Postoperative rehabilitation of anterior cruciate ligament reconstruction using AI brace in COVID-19 outbreak

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INTRODUCTION: With the 2019 novel coronavirus (COVID-19) pandemic spreading quickly around the world, most of the patients had voiced their reluctance to visit the rehabilitation center postoperatively. Our purpose is to investigate artificial intelligence (AI) brace with home-based telerehabilitation would lead to equivalent effective clinical outcomes than the standard hospital-based rehabilitation program.

METHODS:

A retrospective cohort study enrolled a total of 30 patients received anterior cruciate ligament (ACL) reconstruction, including 15 patients using AI brace and the others using regular knee brace from January 2020 to September 2020. All patients underwent arthroscopic ACL reconstruction with autologous quadruple hamstring tendons by an experienced orthopedics surgeon. Patients with AI brace received the home-based rehabilitation through the system connect to smart phone. Regular knee brace group received the rehabilitation program at our institution once a week. Rehabilitation protocol was scheduled in 6 months after surgery. Clinical knee functional scores were assessed during patient visits and analyzed.

RESULTS:

At postoperative 6 month follow-up, superior results of both IKDC score and KOOS were noted in AI brace group in comparison to regular knee brace group (IKDC: 87.84 ± 5.55 and 79.49 ± 9.11, P = 0.003; KOOS: 95.59 ± 4.19 and 87.13 ± 14.40, P = 0.004). With the exception of KOOS-ADL, patients in AI brace group demonstrated superior results of all other subscales with significance than the regular knee brace group. The patients enabled to TAS level 5 were 14 (93.3%) in AI brace group and 11 (73.3%) in regular knee brace group respectively.

DISCUSSION AND CONCLUSION: Our experience demonstrated the advantage of telerehabilitation over compared to the standard hospital-based rehabilitation program after ACL reconstruction surgeries under the COVID-19 pandemic circumstances.