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VIBe: A discrete wearable designed to ease the integration of autistic children into mainstream schools

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A utism Spectrum Disorder (ASD) is the fastest growing developmental disorder in the world today with 1 in 68 American children diagnosed as of 2014. Mainstreaming has proven to help those with ASD develop crucial social and communicative skills, important for leading independent lives. For autistic children repetitive motions or self stimming behavior are familiar movements that they can use to cope with the overload or to stimulate their nervous system (tactile stimulation serves to calm them). These motions and possible outbursts make mainstreaming impractical for many autistic children as they may compromise the learning environment of the classroom. VIBe, a device created by IPAT, solves this issue via a vibration motor. 40 neurotypical children were tested to determine if localized vibrations had an effect on lowering heart rate, along with a control group in which no vibrations were applied. In the experiment, each student was asked to solve an impossible puzzle to agitate them and the recovery time between the control and experimental group was compared. Two iterations of the experiment were conducted. A statistically significant difference in recovery times was measured in each experiment between the two categories: An average of 23 seconds and 55 seconds recovery time for the experimental and control group, respectively, in the first iteration as well as an average of 89 and 123 seconds recovery time for the second iteration (p<0.007), suggesting that vibrations are an effective way in reducing self-stimming and disruptive behavior.

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Multiple-looping technique for tibial fixation in posterior cruciate ligament reconstruction

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Purpose: The purposes of this study are to introduce new technique of tibial fixation using free tendon graft in posterior cruciate ligament (PCL) reconstruction which is less affected by the bone density of the tibial metaphysis and to report results of a case series.

Methods: Sixteen subjects underwent single bundle PCL reconstruction using free tendon Achilles allograft. The graft was looped to be double strand. Free ends were fixed on femoral side using suture washer and or bio-absorbable screw and looped end was fixed on tibial side with multiple-looping technique. Ranges of motion of the knee and side-to-side difference (SSD) were assessed at the last follow-up. Lysholm score was evaluated preoperatively and at the last follow-up. Tegner activity scale was evaluated before injury and at the last follow-up.

Results: Median follow-up period was 20 months. At the last follow-up, two had 5 degrees of flexion limitation and the others showed normal range of motion. Median SSD was 10.5 mm preoperatively and 2.0 mm at the last follow-up (p<0.001). Median Lysholm score was 57 preoperatively and 90 at the last follow-up (p<0.001). Tegner activity scale was 6.5 before injury and 6 at the last follow-up (p=0.001).

Conclusions: Multiple-looping technique for tibial fixation showed satisfactory outcomes after single bundle PCL reconstruction without any significant complications.

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