

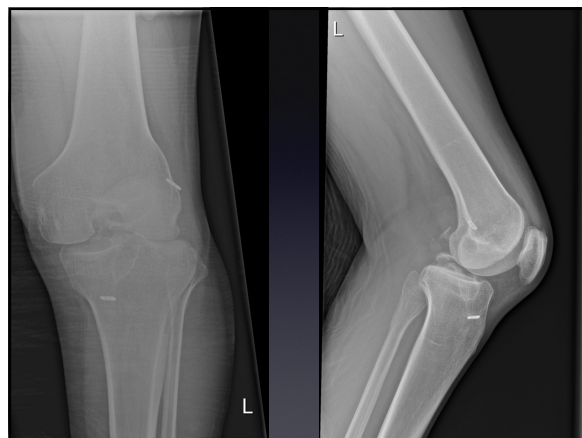
Kneeluxation: care and treatment options



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Sportorthopaedic knee surgeon & trauma surgeon

Trauma centre Patient care Children's hospital
Sport clinic



Research



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Centre for Complex Knee Instability



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Introduction Multi-ligamentous knee injury

Definition: documented complete tibiofemoral dislocation versus one or more cruciates and one or more collateral disruption

Variety of clinical practices: Trauma center, Sport medicine outpatient clinic.

Present to a variety of physicians: orthopaedic surgeons, trauma surgeons, first aid physicians.


True incidence unknown (Dislocation has reduced)

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Trauma mechanism/patient groups last year

- High Energy Trauma
Car accidents dashboard injuries
20(6) bilateral
- Sport related
Hyperextension/Hyper flexion
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- Obesity
Low velocity
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Centralisation Multi-ligamentous knee injury

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Introduction Multi-ligamentous knee injury



- Incidence 0.02-0.2% of orthopaedic injury
- Vascular injury 10-40 %
- Neurological injury 10-20%
- Open dislocation 20-30% (infection 43%, amputation 17%)
- Associated life threatening injuries 27%
- High rate of complications and long term OA 87% > K&L grade 2



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Suspicion of Multi-ligamentous knee injury


- Knee hyperextension
- Popliteal or posterolateral ecchymosis
- Vascular insufficiency
- Peroneal nerve deficit
- Capsular disruption (diffuse tenderness but no hemarthros)
- Obese patient with a low energy fall

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Classification

Kennedy pathomechanics of knee dislocation 1963



Schenck anatomy of injury of knee dislocation 1994

- KD-I Cruciate and possibility of MCL or LCL
- KD-II Biceruciate injury only
- KD-III Biceruciate + medial (M) or lateral (L) disruption
- KD-IV Biceruciate + medial and lateral disruption
- KD-V Dislocation with fracture (4 subdivisions)



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Neurological Examination

Motor and sensory testing of n.tibialis, n. peroneus, injury usually axonotmesis.

Treatment during surgery: explore and if ruptured graft if intact but dysfunctional wait (EMG > 6 weeks).

Recovery is poor +/- 20%
> 1 year tendon transfer

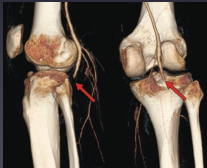



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Vascular Examination

rupture, incomplete tear, intimal tear

Inspection (color, temperature)
 Pulses (a.dorsalis pedis and a. tibialis posterior)
 Ankle brachial index (> 0.9)
 CT angiography



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Physical Examination

Under anaesthesia (with other injury treatment)

Lachman
Collateral stress testing (varus/valgus)
Posterior and anterior drawer test
Posterior sag test
Pivot shift
Dial test

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Additional Examination

X-ray knee AP and lateral

CTA

Knee MRI

On indication stress testing X rays, chronic cases long leg axis.

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Surgical techniques

| Author (Year) | PLC Reconstruction Technique Description |
|--|--|
| Faneli et al ⁸ (2014) | Fibular sling with a single figure-of-8 graft; capsular imbrication |
| Kim et al ¹⁰ (2013) | Isometric reconstruction of the FCL and popliteus with a single graft, re-creating the anterior tibio-fibular ligament |
| Zarzi et al ³⁸ (2013) | Fibular sling; single femoral fixation point |
| Kim et al ¹⁸ (2012) | Isometric reconstruction of the FCL and popliteus with a single graft, re-creating the anterior tibio-fibular ligament |
| Noyes and Barber-Westin ³¹ (2011) | Femoral-fibular-looped FCL reconstruction with capsular imbrication |
| Yoon et al ³⁷ (2011) | Single fibular sling with 2 femoral tunnels; "anatomic reconstruction" involves a fibular sling with anatomic popliteal tendon reconstruction |
| Kim et al ¹⁹ (2011) | Isometric reconstruction of the FCL and popliteus with a single graft, re-creating the anterior tibio-fibular ligament; biceps rerouting tenodesis |
| Kim et al ¹⁹ (2011) | Isometric reconstruction of the FCL and popliteus with a single graft, re-creating the anterior tibio-fibular ligament |
| Jakobsen et al ¹⁶ (2010) | Fibular sling and secondary graft, re-creating the popliteus tendon and PFL |
| LaPrade et al ³⁹ (2010) | Anatomic reconstruction of the FCL, popliteus, and PFL |
| Schoechinger et al ³⁶ (2009) | Fibular sling with 2 femoral tunnels; capsular imbrication |
| Noyes and Barber-Westin ³² (2007) | Bone-patellar tendon-bone FCL reconstruction |
| Faneli and Edson ⁷ (2004) | Biceps tenodesis with capsular imbrication |
| Harner et al ¹⁷ (2004) | Reconstruction of the FCL |
| Wang et al ¹⁵ (2002) | FCL advancement; popliteus reconstruction |

*FCL, fibular collateral ligament; PFL, popliteofibular ligament; PLC, posterolateral corner.

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Take home messages

Recognize and treat and consider co-morbidity. (vascular and neurological)

Reposition (external fixture if necessary)

ORIF if avulsed

Reconstruct the collateral ligaments staged or single procedure with ACL and PCL

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Take home messages

Rare but devastating injury. However not as rare as it is missed not infrequently (watch subtle signs)

More experienced care and more research is needed (centralisation, Norwegian model & contemplate referral)

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