Multi-modal pediatric pain management with continuous paravertebral block for Nuss procedure

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Abstract

The purpose of our study is to improve our protocol for the NPV procedure by using a multimodal pain management strategy for children undergoing Nuss procedure with ultrasound guided continuous paravertebral block (BPVC) as a core regional technique in our multimodal strategy.

Methods

• Devised a multimodal strategy to reduce overall consumption of morphine and other opioids including patients undergoing Nuss procedure. Patients undergoing Nuss procedure were enrolled and pain control at discharge was measured. The strategy included: BPVC infused at surgery, a stable, low pain score. Patients were discharged to home the next day, based on parent/giver’s level of comfort.

Results

• Overall pain scores decreased from median 5/10 pre-BPVC to median 1/10 with the addition of clonidine to the block.

Discussion

• We did not remove any outliers from analysis.

Conclusions

• The level of care, in the 1st 24 hours post operative period with the addition of clonidine to the block, patients were discharged home within 2 days,

Table 1. Summary data before starting multi-modal strategy (pre-BPVC) and subsequent years (2010, 2011…). After PVBC was started, and the associated improvement in analgesia, decreasing hospital length of stay by 39%.

References


Figures

1. Decreasing opioid consumption (morphine). From 2010 to 2013, in the 1st 24 hours (p = 0.09) and in the following 24 hours (p = 0.04).

2. After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

3. Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

4. Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 1: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 2: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 3: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 4: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 5: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 6: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 7: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 8: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 9: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 10: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 11: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 12: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 13: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 14: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 15: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 16: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 17: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 18: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 19: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 20: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 21: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 22: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 23: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

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Fig 25: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

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Fig 28: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 29: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 30: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 31: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 32: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 33: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 34: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 35: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 36: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 37: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 38: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 39: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.

Fig 40: After the initial decrease with PVBC strategy, the length of stay steadily decreased to 20 hours in 2011 and continued to decrease in subsequent years.

Fig 41: Reduction of opioid consumption (MSO4) and significant decrease in LOS over time, in contrast to traditional epidural analgesia, which probably do not provide the density of epidural analgesia.

Fig 42: Note the significant decrease in opioid consumption after BPVC strategy was started. The LOS decreased dramatically after BPVC strategy was started, and then remained stable. Patients could be discharged home within 2 days post operatively.
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