Ten-Years Survival of the Anterior Cruciate Ligament Reconstruction with an "Over-The-Top" plus Lateral-Plasty Technique: Analysis of 322 Consecutive Cases

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INTRODUCTION

NO GOLD-STANDARD FOR ACL RECONSTRUCTION

DIFFERENT TECHNIQUES FOR:
- GRAFT CHOICE
- GRAFT DIAMETER
- FEMORAL TUNNEL PLACEMENT
- FIXATION METHODS
- LATERAL PLASTY

Editorial Commentary: Pursue the Anatomy of the Knee Anterior Cruciate Ligament Footprint
Norimasa Nakamura, M.D., Ph.D., F.R.C.S.

Editorial Commentary: Is Anterolateral Ligament Reconstruction of the Knee Needed? The Debate Rages on
Bruce A. Levy, M.D., Editorial Board, and Orlando D. Sbabag, M.D.

Editorial Commentary: The Quest to Prevent Knee Anterior Cruciate Ligament Bone Tunnel Widening Continues
Scott A. Rodeo, M.D.

Editorial Commentary: Full Extension or 30° Flexion in Graft Fixation for Anatomic Anterior Cruciate Ligament Reconstruction. Is This Surgeons’ Preference?

Abstract: An anatomic anterior cruciate ligament reconstruction with the graft fixed at 30° knee flexion may be the best solution for preventing rotational instability.
INTRODUCTION

SINCE 1993, SAME ACL TECHNIQUE:

- HAMSTRINGS (TIBIAL ATTACHMENT MAINTAINED)
- NO FEMORAL TUNNEL
- OVER-THE-TOP FIXATION (STAPLES)
- LATERAL PLASTY

Marcacci, Zaffagnini KSSTA 1998

- KINEMATIC NAVIGATION STUDIES
- GOOD OUTCOMES IN RCTs vs BPTB & QUADRUPLES HS
- GOOD RESULTS AT 24 YEARS FOLLOW-UP
- NO OSTEOARTHRITIS
- POSSIBLE IN SKELETALLY IMMATURE, CONCOMITANT MAT or HTO

Zaffagnini et al KKSTA 2006
Bonanzinga, Grassi, Zaffagnini et al KSSTA 2017
Grassi, Zaffagnini et al. Accepted CLIN BIOMECH 2018
Zaffagnini, Grassi et al. KSSTA 2013
Zaffagnini, Grassi et al. AJSM 2018
Zaffagnini, Grassi et al KSSTA 2018
Roberti di Sarsina, Grassi, Zaffagnini et al. KSSTA 2018
INTRODUCTION

SINCE 1993, SAME ACL TECHNIQUE:

LACK OF LARGE SAMPLE, LONG TERM OUTCOME TO DETERMINE «LARGE SCALE» FAILURES, REOPERATIONS AND PROMs
INCLUSION CRITERIA:

- 322 CONSECUTIVE PATIENTS OPERATED BETWEEN 2007-2008
- 10-YEARS MINIMUM FOLLOW-UP
- PRIMARY ACL RECONSTRUCTION
- SAME SURGICAL TECHNIQUE: SB HAMSTRINGS + LAT PLASTY
- NO CONCOMITANT LIGAMENT INJURIES
- NO HTO, NO MAT
MATERIAL AND METHODS

EVALUATION:

1°: ACL REVISION (FAILURE)
2°: ALL RE-OPERATIONS
3°: SUBJECTIVE EVALUATION WITH PROMS:
   - KOOS
   - LYSHOLM
   - TEGNER ACTIVITY
   - VAS FOR PAIN (REST & ACTIVITY)

STATISTICAL ANALYSIS:

LOGISTIC REGRESSION FOR FAILURE AND REOPERATION (RR)
MULTIPLE REGRESSION FOR SUBJECTIVE SCORES (COEFF.)
RESULTS

PATIENTS POPULATION:

267/322 PATIENTS (83% FU RATE)
SIMILAR CHARACTERISTICS WITH PATIENTS LOST TO FU

- MEAN AGE AT SURGERY: 30.7 ± 10.6 YEARS
  (11% WERE <18 YEARS OLD)
- SEX: 77% M, 23% F
- MEAN F.U: 10.1 ± 0.4 YEARS
- 30% SMOKERS
- 31% BMI >25 (OVER-WHEIGHT
- 72% PRE-OP TEGNER >5
RESULTS

REOPERATIONS: 35 TOTAL (13.1%)

- 8 Revision ACL (3.0%)
- 10 Menisectomies (3.7%)
- 13 Staples removal (4.9%)
- 2 UKA\TKA (0.8%)
- 1 Joint Lavage (0.4%)
- 1 Loose body removal (0.4%)

SURVIVAL RATE
“FREE FROM ANY SURGERY”

1-year: 97.0%
2-year: 95.1%
5-year: 89.5%
10-year: 86.5%
RESULTS

SURVIVAL RATE OF SPECIFIC REOPERATION

**REVISION ACL**
1-year: 99.2%
2-year: 98.9%
5-year: 98.1%
10-year: 96.3%

**MENISCECTOMY**
1-year: 99.6%
2-year: 99.3%
5-year: 97.0%
10-year: 96.3%

p>0.05
RESULTS

PREDICTORS OF REVISION+MENISCECTOMY

SURVIVAL RATE “FREE FROM REVISION OR MENISCECTOMY”
1-year: 99.3%
2-year: 98.5%
5-year: 95.5%
10-year: 92.8%

PRE-INJRY TEGNER ACTIVITY LEVEL >5: Odd Ratio 7.0 (P<0.05)
PREVIOUS MEDIAL MENISCUS LESION: Odd Ratio 2.6 (P<0.05)
RESULTS

SUBJECTIVE PROMS:

KOOS symptoms: 92.1 ± 11.2
KOOS pain: 95.3 ± 9.1
KOOS ADL: 98.1 ± 8.4
KOOS sport: 90.3 ± 17.3
KOOS Qol: 90.6 ± 18.1

Lysholm: 93.7 ± 11.5
VAS pain rest: 2.1 ± 9.6
VAS pain activity: 22.0 ± 26.7
RESULTS

PROMS PREDICTORS:

KOOS symptoms
- Lateral condropaty: -15.8 (p<0.0001)
- Smokers: -2.8 (0.0482)

KOOS pain:
- Lateral condropaty: -8.1 (p=0.0097)
- Medial condropaty: -4.8 (p=0.0066)
- Female sex: -3.5 (p=0.0060)

KOOS ADL:
- Lateral condropaty: -6.6 (p=0.0143)
- Female sex: -3.1 (p=0.0074)

KOOS sport:
- Lateral condropaty: -16.6 (p=0.0067)
- Medial condropaty: -8.9 (p=0.0109)
- Female sex: -6.9 (p=0.0052)

KOOS Qol:
- Lateral condropaty: -22.9 (p=0.0001)
- Female sex: -6.1 (p=0.0156)
CONCLUSIONS

ACL OVER-THE-TOP plus LATERAL PLASTY

LOW (3-4%) REVISION RATE AT LONG-TERM

LIMITED NUMBER OF REOPERATIONS

MENISCUS LESION and SPORT ACTIVITY PREDICTORS FOR NEW INJURIES

SUBJECTIVE CLINICAL OUTCOMES SIMILAR TO CONVENTIONAL ACL

FEMALE SEX AND CHONDROPATY PREDICTORS FOR WORST OUTCOMES


thank you!