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**Case Series**

# Analgesic combination for robot assisted laparoscopic radical prostatectomy; transversus abdominis plane block and rectus sheath block: Where and how?

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## ABSTRACT

One of the common arguments for advantages of minimally invasive surgery is reduced postoperative pain and faster recovery. Faster recovery is expected with less postoperative pain in robotic surgeries. Robot-assisted radical prostatectomy causes considerable discomfort, mainly during the first postoperative day. The discomfort originates from abdominal pain, bladder spasm and transurethral catheter irritation. We would like to share our experience on use of bilateral subcostal mid axillar TAP block and rectus sheath block for postoperative analgesia in five male patients who underwent robot assisted radical prostatectomy surgery. General anesthesia was performed with 2mg/kg propofol, 1 µg/kg fentanyl, 0.6 mg/kg rocuronium. Anesthesia was maintained by remifentanil infusion and 1 MAC desflurane. After the surgery, TAP block and rectus sheath block performed in supine position. Blocks were done under ultrasound guidance. After the block, patients were extubated. At the end of the surgery patients were administered 1g paracetamol and tramadol 50 mg intravenous. Patients had intravenous tramadol PCA (only bolus dose 10 mg). Rescue analgesia was planned as tramadol 50 mg boluses if VAS scores were above 4 in recovery unit. Neither patient required rescue analgesia nor PCA bolus doses in recovery unit. All patients were satisfied with the analgesia quality. TAP block and rectus sheet block is a very effective combination in robotic prostate surgeries. Perhaps the most important thing is the selection of the most effective analgesic method that contributes to the rapid recovery of the patient.

**Keywords:** Regional anesthesia, Fascial plane blocks, Robot assisted surgery, Prostatectomy

## INTRODUCTION

Radical prostatectomy (RP) represents one of the most frequently used treatment options in localized prostate cancer (PCa), usually performed as either open retropubic RP (ORP) or robot-assisted RP (RARP).[1] One of the common arguments for advantages of minimally invasive surgery is reduced postoperative pain and faster recovery. Faster recovery is expected with less postoperative pain in robotic surgeries. Analgesic methods used in minimally invasive surgeries should be effective and allow early mobilization.

Robot-assisted radical prostatectomy causes considerable discomfort, mainly during the first postoperative day.[2] The discomfort originates from abdominal pain, bladder spasm and transurethral catheter irritation. Thoracic epidural analgesia (TEA) provides excellent analgesia in abdominal surgery. In recent years, the hypotension effect of TEA, especially in minimally invasive surgeries, overshadows its contribution to rapid recovery. Facial plane blocks appear to be more advantageous in this respect.[3] Since Rafi's 2001 description, transversus abdominis plane (TAP) blocks have become one of the most commonly performed truncal blocks. They can be

used to provide postoperative analgesia for open and laparoscopic abdominal surgery.[4] Most approaches for TAP block only provide somatic (i.e., abdominal wall) and not visceral analgesia. Unlike postoperative pain after open surgery, which is mostly of somatic origin, postoperative pain after laparoscopic surgery consists of both somatic and visceral elements.[5]

Current study share the experience on use of bilateral subcostal mid axillar TAP block and rectus sheath block for postoperative analgesia in five male patients who underwent robot assisted radical prostatectomy surgery.

## CASE SERIES

Written informed consent to publish the case was obtained from all patients. Following premedication with midazolam 2 mg intravenous preoperatively, patients were taken to the operating room. Subsequently, general anesthesia was performed with 2 mg/kg propofol, 1 µg/kg fentanyl, 0.6 mg/kg rocuronium. Anaesthesia was maintained by remifentanil infusion and 1 MAC desflurane. After the surgery, TAP block and rectus sheath block performed in supine position. Blocks were done under ultrasound guidance (GE, LOGIQ P9 R3, Seongnam-si, Republic of Korea) with large bandwidth, multi-frequency linear probe (4-12 MHz) and a 22 G, 50 mm, insulated facet type needle (Braun Sonoplex, Melsungen, Germany). TAP block for each side 20 ml of 0.25% bupivacaine between internal oblique and transversus abdominis muscle (Figure1) and rectus sheet block for each side 10 ml of 0.25% bupivacaine was injected under the rectus abdominis muscle (Figure2).

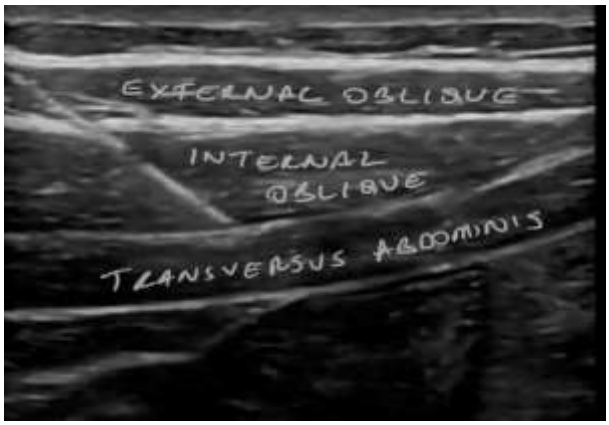


**Figure 1: Ultrasound guided transversus abdominis plane block.**

Local anaesthetic distribution was clearly seen in fascial planes directions. After the block, patients were extubated. At the end of the surgery patients were administered 1 g paracetamol and tramadol 50 mg intravenous. Patients had intravenous tramadol PCA (only bolus dose 10 mg). During the postoperative ward follow-up, as part of multimodal analgesia algorithm, all patients received paracetamol 1 g every 8 hours and dextroketoprofen 50 mg intravenous bid. Rescue analgesia was planned as tramadol 50 mg boluses if VAS scores were above 4 in recovery unit. Neither patient required rescue analgesia nor PCA bolus doses in recovery unit. All patients were satisfied with the analgesia quality. Two patients received two bolus doses of tramadol for 48 hours. Three patients did not need a bolus dose for 48 hours. All cases resulted in nearly opioid-free anaesthesia. None of the patients complained of pain due to bladder catheter for 48 hours postoperatively.

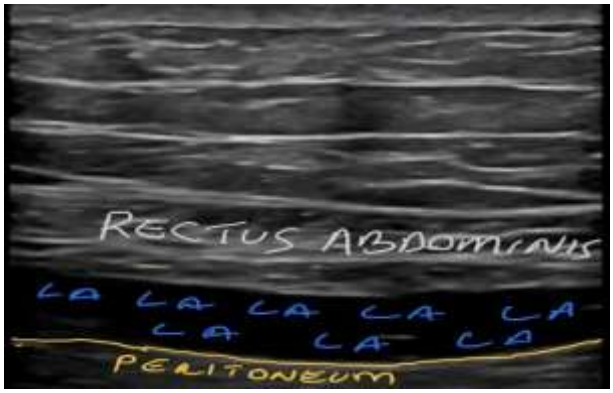


**Figure 2: Ultrasound guided rectus sheath block and local anaesthetics distribution.**

## DISCUSSION

Principal findings of current study were that the TAP block and rectus sheath block combination may afford superior analgesia and patient perception of outcome in terms of early postoperative recovery.

In particular, the patients needed very little opioids and showed no postoperative opioid side effects. Patient satisfaction was very high caused by early mobilization.

Ultrasound-guided TAP blocks are performed in various locations and the expected pattern of analgesia varies greatly depending on the approach. For upper abdominal surgeries, the subcostal approach is most recommended as this may provide analgesia for the T6-T9 anterior cutaneous nerves. For lower abdominal surgeries, the lateral or posterior approaches are both appropriate. Immediately after exiting from their respective intervertebral foramina, spinal nerves divide into anterior and posterior rami. In turn, the anterior ramus gives off two main branches: the anterior and lateral cutaneous nerves. The anterior cutaneous branch (from the T6–T11 segments) gives rise to intercostal nerves, which supply the skin and muscles of the anterior abdominal wall. The T6-T8 intercostal nerves initially travel between the innermost and internal intercostal muscles before entering the transverses abdominis plane compartment at the level of the costal margin. In the transversus abdominis plane compartment, intercostal nerves display extensive interconnections and anastomosis to form the upper

(cephalad) portion of the transversus abdominis plane plexus. The T9-T11 intercostal and T12 subcostal nerves penetrate the transversus abdominis plane compartment posterior to the midaxillary line.[4,6]

There are several approaches to transversus abdominis block (subcostal, lateral and posterior approach). Studies have shown that the subcostal approach is more effective.[7] According to our clinical experience; we think that the subcostal approach (not oblique and on the anterior mid-axillary line) is much more effective. We also recommend the rectus sheath block combination in abdominal surgeries. In our clinic, we use the combination of TAP block and rectus sheath block in robotic and laparoscopic abdominal surgeries.

Chiancone et al showed that bilateral tap block very effective in robotic prostatectomy operations.[8] Elkassabany et al conducted a prospective, randomized double-blinded study evaluating the effects of ultrasound guided TAP block (20 ml of 0.5% bupivacaine) vs. placebo on pain control within 24 h after open retropubic robotic prostatectomy.[9] They showed that the TAP block group had lower pain scores and required less opioid administration in the immediate time after the surgery. Cacciamani et al results of a double-blinded randomized control trial in which they randomized 100 patients into two groups.[10] Fifty-seven patients received TAP blocks and local wound anaesthetic, while 43 patients received local wound anaesthetic only. They found that the group of patients that received TAP blocks had decreased numeric rating scale pain scores within 12 hours post-operatively and their mean pain scores were lower as well. Dal Moro et al a prospective, randomized trial in which 50 patients received TAP blocks and 50 did not.[11] All of the involved patients received scheduled paracetamol three times a day post-operatively. The TAP group required less rescue doses of tramadol within the first 24 hours when compared to the non-TAP group. Our case series also showed that the combination of TAP block and rectus sheath block provides very effective analgesia in minimally invasive surgeries. This combination may also be very important in terms of early recovery in robotic prostate operations. Tap block has many different approaches as described in the literature. We think that the sub-costal transverse approach is the most effective approach.

## CONCLUSION

Bilateral TAP block subcostal midaxillary approach and rectus sheath block is a very effective regional anaesthesia technique for abdominal surgery that deserves larger studies. Facial plane blocks will become increasingly common in minimally invasive surgeries such as robotic surgery and will probably become the gold standard methods in the future. TAP block and rectus sheet block is a very effective combination in robotic prostate surgeries. Perhaps the most important thing is the selection of the most effective analgesic method that contributes to the rapid recovery of the patient. We think that minimally invasive regional anesthesia methods will take an important place in minimally invasive surgeries in the future.

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