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Editorial

Mark Skues, Editor-in-Chief

April of this year saw a gathering in Porto, Portugal, of members of the General Assembly and Executive Committee of the IAAS to chew the fat and set objectives for the coming year or so. A lot of the time was spent learning what other countries are doing in their drive to encourage the progression of ambulatory surgery, while a significant period was spent learning about the forthcoming international congress in Oslo, scheduled for May 2024. As before, it promises to be a superb example of the best of day and short stay surgery in the world, so it is with no apology that I advertise the event below with the first of potentially many posters. So, make a date in your diaries and book your study leave soon.

The four papers in this edition provide a sterling example of the breadth of subjects within the sub-speciality. From the beginning of developments in Thailand with their report of ambulatory laparoscopic cholecystectomy, to evaluations of liposomal bupivacaine, a relatively new and long-acting local anaesthetic drug during shoulder surgery from the United States, they encompass all that is developing in various countries around the world.

The first paper, therefore, is a description of the development of laparoscopic cholecystectomy as a daycase in Thailand, presenting data from inpatient cohorts as well as the shorter stay group. Predictably, the author found a reduction in cost without differences in major complications between the two groups.

The second paper is a case report detailing the principles of care for infants undergoing day surgery. It describes the management of a premature infant scheduled for laser treatment of retinal detachment, as well as providing a concise review of potential problems.

A paper from India is a case report of subungual squamous cell carcinoma, a relatively rare diagnosis, that was managed on an ambulatory basis.

Finally, an interesting paper from Pittsburgh where liposomal bupivacaine was injected as an interscalene block for patients undergoing rotator cuff repair. Interestingly, a prolonged duration of action was noted compared with a historical control group. This is in contradistinction to similar papers, and the author believes this may be due to injection in the interfascial envelope around C5 and C6 in the interscalene groove, so it seems that the closer you get, the longer it works!

That's it for this issue; please keep submitting your work for inclusion in future editions.

Dr Mark Skues
Editor-in-Chief

Evaluation of the Clinical Outcomes in Laparoscopic Cholecystectomy as Ambulatory Surgery: Comparative Analysis in Two Periods 2019–2020 and 2021–2022

Chonnikarn Koonnasit

Abstract

Objectives: To compare the results of ambulatory laparoscopic cholecystectomy and traditional laparoscopic cholecystectomy.
Methods: Data were collected patients aged 20-80 years who underwent elective laparoscopic cholecystectomy between January 2019 - December 2022. We divide in 2 group: Group A: 2019-2020, Traditional laparoscopic cholecystectomy and Group B: 2021-2022, Ambulatory laparoscopic cholecystectomy.
Results: Ambulatory laparoscopic cholecystectomy was successful in 96% of patients. The incidence of bile duct injuries was 1% less in group B patients with ambulatory surgery than 3.8% in group A patients with traditional surgery, but there was no statistical difference. Cost of admission of patients in group B: ambulatory laparoscopic cholecystectomy was significantly lower than patients in group A: traditional laparoscopic cholecystectomy 14,742 bath (427 USD) and 21,222 bath (615 USD) respectively (P<0.001).
Conclusion: Ambulatory laparoscopic cholecystectomy can effectively reduce the cost per admission and reduce the length of stay in hospital without any difference in major complication in selective case with experienced surgeons.

Keywords: Laparoscopic cholecystectomy, Ambulatory surgery, One day surgery, Bile duct injury.
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Introduction

Gallstones are common surgical diseases in the North of Thailand. There are found more in women than men. The common age range is from 30 to 50 years old, with many risk factors such as female gender, obesity, high blood lipid levels, thalassemia and over 40 years of age (1).

There are several levels of symptoms of gallbladder stone disease, categorized as asymptomatic gallstones, symptomatic gallstones, acute calculous cholecystitis, chronic calculous cholecystitis and empyema of the gallbladder (2).

In symptomatic gallbladder disease, patients often have symptoms such as chronic intermittent abdominal pain causing many patients to be misdiagnosed as abdominal pain from stomach disease (dyspepsia). In some cases, they may have referred pain to right scapula. As well, symptoms usually occur after eating a high-fat meal. On the physical examination, tenderness was found under the right ribcage. In some cases, if there is acute inflammation, there will be pain at the right upper quadrant called "Murphy's sign" positive.

Diagnosis can be using abdominal ultrasounography, which has high sensitivity and accuracy. We also use liver function test to confirm gallbladder stones and common bile duct stone.

The gold standard in the management of symptomatic cholelithiasis is the surgical removal of the gallbladder, better known as "cholecystectomy". Carl Langenbuch performed the first successful cholecystectomy at the Lazarus hospital in Berlin on July 15, 1882. Before this, surgical therapy for symptomatic gallstones was limited to cholecystostomy.

Erich Mühe performed the first laparoscopic cholecystectomy on September 12, 1985, in Böblingen, Germany4. Day surgery was born in Glasgow thanks to James Nicoll who described 9000 day case procedures in 1909. He was prompted by the limited availability of beds and the need to reduce the rate of in-hospital infections (5). The term day-surgery as a synonym of ambulatory surgery and same-day surgery.

In the present laparoscopic cholecystectomy (LC) is 90% of cholecystectomy and LC is 2nd most common procedure in general surgery (Appendectomy is most common). However the rate complication such as vasculobiliary injury is higher than open cholecystectomy that why surgeon should be aware (6). In 2012 Atsushi Sato et al, evaluated the applicability and safety of ambulatory laparoscopic cholecystectomy and compared day case and overnight stay LC. There was no hospital mortality and no patient was readmitted with serious morbidity after discharge. Day case LC can be performed with a low rate of complications. In overnight stay patients, there are many who could be performed safely as a day case (7).

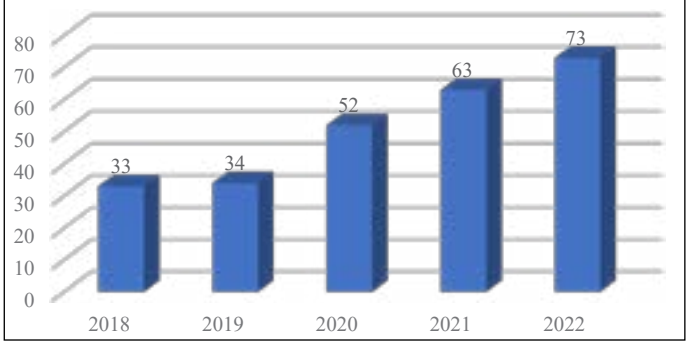
In Spain 2013, Docobo Durántez et al reported patient in group B 82.5% were day cases. Symptoms such as abdominal pain or nausea and/or vomiting were less frequent in group B. Satisfaction rates were high in both groups but higher in the group B (8).

In Italy 2021, Corona et al reported a total of 150 consecutive patients with ascertained cholelithiasis who underwent laparoscopic cholecystectomy. The results of the study suggest that laparoscopic cholecystectomy in day-surgery can be effectively and safely performed, achieving high rates of patient satisfaction, this might have a positive impact on reducing waiting times, patient turnover and health care costs (9).

Pua Crown Prince Hospital (PCPH) located in Nan Province, in the North of Thailand. It is a community hospital size 120 beds. Our hospital is a referral hospital for patients in the of Nan province covering 6 districts nearby the following Chaloem Phrakiat Hospital, Thung Chang Hospital, Chiang Klang Hospital, Bo Kluea Hospital,

Tha Wang Pha Hospital, and Song Kwae Hospital. Statistics show that there have been laparoscopic cholecystectomies performed since 2018-2022 as following 33 cases, 34 cases, 52 cases, 63 cases and 73 cases, respectively, totalling 255 cases (Figure 1).

Figure 1 Number of patients who received laparoscopic cholecystectomy 2018-2022.



Pua Crown Prince Hospital joins the service system for One-Day Surgery (ODS) and Minimally Invasive Surgery(MIS) according to the guidelines of the Department of Medical Services of Thailand in 2020. One-day laparoscopic cholecystectomy starting in 2021.

Therefore, the researcher wanted to study the results of laparoscopic cholecystectomy. In one-day surgery or ambulatory surgery in 2021-2022 compared with traditional laparoscopic cholecystectomy in 2019-2020. In Thailand still has limited research on this subject.

Ambulatory surgery laparoscopic cholecystectomy can be performed in a community hospital. And in line with the development of the health service system, one day surgery (ODS) and minimally invasive surgery (MIS) to be effective, no complications, reduce waiting time, reduce costs and service recipients are satisfied. We have a guideline for Ambulatory surgery laparoscopic cholecystectomy as shown in Figure 2.

Objectives

To compare the results of ambulatory laparoscopic cholecystectomy and traditional laparoscopic cholecystectomy.

Material and Methods

This research is a retrospective cohort study and prospective cohort study historical control

Population: Patients aged 20-80 years with a diagnosis of symptomatic gallstone disease, chronic calculous cholecystitis, and gallbladder polyp who underwent laparoscopic cholecystectomy between January 2019 - December 2022 in department of surgery, Pua Crown Prince Hospital, Nan Province.

We divided the samples into 2 groups according to the period as show in Figure 3.

Group A: 2019-2020, Traditional laparoscopic cholecystectomy

It was a group of patients who had undergone laparoscopic cholecystectomy. That is, come to the hospital at least 1 day before the day of surgery. undergo surgery and go home 1-2 days after surgery if there are no complications.

Group B: 2021-2022, Ambulatory laparoscopic cholecystectomy

It is a group of patients who have undergone laparoscopic cholecystectomy as a one-day surgery or ambulatory surgery, that is, they come to the hospital in the morning. Same day as the day of surgery and go home no later than 24 hours after surgery.

Two-week and three-month follow-up of patients in both groups and data were collected if there was a repeat hospitalization during the first two weeks.

The criteria for selecting research participants consisted of:

Inclusion Criteria

1) Patients aged 20-80 years.
2) Diagnosis of symptomatic gallstones, chronic calculous cholecystitis, and gallbladder polyps.
3) Undergoing laparoscopic cholecystectomy during January 2019 - December 2022.

Exclusion Criteria

1. Patients with inflammation from bile duct stones(Cholangitis) and endoscopic retrograde cholangiopancreatography(ERCP) was performed.
2. Patients with acute cholecystitis who received transcutaneous bile duct insertion (Percutaneous Cholecystostomy).
3. American Society of Anesthesiologists Classification (ASA) score class ≥ 3.
4. Body mass index (BMI) > 35.
5. Patients who underwent open cholecystectomy from the beginning.
6. Laparoscopic cholecystectomy in combination with surgery for other diseases.
7. Unable to participate in ambulatory surgery (2021-2022).

Statistical Analysis

1. Demographic, clinical data and laboratory results will express in percentage, mean and standard deviation, median, frequency and range.
2. The comparison of qualitative data between groups use Chi-square test or

Figure 2 Ambulatory surgery laparoscopic cholecystectomy guideline.

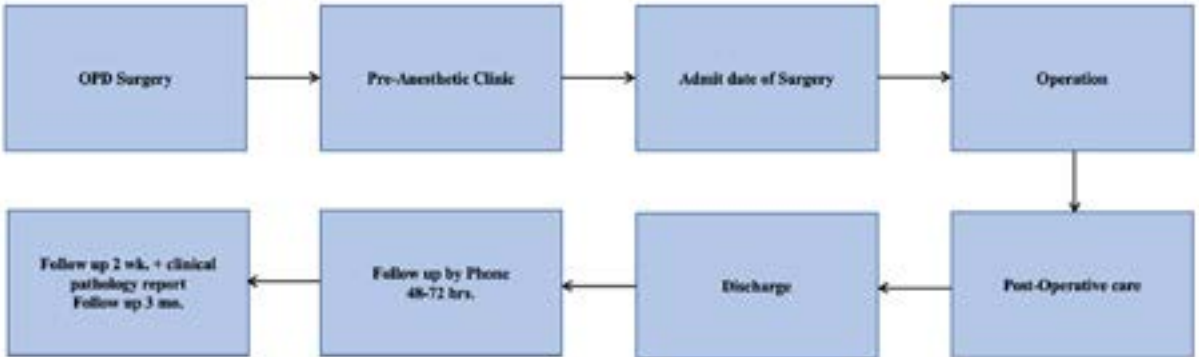
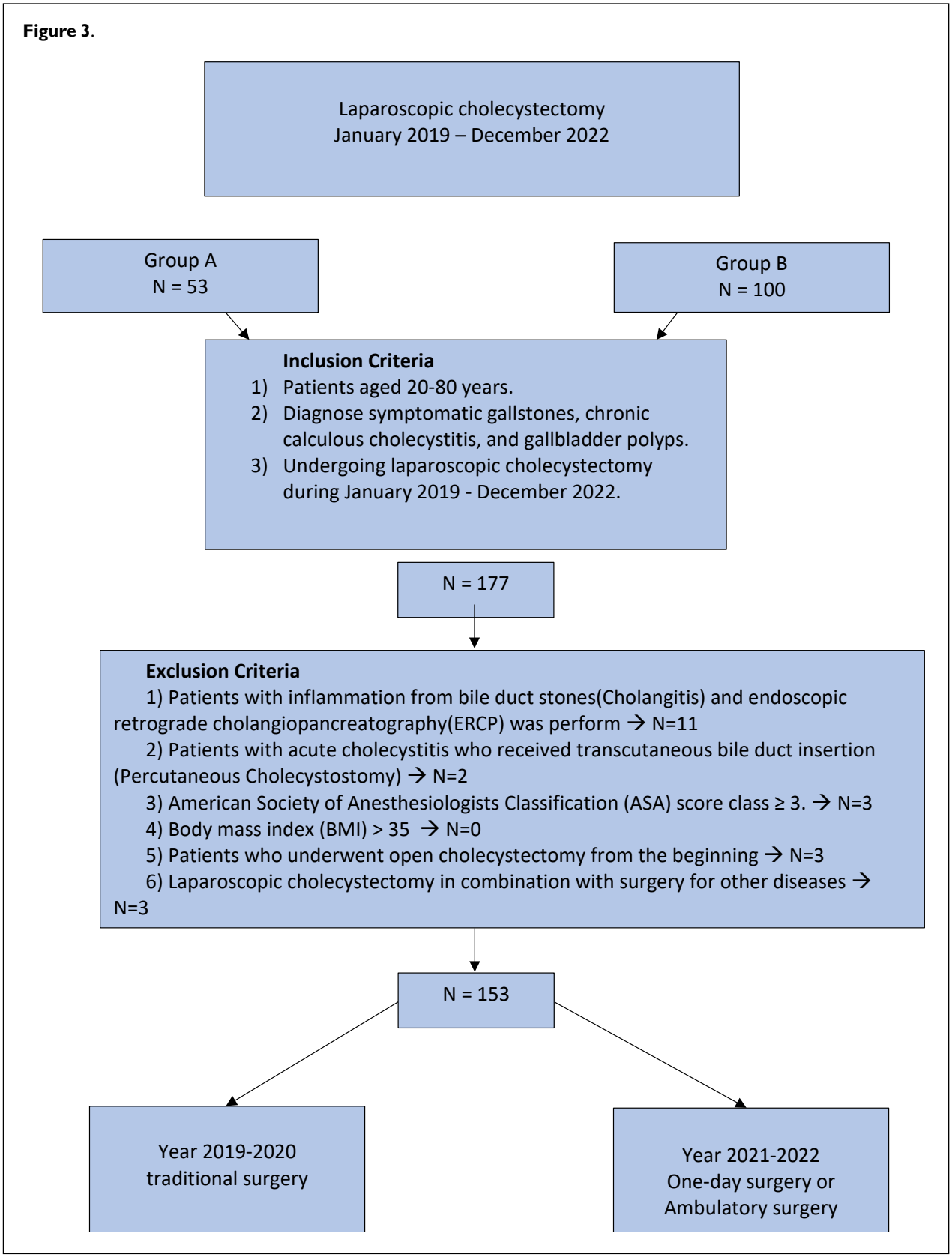


Figure 3.


Laparoscopic cholecystectomy
January 2019 – December 2022
Group A
N = 53
Group B
N = 100
Inclusion Criteria
1) Patients aged 20-80 years.
2) Diagnose symptomatic gallstones, chronic calculous cholecystitis, and gallbladder polyps.
3) Undergoing laparoscopic cholecystectomy during January 2019 - December 2022.
N = 177
Exclusion Criteria
1) Patients with inflammation from bile duct stones(Cholangitis) and endoscopic retrograde cholangiopancreatography(ERCP) was perform → N=11
2) Patients with acute cholecystitis who received transcutaneous bile duct insertion (Percutaneous Cholecystostomy) → N=2
3) American Society of Anesthesiologists Classification (ASA) score class ≥ 3. → N=3
4) Body mass index (BMI) > 35 → N=0
5) Patients who underwent open cholecystectomy from the beginning → N=3
6) Laparoscopic cholecystectomy in combination with surgery for other diseases → N=3
N = 153
Year 2019-2020
traditional surgery
Year 2021-2022
One-day surgery or
Ambulatory surgery

3. Fisher's exact test.
4. The comparisons of quantitative data between 2 groups use Student's T-test or Wilcoxon rank sum test (Mann-Whitney's U test)
5. The comparisons of quantitative data between groups use ANOVA or Kruskal-Wallis tests.
6. Using the statistical significance at $p \leq 0.05$.
7. Propensity score matching
8. Data analysis using Stata program

Sample size

A method for calculating the sample size of this research using the reference formula. According to the research of Docobo Durántez (8),Day surgery laparoscopic cholecystectomy: comparative analysis in two consecutive periods in a cohort of 1132 patients, 2013. Sample size by calculate is 10,056 patients.

Primary outcome: Major complication

Secondary outcome: Cost of admission, ODS success rate in group B

Results

Patients and clinical characteristic

A total of 153 subjects were included in the study, 53 were group A, 100 were group B, 54 males and 99 females. The mean age in group A patients was 54 years and the mean age in patients Group B was 57 years. Group A included 30 and 23 patients with ASA class I and II, respectively and group B included 40 and 60 patients with ASA class I and II, respectively. There was no significant difference in comorbidities between the two groups. Mean total bilirubin in group A was 0.6 mg/dl and 0.5 mg/dl in group B. There was no statistical difference between the two groups including previous ERCP (Table 1).

Operative outcome

Symptomatic Gallstone was the most common in 47 (88.7%) and 71 (71%) patients in Groups A and B, respectively, and secondly, chronic calculous cholecystitis was found in 4 (7.5%) patients in Groups A and 28 (28%) were group B, respectively, and the third was Gallbladder polyp (Table 2).

Post operative diagnosis chronic calculous cholecystitis most common in group B patients and we found symptomatic gallstone and chronic calculous cholecystitis in the same ratio in group A. The two groups of patients were not statistically different. Estimate blood loss in both groups of patients was 10, there was no statistical difference, including drain placement.

Table 1 Baseline Characteristic.

	Group A N=53	Group B N=100	P-value
Sex, n (%)			
Male	12 (22.6%)	42 (42%)	0.017*
Female	41 (77.4%)	58 (58%)	0.017*
Age (yrs.), Mean ± SD	54.77 ± 14.76	57.19 ± 12.14	0.279
20-40	9 (17%)	11 (11%)	0.296
40-60	26 (49.1%)	45 (45%)	0.632
60-80	18 (34%)	44 (44%)	0.229
BMI (kg/m^2), Mean ± SD	23.41 ± 5.09	23.3 ± 3.59	0.878
ASA, n (%)			
I	30 (56.6%)	40 (40%)	0.050
II	23 (43.4%)	60 (60%)	0.050
Underlining disease, n (%)			
None	30 (56.6%)	40 (40%)	0.050
HT	13 (24.5%)	39 (39%)	0.072
DM	6 (11.3%)	12 (12%)	0.901
DLP	5 (9.4%)	22 (22%)	0.052
COPD	2 (3.8%)	0 (0%)	0.051
Thalassemia others	2 (3.8%)	3 (3%)	0.798
Heart disease (AF, IHD)	1 (1.9%)	2 (2%)	0.962
Mean Total bilirubin(mg/dl), median (IQR)	0.6 (0.5, 0.71)	0.5 (0.4, 0.7)	0.132
Mean Direct bilirubin(mg/dl), median (IQR)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.270
Previous ERCP, n (%)	2 (3.8%)	10 (10%)	0.173

Independent t test and Mann-Whitney U or Chi-square test.

Table 2 Operative information.

	Group A n=53	*Group B n=100*	*P-value*
Pre-operative diagnosis, n (%)			
Symptomatic Gallstone	47 (88.7%)	71 (71%)	0.013*
Chronic calculous cholecystitis	4 (7.5%)	28 (28%)	0.003*
Gallbladder polyp	2 (3.8%)	1 (1%)	0.239
Post operative diagnosis, n (%)			
Symptomatic Gallstone	25 (47.2%)	34 (34%)	0.111
Acute op top Chronic cholecystitis	0 (0%)	1 (1%)	0.465
Subacute calculous cholecystitis	0 (0%)	2 (2%)	0.300
Chronic calculous cholecystitis	25 (47.2%)	61 (61%)	0.101
Gallbladder polyp	2 (3.8%)	2 (2%)	0.513
Empyema gallbladder	1 (1.9%)	0 (0%)	0.168
Estimate blood loss (ml)			
Median (IQR)	10 (5, 20)	10 (5, 20)	0.335
Drain placement, n (%)	6 (11.3%)	8 (8%)	0.498
Number of port, n (%)			
3 port	51 (96.2%)	94 (94%)	0.556
4 port	2 (3.8%)	6 (6%)	0.556
Average Operative time (min), median (IQR)	60 (50, 80)	55 (43, 88)	0.234

Mann-Whitney U or Chi-square test.

In a laparoscopic cholecystectomy, a three-port operation is generally used in our center. If there is severe adhesion around the gallbladder or very swollen cholecystitis, difficult to grasp and resulting in difficult surgery, a fourth port may be added under the ribcage to help pull out the gallbladder better. In both groups, 96.2% and 94% of three-port laparoscopic cholecystectomy were performed. There was no statistical difference between the two groups.

Operative time in group B was shorter, 55 minutes and 60 minutes in group A, depending on the surgical experience of each surgeon, but there was no statistical difference.

Post operative and follow up outcomes

In group B patients, the length of hospital stay that did not exceed 24 hours was as high as 96%, with statistical significance. and length of hospital stay >24-48 hours and >48 hours in group A were 58.5% and 41.5%, respectively, with statistical significance (Table 3).

Table 3 Post Operative information.

	Group A n=53	**Group B n=100**	**P-value**
Discharge time (hours), n (%)			
< 24	0 (0%)	96 (96%)	<0.001*
>24-48	31 (58.5%)	2 (2%)	<0.001*
>48	22 (41.5%)	2 (2%)	<0.001*
Success rate of one day surgery, n (%)	-	96 (96%)	N/A
Cause of drop out one day surgery, n (%)			
Abdominal pain / Discomfort	-	1 (1%)	N/A
Hemoperitoneum	-	1 (1%)	N/A
Open conversion	2 (3.8%)	2 (2%)	0.513
Major complication, n (%)			
Bile duct injury	2 (3.8%)	1(1%)	0.239
Vascular injury	0 (0%)	0 (0%)	N/A
Mortality rate, n%	0 (0%)	0 (0%)	N/A
Cost of admission(bath), median (IQR)	21,222 (17,312 - 25,860)	14,742 (13,730 - 16,385.5)	<0.001*

Mann-Whitney U or Chi-square test.

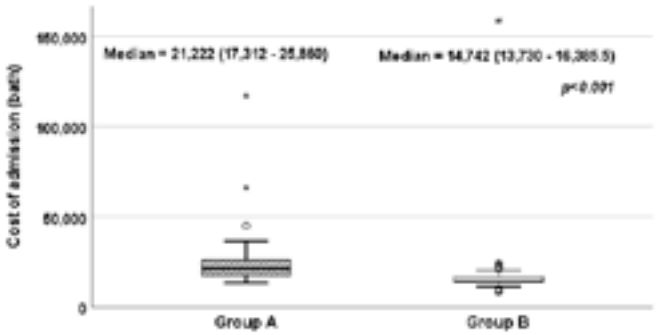
Ambulatory laparoscopic cholecystectomy was successful in 96% of patients in group B. There was 1 patient with abdominal discomfort and 1 Hemoperitoneum (due to the patient not being able to remove the drain), thus ambulatory surgery was unsuccessful.

The open conversion rate was 3.8% and 2% in group A and B patients, respectively, both groups were not statistically significant.

The incidence of major complication, Bile duct injury, was 3.8% and 1% in group A and B, respectively, with no statistical difference between the two groups. In patients with bile duct injury, endoscopic retrograde cholangiopancreatography was performed including Roux-en-y Hepaticojejunostomy to resolve complications that occur without finding the mortality rate at all.

Cost per hospital stay is the resource that the hospital must waste to treat each patient It was found that group B had a lower average cost per hospital stay of 14,742 baht (427 USD) with statistical significance (P-value < 0.001*). Group A had an average higher cost per hospital stay, which was 21,222 baht (615 USD) as show in Figure 4.

Figure 4 Boxplot of Cost of admission (bath) by group..



Pathological information and Surveillance outcomes

For pathological reports, chronic cholecystitis was the most common, 83% in group A and 86% in group B, respectively, and malignant of gallbladder was 1.9% in group A and 1.% in group B. Both patients were referred. Go to a hospital with potential for treatment along with the next chemotherapy (Table 4).

At the 2-week follow-up, most of the patients were asymptomatic. Abdominal discomfort was 2% in group B and 3.8% in group A, respectively, which was not statistically significant. At the 3-month follow-up, most patients were asymptomatic too. For symptomatic patients receive symptomatic treatment in conjunction with dietary recommendations. From the data collection, there was no recurrence of hospitalization during the first 2 weeks of surgery in both groups. considered a satisfactory result.

Discussion

Pua Crown Prince hospital is a 120-bed community hospital in Nan province, in the north of Thailand. We have started laparoscopic cholecystectomy since 2018. Statistics show that laparoscopic cholecystectomy increasing every year (Figure 1).

In the past our hospital perform laparoscopic cholecystectomy was a traditional surgery, resulting in a long hospital stay. Including the Covid-19 disease situation that has become more severe. This gave rise to the idea of performing ambulatory laparoscopic cholecystectomy in our hospital in 2021. Although by the principle of one day surgery or ambulatory surgery especially abroad, patients are usually discharge in the evening after surgery. But our patients are in remote areas. There

Table 4 Pathological information and Surveillance.

	Group A n=53	Group B n=100	P-value
Pathological report, n (%)			
Acute on top chronic cholecystitis	5 (9.4%)	10 (10%)	0.911
Cholesterolosis (strawberry gallbladder)	3 (5.7%)	1 (1%)	0.086
Chronic cholecystitis	44 (83%)	86 (86%)	0.624
Empyema gallbladder	0 (0%)	1 (1%)	0.465
Intracholecystic papillary neoplasm (ICPN)	0 (0%)	1 (1%)	0.465
Malignant of gallbladder	1 (1.9%)	1 (1%)	0.646
Re admission in 2 weeks, n (%)	0 (0%)	0 (0%)	N/A
Cost of Re-admission in 2 weeks(bath), median (IQR)	-	-	-
Cause of re-admission, n (%)			
Biliary leakage	-	-	-
Hemoperitoneum	-	-	-
Clinical After 2 weeks, n (%)			
Asymptomatic	51 (96.2%)	95 (95%)	0.730
Abdominal discomfort	2 (3.8%)	2 (2%)	0.513
Abdominal Ecchymosis	0 (0%)	1 (1%)	0.465
Diarrhea	0 (0%)	1 (1%)	0.465
Subhepatic collection	0 (0%)	0 (0%)	N/A
Surgical site infection	0 (0%)	1 (1%)	0.465
Clinical After 3 mo., n (%)			
Asymptomatic	49 (92.5%)	97 (97%)	0.200
Abdominal discomfort	4 (7.5%)	3 (3%)	0.200

Chi-square test.

are difficult to transport and of low socioeconomic status. We adapted it to the hospital context using the admission at date of surgery and stay overnight principle that means the patient was hospitalized the morning of the day of surgery and discharge the patient on post operative day 1, no later than 24 hours from the time of surgery. Thus dividing the research participants into two groups as mentioned above.

Laparoscopic cholecystectomy performed by an experienced general surgeon and understand vasculobiliary variation of hepatobiliary tract 11. When inserting the camera port, we will identify surgical landmarks anatomy such as Rouviere's sulcus or R4U line that runs from Rouviere's sulcus to segment 4b to umbilical fissure (Figure 5).

Figure 5 R4U line from Rouviere's sulcus - segment 4b - umbilical fissure.
Once the camera is inserted into the abdomen, the difficulty of surgery can be assessed by looking at the inflammation of the gallbladder. We usually perform a three-port laparoscopic cholecystectomy. but in severe cholecystitis, a four-port laparoscopic cholecystectomy is added. We perform laparoscopic cholecystectomy by use the way of Critical View of Safety (CVS) proposed by Steven Strasberg 1995 12 (Figure 6) and know way to bail out procedures such as open conversion and subtotal cholecystectomy (Figure 7).

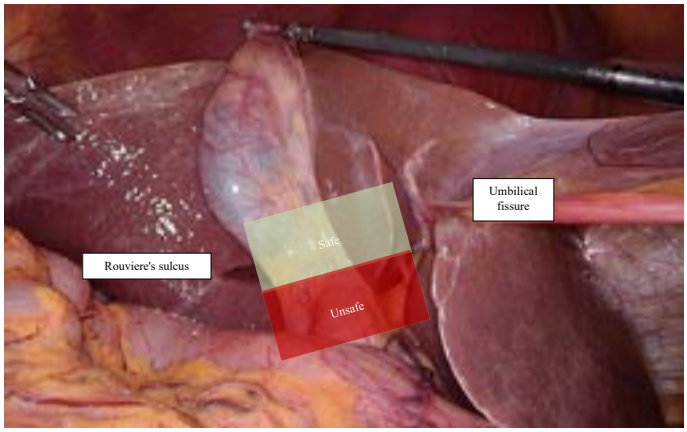


Figure 6 Laparoscopic cholecystectomy according to the guidelines Critical view of safety (CVS).

Based on the research data, it was found that baseline characteristic most of the data on the two groups of patients were not statistically different except for gender, where female patients were more predominantly.

In terms of operational outcome, it was found that in the group of Chronic calculous cholecystitis More in group B, indicating conservative treatment in patients with acute calculous cholecystitis for subsequent elective laparoscopic cholecystectomy. We found no statistical differences in estimate blood loss, drain placement, number of port, and average operative time. Patient in group B had a shorter average operative time, which may indicate increased surgeon experience.

In post operative outcome, we found that in group B the success rate of one day surgery was 96%. From the research of Docobo Durántez

Figure 7
Laparoscopic subtotal cholecystectomy via Endo loop in subacute calculous cholecystitis.

et al, 82.5% were day cases in laparoscopic cholecystectomy (8). In our study, cause of drop out one day surgery was abdominal discomfort 1% and hemoperitoneum 1%. Both patients received supportive treatment and able to go home in less than 48 hours.

Major complication is the subject that we pay the most attention to as a primary outcome. According to the statistics of Health District 1, the upper northern region of 8 provinces, the incidence of bile duct injury was 1.1%. The incidence of bile duct injuries was 1% less in group B patients with ambulatory surgery than 3.8% in group A patients with traditional surgery, but there was no statistical difference. The ambulatory surgery group in this study also incurred fewer bile duct injuries than most northern populations. Incidence of major complications after LC in large series are between 1-5% (13). However, this research is a single center experience with a small sample size, data collection is required or do research as a multicenter in the future.

Cost of admission is the secondary outcome that we pay attention. Because Thailand is a developing country. We have a limited public health budget to provide effective public health services. According to this study, the cost of admission of patients in group B: ambulatory laparoscopic cholecystectomy was significantly lower than patients in group A: traditional laparoscopic cholecystectomy 14,742 bath (427 USD) and 21,222 bath (615 USD) respectively ($p<0.001$). Because it helps to reduce the length of stay in the hospital, reduce costs, reduce medical treatment, reduce hospital crowding and the empty beds can be open to patients with other diseases. We did not find any patients Re admission in 2 weeks. At postoperative follow-up, >95% of patients in Group B were asymptomatic and there was no difference between the two groups.

However, even today we do overnight stay surgery, but in the near future we have a plan to adjust to true day case.

Conclusion

Ambulatory laparoscopic cholecystectomy can effectively reduce the cost per admission and reduce the length of stay in hospital without any difference in major complication. Selection of patients appropriately and considering patient safety as the primary consideration including surgery by experienced surgeons to help prevent complications that can occur.

Acknowledgement

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Scope of Ambulatory Anaesthesia for Premature Infants

Garima Agrawal[1], Raksha Kundal[2]

Abstract

Aim: Case report on Ambulatory anesthesia for a premature infant scheduled for laser treatment for retinopathy of prematurity
Methods: Selection of patient, general anesthesia with multimodal analgesia followed by intensive monitoring.
Results: Successful discharge on the same day.
Declaration: This case report was presented as poster in the 14th International IAAS congress 2022, Bruges, Belgium

Keywords: Ambulatory care, Premature Infants, Anaesthesia.

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Introduction

Prematurely born babies presenting for surgical procedures that require general anaesthesia are more prone to have episodes of apnoea and cardio respiratory events in the post-operative period due to their immature physiology and anatomy than their full term counterparts1 and more so if the post conceptual age (PCA) at the time of surgery is less than 60 weeks. Therefore ambulatory anaesthesia does not have wide acceptance in this particular age group. However, considering the peculiar situation of COVID 19 pandemic, requests for early discharge from health care facility had risen. Retinopathy of prematurity is a condition that requires intervention in the initial weeks of birth for a favourable outcome. We present a case report of a premature infant presenting for laser treatment of retinal detachment due to ROP performed under general anaesthesia who was successfully discharged home the same day.

Methods

An infant with premature birth at 30 weeks with birth weight 950 grams and current weight 1125 grams presented for laser treatment for retinopathy of prematurity at PCA of 42 weeks. Detailed pre-anaesthetic examination revealed history of NICU stay for some days after birth where she had received oxygen supplementation via nasal cannula. There was no documented comorbidity and the child was thriving well.

Written informed consent was obtained from the guardians and adequate fasting period was ensured. On being shifted to operation theatre, the baseline values of oxygen saturation (SpO2=96%), heart rate (HR=136/min)), non-invasive blood pressure (NIBP=70/50mmHg), and respiratory rate (26/min) were recorded. The child was induced with 6%–8% sevoflurane with Fio2 up to 0.4 (minimum O2 to maintain SpO2 of >90%) and an intravenous line was secured. An injection fentanyl 1 µg/kg was given. The airway was secured with supraglottic airway device of appropriate size and was put on pressure-controlled ventilation. Anaesthesia was maintained with O2/air/sevoflurane keeping end-tidal minimum alveolar concentration of one. Before submitting the child for the procedure, bilateral peribulbar block was performed with 0.3 ml/kg of a 1:1 mixture of 0.5%bupivacaine and 2% lignocaine with 5 IU/ml hyaluronidase injected into the peribulbar space through the inferior eyelid at the junction of the lateral third and medial two-thirds of the inferior orbital rim.

An intra-operative period of ninety minutes remained uneventful. At the end of the procedure, sevoflurane was switched off and the LMA was removed once the child was adequately responding.

Injections of paracetamol 15–20 µg/kg and Inj. ondansetron 0.1 µg/kg were administered and once the child was awake she was shifted to the post-anaesthesia care unit. Recovery from anaesthesia was satisfactory with modified Aldrete recovery score of 9/10 at 4 hours. Vigilant post-operative monitoring was done for another 6 hours and no episodes of apnoea, bradycardia, hypoxia or excessive crying were observed. The baby accepted feed and was discharged home the same evening with appropriate instructions to parents.

Discussion

Children are considered as ideal patients for day-care management because they usually have little co-morbidity and common paediatric operations are well suited for day care surgery. The major advantages of day care surgery consist of lessening psychological stress for children and parents and the reduction in hospital costs, frequency of nosocomial infections and length of surgical waiting lists. Usually a surgical procedure lasting less than 120 min with negligible risk of post-operative bleeding or excessive post-operative pain is managed on an ambulatory basis.

Post-operative cardio-respiratory complications are the main concerns for preterm infants scheduled for surgery under general anesthesia (2). Multiple studies have reported postoperative apnoea with routine doses of anaesthetics and its association with gestational age less than 37 weeks or PCA under 60 weeks at the time of surgery (3). In one of the studies, the incidence of postoperative apnoea after ROP surgery was found to be only 5.36% (2), which is less than reported incidence of 20-30% (4) after herniotomy procedure in preterm infants.

Apnoea in premature infants is associated with many complications such as bradycardia, cyanosis, brain damage, hypotension, hypotonia, hydrocephalus, neurologic complications, and even death (5). The main cause of apnoea and respiratory problems in premature infants is an incomplete development of respiratory centres. Anemia6 and a prior history of apnoea have been reported as the highest risk factors for post-operative apnoea. Other factors, such as low gestational age and birth weight, complicating neonatal diseases (4) early fatigability of the diaphragm, airway obstruction, hypothermia, residual effects of muscle relaxants, infections, sepsis, metabolic and cardiac diseases

and anaemia have shown to be associated with apnoea in these infants (3).

Guidelines on paediatric day surgery of the Italian societies of paediatric surgery and paediatric anesthesiology (7) suggests that ex-premature infants less than 60 weeks post-conception age must be excluded from day care procedures. We decided to conduct the laser treatment for ROP under general anaesthesia as a day care procedure since there was no history of apnoea reported by the parents and the child was not anaemic. Consideration was given to the request by parents for early discharge in view of high risk of nosocomial COVID 19 infection.

Caffeine and spinal anaesthesia alone have shown to decrease the risk of apnoea and bradycardia in preterm infants undergoing general anaesthesia (7). We avoided muscle relaxants, used low dose opioids supplemented with regional anaesthetic techniques and non-opioid systemic analgesics such as acetaminophen to reduce the risk of apnoea and related complications in the post-operative period.

In a retrospective study of 191 infants undergoing inguinal herniorrhaphy, most episodes of apnoea were found to occur during the first four hours after the surgery and the risk of postoperative apnoea/bradycardia was 8.8% in ex-premature infants after inguinal herniorrhaphy (8). Previous authors have recommended that children younger than 46 weeks PCA should be monitored for at least 12 hours after surgery (9). We monitored the child intensively in the post-operative ward adjoining the theatre for 10 hours with ECG, SPO2, respiratory rate and NIBP. Child was comfortable and was able to accept mothers feed after 4 hours.

Presence of a responsible adult, preferably both parents, must be there to transport the child and to provide assistance and care to the infant in the post-operative period at home. We ensured that parents had the means to contact us in case of emergency and a primary hospital with paediatric care facilities was accessible in their vicinity

Result and Conclusion

Ambulatory procedures may be considered in premature infants with PCA less than 60 weeks ensuring no comorbidity pertaining to cardiorespiratory system and utilising multimodal anaesthesia techniques in the presence of appropriate logistic support.

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1.

Subungual Squamous Cell Carcinoma: A Case Report

Sumit Jain, Chetan Singla

Abstract

Subungual squamous cell carcinoma is an uncommon condition frequently leading to misdiagnosis because of similarities with a lot of common presentations. Differential diagnosis of subungual SCC should always be kept in mind while dealing with non healing ulcers of the nail bed so that early and appropriate intervention can be carried out in these patients.

Keywords: Subungual squamous cell carcina.

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Introduction

Subungual squamous cell carcinoma is often thought to be an uncommon condition, which frequently leads to delay in diagnosis or misdiagnosis due to similarities in its presentation to other conditions, including pyogenic granuloma, paronychia, onychomycosis, keratoacanthoma, other tumors, warts, or trauma-related injuries (1,2). We are reporting a case of subungual SCC presenting as chronic non healing ulcer.

Case report

A 57-year-old male presented with a non-healing ulcer over the dorsum of the distal phalanx of the left middle finger for 1 year. Patient was painter by occupation. He consulted a local practitioner for the same complaint and underwent nail excision twice within 6 months with a course of oral antibiotics, antifungals and anti-inflammatory drugs but it still recurred. 6 months back patient developed a persistent painful ulcerative lesion over the fingernail involving the dorsum of distal phalanx along with the nail and did not show any improvement with medications. There were no similar lesions elsewhere on the body. The patient did not give a history of diabetes mellitus or hypertension or tuberculosis. Cutaneous examination revealed an extremely tender ulcer of 1.0cm × 0.7cm size over the left middle finger nail bed. (Figure 1) (near here). The floor of the ulcer had ulcerative tissue. There was no evidence of regional lymphadenopathy. Differential diagnosis of SCC, pyoderma gangrenosum and amelanotic melanoma were considered. X-ray of the right middle finger revealed osteophyte at the distal interphalangeal joint with no periosteal reaction or osteomyelitis. Biopsy from the edge and center of the ulcer was suggestive of SCC. The patient was subjected to disarticulation of the distal interphalangeal joint and amputation was done up to the upper part of middle phalanx. Figure 2 shows the postoperative image (near here). The excised tissue revealed microfoci of squamous cell carcinoma on histopathological examination. The patient was followed up for 6 months and there are no signs of recurrence or regional lymphadenopathy.

Figure 1 Image showing SCC nail bed.

Figure 2 Post operative image.

Discussion

Subungual SCC runs a slow progression course and may present with minimal symptoms (3). Affected individuals are typically in the fifth through seventh decades of life. Digits of the hand are involved more often than those of the feet. Typically, one digit is involved; however, some studies have reported on simultaneous involvement of multiple digits (4). The thumb, particularly the distal phalanx, tends to be the most commonly affected digit (5).

Diagnostic confusion emerges because of its uncommon nature and many chronic lesions of the nail bed may be clinically similar to SCC (6). Only about 150 cases of similar condition have been reported in the literature (7). Trauma, chronic paronychia, chronic solar irradiation, X-irradiation, burn scars, arsenic exposure, actinic damage, polycyclic aromatic hydrocarbons, genodermatoses,

immunosuppression and human papillomavirus infection are considered to be the risk factors for the development of SCC (8).

Although SCC of the nail bed is considered a low-grade malignancy, bone invasion and metastasis to the regional lymph nodes may occur but are rare due to lesser lymphatic drainage of these embryologically vestigial organs. Fatal dissemination is only very occasionally reported (9).

Rapidly growing ulcerative lesions should be considered as potential malignancy. Pathological confirmation is necessary for early diagnosis and treatment effectiveness. The presence of pain indicates bone invasion by the tumor, and x-ray is mandatory in these patients to investigate the bone involvement. Given the rarity of the condition, there is no consensus on the optimal treatment. No standardized therapeutic approach is described in SCC, and the choice is selected on the basis of the extension of the tumor and the involvement of the underlying structures. Microscopic surgery and local removal are advised in superficial lesions for the lower recurrence rate, while large excision until amputation are recommended for patients with bone infiltration. The tendency of recurrence is higher in the nail unit than in another part of the body, likely due to residual HPV in the surrounding area or an incomplete excision of the tumor, and for this reason a strict and long follow-up is recommended for SCC.

Conclusion

Subungual SCC resembles a variety of diseases. Physicians need to maintain heightened awareness, and chronic non-healing lesions of the digits should be viewed with suspicion. The prognosis of subungual SCC is very good if it is recognized at an early stage, highlighting the need for early biopsy and appropriate management.

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Liposomal Bupivacaine for Interscalene Block in Ambulatory Rotator Cuff Repair

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Abstract

We conducted a retrospective study of the effectiveness of liposomal bupivacaine for analgesia in interscalene block for patients undergoing ambulatory rotator cuff repair. Postoperative opioid use, the primary outcome measure, was markedly reduced, and pain scores were significantly lower, as compared to use of plain bupivacaine block in a historical control group. Furthermore, most patients found that the duration of pain control was longer than their own prior plain bupivacaine interscalene block.

Keywords: Liposomal bupivacaine; interscalene block; ambulatory; rotator cuff repair.

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Introduction

Liposomal bupivacaine (LB), a liposome-encapsulated form of the local anesthetic bupivacaine, was approved for injection into the surgical field in 2011 (1). Animal and early clinical studies were supportive of its long-lasting analgesic potential, though later studies and meta-analyses did not find significant prolongation of analgesia when LB injected into the surgical field was compared to injection of plain bupivacaine in the surgical field (2) or was compared to bupivacaine interscalene nerve block (ISB) (3). This drug has also been incorporated into transversus abdominus plane (TAP) blocks, and is reported to reduce opioid requirements, particularly in the setting of cesarean delivery (4). In 2018, the drug received approval for use in ISB for shoulder surgery, and is reportedly most effective when used as an admixture with plain bupivacaine (1). Some investigators have reported favorable effects of LB in this setting (5,6), but a number of randomized trials have not been supportive of this drug when compared to ISB with plain bupivacaine (7,8).

Because long-lasting analgesia is important in ambulatory orthopedic patients, we evaluated LB in our shoulder surgery population, ensuring specific injection within the fascial confines of the interscalene groove. We evaluated the effects of LB mixed with bupivacaine on postoperative opioid requirements and pain scores in patients undergoing rotator cuff repair. We deliberately recruited patients who had previously undergone this operation with plain bupivacaine ISB, so

that they could serve as their own controls in reporting their experience with pain control and duration of analgesia. We hypothesized that opioid requirements on postoperative days 1-3 would be 50% lower than for those for a control group who had received plain bupivacaine ISB for the same surgical procedure.

Methods

This prospective, quality improvement project was initiated for presentation to our pharmacy. We subsequently obtained IRB approval for retrospective analysis of the data. Patients presenting for ambulatory rotator cuff repair, who had a history of prior rotator cuff repair with single-shot ultrasound-guided ISB within four years of the current operation, were recruited to participate. Other inclusion requirements were: age over 18 years, ASA class 1-3, and able to provide consent for participation. Pediatric patients, pregnant patients and those with contraindications to peripheral nerve blockade, including severe pulmonary disease, were excluded. Patients with chronic shoulder pain requiring opioids for management were also excluded.

After informed consent was obtained, intravenous access was obtained and monitors placed in the preoperative holding area. The patients underwent ultrasound-guided ISB, with the injectate consisting of 10mL of bupivacaine 0.5% and 10mL of LB 1.3%. In order to ensure a surgical block for the surgery, the needle tip was guided into the interscalene groove between the C5 and C6 nerve roots, ensuring that the fascia lining the middle scalene muscle was traversed, and that the solution accumulated directly between the two nerve roots during injection. The first four mL of the injectate consisted of plain 0.5% bupivacaine, with the remainder administered in the same location as a mixture of the two agents. Pacira, the manufacturer of LB, provided the drug at no cost for this investigation.

In the operating room patients received a standardized anesthetic of propofol infusion and ketamine 15-20mg, with preserved spontaneous ventilation. If deemed necessary for aberrations

in vital signs or rapid respiratory rate, small doses of fentanyl were also permissible. Postoperatively, patients were taken to the post-anesthesia care unit, where recovery occurred and the first postoperative pain scores were assessed. Before returning home, the patients received a self-assessment journal for recording pain scores and oral analgesics during the first three days after surgery, as well as the duration of perceived motor block.

The primary outcome for this study was oral opioid requirement on postoperative days 1-3. We considered a reduction of opioid use of 50% to be clinically significant, compared to comparable data from the control group (n=27) of a prior trial that we had conducted which evaluated the effects of LB injected into the surgical field (9). Secondary outcomes included NRS pain scores (from 0 to 10) on the first three postoperative days, motor block duration, and the patients' qualitative comparison to their prior nerve block duration.

Statistical analysis:

Based on opioid requirements for the control group of a prior trial (9), and with our hypothesis specified as a 50% reduction in postoperative opioid use during the first three days after surgery, we

calculated that 25 patients would be required for this study.

Descriptive statistics were calculated using medians and inner quartile ranges for continuous variables and counts and percentages for categorical variables. Opioid requirement and pain scores distributions were compared by day and across days with Mann Whitney U tests. Linear mixed models were fit to account for within person variance across days and confirm results of non-parametric testing. Missing data was removed from any comparison and testing.

Results

27 patients were approached to participate in the study, and one patient declined. 26 patients provided consent to participate in this investigation. One patient was excluded due to chronic, unremitting shoulder pain and long-term opioid use for management. Of the remaining 25 patients, all turned in their self-assessment journals, or provided the appropriate feedback over the phone. Two of these 25 patients did not provide complete data for postoperative day three. Demographics for the patients are presented in Table 1.

Table 1 Demographic Data.

	Historical Control Group (n=27)	Liposomal Bupivacaine Group (n=26)
Age	58.2 ± 7.2	54.3 ± 12.6
Male	15 (55.5)	14 (53.8)
Right Side	15 (55.5)	15 (57.7)
BMI	31.5 ± 4.8	30.0 ± 5.8
ASA Class		
1	1 (3.7)	2 (7.7)
2	21 (77.8)	17 (65.4)
3	5 (18.5)	7 (26.9)

BMI – body mass index; ASA – anesthesiology physical classification. Categorical variables shown as a numerical value (percentage), continuous variables are shown as means + or – standard deviation.

Oral opioid use was significantly lower on days 1 through 3 for the patients receiving the ISB with LB (Table 2), compared to the control group who had received plain bupivacaine ISB for rotator cuff repair. NRS pain scores were also significantly lower on all three days; these decrements were clinically relevant as well. Mixed models agreed with these results longitudinally, both for oral opioid requirements (β=-31.2, CI=(-41.2, -21.2), p <.001) and for reported NRS pain scores (β=-3.3, CI=(-4.7, -1.9), p <.001). The reported mean duration of motor block was 25.5 (14.8) hours.

In the qualitative assessment, 92% (n=23) of the patients reported that pain control lasted distinctly longer than it had with their prior bupivacaine ISB. All of these patients responded that they would desire LB for a future nerve block, while the two patients who did not have a perceived prolongation of block duration were not favorable toward use of this drug again.

Discussion

In this retrospective QI study, we found significantly reduced oral opioid requirements and NRS pain scores for ISB utilizing a mixture of LB and bupivacaine, on postoperative days 1, 2 and 3, compared to a historical control group which had received ISB consisting only of plain bupivacaine. The reduction in opioid use in the patients receiving LB was consistent with our hypothesis. Pain scores reported on the first three postoperative days were reduced by more than two units on the NRS scale, which substantiates clinical, as well as statistical, significance. In addition, 92% of the patients reported that the block incorporating LB lasted meaningfully longer than a prior block with plain bupivacaine alone for shoulder surgery.

These results stand in contradistinction to several other studies which have evaluated LB in the setting of RCR or shoulder arthroplasty. Kim et al assessed RCR patients in a randomized, controlled trial, in which ISB was provided with mixed LB and bupivacaine and compared to bupivacaine with dexamethasone (7). They noted no significant differences in pain scores, opioid requirements or duration of the block. Similarly, Flaherty, et al assessed this mixture in ISB in patients undergoing RCR, with similar postoperative opioid usage. The authors did note modest improvement in pain scores at 24 hours and 72 hours, but not 48 hours (8).

However, some studies have found favorable outcomes with the use of LB. Vandepitte et al evaluated mixed LB and bupivacaine for ISB in a randomized trial for patients undergoing major shoulder surgery. The primary outcome, worst pain experienced by the patients, was significantly lower for the LB group in the first postoperative week (5). In a multi-center study in which ISB with LB-bupivacaine plus bupivacaine was compared to a control group with injection of saline placebo, the LB-bupivacaine group had significantly improved pain scores and a 65% reduction in opioid requirements (6).

We believe that LB may be of greater utility for prolonged analgesia when deliberately injected within the fascial envelope that encloses C5 and C6 in the interscalene groove. We specified that the injectate be placed within these fascial confines, as evident on ultrasound imaging, for our study, which may explain the prolonged analgesia provided by LB. The patients had well-controlled pain for the first

Table 2 Continuous Values.

Variable	Total median (IQR)	Control median (IQR)	Treatment median (IQR)	P-Value
Duration	46 (24 - 61)	60 (48.5 - 77.5)	24 (14 - 30)	<.001
Pain_1	4.1 (1.85 - 7)	6.2 (3.8 - 8.2)	3 (0 - 4.2)	<.001
Pain_2	5 (2.1 - 7)	6.6 (5 - 7.8)	3 (0 - 5)	<.001
Pain_3	5 (3 - 6.5)	6 (5 - 7.5)	3.1 (0 - 5.1)	<.001
Combined Pain Days 1-3	5 (2.2-7)	6.2 (4.67 - 8)	3 (0-5)	<.001
OME_1	15 (7.5 - 37.5)	37.5 (22.5 - 60)	7.5 (0 - 15)	<.001
OME 2	15 (0 - 37.5)	37.5 (30 - 45)	5 (0 - 15)	<.001
OME 3	15 (0 - 32.5)	32.5 (18.8 - 46.9)	0 (0 - 7.5)	<.001
Combined OME	15 (0-37.5)	37.5 (22.5 - 52.5)	7.5 (0 - 15)	<.001

three postoperative days. Other studies in which LB has been utilized for ISB, while specifying injection between the nerve roots, have been less detailed about the specific site of injection with regard to the fascia bounding the groove (5,7,8), and this may help to explain a relative lack of efficacy. While speculative, this may explain our excellent outcomes with regard to opioid use and pain scores for the first 72 hours after surgery.

Our study was also unique in specifically selecting patients who had received prior single shot bupivacaine ISB, which allowed subjects to act as their own control. While patients' perceptions are necessarily subjective and qualitative, there was a very high degree of appreciation of a prolonged duration. Over 90% of patients stated that the block lasted longer with the mixture of LB-bupivacaine than with their prior nerve block utilizing plain bupivacaine.

This study has several limitations. Foremost, it was a non-blinded comparison to prior, historical data, rather than a randomized trial. We chose this design because the study was formulated initially as a QI project for presentation to our pharmacy committee; after completion, we decided to report our results as a retrospective, observational investigation. In a study such as this which is not blinded, a placebo effect cannot be discounted. In addition, while no specific funding was provided for this study, the manufacturer of LB, Pacira, provided the drug at no cost. Finally, patient reports of improved duration with LB are necessarily qualitative, since they had not recorded exact durations of their previous bupivacaine nerve block.

Conclusion

In this retrospective evaluation of LB mixed with bupivacaine for ISB for rotator cuff repair, we found that opioid use was markedly reduced, and pain scores were significantly lower, as compared to use of plain bupivacaine in a historical control group. Furthermore, most patients found that the duration of pain control was longer than with a prior plain bupivacaine ISB.

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