Is there any benefit in ACL reconstruction in patients over 60 years old?

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Disclosure

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Introduction

- Anterior Cruciate Ligament (ACL) reconstruction is one of the most **common** and successful procedure in orthopedic surgery.

- Initially, surgery was reserved only for young, active and usually professional-level patients, excluding extreme age groups of skeletally-immature patients or older patients and non-professional athletes.

- Increased knowledge around the pathology, the improvement of surgical techniques, more sophisticated instrumentation and the advance of anesthesiology and rehabilitation procedures allowed us to **progressively extend surgical indications to all active patients with knee instability.**

Introduction 2

- There are well-documented works with very good results after ACL reconstruction in patients over 50 years old, when these are carefully selected for motivation and sports level
- Surgeons are challenged to treat probably the most demanding group of patients over 60 years old in western countries; more of them are practicing sports than before, and a potential injury requires a treatment that will allow them return to their previous level of activity.
- To the authors' knowledge, no results have been reported after ACL reconstruction in patients over 60 years old.
- The aim of this study was to evaluate the results of ACL reconstruction in active patients older than 60 years without knee arthritis, in terms of functional recovery, return to sports and incidence of osteoarthritis.

Materials & Methods

- Retrospective study - all consecutive cases of patients over 60 yo with **isolated ACL tear** and **no radiological evidence of knee arthritis** operated on ACL reconstruction
- Surgical treatment if **instability** in daily or sports activities **after 6 months** of conservative treatment on patients
- ACL reconstruction quadrupled autologous **hamstrings** tendons in a single bundle way fixed with absorbable interference screws
- **Exclusion criteria** were ACL re-ruptures, contralateral knee injuries, multi-ligament lesions of the knee and presence of a radiological osteoarthritis > grade 2 Ahlbäck in any knee compartment. **A minimum of 2 years follow-up** was necessary to be included in the study.

Materials & Methods 2

- **Rehabilitation protocol**

- All patients followed the same post-operative rehabilitation protocol. Partial weight-bearing 3 weeks. Early range of motion 0-90. More active muscle strengthening, proprioception exercises and return to full daily activities were advised from 6th to 12th week. Jogging, swimming and progressive return to low-level sports activities were allowed from 3rd to 6th month after surgery. Return to previous sports activities was allowed after 6 months.

- **Functional evaluation**

- IKDC to evaluate anterior drawer, joint effusion and range of motion pre-operatively and post-operatively at the last follow up. Functional and sports recovery were valued with subjective scores; IKDC , Lysholm and KOOS were measured pre-operatively and at the last follow-up.

Results 1

- 7 females and 5 males were included.
- Mean follow up was 49.6±24 months (no patient was lost to follow-up).
- Mean age at the moment of surgery was 61±1 years.
- Cause of initial trauma was alpine ski in 7 cases (58%), tennis in 1 case (8%), trekking in 1 case (8%) and accidental falling in 3 cases (26%).
- All patients were initially treated with non-surgical methods for 6 months. Mean time between trauma and surgery was 11.5 months (6-18 months).

- Meniscal tears were recorded intra-operatively; in 8 cases (66%) meniscal tears were found. In every case with meniscal tear, this was located in the posterior horn of medial meniscus. All patients were treated with partial meniscectomy. Six patients (50%) had ICRS stage I-II chondral lesions (no further tx).

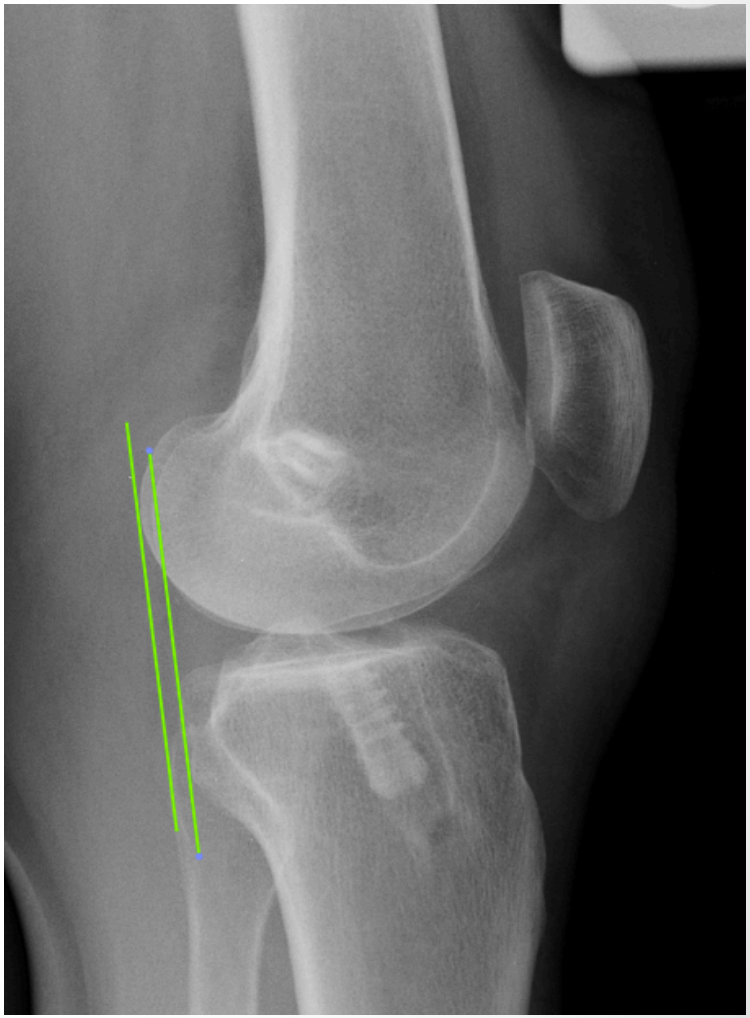
Results 2

- Pre-operative objective IKDC evaluation showed stage B in 4 cases (33.3%), stage C in 5 cases (41.6%) and stage D in 3 cases (25.1%). At the last follow up, no patients reported episodes of instability and objective IKDC evaluation showed stage A for 3 patients (25.1%), stage B for 7 patients (58.3%) and stage C for 2 cases (16.6%). Pre-operatively all patients had positive Lachman and pivot-shift tests. At last follow-up, Lachman test was negative in 5 cases (42%) and grade B with firm end-point in 7 cases (58%). Pivot shift test was negative in 6 cases (50%), grade B in 5 (42%) cases and grade C in 1 (8%) patient (Table 1).

- IKDC score: 7 patients had "single leg hop" stage A, 3 stage B, and 2 wasn't tested because of medical condition (malignancy and cerebrovascular disease).

Laximetry evaluation

- Stress x-rays evaluation of anterior tibial translation showed a statistically significant difference between mean side-to-side difference of anterior tibial translation before surgery (7.2±6.4mm) and after reconstruction (1.9±4.3mm) ($p<0.05$) (Figure 1). Post-operatively, difference of anterior tibial translation greater than 5 mm from non-injured side was noticed only in 2 cases.



Radiological evaluation

Single-leg weight bearing views showed 6 patients with stage I (Ahlbäck) osteoarthritis pre-operatively. Post-operatively one patient (8%) showed progression from stage 0 to stage I for the study period (p=NS)

Patient	Age (years)	Follow up (months)	Associated meniscectomy	Lachman	Pivot shift	Objective IKDC	Cause of IKDC	Laximetry* (mm)
1	61	91	yes	firm end point	glide	B	glide	6,4
2	64	81	yes	firm end point	glide	B	glide	3,5
3	60	69	yes	firm end point	glide	B	glide	3,6
4	63	66	yes	-	0	B	lost of recurvatum	-4.6
5	62	62	no	-	0	A	-	-3.5
6	61	58	yes	firm end point	clunk	C	clunk	1,8
7	59	31	no	-	0	A	-	-0.5
8	61	30	sequela	firm end point	0	B	lost of recurvatum	1.2
9	61	30	no	-	0	A	-	-0.7
10	59	29	yes	firm end point	glide	B	glide	5
11	61	27	yes	firm end point	glide	B	glide	10.5
12	60	21	yes	-	0	A	-	1

*Laximetry : Side-to-side difference of anterior tibial translation on stress x-rays (Telos™)

Return to sports

- At the last follow-up 10 patients (83.3%) reported return to sports activities.
- ACL-RSI global score was 76.2±32.2% at the last follow-up.

Six patients (50%) resumed activities at the same level before surgery (91.9% mean ACL-RSI score). These six patients (50%) return to alpine skiing. For patients reported a modification of their level of activity (75.2% mean ACL-RSI score) because of apprehension during pivoting sports. They changed pivoting sports for cycling and trekking. Two patients (16.6%) stopped their sporting activities completely for medical reasons not related to knee condition (malignancy and cerebrovascular disease).

Discussion – previous data

- This study was designed in order to evaluate the results of a common surgery in an uncommon group; that of ACL reconstruction in active patients over 60 years old with ACL deficiency but without knee arthritis. There are no published data for similar populations who underwent ACL reconstruction. Our data showed satisfactory results with almost complete return to desired sports activities, no major complications and no deterioration to knee arthritis for a study period of 2 years. The results of his study showed good results in terms of objective and subjective results.

- There are several studies on ACL reconstruction in patients more than 50 years old that confirmed similarly good functional and clinical results. Blyth et al. reported 81% of their patients with posto-operatively IKDC A and B. In terms of clinical evaluation on knee laxity, Dahm et al. had 94% of cases with Lachman test with firm end point, and Trojani et al. reported 88% of their patients with negative pivot shift test.

- These results are superior to those obtained with conservative treatment of ACL tears in a cohort study of 52 patients between 40 and 60 years old. Cicotti et al. reported a disappointing 97% of their study group with grossly positive Lachman test and 67% with grossly positive pivot shift test at last follow-up.

Discussion – return to sports

- Functional score results using IKDC, Lysholm and KOOS also showed significant improvement between pre-operative and post-operative evaluations. Our results are comparable to those reported for patients undergoing ACL reconstruction aged more than 50 and for younger population.

- Figueroa et al. reported on 50 patients with mean age of 52.1 years at a mean follow up of 53.2 months with functional scores (IKDC and Lysholm) superior to 90. Dahm et al. reported similarly excellent results in a series of 35 patients (mean age 57 years). In this study, the authors reported very good results that justify ACL reconstruction in active patients, which allows them to return to pre-injury level of activity despite an even longer mean follow-up of 72 months.

- Desai et al. showed their data from the Swedish Register in an effort to compare ACL reconstruction in patients over 40 and younger patients: older patients reported lower pre-operative KOOS, but at follow-up, KOOS was similarly high in all age groups.

- **As far as return to sports activities, there are also satisfactory reports of patients over 50 who returned to sports after ACL reconstruction from 60% [13] to 86% [6]. Our results confirm these data in terms of sports activities frequency and intensity: 83.3% returned to sports and half of them reported full resumption of sports with the same level before injury, including regular alpine skiing. These patients had very high post-operative ACL-RSI scores, indicative of little or no apprehension during sports.**

Discussion - complications

In the present study 50% had stage I medial compartment osteoarthritis before surgery and all of them was asymptomatic. Only one (8%) showed a radiological progression to stage I after surgery but without clinical symptoms for our study period.

- It is difficult to determine if knee arthritis is related the soft-tissue surgery or related to the natural evolution of an arthritic knee. Although our study period is rather short to record evolution of arthritis, we recorded no case of catastrophic deterioration for the first 2 years after surgery.

- Dham et al. studied this parameter for a longer period and reported on a group of patients with osteoarthritis stage 0 and I (Kellgren-Lawrence) 16% of radiological progression to stage II and III.

- These data confirm the importance of careful patient selection and the need of excluding the ones with established osteoarthritis, severe meniscal injury or lower limb malalignment. Furthermore, we reported no case of other peri-operative complications, including infection or thrombo-embolic disease. We also recorded no case of graft failure at 41 months of follow-up. Graft re-rupture rates in patients over 50 years old, are reported between 3% and 8.6%. These results are comparable to ACL reconstruction in younger patients.

Conclusion

- ACL reconstruction in ***carefully selected*** active older patients **restored knee stability and allowed them to returned to their pre-injury level of activities**.

- Very good results on functional recovery were recorded, **peri-operative complications were not higher than younger patients**, and midterm functional knee deterioration or evolution of knee arthritis was not recorded.

- Our data showed that older and active patients with non-arthritic ACL-deficient knees may benefit from a knee stabilizing procedure, rather than benignly neglecting them.

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