ACL Re-Rupture Fixation Using ActivaScrew™ Interference

Tero Järvinen
M.D., Ph.D.

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Bioretec develops and produces globally innovative bioabsorbable products and surgical solutions for better patient outcome, user friendliness and cost-efficiency in clinical care.

Bioretec Ltd. • Hermiankatu 22 • FI-33720 Tampere • Finland
Tel. +358 20 778 9500 • Trade Reg. No. 738.932 • VAT No. FI14741969
sales@bioretec.com • **www.bioretec.com**

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Summary Table

Smoking:	No	**Sex:**	Male	
Use of alcohol:	Normal use	**Age:**	29	years
Other disease:	No	**Height:**	182	cm
Contin. Medicatio	No	**Weight:**	80	kg

Operator:	**Tero Järvinen**		
Dg no.:	S83.5.	**Operation:**	ACL reconstruction
DG:	Re-ruptura ligamentum ACL genu l.sin.	**Operation no.:**	NGE35.
Injury date:	-	**Immobilisation:**	Free mobilisation
Operation date:	22.3.2014	**Prim. weight bearing:**	No weight bear. 2 weeks
Operation time:	80 min	**Sec. weight bearing:**	Partial weight bear. 2 weeks
Hospital stay:	1 days		
Sick leave:	60 days		
Bloodless field:	Yes		
Prophylactic antibiotics:	Yes		

Implant 1:	ActivaScrew Interference 8 x 24	LOT:	-
Implant performed:	Excellent	Drilling:	8 mm drill
Implant 2:	ActivaScrew Interference 9 x 30	LOT:	-
Implant performed:	Excellent	Drilling:	8 mm drill

Operation:	No technical difficulties
Notice:	8 x 24 was applied at the femoral side and 9 x 30 at the tibial side

	Primary	3 weeks	6 weeks	3 months	1 year	Later Control
Operator:	Tero Järvinen	Tero Järvinen	Tero Järvinen	Tero Järvinen	Tero Järvinen	-
Obj. result:	Good	Good	Good	Good	Good	-
Subj. result:	Good	Good	Good	Good	Excellent	-
Joint stability:	Good	Excellent	Excellent	Excellent	Excellent	-
Swelling:	Moderate	No	No	No	No	-
Redness:	Slight	No	No	No	No	-
Pain:	Occasional medic.	No	No	No	No	-
Second operation:	-	No	No	No	No	-
Range of motion:	Deficiency 10-30deg.	Deficiency<10deg.	Normal	Normal	Normal	-
Sports activities:	No	No	Limited	Limited	Like before	-
Tissue reaction:	No	No	No	No	No	-
Infection:	No	No	No	No	No	-

Extra notices: The current operation was a re-reconstruction of ruptured ACL. The primary injury took place in karate in 2008. Hemarthrosis and total ACL rupture were detected in MRI at the time. The primary ACL reconstruction was carried out by double-bundle technique using bioabsorbable interference screws in 2008. No trauma was related to second injury. The stability of the knee was just lost 5 years after the primary reconstruction and the new MRI investigation revealed an ACL re-rupture.

1 Case Description

Patient was a 29 years old male, who had a left knee trauma in karate in 2008. Hemarthrosis and a total ACL rupture were diagnosed by the MRI. Arthroscopic ACL reconstruction using double-bundle technique with bioabsorbable screws was carried out in May 2008. In addition to ACL reconstruction, a partial, traumatic rupture of the medial meniscus was resected. The subjective outcome was excellent for five years, but suddenly without any trauma or re-injury the patient noticed AP-laxicity, “giving away” symptoms in fall of 2013 and seek orthopedic surgeon for clinical opinion.

ACL re-rupture was suspected based on the clinical examination and the diagnosis was confirmed by the MRI. The decision for re-operation was made in March 2014. The operative plan was to perform single-bundle ACL revision reconstruction using hamstring-tendons from contralateral leg and ActivaScrew™ Interference screws for the fixation of the graft.

2 Surgical Procedure

Arthroscopy through anterolateral portal revealed both ACL double-bundles totally ruptured, grade II arthrosis in the medial tibial plateau and a small degenerative rupture in the corpus part of the lateral meniscus.

The small lesion of the lateral meniscus was resected. The ruptured ACL stumps, intercondylar space and the medial surface of the femoral lateral epicondylus were debrided by shaver. The femoral tunnel was first drilled by K-wire, then by 4.5 mm drill bit. ACL graft was harvested using the autologous gracilis and semitendinosus tendons obtained from healthy, contralateral leg. The final prepared graft had a diameter of 8 mm and length of 12 cm.

Femoral tunnel, 30 mm x 8 mm in length and diameter, was drilled anatomically at the AP-bundle site. Transtibial tunnel (8 mm) was drilled at the middle of the old tibial ACL stump. Femoral fixation was carried out with ActivaScrew™ Interference screw (8 x 24 mm) after anterior notching in full knee flexion. Tibial fixation was carried out with ActivaScrew™ Interference screw (9 x 30 mm) after notching in full knee extension.

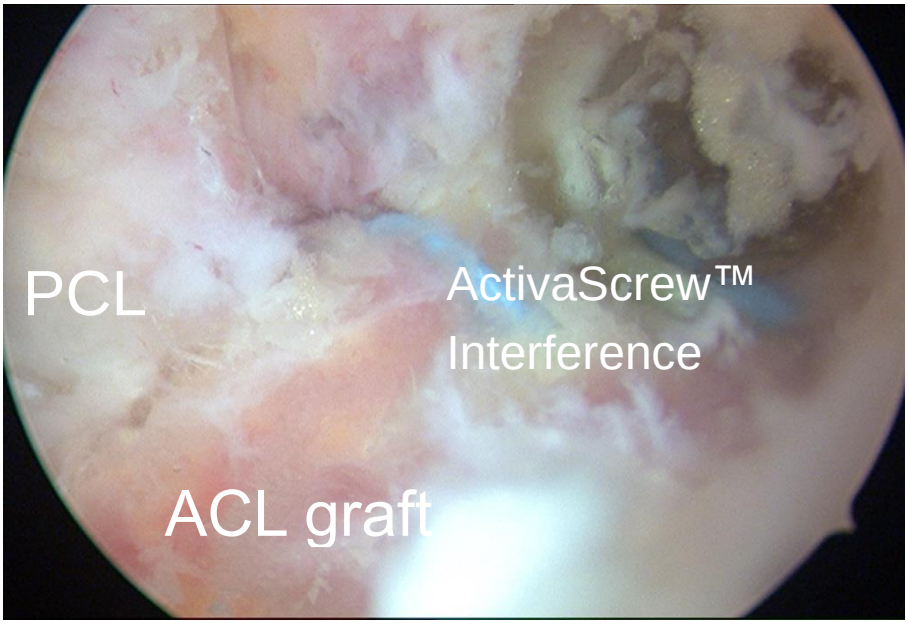

Figure 1 Arthroscopy view of the ACL graft fixation.

3 Results

3.1 Peri-operatively

The evaluation of the outcome at the end of the arthroscopy; pivot shift negative, immediate tightening of the ACL in the anterior drawer test, full ROM (no graft impingement) and the tangential orientation of the ACL graft next to PCL.

3.2 Post-operatively

Stiches were removed two weeks after the operation. The patient later told that he had followed a slightly modified postoperative regimen by having no weight-bearing of the operating lower extremity for two weeks, partial weight bearing for week 3 and full weight bearing from three weeks on. Both crutches were used for the first three weeks and one crutch (contralateral) for one additional week.

The patient did exercises requiring full weight-bearing and normal daily activities at 6 weeks. He didn't have symptoms in normal daily activities (no pain, no swelling, return of normal gait, no problems encountered in going up and down stairs). Return from sick-leave to normal work took place at two months according to the original postoperative regimen.

3.3 6 Weeks Follow Up

Clinical examination revealed no swelling in the knee joint. ROM was 0-130 (slight flexion deficit). McMurray-test yielded -/-. The knee was stable in anterior-posterior direction in Lachman- and anterior drawer-tests. Pivot test was negative. Slight quadriceps atrophy was noted. The patient had a feeling that the recovery was progressing as well as after the primary ACL reconstruction in 2008.

3.4 3 Months Follow Up

Clinical examination revealed no swelling in the knee joint. Full ROM was achieved (ROM 0-140). McMurray-test yielded still -/-. The knee was stable in anterior-posterior direction in Lachman- and anterior drawer-tests. Pivot test was negative. Quadriceps-atrophy had almost disappeared. The patient described full recovery in normal daily activity, no symptoms. However, he claimed muscle strength-recovery being still partial.

3.5 12 Months Follow Up

No follow-ups were planned after 3 months. The patient was given an opportunity to contact surgeon if any problems arise. No contacts were initiated by the patient, but an extra phone call-follow up at one year was made by the surgeon. The patient was very satisfied with the outcome from the ACL revision surgery. He had no symptoms and had a feeling that muscle strength had recovered almost completely. He did not encounter problems in jogging/football and was able to perform heavy, physical work up to 12 hours/day for consecutive days. The knee felt stable.

4 Conclusion

Even though that the operation was a re-reconstruction of torn ACL, the operative plan was to proceed directly to ACL-re-reconstruction without removal of the fixation devices due to the use of the bioabsorbable interference screws in the primary operation in 2008. Thus, there was no need for metal implant removal in the revision surgery and the re-reconstruction of the ACL could be carried out in the same operation by simple drilling the bony tunnels in the optimal, anatomic positions.

Notching of the bone by the Bioretec´s Notcher is a crucial part of the ACL reconstruction. Notching performed prior to the screw application guarantees convenient screw insertion and no damage to the graft (graft fraying). In my

clinical practice I have not encountered any implant breakage during screw insertion nor any other implant related adverse reactions despite the extensive use of the Bioretec´s ActivaScrew™ Interference -screws (> 300 screws implanted). The sterile screw packaging guarantees aseptic use and thus reduces the risk of implant contamination during surgery.

5 Contact Information Concerning the Case

Professor & Chief Surgeon
Tero Järvinen, M.D., Ph.D.
Faculty of Medicine & Health Technologies
Tampere University & Tampere University Hospital
Finland