Intra-operative Laxity Assessment of Two ACL Reconstructions: Anatomic Double-Bundle Bs Over-the-Top Single-Bundle with Additional Extra-Articular Tenodesis

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PURPOSE OF THE STUDY

TO QUANTIFY INTRA-OPERATIVELY THE IMPROVEMENTS IN STATIC AND DYNAMIC KNEE STABILITY GIVEN BY TWO DIFFERENT ACL RECONSTRUCTION PROCEDURES

BY MEANS OF

QUANTITATIVE INTRA-OPERATIVE LAXITY ASSESSMENT
Between September 2007 and April 2010

34 CONSECUTIVE PATIENTS INCLUDED IN THE STUDY:

HAMSTRINGS ACL RECONSTRUCTION

- 20 SINGLE BUNDLE OVER THE TOP + LATERAL PLASTY
- 14 ANATOMIC DOUBLE BUNDLE (4 tunnels)

Marcacci 1998, Cha-Fu 2005
BLU-IGS navigation system
KLEE – software for kinematics

MATERIALS and METHOD
KINEMATICS BEFORE AND AFTER RECONSTRUCTION

MATERIALS and METHOD

AP STRESS AT 30°/90°

VV STRESS AT 0°/30°

IE ROTATION AT 30°/90°

PIVOT-SHIFT
MATERIALS

KINEMATIC TESTS BEFORE AND AFTER RECONSTRUCTION

PIVOT-SHIFT TEST

![Graph showing AP displacement (mm) before and after reconstruction with lowest peak at 20 degrees flexion.](image-url)
ANALYZED PARAMETERS DURING NAVIGATED PIVOT-SHIFT

MAXIMAL ANTERIOR TRASLATION OF THE LAT. TIBIAL COMPARTMENT

THE HYSTERESIS OF THE JOINT = AREA IN THE AP DISPLACEMENT CURVE

ACCELERATION OF THE LAT. TIBIAL COMPARTMENT
RESULTS

REDUCTION OF THE GLOBAL AMOUNT OF LAXITY (ROTATIONS/TRANSLATION) AFTER THE ACL RECONSTRUCTION

✓ SBLP BETTER CONTROLS VV0 LAXITY RESPECT TO ADB

* = P<0.01
RESULTS

REDUCTION OF THE GLOBAL AMOUNT OF TRANSLATION AFTER THE ACL RECONSTRUCTION

SBLP BETTER CONTROLS TRANSLATION of LATERAL COMPARTMENT at AP30 RESPECT TO ADB

* = P<0.01
ADB BETTER CONTROLS DYNAMIC LAXITY WITH RESPECT TO SBLP BY MEANS OF PIVOT-SHIFT

* = P<0.05
CONCLUSIONS

• BOTH ADB AND SB+LP REDUCE LAXITY RESPECT TO PRE-OP.

• SB+LP BETTER CONTROL THE LATERAL COMPARTMENT TRANSLATION RESPECT TO ADB.

• PIVOT-SHIFT PHENOMENON IS BETTER CONTROLLED BY ADB.
REFERENCES


