Background

Since hernia repair is increasingly becoming a daytime procedure, there is a need to optimize postoperative pain management to enhance early recovery.

Various regional techniques are used in different centres to provide pain relief following hernioplasty. So far, there has been no comprehensive review of the relative analgesic benefits of these techniques.

The PROSPECT initiative provides evidence-based recommendations for procedures-specific postoperative pain management, formulated by an international Working Group of anaesthesiologists and surgeons.

PROSPECT conducted a systematic review of postoperative analgesic and recovery outcomes in herniorrhaphy, and assessed other recovery outcomes where reported.

Methods

A systematic review of the available randomized controlled trials (RCTs) using Cochrane protocol was performed. The Medline and EMBASE databases were searched from 1966 to January 2004 for all RCTs and nonrandomized studies investigating regional analgesic techniques following adult herniorrhaphy. A total of 61 studies were identified, and 43 (some studies investigated more than one technique) were included in this analysis.

A meta-analytic approach was used to compare both analgesic and non-analgesic outcomes. Data were analyzed by the Review Manager (RevMan) Version 5.3, Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2011, with fixed-effects or random-effects models as appropriate.

Only studies that showed pain relief following hernia repair are considered in this discussion.

Table 1. PROSPECT definitions of LA injection techniques

- Terminology and descriptions of LA techniques were inconsistent between studies.
- Most studies of LA application described methods that combined two or more LA injection techniques, according to the definitions used by PROSPECT.

Table 2. Qualitative results of systematic review

- LA injection techniques reduce pain and supplementary analgesic requirements compared with placebo, whether given before or after incision.
- LA injection for operative analgesia provides superior postoperative analgesia compared with general or neuraxial anaesthesia, reduces the length of hospital stay and incidence of nausea or sore throat compared with general anaesthesia, and reduces the incidence of urinary retention compared with spinal analgesia.
- For perineural nerve block, LA injection, and application of NSAIDs, clonidine or opioids, data are more limited or inconclusive.

Results

Figure 1. Systematic review of analgesic effects of regional analgesic techniques following adult herniorrhaphy

- The majority of studies assessed LA injection techniques for analgesia or operative anaesthesia.
- Infiltration or topical gel (n=2)
- LA instillation (no needles), Placebo (2/2)
- Intra-operative LA instillation without needles reduced pain.
- Field block
- Discrete nerve block at the site of the ilioinguinal, iliohypogastric and/or genitofemoral nerve

Figure 2. Overview of systematic review: The majority of studies assessed LA injection techniques for analgesia or operative anaesthesia.

- LA, local anaesthetic; SA, spinal anaesthesia; EA, epidural anaesthesia; NSAID, nonsteroidal anti-inflammatory drug.

Figure 3. All twelve studies that compared pre-/intra-operative LA injection techniques with placebo showed a reduction in pain scores, recorded at various times postoperatively; of these, nine studies showed a significant benefit at 0–6 h.

Figure 4. LA injection for anaesthesia versus GA.

- Metaanalyses showed a significant benefit of LA injection techniques for reducing pain scores at rest at (A) 1 h and (B) 24 h, and (C) on movement at 24 h.

Conclusions

- LA injection techniques are effective for postoperative analgesia, particularly during the first 6 hours after surgery, whether administered pre- or intra-operatively.
- LA injection for operative anaesthesia provides superior postoperative analgesia and other recovery benefits compared with general or neuraxial anaesthesia.
- Intra-operative LA instillation without needles reduced pain scores, but data are limited.
- There is evidence that the intraoperative LA injection is safe, even after a catheter, reduces postoperative pain. However, further studies are warranted to investigate the potential risks and benefits of this technique.
- There is little evidence to support the use of perineural nerve blocks or local application of NSAIDs, clonidine or opioids.

Pain following hernia repair: Which regional analgesic techniques?
### Regional analgesic techniques studied

| Control | Placebo | LA injection, at-closure | Placebo | LA injection, pre-operative | Placebo | LA injection, pre-operative | Placebo | LA injection ± GA | Placebo | Peripheral nerve block | Placebo | LA analgesic techniques | Placebo | Operative anaesthesia techniques | Placebo | Other regional analgesic techniques | Placebo | Systemic NSAID | Placebo | Systemic clonidine | Placebo | Systemic opioid | Placebo | Other regional analgesic techniques | Placebo | Systemic opioid | Placebo | Other regional analgesic techniques | Placebo | Systemic opioid |
| LA injection, pre/intra-operative 1,19,20 | LA injection, pre-operative 1,21,22 | LA instillation (no needles), intra-operative 16,17 | LA instillation, at-closure 18 | Postoperative LA infusion 19–21 | Paravertebral nerve block 22 | Bolus LA at the surgical site, postoperative 23,24 | **Regional analgesic techniques** | **Control** | **Placebo** | **LA injection, at-closure** | **Placebo** | **LA injection, pre-operative** | **Placebo** | **LA injection, pre-operative** | **Placebo** | **LA injection ± GA** | **Placebo** | **Peripheral nerve block** | **Placebo** | **LA analgesic techniques** | **Placebo** | **Operative anaesthesia techniques** | **Placebo** | **Other regional analgesic techniques** | **Placebo** | **Systemic NSAID** | **Placebo** | **Systemic clonidine** | **Placebo** | **Systemic opioid** | **Placebo** | **Other regional analgesic techniques** | **Placebo** | **Systemic opioid** |
| LA: local anaesthetic | GA: general anaesthesia | SA: spinal anaesthesia | EA: epidural anaesthesia | **References** |