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Original Article

The effect of adjunct caudal block on postoperative analgesia in robot-assisted laparoscopic radical prostatectomy: A prospective randomized controlled, single blinded pilot study in a tertiary centre

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Abstract *Objective:* Caudal block provides satisfactory postoperative pain relief in lower abdominal operations. This pilot study explores its safety and effect on postoperative pain control in patients who underwent robot-assisted laparoscopic radical prostatectomy (RARP). *Methods:* From 2013 to 2014, 40 consecutive patients were randomized into two groups — one received caudal block using ropivacaine immediately after operation, the other received standard analgesia. Primary outcome measure was pain score based on 11-point Likert scale (0–10) recorded at recovery room, and at 6, 12, 24, 48, and 72 h after operation. All analgesic requirements, opioid-related adverse events and time to passage of flatus were examined. *Results:* Mean age of the two groups was similar (60.4 vs. 62.3 years, $p = 0.33$), as was American Society of Anaesthesiologists (ASA) class, body mass index (BMI) and operation times. No significant difference in median pain scores was reported in recovery room (2 vs. 3, $p = 0.34$), and at 6 (2 vs. 2, $p = 0.94$), 12 (0 vs. 0, $p = 0.62$), 24 (1 vs. 0, $p = 0.58$), 48 (1 vs. 0, $p = 0.36$) and 72 (0 vs. 0, $p = 0.78$) h postoperatively between control and caudal block groups, respectively. There was a higher mean opioid usage in the caudal block group. Although this was statistically insignificant while no significant difference in mean paracetamol usage was observed postoperatively. Median time to passage of flatus was similar (2.0 vs. 2.0 days, $p = 0.97$). There was one case of superficial wound infection and no opioid-related adverse events observed. Hospital stay was similar in both groups (2.5 vs. 2.5 days, $p = 0.96$).

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Conclusion: Although a safe modality, caudal block in post RARP patients does not seem to improve pain control nor reduce analgesia requirements.

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1. Introduction

Robot-assisted laparoscopic radical prostatectomy (RARP) has gained significant popularity in the past decade and has been accepted as a standard treatment for localised prostate cancer. With improved visualisation and flexibility of instruments provided by DaVinci Surgical system, RARP can achieve less blood loss and postoperative pain, more rapid recovery, while maintaining comparable oncological and functional outcome compared to open retropubic radical prostatectomy [1]. Optimal pain control ensures shorter hospital stay by means of early ambulation and bowel movement, lower risk of deep vein thrombosis and nosocomial infection. Opioids remain the mainstay of analgesia for RARP and other major abdominal and pelvic surgeries [2]. However, the notorious adverse effects including nausea, vomiting, prolonged ileus and respiratory depression limits its widespread use and result in poor compliance. A multimodal pain regimen, which includes preemptive non-opioids analgesia, intravesical instillation or transversus abdominis plane (TAP) infiltration of local anaesthetics were reported to reduce postoperative use of opioids, some of which demonstrated encouraging results.

Caudal block is widely used in paediatric surgery. It provides satisfactory postoperative pain relief in lower abdominal operations with minimal complications. Evidence shows that caudal block has advantage of higher safety profile over other regional or local anaesthesia modalities [3]. A Chicago retrospective study revealed that caudal block could effectively reduce intraoperative opioids use compared with TAP in paediatric robotic assisted urological surgeries [4]. On contrary, use of caudal block is less desirable in adult patients mainly because of anaesthesiologist's unfamiliarity, inferior location of puncture, lower efficacy and risk of infection [5]. However, although evidence is limited, promising outcome from recent studies favoured the value of adjunctive caudal block as a postoperative analgesia strategy in adult urological surgeries [6–8]. Therefore, we conducted this pilot study to further explore its role in postoperative pain control and its safety in patients who underwent RARP at our institution.

2. Materials and methods

2.1. Inclusion and exclusion criteria

This single centre, randomized controlled, single-blinded study evaluated the effect on postoperative pain control and safety of caudal block in patients who underwent RARP in Singapore General Hospital from May 2013 to February 2014. Patients ranging from 39 years old to 72 years old with

American Society of Anesthesiologists (ASA) Physical Status classification of 1, 2, or 3 who were planned for RARP were included into this study. Patients were excluded if they had a history of allergy to any of the anaesthetic or analgesic agents, were on long-term analgesia, had a history of chronic pain or opioid addiction or took any medicine deemed to affect their perception of pain prior to the surgery.

2.2. Randomisation

Randomisation was carried out by means of sealed envelope method (20 cases, 20 controls) and was administered by an independent party not involved in the study. Patients randomized to caudal block group (cases) received postoperative caudal block and standard analgesia in the ward, which included oral paracetamol, and opioid-based analgesia, which included intravenous morphine in the form of patient-controlled analgesia (PCA), intramuscular pethidine *pro re nata* (PRN) as well as oral tramadol PRN. The control group did not have caudal block postoperation but had the same standard analgesia described above as the cases.

2.3. Caudal block technique

A single dedicated senior consultant anaesthesiologist administered the caudal blocks on the subjects after operation had been completed and before reversal of general anaesthesia. Patients were placed in left lateral position with knees and hip flexed, while still under general anaesthesia. Using anatomical landmarks to identify the sacral hiatus, which forms an equilateral triangle with both posterior superior iliac spines, superior to the coccyx. Ultrasound was not used in any case. Correct positioning of needle in sacral canal was judged by the feel of popping through sacrococcygeal ligament and the ability to advance needle into sacral canal. Incorrect positioning of the needle is determined by aspiration of blood or cerebral spinal fluid (CSF). The ease of injection of saline without subcutaneous swelling would help exclude superficial placement of needle. 1.8 mL of 2% lignocaine with 1/80,000 adrenaline was injected prior to administering the full dose of 20 mL 0.5% ropivacaine to exclude inadvertent intravenous injection. Single shot caudal technique was done using B Braun Sterican 21G 1.5" hypodermic needle. Clinical success of caudal block was assessed by patient reported numbness of sacral and lumbar dermatomes as well as lack of urinary catheter discomfort. As patient is still under general anaesthesia during administration of caudal block, clinical success of block could only be retrospectively assessed in the recovery room after patient awakens.

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