layers from each other. Create a Z-plasty to enable the possibility of reclosing the lateral structures in an elongated way at the end of the trochleoplasty. The lateral capsule is opened and the patella retracted medially to fully expose the trochlea.

One of the most frequent causes for patellofemoral dysfunction is habitual patella dislocation or subluxation. This technique guide shows one method of how to solve structural causes of patella instability by doing a deepening trochleoplasty.

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With care and a blunt instrument, recontour the cartilage layer into the new groove.

Figure 1: The trochlea and patella with its congruency as static factor for patellofemoral stability
Figure 2: The medial patellofemoral ligament as a passive factor for patellofemoral stability
Figure 3: The trochlea groove with its congruency as static factor for patellofemoral stability
Figure 4: CT detection of typical indication for trochleoplasty

Determine the new direction of the trochlea groove from proximal to distal with a serration and create it with a curved osteotome.

Fix the chondral layer onto the bone with three parallel Vicryl #2 sutures and three 3 mm x 3.5 mm PushLock® suture anchors. Start by placing one PushLock at the distal end of the groove. Guide the Vicryl sutures through the groove towards the proximal end, and place another PushLock proximal to the chondral border, while the flap is gently pinned into the new groove with a blunt instrument. Finally, fix the suture “V” at the lateral side with a third PushLock at the highest point of the lateral condyle.

Using a scalpel, the proximal and lateral perichondrium is separated from the muscularis and detached with a periosteal dissector. Using a curved osteotome, the proximal retinacular cartilage flap is detached, and the proximolateral part is detached using a curved chisel, leaving 3–5 mm of adherent subchondral bone. The cartilage flap is carefully chiseled off the lateral femoral condyle in one piece from proximal to distal, until the proximal 5 mm of the flap is mobilized.

Assemble the RetroConstruction™ Drill Guide with the single use drill sleeve, the 3 or 5 mm Offset Marking Hook and the 2.9 mm Burr. The RetroConstruction handle is inserted into the groove. With the arthroscopy handle, the burr is advanced into the groove. Side to side movement of the burr can be felt with a blunt instrument. Usually, the suture “V” is fixed at the lateral side with a third PushLock at the highest point of the lateral condyle.

Using a scalpel, the proximal and lateral perichondrium is separated from the muscularis and detached with a periosteal dissector. Using a curved osteotome, the proximal retinacular cartilage flap is detached, and the proximolateral part is detached using a curved chisel, leaving 3–5 mm of adherent subchondral bone. The cartilage flap is carefully chiseled off the lateral femoral condyle in one piece from proximal to distal, until the proximal 5 mm of the flap is mobilized.

Supra-trochlear spur
Crossing sign
Double contour

Figure 3: X-ray detection of typical indication for trochleoplasty
Figure 4: CT detection of typical indication for trochleoplasty
Figure 5: The patella, femur and trochlear groove

With care and a blunt instrument, recontour the chondral layer into the new groove.
Deepening Trochleoplasty System

Instruments

- Marking Hook for Trochleoplasty, 3 mm Offset (a) AR-1510TP-03
- Marking Hook for Trochleoplasty, 5 mm Offset AR-1510TP-05

Additional Instruments

- Punch, for 3.5 mm PushLock AR-1510BF
- RetroConstruction Drill Guides AR-1510H

Disposables (AR-300-B301S)

- Drill Sleeve for Trochleoplasty, inner ø 4.5 mm
- Burr, straight, 2.9 mm x 162 mm

References:


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Deepening Trochleoplasty System

**Instruments**
- Marking Hook for Trochleoplasty, 3 mm Offset (a) AR-110761-01
- Marking Hook for Trochleoplasty, 5 mm Offset AR-110762-05

**Additional Instruments**
- Patella PushLock Suture Anchor, 3.5 x 19.5 mm AR-1926R0
- Punch, for 3.5 mm PushLock AR-1926P
- RetroConstruction Hole Guide AR-111011

**Deepening (AR-300-B301S)**
- Drill, for Trochleoplasty, inner ø 4.5 mm
- Burr, straight, 2.9 mm x 162 mm

**References:**

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