

Returning to sports after an anterior cruciate ligament reconstruction: When is a good time?

Dear Editor,

Anterior cruciate ligament (ACL) reconstruction is the mainstay of treatment for active individuals with ACL injuries. The ability to return to pre-injury activity is important for patients after ACL reconstruction (ACLR).^{1,2} Despite that, the ideal timeline for patients to return to sport after ACL reconstruction is widely debated.

Nine to 12 months after surgery have been recommended as an ideal timeline for ACLR patients to return to sports.³ However, recent studies have shown a higher risk of reinjury up to 2 years after surgery and great variability in patient outcomes remains.⁴ Therefore, we sought to evaluate functional improvement of our cohort of ACL reconstructed patients over a period of 2 years to determine if return to sports should be delayed.

Fifty-six consecutive patients (42 men and 14 women), who underwent a transportal 4-strand hamstring graft ACLR between 2016 and 2017, were recruited after institution review board approval. The mean age of these patients was 27.1 years (range 17–42) and all patients had been playing recreational sports at least twice a week before injury.

Our cohort underwent isolated ACLR, ACLR with meniscal debridement (MD), or ACLR with meniscal repair (MR). Patients with concomitant cartilage or multiligament surgeries were excluded. The mean duration of surgery for all cases was 62 minutes (range 48–80). The International Knee Documentation Committee (IKDC) subjective scores, Lysholm scores and Tegner scores were collected pre-surgery, 1 and 2 years after ACLR.

Postoperatively, all patients underwent a standard ACL physiotherapy protocol. Full weight-bearing was permitted for patients that underwent isolated ACLR or ACLR with MD. Protected weight-bearing (touch-down weight-bearing of 5kg for the first 3 weeks, then partial weight-bearing of 50% body weight for the next 3 weeks) was enforced for patients with ACLR with MRs for 6 weeks. Postoperatively, all patients were allowed range of motion 0–90° in a knee brace with progression to full range of motion after 6 weeks.

The patients were commenced on stationary cycling at 6 weeks, jogging at 4 months (if operated limb strength reached 80% of the contralateral limb), agility drills at 6 months and sports specific drills at 7 months.

The physiotherapy sessions were scheduled weekly up to 6 weeks, fortnightly up to 3 months, and monthly after 3 months until 12 months.

The mean IKDC subjective scores, Tegner scores and Lysholm scores were compared using paired t-test. Post hoc analysis with Bonferroni correction was used to assess for difference between groups. Statistical significance was defined at a *P* value of <0.05 and analyses were carried out with SPSS Statistics software version 23 (IBM Corp, Armonk, US).

In our cohort, 15 patients had isolated ACLR, 13 patients had ACLR with MD, and 28 patients had ACLR with MR.

The IKDC subjective scores improved significantly between 1 year (81.1±12.7) and 2 years (86.9±10.1) post-surgery (*P*=0.016). There were also significant improvements (*P*<0.05) in IKDC subjective scores between 1 year and 2 years post-surgery in all groups (ACLR, ACLR+MD and ACLR+MR) (Fig. 1A).

The Tegner scores improved significantly between 1 year (5.6±1.6) and 2 years (6.4±1.9) post-surgery (*P*=0.001). There were significant improvements in Tegner scores in ACLR+MD (*P*=0.021) and ACLR+MR (*P*=0.043) groups between 1 and 2 years post-surgery. No difference in Tegner scores was seen in the isolated ACLR patient cohort between 1 and 2 years post-surgery (*P*=0.424) (Fig. 1B).

There was no difference in Lysholm scores between 1 year (91.4±7.6) and 2 years (88.7±14.6) post-surgery (*P*=0.27). This finding was consistent across all groups: isolated ACLR (*P*=0.324), ACLR+MD (*P*=0.151) and ACLR+MR (*P*=0.42) (Fig. 1C).

Twenty-four percent and 51% of our patients returned to sports at their pre-injury levels at 1 and 2 years, respectively. Among the 3 surgical intervention groups, no significant difference (*P*>0.05) was observed in improvement of IKDC subjective scores, Tegner scores and Lysholm scores at 1 year and 2 years postoperatively.

Our study reports a return to sports rate of 24% at 1 year and 51% at 2 years. Our findings are similar to those in the landmark prospective study of 122 patients by Ardern et al., who reported that 31% of patients returned to pre-injury levels at 1 year and 60% returned to their pre-injury levels at 2 years.⁵ Welling et al.

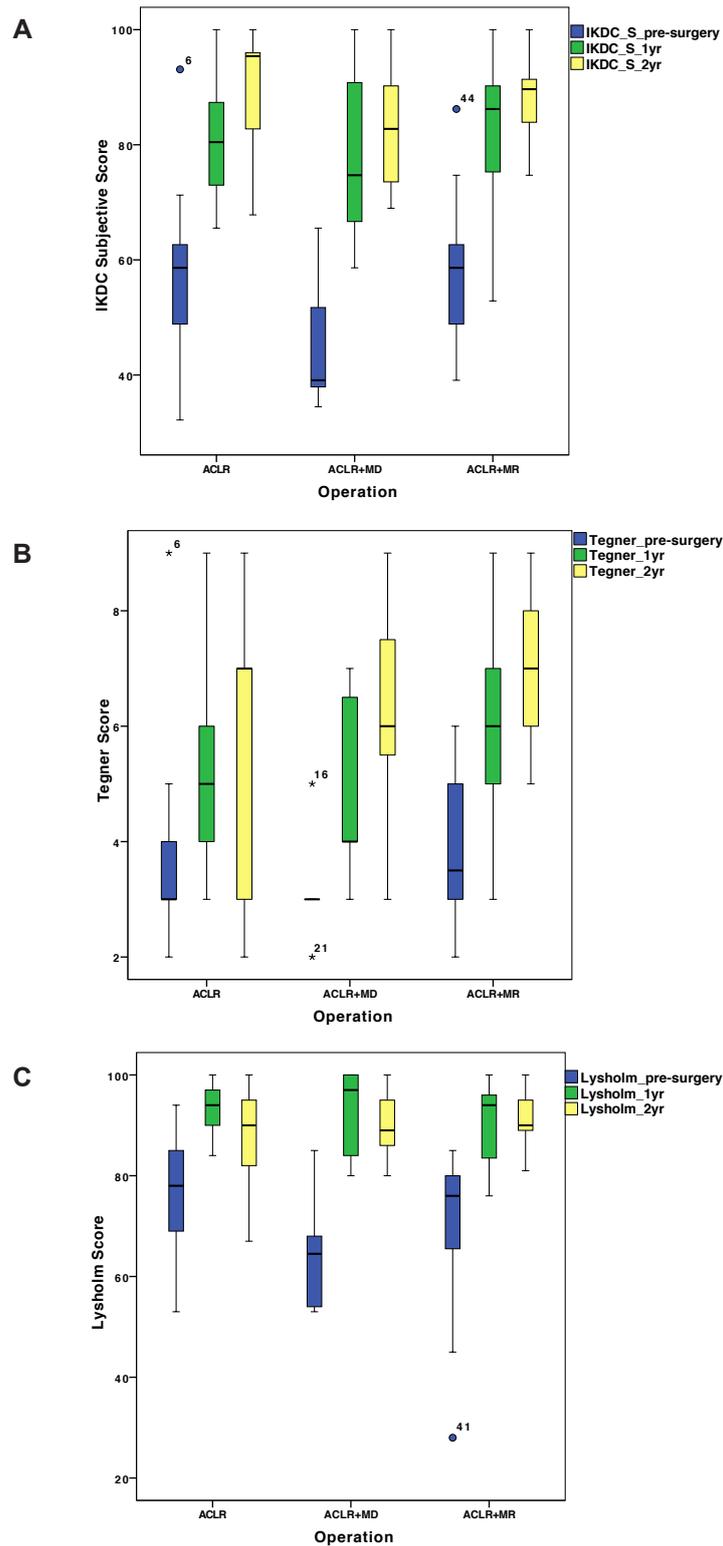


Fig. 1. Boxplots of isolated ACLR, ACLR + MD, and ACLR + MR. (A) Blue boxplot (pre-surgery IKDC subjective scores), green boxplot (IKDC subjective scores at 1 year post-surgery) and yellow boxplot (IKDC subjective scores at 2 years post-surgery). (B) Blue boxplot (pre-surgery Tegner scores), green boxplot (Tegner scores at 1 year post-surgery) and yellow boxplot (Tegner scores at 2 years post-surgery). (C) Blue boxplot (pre-surgery Lysholm scores), green boxplot (Lysholm scores at 1 year post-surgery) and yellow boxplot (Lysholm scores at 2 years post-surgery).

ACLR: anterior cruciate ligament reconstruction; IKDC: International Knee Documentation Committee; MD: meniscal debridement; MR: meniscal repair

reported that only 11.3% of patients met the return to sports criteria at 12 months, again emphasising the need to delay return to sports.⁶ These findings reaffirm our recommendation to extend return to sports to a minimum of 12 months after surgery.

Our patients continue to improve in functional scores after 1 year of ACLR. This is supported by the improvement in IKDC subjective scores and Tegner scores between 1 and 2 years. Ithurnburn et al. also showed that most of their study participants only achieved higher functional recovery based on knee outcomes scores at 2 years.⁷ This supports our hypothesis that patients experience functional improvement up to 2 years post-ACLR.

In a 5-year follow-up study, Lee et al. reported that 62% of their post-ACLR cohort returned to sports at 5 years.⁸ We report a return to sports rate of 51% at 2 years, suggesting a gradual temporal improvement post-ACLR.

Phillips et al. highlighted differences in outcomes for isolated ACLR and ACLR with concomitant meniscal surgery.⁹ In our cohort, we found no difference in knee outcomes scores between patients who had isolated ACLR or ACLR with meniscus surgery at 1 and 2 years postoperatively.

The limitations of this study are the small sample size, lack of data on objective muscle strength during rehabilitation, and patient's motivation levels; these are known factors in predicting successful return to sports.¹⁰

Amalgamating our study findings with current literature, we suggest that 12 months is the earliest time for return to sports after ACLR. However, the consideration should not purely be time-based. Other factors such as limb strength, running gait, sports specific drills and patient motivation are important to attain the best possible conditions for a successful return to sports.

In conclusion, ACL reconstructed patients continue to exhibit functional improvement at 1 year after surgery, with more patients ready to return to sports at 2 years.

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