BACKGROUND AND OBJECTIVES

- Joint immobilization after anterior cruciate ligament (ACL) reconstruction may lead to several complications including the development of intra-articular adhesions and range-of-motion (ROM) deficits during rehabilitation
- Prior studies have failed to show CPM to be effective in increasing post-operative ROM or reducing postoperative pain after adult ACL reconstruction
- CPM has been shown to reduce rates of arthrofibrosis requiring manipulation under anesthesia (MUA) in adult populations and animal models
- The goal of this study was to investigate the effectiveness of CPM in reducing MUA rates or improving ROM after ACL reconstruction in a pediatric population

METHODS

- Retrospective cohort study of pediatric patients (age<20) who underwent primary ACL reconstruction at an urban tertiary care children's hospital between January 1, 2009 - June 30, 2015
  - Only patients who received physical therapy (PT) within our health system were included due to the availability of follow-up ROM measurements
  - Subjects who underwent meniscus repair at index surgery were excluded due to stricter postoperative ROM restrictions
  - Range of motion and postoperative pain data was taken from PT records at 1 week, 1 month, 3 months, and 6 months post-surgery
  - Limb strength was analyzed between 3 months and 6 months post-surgery utilizing a biodex isokinetic testing machine
  - Clinically-significant arthrofibrosis was defined as reduced knee flexion requiring MUA within 6 months of surgery
    - In assessing MUA rates, all subjects had >6 months of clinical follow-up after surgery

RESULTS

- Final population included 163 patients: 97 in the CPM cohort and 66 in the no CPM cohort
  - No significant difference between the cohorts in ROM at the 1 week (p=0.137), 1 month (p=0.695), 3 month (p=0.897), or 6 month (p=0.339) time points (Figure 1)
  - No significant difference in pain scores at these same time points (p=0.684, 0.623, 0.507, and 1.00, respectively)
  - At 3 and 6 months, neither Quadriceps strength or Hamstrings strength tested at 180°/sec and 300°/sec differed significantly between the cohorts
  - Four patients (7.4%) in the no CPM cohort required MUA (p=0.023) for arthrofibrosis, while no patients in the CPM cohort required an MUA, corresponding to a number needed to treat of 13.5

DISCUSSION AND CONCLUSIONS

- CPM use did not improve postoperative pain, ROM, or limb strength in our series
- CPM use, however, was associated with a reduced rate of MUA due to arthrofibrosis
- This information may influence prescribing habits for CPM after ACL reconstruction
- Future directions and recommendations
  - Larger studies could provide a more precise estimate of MUA rates among cohorts, which would allow for more exact comparison between the groups’ outcomes
  - Examine CPM use in publicly versus privately insured patient populations
  - A thorough financial analysis regarding the cost-effectiveness of CPM is warranted

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