

Addition of Liposomal Bupivacaine to Adductor Canal Block for Post-operative Pain Following Total Knee Arthroplasty

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Background

- Advances in Multi-Modal Analgesia and motor-sparing regional blocks have revolutionized post-op analgesia for TKA, particularly as same-day discharge (SDD) becomes more prevalent.
- At ASRA 2018, we presented a case report of the use of Liposomal Bupivacaine (LB) for ACB and iPACK (LB-ACB/iPACK) for a complex TKA revision in a patient on significant pre-op chronic narcotics¹. (LB use for ACB is considered off-label at this time but is being done by many practitioners².) He had marked pain relief extending 5-6 days.
- After successful adoption of LB-ACB/iPACK for TKR revisions, we elected to trial it as a quality improvement for our primary TKRs.

Methods

- From May through November 2019 medication consumption (narcotic and non-narcotic), pain levels, pain satisfaction and patient data were collected daily for POD 0-7 using our WBRP with 83% overall outcome form compliance.
- This data, patient reported feedback and contemporary physical therapist insights were used to analyze post-operative analgesia and function.
- After receiving baseline information on our standard MMAP 15ml Bupivacaine 0.25% + iPACK - 20ml Bupivacaine 0.25% w epinephrine (Protocol A), quality improvement changes to block formulation based on clinical and patient feedback occurred over an 8-month period.
- Several iterations (Protocol B&C) were trialed until the final protocol of 10mL of LB to 5mL of 0.25% bupivacaine for ACB (Protocol D) maintained decreased narcotic consumption and postoperative pain, with no adverse clinical outcomes.

Methods

PROTOCOL A : STANDARD MMAP

- ACB - 15 ml Bupivacaine 0.25%
- iPACK - 20 ml Bupivacaine 0.25% w epi

PROTOCOL B: LB#1

- ACB - 15 ml LB + 5 ml Bupivacaine 0.5 %
- iPACK - 5 ml LB +15 ml Bupivacaine 0.25%.

PROTOCOL C: LB#2

- ACB - 10 ml LB + 5 ml Bupivacaine 0.5%
- iPACK = 20 ml Bupivacaine 0.25% w epi

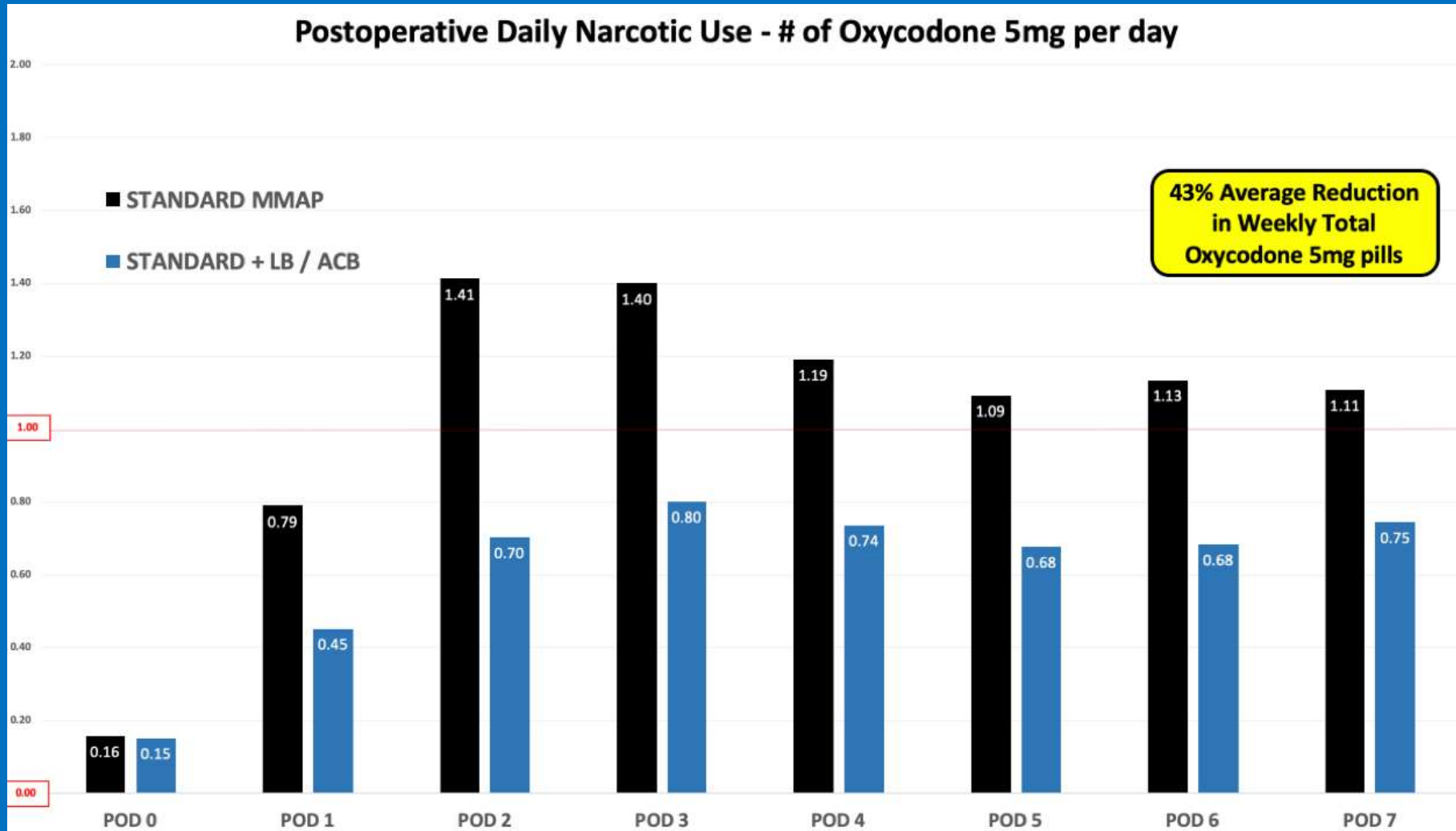
PROTOCOL D: LB#3

- ACB = 10 ml LB + 5 ml Bupivacaine 0.25%
- iPACK = 20 ml Bupivacaine 0.25% w epi

Results

- Protocols A(N= 130) and D(N=132) were compared in final analysis. No significant differences at baseline between groups.
- Protocol D resulted in improved analgesia demonstrated by 44% decrease in daily use of oxycodone 5mg pills POD 1-7 (1.05 to 0.59 pills/ day, $p<0.01$), 43% decrease in total oxycodone 5mg pills over POD 0-7 (7.48 to 4.25, $p<0.01$), and increase in patients taking 0 narcotic pills POD 0-7 (25% to 38%).
- There was no difference in 12-week postoperative Knee Injury and Osteoarthritis Outcome Score Jr. ($p=0.39$), Veterans Rand 12 Physical ($p=0.10$) or Mental Component Scores ($p=0.12$).

Results



Discussion & Conclusion

- As Total Knee Arthroplasty moves to SDD, it will become even more important and challenging to control pain post-discharge. In the opioid crisis era, this needs to be done while decreasing reliance on narcotics.
- The addition of LB 10 ml to the ACB with our Standard MMAP accomplished an even further reduction in post-op narcotic use with 43% reduction in narcotic use POD 1-7 and an increase from 25% to 38% who required ZERO narcotics POD 1-7.
- With an already aggressive MMAP and low narcotic usage, the addition of LB to ACB significantly decreased TKA postoperative narcotic usage POD 1-7.

References

1. Multi-Modal Anesthesia for Total Knee Revision in a Patient on Chronic Narcotics, M Hamilton, MD. ASRA 17th Annual Meeting, Nov 2018.
2. Improved Pain Control With Adductor Canal Block Using Liposomal Bupivacaine After Total Knee Replacement: a Retrospective Cohort Study, A Lakra, MD. Arthroplasty Today, Sept 2019 (5) issue 3, 325-328.