

## ROLE OF PORT SITE INFILTRATION OF LONG ACTING LOCAL ANAESTHETIC AGENTS IN POST-OPERATIVE PAIN REDUCTION, EARLY RECOVERY AND OVERALL PATIENT SATISFACTION AFTER LAPAROSCOPIC CHOLECYSTECTOMY

\*Dr. Goel Apoorv, Bansal Roli, Garg Prakhar and Kothari Shyam

Consultant, Department of Surgery St Joseph Hospital, Ghaziabad-201001.

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\*Corresponding Author

Dr. Goel Apoorv

Consultant, Department of  
Surgery St Joseph Hospital,  
Ghaziabad-201001.

### ABSTRACT

**Background:** In today's era of minimally invasive surgery early post-operative pain reduction, early recovery and return to normal activities is also an important aspect. This study has been designed to analyze the effect of a long acting local anaesthetic agent (0.25 % Bupivacaine) infiltration over port sites in cases of laparoscopic cholecystectomy. **Material and Methods:** This is a comparative study carried out at St Joseph Hospital, Ghaziabad from September 2019 to March 2020 on 124 patients who underwent standard four port laparoscopic cholecystectomy. Group I was control group in which no local anaesthesia was offered and Group II received 20ml of 0.25 % Bupivacaine infiltrated over port sites. Various parameters were assessed during intra-operative and post-operative period. Pain was analysed using Visual Analogue Scoring (VAS) for first 24 hours and overall patient satisfaction scoring was done using questionnaire and scorecard. **Results:** Cholelithiasis is a disease of middle aged females. Post-operative pain was significantly reduced in group II receiving port site infiltration with 0.25% Bupivacaine. Early recovery, return to normal activities and overall patient satisfaction was significantly better in group II. **Conclusion:** Port site infiltration with 0.25% Bupivacaine significantly reduces early post-operative pain, enhance early recovery and improves overall patient satisfaction after laparoscopic cholecystectomy.

**KEYWORDS:** Cholelithiasis; Laparoscopic Cholecystectomy; 0.25% Bupivacaine.

### INTRODUCTION

From last three decades minimally invasive surgery has seen many advances. Laparoscopic cholecystectomy is now a gold standard procedure for cholelithiasis and most commonly performed laparoscopic surgery all over world.<sup>[1]</sup> Laparoscopic surgery has provided fast recovery, short hospital stay, early return to work, minimum scar but post-operative pain management is still a concern.<sup>[1,2]</sup>

Pain after laparoscopic cholecystectomy can occur within hours usually over the port sites or at right shoulder or diffuse pain. Thus the pain following laparoscopic cholecystectomy is multifactorial. Pain occurring over port sites is due to somatic component whereas pain over right shoulder or diffuse abdominal pain is because of visceral component caused by stretching due to pneumoperitoneum. On the basis of this theory various techniques have been described to reduce this pain.<sup>[2-4]</sup> The pain can be mild to severe and even require injectable analgesics such as Diclofenac Sodium or opioids. This pain can delay recovery and lengthen hospitalisation. Opioids and Diclofenac has its own

adverse effects.<sup>[4]</sup>

There are numerous studies on reduction of early post-operative pain following laparoscopic cholecystectomy including port site infiltration of local anaesthetics, laparoscopy guided Transverse Abdominus block, intraperitoneal instillation of local anaesthetics and other methods out of which port site infiltration has shown good results.<sup>[2-7]</sup>

Bupivacaine is long acting local anaesthetic with half-life of 2.5 to 3 hours and effect is noticed even for 6 hours. The safety margin of Bupivacaine is good and the method of port site infiltration is cost effective and associated with minimal adverse effects.<sup>[8-10]</sup>

Our study aims to analyse the effect of local infiltration of 0.25% Bupivacaine over port sites for reduction of early post-operative pain, early recovery and overall patient satisfaction in cases of laparoscopic cholecystectomy.

## MATERIAL AND METHODS

This is a comparative study conducted at St Joseph Hospital, Ghaziabad from September 2019 to March 2020. All cases aged between 18 years to 65 years and ASA class I and II were included in the study and underwent elective laparoscopic cholecystectomy. Patients with Choledocholithiasis, intraoperative drain placement, Post ERCP, surgery duration more than two hours, previous upper abdominal surgeries, conversion to open cholecystectomy and difficult extraction of gall bladder were excluded from the study. Total 124 patients participated in the study and were randomised into two groups of 62 patients each using a sealed envelope method. Informed consent was obtained from the patients. All patients underwent standard four port laparoscopic cholecystectomy performed by a single team of surgeons experienced in laparoscopic surgeries. Pneumoperitoneum was maintained at 12-14mmHg. Gall bladder was delivered through epigastric port in all patients. Group II patients received 20 ml 0.25% Bupivacaine divided into 6ml each for umbilical and epigastric port and 4ml each for right mid-clavicular line and anterior axillary line port respectively and infiltrated in the sub-cutaneous plane before closure. Group I acted as control group and received no infiltration. All patients in both groups received 50 mg Tramadol Injection in immediate post-op period as standard protocol.

Pain intensity was recorded by the same team using a Visual Analogue Scoring (VAS) system at interval of 6, 12, 24 and 48 hours respectively. Intramuscular

Diclofenac Sodium 75mg was used as rescue analgesia for patients with VAS score > 6.

Overall patient satisfaction scoring was done by same team on 10<sup>th</sup> post-operative day by using a questionnaire and scorecard [Table 3] based on patient's experience regarding post-operative pain, time taken for return to routine activities and recovery.

Data analysis was performed using the Statistical Package for Social Sciences version 17.0 software (SPSS Inc.; Chicago, IL, USA). A p-value <0.05 was considered statistically significant.

## RESULTS

Total 124 patients underwent laparoscopic cholecystectomy out of which 106 were females. Average age of patients was 38.84±2.67 years. There was no significant difference seen in duration of surgery and post-operative wound infection in both the groups. Mean hospital stay and time taken for return to normal activities was more for group I patients as compared with group II and statistically significant. Overall patient satisfaction was significantly better in group II patients. (Table 1).

Mean VAS score of patients in group II at 6 and 12 hours was significantly low as compared with group I and requirement of rescue analgesia was also significantly less in group II. At 24 and 48 hours there was no significant difference in pain intensity in both the groups. (Table 2)

**Table 1: Patients characteristics and other factors.**

Intra-operative Factors	Control group (Group I) n=62	Bupivacaine Group (Group II) n=62	P Value
Mean Age (years)			
Sex	39.54 ± 3.23	38.48.2 ± 2.55	0.89 (NS)
Male	8(12.91%)	10(16.12%)	0.94(NS)
Female	54 (87.09 %)	52(83.87%)	0.85(NS)
Mean Duration of Surgery (minutes)	60.45 ± 5.6	62.6 ± 4.5	0.78 (NS)
Mean Duration of stay in Hospital (days)	2.35 ± .56	1.2 ± .68	0.022(HS)
Return to routine activities (days)	5.23 ± 1.56	3.55 ± 1.07	0.012(HS)
Post-operative wound infection	2	3	0.88(NS)
Overall Patient Satisfaction Score (1 to 5)	3.45	4.58	0.032(HS)

NS - non-significant; HS – highly significant

**Table 2: Comparative Analysis of post-operative pain using VAS (Visual Analogue Scoring) and requirement of rescue analgesia.**

Time Interval	Control Group (Group I)	Bupivacaine Group (Group II)	P Value
<b>6 hours</b>	4.82 ± 0.54	1.45 ± 0.30	<0.001 (HS)
<b>12 hours</b>	5.01 ± 0.87	2.67 ± 1.20	<0.001 (HS)
<b>24 hours</b>	2.65 ± 1.53	2.14 ± 1.11	0.65 (NS)
<b>48 hours</b>	1.76 ± .56	1.69 ± .79	0.89 (NS)
Requirement of Rescue Analgesia(n)	46	14	0.012(HS)

NS - non-significant; HS – highly significant

**Table 3: Patient Overall Satisfaction Questionnaire and Scorecard.**

Questions	Score (1 to 5) Tick the appropriate answer				
1. How was experience regarding early post-operative pain?	1	2	3	4	5
2. Was your recovery smooth after the surgery?	1	2	3	4	5
3. How was your experience regarding resuming your routine activities?	1	2	3	4	5
4. Do you frequently need to consume analgesics post discharge from hospital?	1	2	3	4	5
5. How will you rate the overall satisfaction post-surgery considering pain, recovery and return to routine work?	1	2	3	4	5

Score (1- Worst, 5 – Most Satisfied)

## DISCUSSION

Laparoscopic cholecystectomy is the gold standard procedure for symptomatic cholelithiasis and most commonly performed laparoscopic procedure worldwide.<sup>[1]</sup> Though pain, discomfort and duration of stay after minimally invasive procedure is less as compared to open technique but early post-operative pain after laparoscopic cholecystectomy is still prevalent and it may increase patient stay and discomfort following surgery.<sup>[1-3]</sup>

There are various factors responsible for the pain after laparoscopic cholecystectomy. It may arise from incision site (somatic pain), from gall bladder bed (visceral pain) or may be due to stretching caused by pneumoperitoneum.<sup>[2-4]</sup>

Many studies and researches had been conducted in last 30 years for the pain management after laparoscopic cholecystectomy. Various methods like infiltration of local anaesthetic at port sites, intraperitoneal instillation at gall bladder bed and TAP (Transverse Abdominus plane) block. Many studies have shown significant reduction in post-operative pain after infiltration at incision sites whereas few studies had shown no statistical difference in pain or duration of stay.<sup>[5,8,9,11,12]</sup>

In our study we have analysed and compared the effect of port site infiltration of 0.25% Bupivacaine in reduction of early post-operative pain, early recovery, return to routine work and overall satisfaction after laparoscopic cholecystectomy. Our results had shown significant reduction in early post-operative pain specifically at 6 and 12 hours and therefore less requirement of rescue analgesia which is consistent with that of studies by El-labban *et al*<sup>[10]</sup> Ali K Nazir *et al*<sup>[11]</sup> and Lepner *et al*<sup>[12]</sup>. The study showed significant improvement in return to routine activities, decrease hospital stay and better overall patient satisfaction in group II.

Port site infiltration of 0.25% Bupivacaine is effective in reduction of early post-operative pain, decrease hospital stay, early recovery and return to routine activities with better overall satisfaction after laparoscopic cholecystectomy.

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Conflict of Interests – None.

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