

Minimally Invasive Quadriceps Tendon Harvesting System



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The quadriceps tendon is used in cruciate ligament revision surgery and, more and more frequently, for the primary reconstruction of the anterior (ACL) and posterior (PCL) cruciate ligaments. In addition, the quadriceps tendon has emerged as an ideal graft source for the reconstruction of the medial patellofemoral ligament (MPFL).

This is mainly due to the following properties of the quadriceps tendon:

- Lower harvest site morbidity in comparison to the patellar tendon
- Harvesting with or without a bone block possible
- Good biomechanical properties

A special tendon harvesting system was designed to provide fast, safe and atraumatic tendon harvesting, featuring the following properties:

- Reproducible technique
- Safe subcutaneous tendon harvesting
- Defined harvesting depth
- Attractive cosmetic results

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The instrument set for tendon harvesting includes the following components:

- Tendon knife
- Tendon separator
- Handle
- Tendon cutter

The harvesting system offers special knife sizes which, depending on the indication, can be selected for cruciate ligament or MPFL reconstruction.

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1. A transverse skin incision of approx. 3 cm is made along the midline either centrally (Fig. 1, ACL or PCL) or superomedially (Fig. 2, MPFL) at the upper edge of the patella. The leg is flexed at 90°. Following subcutaneous dissection, the prepatellar bursa layers are split lengthways and the quadriceps tendon is exposed. A Langenbeck retractor is then introduced proximally.



2. Subsequently, a tendon knife (Fig. 3) in the desired width is selected for cruciate ligament or MPFL reconstruction and mounted on the handle.

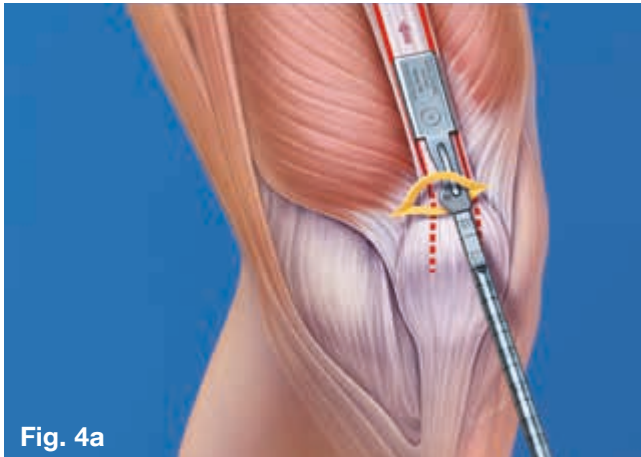


Fig. 4a

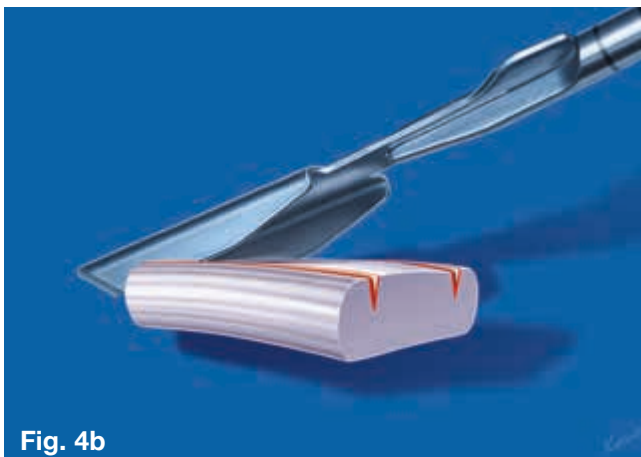


Fig. 4b

3. The tendon knife is inserted through the skin incision and advanced subcutaneously through the tendon in the proximal direction until the desired graft length is achieved (ACL 6-7 cm, PCL 7-8 cm and MPFL 8-9 cm) (Fig. 4a). The length of the grafts is controlled via the measuring scale on the handle. The width and length of the graft is then defined. As shown in the schematic illustration (Fig. 4b), the tendon is not completely transected, but rather incised to a depth of up to six millimeters (ACL, PCL) or four millimeters (MPFL).



Fig. 5

4. The tendon separator, which determines the thickness of the graft, is now mounted on the handle at the required depth (5 mm for ACL, PCL or 2 to 3 mm for MPFL) (Fig. 5)

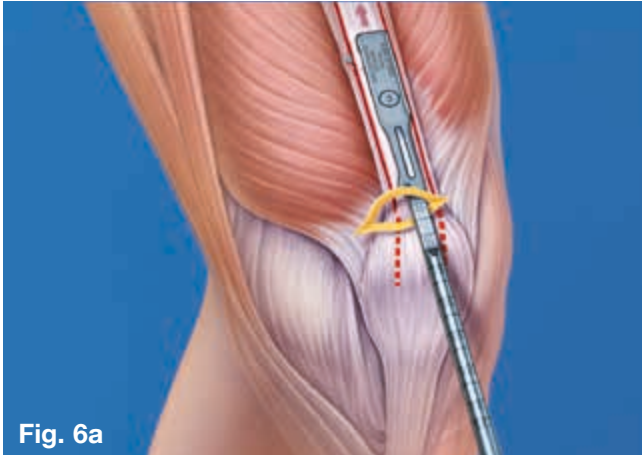


Fig. 6a



Fig. 6b

5. The tendon separator is inserted in the tendon interface laterally through the skin incision and advanced subcutaneously in the proximal direction to the correct length in order to detach the tendon using horizontal cutting motions (Figs. 6a, b).



Fig. 7

6. Finally, the tendon cutter (Fig. 7) is introduced in order to detach the graft subcutaneously at the proximal end.



Link to video

7. The cutter has a measuring scale to enable measuring and cutting at the predefined length (Fig. 8).



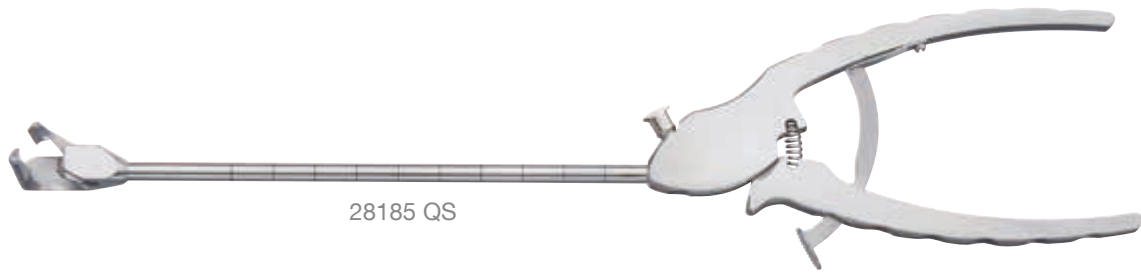
8. Extracted graft strand, which can then be further prepared for cruciate ligament or MPFL reconstruction. (Fig. 9)

9. For cruciate ligament construction, an oscillating saw can be used to harvest a bone block from the proximal patella in the appropriate width and thickness. Alternatively, the graft can be detached from the patellar margin without a bone block and used as a soft-tissue graft. For MPFL reconstruction, the tendon graft remains pedicled to the patella and is folded medially.

References

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- Fink C, Veselko M, Herbort M, Hoser C, 2014. Minimally invasive reconstruction of the MPFL using Quadriceps tendon. *Arthros Tech* 2014, 3(3) e325 - e329 [Epub ahead of print]
- Herbort M, Raschke MJ, Hoser C, Lenschow S, Weimann A, Fink C, 2014. MPFL Reconstruction using a Quadriceps tendon graft, Part 1: Biomechanical Properties of Quadriceps Tendon MPFL. Reconstruction in Comparison to the Intact MPFL. A Human Cadaveric Study. *Knee*
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Instrument Set



28185 QS

28185 QS **Quadriceps Tendon Cutter**, for subcutaneous terminal cutting of the quadriceps tendon



28185 MH

28185 MH **Handle**, for use with Quadriceps Tendon Separators 28185 EA – EC and Quadriceps Tendon Knives 28185 FA – FF



28185 FA

- 28185 FA **Tendon Knife**, for removal of the quadriceps tendon for MPFL reconstruction, vertical parallel cutting, width 10 mm, height 4 mm, sterile, for use with Handle 28185 MH
- 28185 FB **Tendon Knife**, for removal of the quadriceps tendon for MPFL reconstruction, vertical parallel cutting, width 12 mm, height 4 mm, sterile, for use with Handle 28185 MH
- 28185 FC **Tendon Knife**, for removal of the quadriceps tendon for cruciate ligament reconstruction, vertical parallel cutting, width 8 mm, height 6 mm, sterile, for use with Handle 28185 MH
- 28185 FD **Tendon Knife**, for removal of the quadriceps tendon for cruciate ligament reconstruction, vertical parallel cutting, width 9 mm, height 6 mm, sterile, for use with Handle 28185 MH
- 28185 FE **Tendon Knife**, for removal of the quadriceps tendon for cruciate ligament reconstruction, vertical parallel cutting, width 10 mm, height 6 mm, sterile, for use with Handle 28185 MH
- 28185 FF **Tendon Knife**, for removal of the quadriceps tendon for cruciate ligament reconstruction, vertical parallel cutting, width 12 mm, height 6 mm, sterile, for use with Handle 28185 MH



28185 EA

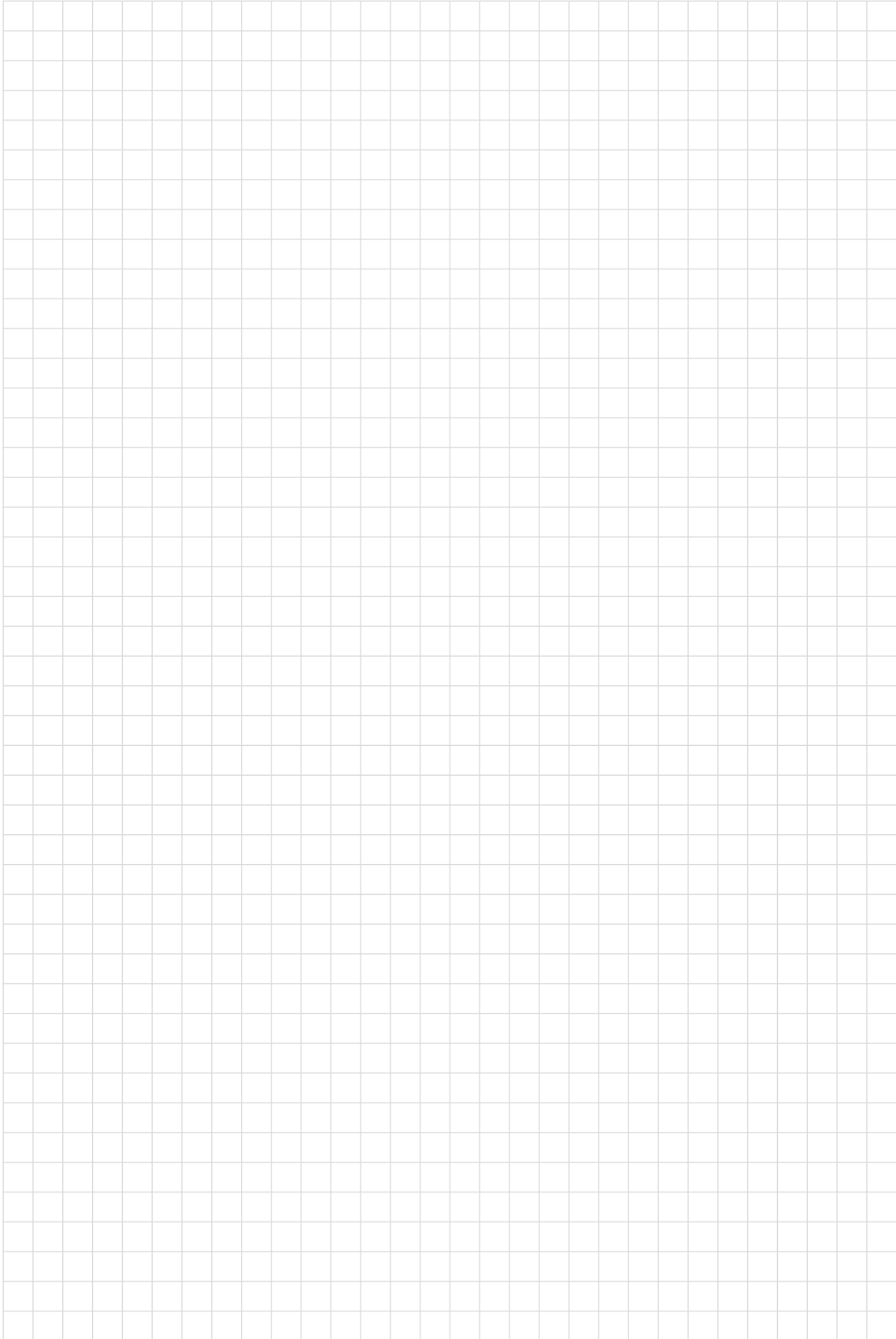
- 28185 EA **Tendon Separator**, for removal of the quadriceps tendon for MPFL reconstruction, horizontal parallel cutting, height 2 mm, sterile, for use with Handle 28185 MH
- 28185 EB **Tendon Separator**, for removal of the quadriceps tendon for MPFL reconstruction, horizontal parallel cutting, height 3 mm, sterile, for use with Handle 28185 MH
- 28185 EC **Tendon Separator**, for removal of the quadriceps tendon for cruciate ligament reconstruction, horizontal parallel cutting, height 5 mm, sterile, for use with Handle 28185 MH

Knives for quadriceps tendon harvesting

MPFL Reconstruction	Cutting	Dimensions (w × h)	Article number
Tendon Knife	vertical parallel	10 × 4 mm	28185 FA
Tendon Knife	vertical parallel	12 × 4 mm	28185 FB
Tendon Separator	horizontal parallel	2 mm height	28185 EA
Tendon Separator	horizontal parallel	3 mm height	28185 EB

Cruciate Ligament Reconstruction	Cutting	Dimensions (w × h)	Article number
Tendon Knife	vertical parallel	8 × 6 mm	28185 FC
Tendon Knife	vertical parallel	9 × 6 mm	28185 FD
Tendon Knife	vertical parallel	10 × 6 mm	28185 FE
Tendon Knife	vertical parallel	12 × 6 mm	28185 FF
Tendon Separator	horizontal parallel	5 mm height	28185 EC

Notes



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THE DIAMOND STANDARD

KARL STORZ Endoscopy-America, Inc.
2151 East Grand Avenue
El Segundo, CA 90245-5017, USA
Phone: +1 424 218-8100
Phone toll free: 800 421-0837 (US only)
Fax: +1 424 218-8525
Fax toll free: 800 321-1304 (US only)
E-Mail: info@ksea.com

KARL STORZ GmbH & Co. KG
Mittelstraße 8, 78532 Tuttlingen, Germany
Postbox 230, 78503 Tuttlingen, Germany
Phone: +49 (0)7461 708-0
Fax: +49 (0)7461 708-105
E-Mail: info@karlstorz.com

www.karlstorz.com



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