

Continuous Adductor Canal Block For Bilateral Total knee Arthroplasty: A retrospective study

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INTRODUCTION: Total knee arthroplasty is the most common orthopedic surgery in the lower extremity performed in North America. The recovery after bilateral total knee arthroplasty (BTKA) is challenging, given the need for effective pain control, early mobilization, and safe discharge home. Epidural catheters, single-shot nerve blocks, and oral/multimodal regimens are common, however not optimal for analgesia and mobility. The aim of this study is to assess the effectiveness and safety of bilateral continuous adductor canal block (B-CACB) and compare it to the bilateral single adductor block (B-SACB) technique in BTKA.

METHODS: We performed a retrospective study including patients scheduled for BTKA from 2020-2023. Research Ethics Board approval was obtained (23-0223-C). Demographics, anesthesia technique, pain score, opioids consumed (oral morphine equivalent, [OME]), complications, and mobilization assessment from a multidisciplinary team including physiotherapist were collected. Data were summarized using mean (standard deviation, SD) or median [interquartile range, IQR] for continuous variables and frequency (%) for categorical variables. The measurements were compared using t-test, Mann-Whitney test, Kruskal-Wallis test, or ANOVA depending on data distribution. Fisher exact test and logistic regression was used to assess the association between variables were used. All analyses were performed STATA 14.0 (StataCorp, USA).

RESULTS:

Sixty-three patients were identified, with 32 patients in the B-SACB group and 31 in the B-CACB group. There were no differences in age, BMI, ASA score, use of neuraxial anaesthesia, or use of intrathecal morphine (Table 1). There was no association between opioid consumption between 0-24 hours and type of block (p=0.05). At 24-48 hours, the B-CACB group consumed an average of 20 mg/day less OME (p=0.04, 95% confidence interval: 1.2-38.9 mg) than B-SACB group (Table 2). There was a significant association between mobilization and type of block (p=0.02), favouring B-CACB. The B-CACB group was 3.5 times more likely to mobilize above 2 meters than B-SACB group on POD1 (OR: 95% confidence interval=1.2 – 9.9) and 4.5 times on POD2 (OR: 95% confidence interval =1.2 – 16.3) as documented in the physiotherapy assessment (Table 3). Fourteen patients were discharged home with catheters (median [IQR] 2 [2-3] days) and 17 were discharged to an inpatient rehabilitation center without catheters because of inpatient rehabilitation hospital's internal policy. No patients reported LAST symptoms and only 3 patients described leaking or dislodgement.

DISCUSSION AND CONCLUSION:

B-CACB is associated with lower opioid requirements at 48 hours than B-SACB, with a quicker mobilization allowing earlier discharge. Patients who were discharged with B-CACB did not have adverse events. Previous studies have demonstrated the effectiveness of the CACB, although with small, noncomparative studies. A case series of 17 cases of CACB for BTKA showed no motor block, which allowed early physical therapy, highlighting the safety of the technique. This is the first study reporting the outcomes of patients scheduled for BTKA comparing outcomes with B-SACB versus B-CACB. B-CACB is a feasible, effective and safe plan for BTKA surgery in selected patients.

Table 1. Patient demographics

	Single ACB n=32	Continous ACB N=31
Age	63.5[60-68.5]	65[57-67]
BMI	30[26-35]	30.5[26-33]
ASA II/ASA III	12/20	8/23
Anesthetic plan neuraxial	29(90.6%)	28(90.3%)
Intrathecal morphine*	100 [100-150]	100 [100-100]

Values are median [IQR] or n(%)
ACB: Adductor canal block
*Mann-Whitney: p=0.11

Table 2. Highest pain reported by visual analogue scale and opioid consumption .

	POD 1		POD 2	
	VAS	OME	VAS	OME
Single ACB	3.5 [0-6]	10 [5-30]	7 [6-8]	60 [33-87]*
Continous ACB	6 [5-7]	7.5 [0-20]	6 [4-7]	30 [15-65]

Values are median [IQR]
ACB: Adductor canal block, POD: Postoperative day, VAS: Visual analogue scale, OME: Oral morphine equivalent.
*Mann-Whitney: p=0.02.

Table 3. Mobilization in POD1 and POD2

	POD 1*		POD 2**	
	Single ACB	Continous ACB	Single ACB	Continous ACB
Steps up 2 meters	20 (62.5)	10 (32.3)	12 (66.7)	8 (40)
Steps above 2 meters	12 (37.5)	21 (67.7)	6 (33.3)	12 (60)

Values are n (%)
ACB: Adductor canal block, POD: Postoperative day
*OR=3.5, p (0.02) **OR=4.5, p(0.02)