

[PR1-110] No Advantage of Continuous Catheter over Single-Shot Regional Anesthetic for Pain Control After Anterior Cruciate Ligament Reconstruction

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Purpose: To determine the optimal postoperative pain management regimen for youth undergoing anterior cruciate ligament (ACL) reconstruction.

Methods: This was a prospective, single-blinded, randomized trial comparing lumbar plexus catheter (LPC) to femoral nerve catheter (FNC) and a single-shot femoral nerve block (SSFNB) performed just prior to ACL reconstruction with hamstring autograft. Our hypothesis was that the LPC would provide superior analgesia and quality of recovery when compared to the other two techniques. Patients in all three groups underwent an additional single-shot sciatic nerve block. Block concentrations were relatively low to preserve motor function (0.2 % ropivacaine with epinephrine). Fifty-two patients ages 11-21 years undergoing ACL reconstruction enrolled and were randomized to one of three groups, with information on postoperative pain, quality of recovery, opioid use and side effects collected by a blinded interviewer.

Results: Though a pre-study power analysis suggested 114 patients necessary for an 80% power to detect a difference between groups, enrollment was halted at 52 patients (60% power) because of institutional practice changes and no clear advantage to the catheter groups. A post-hoc power analysis suggested that an enrollment of more than 170 patients would be necessary to find a difference between groups.

However, careful analysis of collected data by the blinded interviewer revealed that there were no advantages to any one technique with the current enrollment, when comparing pain, narcotic usage, and opioid side effects (Table 1).

Conclusion: Though there are advantages to regional anesthetics over opioid-based pain control after ACL reconstruction in youth, no advantages in analgesia, side effects or quality of recovery could be found when comparing continuous catheter techniques to a SSFNB.

Significance: Given the high costs of operating room time, regional techniques that are more efficient, such as a SSFNB, may be considered a preferred alternative for patients undergoing ACL reconstruction. Higher numbers of patients might, however, reveal subtle advantages to catheter-based techniques not evidenced here. Further studies should examine the optimal dose and concentration of local anesthetic as well as analgesic adjuncts such as dexamethasone

Table 1: Pain Measures by treatment group

		Treatment Group			ANOVA p-value
		0	1	2	
24h P _{max}	Valid N	21	18	13	0.16
	Mean	7.6	6.3	7.1	
	Std. Dev.	2.2	2.2	1.7	
24h P _{avg}	Valid N	21	18	13	0.26
	Mean	4.4	3.4	4.3	
	Std. Dev.	1.9	2.8	1.1	
24h #oxy	Valid N	21	18	13	0.07
	Mean	3.9	2.8	3.9	
	Std. Dev.	1.8	1.7	1.4	
48h P _{max}	Valid N	20	17	13	0.41
	Mean	5.4	5.5	6.4	
	Std. Dev.	2.3	2.3	1.9	
48h P _{avg}	Valid N	20	17	13	0.57
	Mean	3.1	2.6	3.2	
	Std. Dev.	1.7	2.1	0.7	
48h #oxy	Valid N	20	18	13	0.99
	Mean	2.9	3.1	3.0	
	Std. Dev.	2.6	2.0	1.8	
72h P _{max}	Valid N	20	17	13	0.28
	Mean	3.9	4.7	5.3	
	Std. Dev.	2.4	2.7	2.3	
72h P _{avg}	Valid N	20	17	13	0.37
	Mean	1.9	2.6	2.4	
	Std. Dev.	1.2	2.3	1.1	
72h #oxy	Valid N	20	18	13	0.75
	Mean	2.0	2.6	2.2	
	Std. Dev.	2.6	2.0	1.9	