

# Failure Rates and Complications with Multiple-Revision ACL Reconstruction: Don't Forget the Over-The-Top Technique

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# Disclosure

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# Objective

- **Multiple-revision anterior cruciate ligament reconstruction (ACL-R) presents several technical challenges, often due to residual hardware, tunnel widening, or malposition.**
- **The aim of this study was to compare complication rates between over-the-top (OTT) and anteromedial portal drilling (AMD) techniques in patients undergoing multiple-revision ACL-R.**

# Patients and Methods

- **A retrospective cohort study comprised of patients undergoing multiple-revision ACL-R was performed by four sports medicine fellowship trained surgeons in single institute.**
- **Patients with two or more revision ACL-Rs performed with the OTT or AMD techniques were included.**
- **Data on patient demographics, graft characteristics, number of revisions, concomitant procedures, complications (arthrofibrosis, septic arthritis, cyclops lesion), and failures were collected.**

# Results

- **A total of 101 patients undergoing multiple revision ACL-R with OTT (n=37, 37%) and AMD (n=64, 63%) techniques were identified.**
- **The mean follow-up period was 60 months (range: 12-196).**
- **No statistically significant differences were found in age, gender, body mass index, laterality, or follow-up length ( $p > 0.05$ , Table 1) between the groups.**

**Table-1: Basic characteristics of patients**

<b>Variables</b>	<b>OTT Group (n=37)</b>	<b>AMD Group (n=64)</b>	<b>p Value</b>
Age, mean (min – max)	27.5 (16-49)	28.6 (18-44)	p=0.54
Gender			
Female, n (%)	15 (41)	31 (48)	p=0.44
Male, n (%)	22 (59)	33 (52)	
BMI (kg/m <sup>2</sup> ), mean (SD)	26.5 (±4.4)	26.8 (±5.4)	p=0.81
Laterality (right), n (%)	14 (38)	28 (44)	p=0.56
Follow-up (months), mean, (min – max)	52.9 (12-170)	63.5 (12-196)	p=0.25
Revision Number			
Second, n (%)	34 (92)	61 (95)	p=0.59
Third, n (%)	2 (5)	3 (5)	
Forth, n (%)	1 (3)	0 (0)	

AMD = Anteromedial drilling; BMI = Body mass index; OTT =Over-The-Top

# Results

- **Allograft was the most frequently used graft (n=64, 67.3%) with no significant differences between groups in terms of graft diameter.**
- **There were no statistically significant differences between groups regarding rate of concurrent medial meniscus, lateral meniscus, cartilage, or lateral extra-articular tenodesis procedures ( $p > 0.05$ ; Table 2)**

**Table-2: Operative data of patients**

<b>Variables</b>	<b>OTT Group (n=37)</b>	<b>AMD Group (n=64)</b>	<b>p Value</b>
Graft diameter, mean, (min – max)	9.8 mm ( $\pm$ 1.1)	9.6 mm ( $\pm$ 1)	p=0.51
Graft choice			
HT, n (%)	7 (19)	4 (6)	N/A
QT-S, n (%)	0 (0)	11 (17)	
QT-B, n (%)	0 (0)	4 (6)	
BPTB, n (%)	0 (0)	7 (11)	
Allograft, n (%)	30 (81)	38 (59)	
Medial Meniscus Procedure, n (%)	13 (35)	32 (5)	p=0.15
Meniscectomy, n (%)	5 (13)	10 (15)	
Repair, n (%)	1 (2)	8 (12)	
MAT, n (%)	7 (18)	14 (21)	
Lateral Meniscus Procedure, n (%)	7 (18)	10 (15)	p=0.67
Meniscectomy, n (%)	5 (13)	3 (5)	
Repair, n (%)	1 (2)	3 (5)	
Posterior Root Repair, n (%)	1 (2)	4 (6)	
Cartilage Procedure, n (%)	0 (0)	3 (5)	p=0.3
LET, n (%)	3 (5)	6 (16)	p=0.07

AMD = Anteromedial drilling; BPTB = bone-patellar-tendon-bone autograft; HT = Hamstring tendon autograft; LET = Lateral extra-articular tenodesis; MAT = meniscus allograft transplantation; N/A: Not available; OTT = Over-The-Top; QT-B = Quadriceps tendon autograft with bone block; QT-S = All soft tissue quadriceps tendon autograft.



# Results

- **As displayed in Table 3, there was also no statistically significant difference in complication rate (OTT: n=2 (5.4%); AMD: n=8 (13%);  $p > 0.05$ ) or graft failure rate (OTT: n=4 (11%); AMD: n=14 (22%);  $p > 0.05$ ) between groups.**

**Table-3: Post-operative data of patients**

<b>Variables</b>	<b>OTT Group (n=37)</b>	<b>AMD Group (n=64)</b>	<b>p Value</b>
Reoperation, n (%)	5 (14%)	20 (34.1%)	<b>P&lt;0.05</b>
Complication, n (%)	2 (5.4%)	8 (13%)	p=0.74
Arthrofibrosis, n (%)	1 (2.7%)	5 (7.8%)	
Septic arthritis, n (%)	0 (0.0%)	2 (3.1%)	
Cyclops Lesion, n (%)	1 (2.7%)	1 (1.5%)	
Failure, n (%)	4 (11%)	14 (22%)	p=0.16

AMD = Anteromedial drilling; OTT = Over-The-Top.

# Conclusion

- **The results of this study showed notably elevated failure and complication rates in challenging multiple-revision ACL-R.**
- **Complication and failure rates were lower in the OTT compared to the AMD technique, however, there were no significant between group differences in these outcomes.**

# Conclusion

- **This suggests that we may be underpowered to detect between group differences.**
- **In the setting of multiple-revision ACL-R, surgeons may consider the use of the OTT technique but further study in a larger cohort is required to determine if the OTT provides more favorable complication and failure rates.**