Outcome of a combined ACL and ALL reconstruction with a minimum 2-years follow-up.

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Since 2003 with G. WALCH & P. CHAMBAT

- Sports Medecine
- 600 ACL / year
Biomechanics

Normal ACL

Rotational Axis

ACL Rupture

Biomechanics

Double Bundle R

2006 to 2008: 400 ACL DB

- ↑ Graft Rupture
- ↑ Cyclops Syndrome
- 20% Pivot Shift ++


New Ligament.....?

New ligament discovered in knee, Belgian surgeons say
By Smitha Mundasad
Health reporter, BBC News

Surgeons describe newly discovered knee ligament

Des chirurgiens belges redécouvrent un ligament du genou

Doctors Identify a New Knee Ligament In Belgium

By GRETCHEN REYNOLDS

Le ligament était décrit par un médecin au XIXe siècle puis oublié, est involontairement lésé par les chirurgiens lors d'une intervention des ligaments croisés.
Anatomy

Jack Hughston, 1976
Anterolateral structures
= middle one third of the lateral capsular ligament

Werner Muller, 1982
Lateral Femorotibial Ligamentous attachment
= deep posterior portion of the iliotibial tract
+ Middle capsular ligament

Hughston JC, Andrews JR et al.
W. Muller, The Knee, Springer-Verlag, 1982
New Ligament.....?

Navigated Knee Kinematics After Tear of the ACL and Its Secondary Restraints: Preliminary Results

Monaco E et al. *Orthopedics 2010*

[Image of anatomical diagram]

Thaunat, Sonnery-Cottet et al. *KSSTA 2013*

Vincent, Neyret et al. *KSSTA 2012*
Anterolateral Ligament


Anterolateral Ligament

Sonnery-Cottet B et al.
Arthroscopic Identification of the Anterolateral Ligament of the knee
Arthros Tech 2014
Biomechanics of ALL

Monaco E et al. Navigated knee kinematics after tear of the ACL and its secondary restraints: preliminary results. *Orthopedics 2010*

“The lesion of the AnteroLateral FemoroTibial Ligament increases tibial rotation and could be correlated to the pivot shift phenomenon.”

Claes et al. *ISAKOS 2013, AAOS 2013*
Selective cutting of ACL bundles/ALL

“Ruptured ALL is prerequisite for grade 3 Pivot shift in ACL deficient knee”
Biomechanics of ALL

Length Change Patterns in the Lateral Extra-articular Structures of the Knee and Related Reconstructions.
Biomechanics of ALL


+ 16% de length 0 to 90°
Biomechanics of ALL

Courtesy
Dr. Imbert
Dr. Lutz
Biomechanics of ALL

Extension to flexion

Distance variation (mm)

Femoral paired points
Internal tibial rotation at 20°

- Epicondyle
- Distal anterior epicondyle
- Proximal posterior epicondyle

Distance variation (mm)

Femoral paired points
Biomechanics of ALL

Internal tibial rotation at 90°

Distance variation (mm)

- Epicondyle
- Distal anterior epicondyle
- Proximal posterior epicondyle

Femoral paired points

Graph shows the comparison of distance variations at 90° for different locations on the tibia.
Surgical Technique
Surgical Technique
Surgical Technique
Anterolateral Ligament
Anterolateral Ligament
From January 2011 to January 2012

396 primary ACL reconstructions

At minimum 2 years

92 ACL + ALL reconstruct

- IKDC objective & subjective
- Tegner, Lysholm
- Instrumented laxity: Rolimeter
- Complications
ACL + ALL reconstruction

396 ACL Reconstructions

304 (77%) Isolated ACL R

92 (23%) ACL+ ALL R

83 for final evaluation

1 lost to follow-up, 1 ACL graft rupture, 7 Controlateral ACL rupture
ACL + ALL reconstruction

• Indications
  • Pivoting Sport
  • High Level
  • Pivot Shift ++
  • Chronic ACL
  • Lateral notch X-rays
  • Segond facture
ACL + ALL reconstruction

Subjective IKDC

P < 0.0001
ACL + ALL reconstruction

LYSHOLM

- PREOP: 51.4
- POSTOP: 92

P < 0.0001

TEGNER

- PREOP: 7.3
- POSTOP: 7.1

P < 0.01

ACL + ALL reconstruction
ACL + ALL reconstruction

**Objective IKDC**

- **A**
  - PREOP: 0%
  - POSTOP: 92%
- **B**
  - PREOP: 0%
  - POSTOP: 8%
- **C**
  - PREOP: 63%
  - POSTOP: 0%
- **D**
  - PREOP: 37%
  - POSTOP: 0%

*p < 0.001*
ACL + ALL reconstruction

Pivot shift

P < 0.001
ACL + ALL reconstruction

Instrumented AP laxity side-to-side (mm)

- **PREOP**: 8 (±1.9)
- **POSTOP**: 0.7 (±0.8)

P < 0.001
ACL + ALL reconstruction

- No specifics complications:
  - 6 failures of meniscal suture
  - 1 cyclop syndrome

- Full ROM +++
## ACL + ALL reconstruction

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients included</td>
<td>92</td>
</tr>
<tr>
<td>Men/Women</td>
<td>68/24</td>
</tr>
<tr>
<td>Age at surgery</td>
<td>24 (± 9)</td>
</tr>
<tr>
<td>BMI</td>
<td>24 (± 2.7)</td>
</tr>
<tr>
<td>Mean follow-up (month)</td>
<td>32.4 (± 3.9)</td>
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<tr>
<td>Lost for Follow-up</td>
<td>1</td>
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<tr>
<td>Graft rupture during the study period</td>
<td>1</td>
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<tr>
<td>Contralateral ACL rupture</td>
<td>7</td>
</tr>
<tr>
<td>Number of patient for final evaluation</td>
<td>83</td>
</tr>
</tbody>
</table>
Imaging of ALL

Hachiya Orthopaedic Hospital, Nagoya, Japan

Koichi Muramatsu MD, Watanabe Hiroki MD, Yudo Hachiya MD

ALL is visualized more clearly on 3D-T2 image
Conclusions

- ACL R alone is not sufficient to control the rotational instability in all cases

- Double-bundle ACL reconstruction emerged in an attempt to minimize persistent rotational laxity, but to date evidence for clinical efficiency is mixed

- Increased interest for secondary restraints of the knee in particular ALL

- Debate anatomy/isometry

  « ALL needs more work to confirm »
Thank you

www.centre-orthopedique-santy.com

and Welcome to Lyon
Anterolateral Structures

Proximal insertion

Supracondylar insertion

Retrograde insertion

ITB dissected / flapped down

Fib

G

Courtesy

Andy Williams, Christophe Kittl, Andrew Amis