

Comparing the Analgesic Efficacy of Ultrasound Guided Transversus Abdominis Plane Block Versus Local Wound Infiltration in Open Inguinal Hernia Surgeries using 0.25% Bupivacaine

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Abstract: *Post operative pain remains to be the most common challenge after any surgery. Pain management is now one of the most important components of ERAS. Patients undergoing lower abdominal surgeries like hernia repair although do not complain of much pain pre operatively, have considerable amounts of post operative pain. Regional/ peripheral blocks are increasingly gaining popularity due to their ease of administration and minimal side effects. Local wound infiltration although easy to administer has a limited period of pain relief and does not provide an adequate plane of analgesia. The newer technique of administering a TAP block is using ultrasound (USG) guidance provides better localization and deposition of local anaesthetic agent along with better anatomical vision improving accuracy rates. We conducted our study on 30 male patients between the age 20-60 years of age belonging to ASA class I or II posted for elective open inguinal hernia surgeries to compare the analgesic efficacy of an ultrasound guided transversus abdominis plane block to local wound infiltration for open hernia surgeries*

Keywords: pain, hernia, analgesia, ERAS, transversus abdominis, ultrasound, vas score

1. Introduction

Post operative pain remains to be the most common challenge after any surgery^{1,2}. Various modalities for decreasing post operative pain have been studied like multimodal analgesia which uses a combination of two analgesic drugs to produce a synergistic effect³. The combination of spinal/ epidural anaesthesia using additives like fentanyl and clonidine have shown an increased duration of pain relief, although rigorous monitoring is required to prevent and treat their effects on the haemodynamic parameters of the body (hypotension, bradycardia)

Patients undergoing lower abdominal surgeries like hernia repair although do not complain of much pain pre operatively, have considerable amounts of post operative pain.

Regional/ peripheral blocks are increasingly gaining popularity due to their ease of administration and minimal side effects.⁴ Local wound infiltration although easy to administer has a limited period of pain relief and does not provide an adequate plane of analgesia

The transversus abdominis plane (TAP) block is a peripheral nerve block (PNB) that anaesthetises the nerves supplying the anterior abdominal wall (T6-L1) It was first described in 2001 using the lumbar triangle of Petit as a landmark.⁵ The success rates with these blind techniques however remain unpredictable.

The newer technique of administering a TAP block is using ultrasound (USG) guidance provides better localization and

deposition of local anaesthetic agent along with better anatomical vision improving accuracy rates.⁶

This study shall compare the analgesic efficacy of an ultrasound guided transversus abdominis plane block to local wound infiltration for hernia surgeries.

2. Material and Methods

We conducted our study on 30 male patients between the age 20-60 years of age belonging to ASA class I or II posted for elective open inguinal hernia surgeries at M.G.M Medical College, Kamothe, Navi Mumbai were selected for the study. The study was conducted from September 2019 to November 2019. Patients undergoing laproscopic hernia surgery and those having obstructed/strangulated hernias were excluded from the study. Informed written consent was taken from each patient prior to the surgery.

The study population was randomly divided into 2 groups with 15 patients in each group
Group A: Spinal anesthesia + Local wound infiltration with 10ml of 0.25% Bupivacaine
Group B: Spinal anesthesia + USG guided TAP block with 10ml of 0.25% Bupivacaine

All patients underwent a thorough pre anaesthetic checkup taking into account the patient's chief complaints, general and systemic examination, co-morbidities and allergies. Routine investigations like complete blood count and urine routine were done along with any special investigation as required due to the co morbid condition or age. All the patients were advised to take Tab Pantoprazole 40mg and Tab Alprazolam 0.25mg one night prior to the day of

surgery. On the day of surgery, pre operative vitals were noted after attaching monitors and all patients were given spinal anaesthesia with 3ml of 0.5% bupivacaine (heavy) in the L3-L4 intervertebral space after confirmation of free flow of CSF

Post operatively, the patients received either USG guided TAP block or local wound infiltration with 0.25% bupivacaine

Ultrasound guided TAP block was administered with 10 ml of 0.25% bupivacaine with the patient in supine position and the probe placed transverse to the abdominal wall in between the subcostal margin and iliac crest. A 23 gauge needle was introduced till it reached the plane between the internal oblique and transversus abdominis muscle. Successful block was confirmed on observing the expansion of the transversus abdominis plane on injecting the drug.

Post operative VAS scores were noted at 0,1,2 and 3 hrs. Rescue analgesia was given at a VAS score of 4 or more.

3. Observations and Results

3.1 Demographics

A) Age Distribution

The age distribution amongst both the groups was as follows:

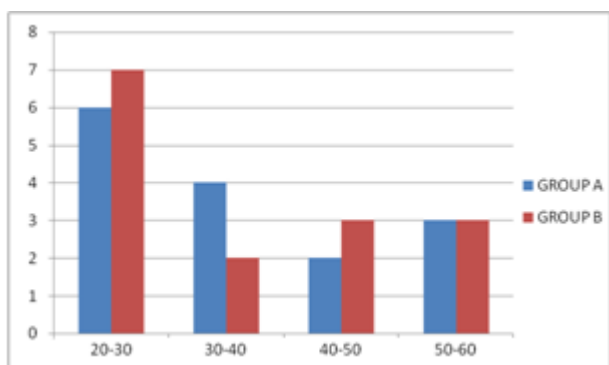


Figure 1: Graph showing age distribution amongst the two groups

B) ASA Grading

The ASA grading amongst the two groups was as follows:

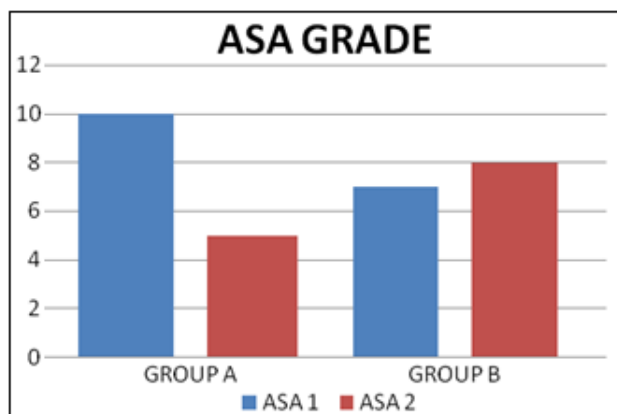


Figure 2: Graph showing ASA grading of patients amongst the two groups

C) Post Operative Vas Scores

Time (Hrs)	Group A		Group B	
	Mean	Std. Deviation	Mean	Std. Deviation
0 HR	2.35	0.72	2.00	0.53
1 HR	2.33	0.72	2.26	0.70
2 HR	3.92	0.70	3.13	0.74
3 HR	4.64	0.73	3.06	0.70

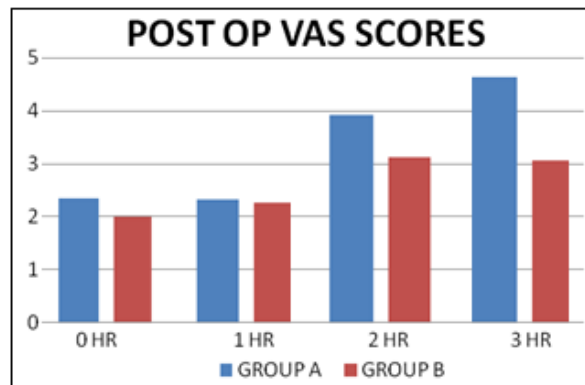


Figure 3: Graph showing the average VAS score distribution amongst both groups post operatively

The Vas scores of Group A were higher compared to the VAS scores in group B, showing that the analgesic efficacy of a USG guided TAP block was much higher than that of local wound infiltration

4. Discussion

Post operative pain management has always been an anaesthetic challenge. Pain management is now one of the most important components of ERAS.⁷

We conducted our study on 30 male patients out of which Group A had 10 patients belonging to the ASA 1 category and 5 patients belonging to the ASA 2 category. Group B had 7 patients belonging to ASA 1 class and 8 patients belonging to the ASA 2 class. The average age of patients in Group A and Group B was 25 and 27 years respectively.

The average VAS score of the patients in Group A at the 3 hrs post operatively, was 4.64 which was much higher compared to the patients in Group B whose average VAS score was 3.06 at the end of 3 hours.

Similar studies comparing the analgesic efficacy of TAP block to local wound infiltration in patients undergoing open hernia repair and concluded that the analgesic effect of TAP block was superior to the efficacy of local wound infiltration.^{8,9,10}

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