

## Simultaneous Repair of Bilateral Inguinal Hernia under Local Anaesthesia

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### Abstract

Open repair of inguinal hernias is a recognised standard approach to groin hernia repairs. Furthermore, this approach is uniquely suited to repair under local anaesthesia (LA). LA repair of unilateral Inguinal hernia (IH) is widely reported in the literature as a safe, well tolerated, and effective operation. However, there is minimal evidence in literature on simultaneous repair of bilateral inguinal hernias under local anaesthesia. This approach is a useful tool in patients with bilateral IH who are unfit for or choose to avoid general anaesthesia (GA). We report our experience with simultaneous repair of bilateral inguinal hernias under local anaesthetic.

**Methods:** We reviewed prospectively collected data of patients with bilateral inguinal hernias for whom simultaneous repair under LA was performed between 2009 – 2019. Data was collected for patient demographics, post-operative visual analogue pain score (VAS), operating time, volume of local anaesthetic used, patient satisfaction and complication rates. All patients had a Lichtenstein's hernioplasty using a buffered local anaesthetic mixture made up of 30ml 0.5% Bupivacaine with adrenaline, 20 ml 2% Lignocaine with adrenaline, 50 ml of 0.9% Saline and 6 ml of 8.6% Sodium Bicarbonate. In each patient, both procedures were performed sequentially as a day case operations.

**Results:** In total, 24 patients were included in the study with male preponderance (92%) and only two were females. Their ages ranged 35 - 81 years. Their BMI varied from 18 – 30, with a mean of 24. The average operating time was 66.8 minutes (ranging 38 - 120 minutes, median 60 min). The mean pain score was 24, on a VAS 0-100 scale (range 4 - 50, median 25) with patient satisfaction scores (0-100 scale) varying from 50-100 (Median 90, Mean 88.1).

**Conclusion:** We conclude that successful simultaneous repair of bilateral inguinal hernia under local anaesthetic can be performed safely in a timely fashion, with minimal patient discomfort and high satisfaction rate. This approach should be considered as a viable alternative in the tailored approach to repairing IHs and offered to patients not deemed suitable for elective general anaesthesia with the advantage of addressing both groin hernias during the same operating session.

### Introduction

Hernia repair is one of the most commonly performed operations worldwide(1). Bilateral inguinal hernias are a more common occurrence amongst the paediatric population but they constitute about 6% of inguinal hernias in

adults(2). There are several surgical options including tissue-based repair and prosthetic repair using open or laparoscopic approaches. It is widely accepted that inguinal hernia(IH) repair should be tailored to the individual patient taking into consideration the hernia (primary or

recurrent/ unilateral or bilateral), patient's comorbidities including fitness for general anaesthesia (GA), patient's preferences and surgical expertise and resources. Current evidence favours use of prosthetic mesh in the repair of hernias and more recently, laparoscopic repair is a recommended approach more so in the presence of bilateral hernias where simultaneous repair can readily be provided(1, 3). The laparoscopic repair's requirement for general anaesthesia serves as a limiting factor in some patients either because of the patient's preference to avoid GA or their fitness for GA. Local anaesthesia keeps simultaneous repair as a viable option in these group of patients although only open repair can be provided using this modality at this time. Open mesh repair remains the gold standard with good outcomes and high patient satisfaction(4, 5). However, there is little literature regarding repair of bilateral inguinal hernia under local anaesthetic. We analysed our experience in simultaneous repair of bilateral inguinal hernia under local anaesthetic. Simultaneous repair of bilateral inguinal hernia is more convenient and economical to the patient and healthcare system requiring only one operative session and one phase of convalescence(6).

## Methods

We retrospectively analysed our prospectively collected data base of inguinal hernia repairs done under local anaesthesia between 2012 and 2020. Patients who had simultaneous repair of bilateral inguinal hernia LA were identified and the data was analysed for patient demographics, patient reported pain score, operating time, volume of local anaesthetic used, patient satisfaction score and complication rates, including recurrence. All the procedures were performed by a consultant general surgeon, with a special interest in local anaesthetic hernia repairs, or surgical trainees under his supervision.

The decision to perform the repair under local anaesthetic was made by the patient and consultant surgeon, after discussion of the various

options. The usual consent process and preoperative preparation was followed. All the patients had standard tension free open mesh repair (Lichtenstein's repair). Standard lightweight Prolene or polyglactic acid mesh was used in all the patients and all the procedures were performed as day case operations. The LA used was a buffered mixture constituted in 106mls aliquots made up of 30ml 0.5% Bupivacaine with adrenaline, 20 ml 2% Lignocaine with adrenaline, 50 ml of 0.9% Saline and 6 ml of 8.4% Sodium Bicarbonate. This mixture has been validated as safe for 70kg man and shown to reduce the pain of both infiltration and surgical procedure(7). Local anaesthetic was initially administered by infiltrating 5-10mls of the mixture sub-dermally along the line of the incision followed by another 5-10mls injected vertically to the underlying subcutaneous tissue. Subsequently, 20mls was injected deep to the external oblique aponeurosis at a landmark two finger breadths medial to the anterior superior iliac spine utilizing the loss of resistance on piercing the fascia with a blunt needle to identify this plane thus effectively blocking the regional nerves. Supplementary local anaesthetic was used during the procedure as required. After the procedure, the patient demographics, total operating time, and volume of local anaesthetic mixture used were recorded by the surgeon. The patients were asked to fill in a visual analogue scale before discharge, rating the pain score (0 to 100 with 0 being severe pain and 100 being no pain) and patient satisfaction score (0 to 100 with 0 being extreme dissatisfied and 100 fully satisfied). The electronic patient records were reviewed to identify any complications or recurrence.

## Results

There were 24 patients, who underwent local anaesthetic repair of bilateral inguinal hernia, 22 Males and 2 Females. Age range was 35 - 81 years. The BMI varied from 18 - 30, with a mean of 24. The average operating time was 66.8 minutes (38 - 120 minutes, median 60 min). The

mean pain score was 24, on a 0-100 scale (range 4 - 50, median 25). Patient satisfaction scores varied from 50-100 (Median 90, Mean 88.1) 3 patients had unilateral bruising and hematomas

(6%), none of these required surgical intervention and there were no readmissions. One patient had a unilateral recurrence (2%) and no patient experienced chronic groin pain.

Sex		Age (in Years)		BMI	
Male	22	Youngest	35	Maximum Value	30
Female	2	Oldest	81	Minimum Value	18
				Mean	24
Operating Time (in Minutes)		Pain Score (scale of 0-100)		Patient Satisfaction (scale 0-100)	
Maximum Time	120	Highest Score	50	High	100
Minimum Time	38	Lowest Score	4	Low	50
Median	60	Mean	24	Mean	88.1
Average	66.8	Median	25	Median	90

**Discussion:**

Bilateral hernias are usually managed laparoscopically, under general anaesthetic, with the advantage of the same small incisions used to both sides and the added benefit of quicker postoperative recovery(1, 8, 9). Inguinal hernia repair under local anaesthetic is an extensively reported and accepted procedure and may be the only option applicable in certain patient groups(4, 8). Local anaesthetic repair can be safely performed in high-risk patients, thus avoiding the challenges associated with general anaesthesia. There are immediate associated benefits including cost reduction and logistic advantages as these cases are performed during one hospital attendance and almost always as day case operations. This results in a more efficient utilisation of the theatre resources in treating both hernias as compared to the demands that would be necessary at another attendance if was required for staged sequential repair. We acknowledge that many of these patients who are deemed unfit for a laparoscopic repair are managed with a staged sequential repair as two separate procedures. However, this results in an extra hospital episode with associated higher costs and two postoperative recovery periods. Concerns about local anaesthetic toxicity from higher volume of LA required anaesthetizing both

groins. However, the dilute buffered anaesthetic solution used in this study provides sufficient volume and concentration of the anaesthetic agents resulting in a safe and effective mixture that prevents LA volumes from exceeding safe concentrations without compromising the quality of anaesthesia provided. Another consideration is the increased morbidity that could arise from bilateral groin incisions including concerns of chronic groin pain being bilateral if it occurs. In addition to these concerns not being demonstrated in our study, simultaneous repair using the laparoscopic approach is increasingly being performed with good outcomes and as such the treatment of both groins should not increase morbidity. Furthermore, our study demonstrated that the treatment goal can also be achieved within a reasonable duration avoiding patient distress from a long procedure under LA. Our patient satisfaction scores were excellent, and the pain scores were consistently low with the procedure suggestive of a good patient experience. Additionally, the benefits of LA over GA in general , including but not limited to the avoidance of post-operative nausea and vomiting, quicker recovery and the maintenance of normal physiology throughout the procedure are all harnessed in this approach

**Conclusion:**

We conclude that simultaneous repair of bilateral inguinal hernia under local anaesthesia is a practical option, in a selected group of patients when performed by a surgeon with special interest in the technique. This approach resulted in high levels of patient satisfaction and good outcomes. This small study shows that a simultaneous bilateral inguinal hernia repair is safe and feasible using a dilute buffered solution of local anaesthetic and there was no report of increased morbidity or mortality.

**Limitations:**

This was a relatively small study reflected by the unique population it addresses which would typically be patients with bilateral inguinal hernia who are either unfit for or decline GA. Although a larger study would more readily demonstrate potential complications, this study clearly demonstrates the feasibility of this approach and when appropriate, it should be part of the options provided to patients while providing a tailored approach to the repair of their hernias.

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