Supplementary material

213 patients received MPFL reconstruction two years prior to the inclusion in the study

- n=22 patients
  - <18 years old

191 patients

- n=69 patients
  - Concomitant surgery at the ipsilateral knee

125 patients

- n=50 patients
  - No recruitment possible due to missing contact information
    - n=17 patients
  - No interest/possibility to participate in the study

58 patients

- N=9 patients
  - Previous surgery at the ipsilateral knee

49 patients

- n=5 patients
  - Following surgery at the ipsilateral knee
    - n=2 patients
    - Bilateral knee surgery

42 patients

- n=4 patients
  - MRI contraindications

38 patients

- n=4 patients
  - MR contraindications

34 patients

- n=2 patients
  - Incomplete postoperative MRI
    - n=1 patient
  - Insufficient quality of the postoperative MRI

31 patients

- Total cohort

N=10 patients with only 2.5 year follow-up MRI

- n=7 patients: No preoperative MRI available
- n=3 patients: Insufficient quality of the preoperative MRI

21 patients with preoperative and 2.5 year follow-up MRI

SI. Flowchart illustrating the patient selection.
| WORMS Variable                      | Score | Classes                                      |
|------------------------------------|-------|----------------------------------------------|
| Menisci: Individual scoring for:   |       |                                              |
| Medial meniscus anterior horn      | 0     | no lesion                                    |
| Medial meniscus body               | 1     | intrasubstance abnormalities                 |
| Medial meniscus posterior horn     | 2     | non-displaced tear                            |
| Lateral meniscus anterior horn     | 3     | displaced or complex tear without deformity  |
| Lateral meniscus body              | 4     | maceration                                    |
| Ligaments; Individual scoring for: |       |                                              |
| Anterior cruciate ligament         | 0     | none                                         |
| Posterior cruciate ligament        | 1     | signal abnormalities around Tendon/Ligament  |
| Medial collateral ligament         | 2     | signal abnormalities within the Tendon/Ligament |
| Lateral collateral ligament        | 3     | partial tear                                  |
| Patellar tendon                    | 4     | complete tear                                 |
| Popliteal tendon                   |       |                                              |
| Cartilage; Individual scoring for: |       |                                              |
| Patella                            | 0     | normal                                       |
| Trochlea                           | 1     | signal abnormalities                          |
| Medial femoral condyle             | 2     | partial thickness defect <1cm                |
| Lateral femoral condyle            | 2.5   | sull thickness defect <1cm                   |
| Medial tibia                       |       |                                              |
| Lateral femoral condyle            | 3     | multiple partial <1cm, or partial defect ≥1cm (<75% of region) |
| Medial tibia                       | 4     | diffuse partial thickness loss > 75% of the region |
| Lateral tibia                      | 5     | multiple full thickness or full defect ≥1cm (<75% of region) |
| Bone marrow edema; Individual scoring for: |       |                                              |
| Patella                            | 0     | normal                                       |
| Trochlea                           | 1     | minimal (minimal Ø <5 mm)                    |
| Medial femoral condyle             | 2     | moderate (5 ≤ Ø <20 mm)                      |
| Lateral femoral condyle            | 3     | severe (≥20 mm)                               |
| Medial tibia                       |       |                                              |
| Lateral tibia                      |       |                                              |
| Depression of surfaces; Individual scoring for: |       |                                              |
| Patella                            | 0     | none                                         |
| Trochlea                           | 1     | minimal                                       |
| Medial femoral condyle             | 2     | moderate                                      |
| Lateral femoral condyle            | 3     | severe                                        |
| Medial tibia                       |       |                                              |
| Lateral tibia                      |       |                                              |
| Subarticular cysts; Individual scoring for: |       |                                              |
| Patella                            | 0     | normal                                       |
| Trochlea                           | 1     | minimal (minimal Ø <3 mm)                    |
| Medial femoral condyle             | 2     | moderate (3 ≤ Ø <5 mm)                       |
| Lateral femoral condyle            | 3     | severe (>5 mm)                                |
| Medial tibia                       |       |                                              |
| Lateral tibia                      |       |                                              |
| Osteophytes; Individual scoring for: |       |                                              |
| Patella                            | 0     | none                                         |
| Trochlea                           | 1     | minimal                                       |
| Medial femoral condyle             | 2     | moderate                                      |
| Lateral femoral condyle            | 3     | severe                                        |
| Medial tibia                       |       |                                              |
| Lateral tibia                      |       |                                              |
| Joint effusion                     | 0     | none                                         |
|                                   | 1     | mild (< 33% of maximum distention)            |
|                                   | 2     | moderate (33-66% of maximum distention)       |
|                                   | 3     | severe (> 66% of maximum distention)          |
| Loose bodies                       | 0     | none                                         |
|                                   | 1     | 1 loose body                                 |
|                                   | 2     | 2 loose bodies                               |
|                                   | 3     | >3 loose bodies                              |
| Popliteal cyst                     | 0     | normal                                       |
|                                   | 1     | mild                                         |
|                                   | 2     | moderate                                      |
|                                   | 3     | severe                                        |
| **Maximum Total WORMS sum score**  | 164   |                                              |

S2. WORMS scoring system.
**S3.** Patellar instability measurements on MR imaging. Intermediate weighted MR images with fat saturation are shown. A: Lateral patellar tilt was determined by measuring the angle between a reference line through the patella and a line tangential along the femoral condyles posteriorly. B: Patellar height. The Caton-Dechamps index was calculated by dividing the distance of the lowest point of the patellar articular surface and the anterior point of the tibial plateau (a) by the length of the patellar articular length (b). C: Trochlear dysplasia measurements obtained at the transverse slice 30 mm proximal to the knee joint line. The angle between the medial and the lateral trochlear facet was measured to determine the sulcus angle (α). The facetal ratio was calculated as the ratio between the length of the medial trochlear facet (a) and the lateral trochlear facet (b). The trochlear depth was calculated as \((c + d) / 2\) – e while c represents the maximal distance from the lateral femoral condyle to the line tangential along the femoral condyles posteriorly, d represents the maximal distance from the medial femoral condyle to the line tangential along the femoral condyles posteriorly and e represents the minimal distance from the deepest point in the trochlear groove to the line tangential along the femoral condyles posteriorly. D: The tibial-tuberosity to trochlear groove (TTTG) distance was defined as the distance between the center of the tibial tuberosity and the deepest point of the trochlear groove on a line parallel to the line tangential along the femoral condyles posteriorly.
### S4. Patellar instability measurements at the ipsilateral and at the contralateral knee. TTTG, tibial-tuberosity to trochlear groove distance; MR, magnetic resonance; postop, postoperatively; SD, standard deviation. *P<0.05

| Parameter                      | Ipsilateral mean±SD (range)       | Contralateral mean±SD (range)    | P-value |
|-------------------------------|----------------------------------|---------------------------------|---------|
| Facet ratio                   | 0.49±0.12 (0.12 to 0.71)         | 0.54±0.14 (0.17 to 0.8)         | 0.051   |
| Trochlear depth (mm)          | 4.7±1.4 (1.1 to 6.7)             | 5.3±1.7 (1.5 to 8.5)            | **0.025*** |
| Sulcus angle (°)              | 149±11° (127 to 177)             | 149±9° (129 to 172)             | 0.956   |
| TTTG (mm)                     | 13.3±4.0 (3.0 to 20.0)           | 10.0±4.2 (1.8 to 19)            | <0.001* |
| Patella tilt postOP (°)       | 13.1±6.2 (3 to 23.0)             | 14.7±7.7 (-6.5 to 27.3)         | 0.214   |
| Caton Dechamps postOP         | 1.13±0.02 (0.89 to 1.42)         | 1.16±0.14 (0.96 to 1.45)        | 0.224   |