A Study of Postoperative Pain Following Day-Case Hernia Repair

TAHAWAR A RANA & JACOB A AKOH

Keywords: Hernia repair; Day case surgery; Postoperative pain; Local anaesthetic.

Abstract
Purpose: To prospectively explore the severity and duration of acute pain following ambulatory hernia repair.

Methods: Fifty-four patients with abdominal wall hernia repairs between October 2006 and January 2007 were included. The types of hernia, anaesthetic techniques, the “time to rescue” and the “time to discharge” were recorded prospectively. The subjective pain scores after surgery, on days one to seven and day 28 postoperatively were analysed.

Results: All 50 patients planned as day-cases (93% day case rate) were discharged on the same day (100% success rate). Local anaesthesia was used for hernia repair in 37 patients (69%). The mean pain score decreased from 3.5 on day one to 2.1 on day seven. The median “time to rescue” was 225 minutes, while the median “time to discharge” was 125 minutes. Fourteen (26%) patients still had residual discomfort on day 28.

Conclusion: The majority of groin herniae can be repaired as day case under local anaesthesia with satisfactory pain control after discharge.

Introduction

Day case repair of groin herniae is rapidly becoming established as the gold standard of care with numerous advantages including shorter hospital stay, lower bed occupancy and improved patient satisfaction. Though local, regional and general anaesthesia have been employed for hernia repair, local anaesthesia [LA] is emerging as a clear choice and this has notable implications where resources are limited. This study prospectively assessed the severity and duration of postoperative pain following ambulatory hernia repair in a centre with a well established hernia service.

Methods

Fifty-five consecutive hernia repairs at Derriford Hospital, Plymouth over a three-month period between October 2006 and January 2007 were included in the study. These patients were firstly seen at an outpatient clinic where the need for surgery and the type of anaesthesia were discussed. Small to moderate fully reducible herniae were deemed suitable for repair under local anaesthetic [LA]. This was followed by a telephone health questionnaire conducted by a pre-assessment nurse. The technique used was the open tension-free repair with or without a mesh. LA was used for most cases but general anaesthesia [GA] was used either according to patient’s preference, for large herniae or in obese patients.

All the procedures were performed in an ambulatory day case setting. On arrival at the centre, patients were admitted by the day-case theatre nurse, seen and consented by the surgeon, with appropriate marking of the relevant site/side of the operation. For those undergoing repair under LA, this was administered in the anaesthetic room before the patient was transferred into theatre. The LA technique used in this series consisted of a mixture of 0.25% levobupivacaine mixed with 1% lignocaine with or without adrenaline (1,200,000) infiltrated to block the ilioinguinal and iliohypogastric nerves (near the anterior superior iliac spine), the genital branch of the genitofemoral (near the pubic tubercle) and to all layers starting at the internal ring to the skin along the proposed line of incision. Patients who wished, were given 2–4 mg midazolam IV to provide awake sedation. Top up LA in the form of 1% lignocaine was given during surgery where necessary. At the end of the procedure patients were transferred to the recovery room and given a cup of tea.

The patient was asked about any pain pre-operatively and then assessed immediately after the operation, 1 hour post-operatively, and upon discharge. The ‘subjective pain score’ was used on a scale of 0–10, where zero = ‘no pain’ and 10 = ‘worst pain ever’. The time from surgical closure to discharge was recorded. The ‘time to rescue’ (defined as

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Table 1 Drugs used to achieve post-operative analgesia in 54 patients.

<table>
<thead>
<tr>
<th>Analgesic agent</th>
<th>Dose</th>
<th>Number of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-codamol</td>
<td>30mg/500mg</td>
<td>51</td>
<td>94%</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>400mg TDS</td>
<td>45</td>
<td>83%</td>
</tr>
<tr>
<td>Opiates [e.g., Tramadol]</td>
<td>50mg TDS</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>1g QDS</td>
<td>4</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

Pain scores, time to rescue and time to discharge (from end of surgery time to patient discharge), time and date of discharge; and medications prescribed and given for perioperative and post-operative analgesia. The data collected was analysed separately for patients who underwent operations under LA, GA + LA or GA alone.

Pain scores were interpreted as follows: 0 = no pain. 1–3: mild pain (not requiring analgesia); 4–7: moderate pain; and 8–10 was regarded as severe pain (would warrant conversion to GA peroperatively, delay discharge from hospital and merit follow up by the surgical team).

Results

Fifty five hernia repairs were carried out in 54 consecutive patients during this period: one patient had bilateral repairs. Of these, 46 (85%) were male and 8 (14%) were female. The median age was 55 years (range 19 to 86), with 9 patients (17%) over 65 years of age. Forty four (80%) herniae were inguinal, eight (14.5%) were umbilical/paraumbilical, with one femoral, one epigastric and one incisional hernia. Three of the 44 inguinal herniae were recurrent. All the operations were performed by two general surgeons.

All 50 (93%) of the 54 patients who were planned as day-cases were discharged on the same day giving a 100% day case success rate and a 93% day case rate overall. Pre-operative Diclofenac (50 mg) was prescribed and administered to 45 (83%) patients, with 2 (4%) receiving Paracetamol alone, whereas 7 (13%) patients received no pre-operative analgesia. All patients were prescribed postoperative analgesics with Co-codamol and Ibuprofen being the commonest combination [Table 1]. The type of anaesthesia employed is shown in Figure 1. Thirteen of the 17 patients requiring GA also received LA peroperatively (GA + LA group) while 4 did not (GA alone group). None of the patients operated under LA were converted to GA.

Two patients (3.7%) experienced post-operative nausea. One had been operated under LA and the other under...
Table 2 Mean postoperative pain score ratings (out of 10) post-operatively according to type of anaesthesia.

<table>
<thead>
<tr>
<th>Anaesthesia</th>
<th>Immediate</th>
<th>1 hour post-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>0.5 [± 1.52]</td>
<td>0.5 [± 1.28]</td>
</tr>
<tr>
<td>GA + LA</td>
<td>3.2 [± 2.77]</td>
<td>2.6 [± 1.89]</td>
</tr>
<tr>
<td>Mean pain score</td>
<td>1.2 [± 2.27]</td>
<td>1.0 [± 1.72]</td>
</tr>
</tbody>
</table>

Figure 2. Mean post-operative pain scores (out of 10) for the first seven days after hernia repair according to the type of anaesthesia.

Discussion

Hernia surgery is still the most commonly performed general surgical procedure with over 100,000 inguinal hernia repairs being performed in the UK each year. The Royal College of Surgeons of England recommends that at least 50% of groin hernia repairs should be performed under LA, while the British Association of Day Surgery recommends that 95% of primary inguinal hernia repair should be performed as day case. Excluding the one incisional hernia and three recurrent hernias in this study, a 100% day case rate was achieved for primary abdominal wall hernias. Though LA repair rates are low (<18%) in many European countries and 22% in Ghana, an LA rate of 69% exceeds the 50% recommended by the Royal College of Surgeons of England and approaches the rates reported in specialist hernia centres.

Good analgesia was achieved with LA during surgery in our series, and no patients had to be converted to GA due to inadequate pain control. This is probably a result of detailed discussions with patients preoperatively and selection of patients with smaller hernias and excluding obese patients. Similar results have been reported from Jerusalem with zero conversion to GA, but other series quote rates of conversion from <1% to 7%.

Most studies have concentrated on chronic residual pain (more than three months after hernia repair) with little information on acute pain after hernia repair. This study specifically looked at this and its effects on analgesic prescription and time of discharge. Although the visual analogue score (VAS) is considered a more appropriate method than the subjective verbal score, the latter was employed in this study as the VAS could not be easily assessed over the telephone. Patients were adequately counselled with respect to scoring for severity...
of pain. Immediate and one hour postoperative mean pain scores in the LA group were significantly better than the other two groups (GA alone and GA + LA). This is in keeping with reports by other authors. The use of a long acting local anaesthetic is probably accountable for the shorter median time to rescue (230 minutes) in those operated under LA compared to GA patients with or without infiltration of LA (180 and 120 minutes respectively). It is not clear why the time to rescue was shorter for the GA + LA group than the LA group in this study. Perhaps the quantity of anesthetic infiltrated [less in this case] and the technique (more likely to be wound infiltration rather than nerve block) may be important factors. As in this study postoperative pain can be significantly reduced by the infiltration of LA at the end of a procedure carried out under GA. The unusual finding of a higher immediate postoperative pain score (3.2) in GA + LA group compared to GA alone (1.5) is probably due to the small number of patients involved.

With appropriate analgesic management and patient counselling prior to the procedure, pain did not hamper discharge following hernia surgery. The median time to discharge for all groups was 125 minutes. Porte et al. were able to significantly reduce hospital stay with the use of LA, while other authors have been able to achieve mean discharge times of under two hours (160 minutes). LA facilitates early patient mobilisation and discharge, with fewer complications than spinal anaesthesia. While early return to work is attributed to the use of LA, counselling about the procedure also helps significantly in preparing the patients about what to expect. All our patients had a detailed briefing with a doctor or a hernia nurse specialist on the day of the operation, and the daily communication over the telephone for the first week after the operation potentially helped as well. Millickan and Doolas used LA with sedation in 2000 patients and showed that 95% returned to normal activity in 3 days and only 18% required prescription of pain medication. In our series the mean pain score was 2.5 (median score 2) by day three (Figure 2), meaning the vast majority of patients did not require analgesia beyond this. Beyond the first week the mean (and median) pain scores had fallen to 1.5, meaning less discomfort than actual pain. It is interesting that none of the patients in this series complained of significant pain at 28 days postoperatively.

The average age of the patients in our series was 53 years with 6 [11%] above 75 years of age, with all patients tolerating day case surgery well and good pain control after operation, including under LA. Older patients typically experience less pain after day case surgery when compared to younger patients, and it is a safe option in the elderly, without requiring sedation or extensive monitoring. Age alone does not need to be a contraindication to day case hernia repair provided home circumstances allow.

This study confirmed that most groin hernias can be repaired as day cases following careful planning.

- confirmation that social circumstances are conducive to ambulatory surgery.
- surgical assessment.
- telephone pre-assessment.
- well informed patients and carers.

The results of this study may provide a suitable catalyst for the development of a ‘see and treat’ practice for hernia repair.

**Acknowledgements**

We acknowledge the contributions of Christine Porter, Hernia Nurse Practitioner, Plymouth Hernia Service for collection of data and telephone contact with patients, as well as Dr Felicity Fitzgerald and Dr Toby Winterbottom for data collection.

**References**

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