

## ORIGINAL ARTICLE

# Ultrasound guided rectus sheath block in management of pain in laparoscopic tubal ligation

Vibhuti A. Shah<sup>1</sup>, Manan Bajaj<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Anesthesia, AMC MET Medical College, Sheth L.G. General Hospital, Ahmedabad, Gujarat (India)

<sup>2</sup>Resident, Department of Anesthesia, SMT. NHL Municipal Medical College, Ahmedabad, Gujarat (India)

**Correspondence:** Vibhuti A. Shah, Associate Professor, Department of Anesthesia, AMC MET Medical College, Sheth L.G. General Hospital, NR Rambaug Fire Station, Opp. Vyayam Vidhyalay, Maninagar, Ahmedabad, Gujarat-380008 (India); E-mail: vibhutishah18@gmail.com

## ABSTRACT

**Background & objectives:** Laparoscopic tubal ligation (LTL) is a day care surgery and requires a small supraumbilical incision for the umbilical port. Pain after LTL is more than diagnostic laparoscopy. We aimed to examine the efficacy and benefits of a preemptive ultrasound guided single injection rectus sheath block (RSB) in providing improved early on postoperative pain scores in comparison to general anesthesia alone.

**Methodology:** Sixty patients underwent elective LTL, were randomly allocated by a computer generated list into two groups: the ultrasound guided rectus sheath block group - the Group R, received a bilateral RSB using 20 ml of 0.25% bupivacaine on either side after initiation of anesthesia and earlier than the surgical incision; and general anesthesia group - the Group G, received general anesthesia alone. Intravenous tramadol was also given and its time was recorded. Pain was measured by verbal analogue score (VAS). Sedation score (from 0 awake to 5 unarousable) was used to record sedation level. Any adverse events were recorded. Statistical Analysis was done with the help of SPSS software version 15. Mann-Whitney U-test, t-test, Pearson  $\chi^2$  test and Fisher's exact test was used for analysis of different variables. Statistical significance was set at 5%.

**Results:** The rectus sheath block with bupivacaine compared with control group reduced verbal analogue scores. Tramadol requirements in the first 12 postoperative hours were also lower. The frequency of nausea and sedation was reduced in the Group R. There were no complications accredited to the rectus sheath block.

**Conclusion:** Ultrasound guided rectus sheath block, as a part of multimodal analgesic regimen, provides superior analgesia up to 12 postoperative hours after voluntary laparoscopic tubal ligation.

**Key words:** Analgesia; Bupivacaine; Laparoscopy; Tubal ligation; Pain; Rectus sheath block; Ultrasound

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## INTRODUCTION

A tubal ligation is an everlasting technique of birth control. Laparoscopy makes it achievable to observe and perform the surgery during small incisions in the abdomen.<sup>1</sup> Laparoscopic tubal ligation (LTL), a day care surgery requires a small supraumbilical incision for the umbilical port. Pain after LTL is

more than diagnostic laparoscopic.<sup>2</sup> The largest component of abdominal pain is the incisional pain which is usually mild to moderate in intensity and maximum postoperatively. Incisional site contributes for up to 70% of pain after laparoscopic surgeries, many studies have been conducted to deal with incisional site pain.

**Table 1: Postoperative tramadol requirement (mean  $\pm$  SD)**

	Group R	Group G	P value
Request for first analgesia (h)	9.75 $\pm$ 2.82	2.82 $\pm$ 0.688	0.001
Total tramadol consumption (mg)	13.33 $\pm$ 34.57	168.33 $\pm$ 63.63	< 0.001

**Table 2: Postoperative visual analogue pain score (VPAS). Data presented as median (interquartile range)**

Time	Group R	Group G	P-value
2 hours	0(0-0)	7(6-7)	< 0.001
4 hours	0(0-0.25)	6(6-7)	< 0.001
6 hours	0(0-1)	6(5-6)	< 0.001
12 hours	1(1-1)	5(4-5)	< 0.001

The rectus sheath block (RSB) was reported primary in 1899 by Schleich and was initially utilized to get relaxation of abdominal wall muscles through laparotomy before the adjunct of neuromuscular block.<sup>3-6</sup> This method aimed to block the terminal branches of the intercostal nerves that are situated in the gap linking the rectus abdominis muscle and its posterior rectus sheath resulting in anesthesia of the midline. Ultrasound (U/S) guidance permits for a better success rate in administering local anesthetic in the accurate plane and reducing the complications. U/S guidance compared to relying on 'pops', makes this block more efficient and lessens the risk for inadvertent peritoneal and vascular punctures. Our study examined the efficacy of a preemptive ultrasound guided bilateral rectus sheath block for postoperative pain in comparison to general anesthesia alone.

## METHODOLOGY

The study was designed as prospective, randomized, controlled study comprising 60 ASA I/II adult female patients undergoing voluntary LTL from March 2014 to July 2014. Ethical approval of study was taken from hospital authorities and ethical committee of the college and written informed consent was taken from all the participants. Patients were blinded to the treatment group as was the anesthesiologist involved in postoperative data collection. Allergy to local anesthetics, skin conditions precluding the block, or pre-operative chronic dependence on opioid medication were excluded from the study.

The primary outcome measured in this study was time to first request analgesic and 12 h tramadol consumption. Secondary outcomes were visual analogue pain scores and side effects.

**Statistical analysis:** Sample size was estimated

based on mean 12 h tramadol requirement. From the previous studies; we see that mean difference in tramadol requirement in 2 groups was  $3.5 \pm 3.5$ . Sample size of current study came out to be 22 per group with 90% power and confidence interval was set at 95 %. For probable drop outs, it was determined to comprise 30 patients per group.

Statistical Analysis was done with the help of SPSS software version 15. Mann-Whitney U-test, t-test, Pearson  $\chi^2$  test and Fisher's exact test was used for analysis of different variables. Statistical significance was set at 5%.

## RESULTS

Sixty patients undergoing laparoscopic tubal ligation were enrolled in the study. Thirty patients received rectus sheath block and thirty did not. All patients completed the study. The groups were similar in age and BMI. The block significantly reduced the incidence of sedation. The incidence of nausea was higher in Group R in comparison to Group G. The comparison of mean time to request by the patients for first analgesia and total postoperative tramadol requirement in two groups is given in Table 1.

Comparative postoperative visual analogue pain scores (VPAS) with and without RSB are shown in Table 2.

## DISCUSSION

LTL is one of the most commonly performed laparoscopic surgeries. Pain after LTL is mostly incisional pain, where the umbilical port is inserted. Peripheral use of local anesthetics includes various routes of administration such as intraperitoneal instillation and port site infiltration. Although in many of these studies a significant reduction in postoperative pain score after intraperitoneal

rectus sheath block for tubal ligation surgery

instillation of local anesthetics has been reported, others have reported no benefit. Majority of the studies were in favor of local anesthetics,<sup>7</sup> mainly during early postoperative period, that they decrease the total opioid consumption during the postoperative period. However, they have not been found to be effective during late postoperative period and they cannot be used as a single agent for pain management after laparoscopic cholecystectomy.

Mixed results were found regarding the application of TAP blocks in laparoscopic transversus abdominis plane (TAP) block. Recently Kasem et al.<sup>8</sup> concluded that U/S guided RSB is an effective analgesic technique with morphine-sparing effect after single incision laparoscopic cholecystectomy. However, to the best of our knowledge, U/S guided RSB has not been evaluated in LTL surgery. Our study demonstrates that the U/S guided RSB

reduced the overall tramadol requirements in the first 12 post-operative hours. Postoperative VAPS at rest were reduced after RSB at all time points assessed (Table 1).

## CONCLUSION

U/S guided RSB is an effective analgesic technique, with opioid-sparing effect and less nausea and sedation during the postoperative period after LTL surgery.

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2. Department of Obstetrics and Gynecology, Sheth LG General Hospital, Ahmedabad (India)

**Authors' contribution:**

VS: Study design, Manuscript drafting, Concept of the study  
MB: Data collection, Statistical analysis, Manuscript drafting

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