THE IMPACT OF POSTOPERATIVE EPIDURAL ANALGESIA ON BOWEL FUNCTION: IS THERE A GOOD PROTOCOL?

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The impact of neuraxial techniques and substances commonly involved with them upon the function of the bowel is still subject of debate. Considering bowel function, this is mostly affected by postoperative analgesic techniques and may affect the duration of the hospital stay.

The finding that epidural analgesia for postoperative analgesia may accelerate the recovery of bowel motility goes back to the eighties (1). At first sight this may seem logical as local anesthetics (LA) may block the orthosympathetic efferents allowing the vagal nerve to receive a predominant role. Similar effects should not be expected by replacing LA by opioids (1). At the same time surgeons pretended that due to bowel constriction the anastomosis might be more difficult to make while, based on incidental reports, it was even suggested that faster recovery of bowel motility might be responsible for premature rupture of the anastomosis (2). The use of neostigmine was thought to be an additional risk while larger water content of the anastomosis was a possible hypothesis for its inferior quality. However, a meta-analysis could not reveal any enhanced risk with epidural use of LA (3). In animal models it was shown that the water mostly accumulates in the mesenterium, not in the bowel itself, and that the quality of the anastomosis might be even improved due to more collagen content, as found by authors (previously warning against epidural use postoperatively) but this was not confirmed by others (4,5). Actually, some studies have even found

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decreased leakage incidence of the anastomosis in patients treated with epidural analgesia (5,6).

An additional concern, though still unclear and conflicting, has been the hypothesis that a limited thoracic epidural may block the sympathetic outflow in the blocked segments while compensation-wise increasing the outflow to other segments and bowel parts, thus decreasing the blood supply in that particular area and rather endangering than improving anastomotic healing (7). However this issue was contested in instrumented dogs (8). Others found that perfusion to the mucosa might be diverted to the muscularis layer (9). Much will depend on the hemodynamic effect of the epidural, the location and extent of the epidural and/or the presence of epinephrine in the mixture.

As since the early nineties opioids were commonly added to the local anesthetic, it may become less clear what may be the net result of such combination with the mixing of counterproductive substances with respect to their effects upon the bowel even if few studies found that epidural morphine may also shorten, albeit less than LA, bowel recovery time (10). Even if the additional effect of the epidural opioid remains unsettled, we should agree that opioids will prolong the time to first bowel activity or in the best case have no effect.

When reviewing the literature, epidural analgesia, as compared to conventional pain therapy including intravenous PCA, may indeed provide superior analgesia and accelerate the appearance of first bowel sounds or first flatus (11-20). This faster return of bowel activity, as far as demonstrable, was mostly in the range of 0.5-2 days maximally while in the majority of studies and reviews this was not necessarily reflected in faster home discharge, demonstrating that other factors may play a role in this (13, 16-18, 20). Not surprisingly, one study even found a slower return of bowel activity with epidurals as compared to spinal anesthesia or PCA (21).

Nevertheless, fast-track protocols became very popular during the last 10-15 years in which epidurals played a predominant role in combination with avoidance of oral opioids, the use of adjuvant substances, non-opioid analgesics and early intake of fluid and solids.

The most commonly added opioids are fentanyl and sufentanil of whom it is known that despite their spinal effect, total doses, plasma-concentrations and side-effects after prolonged administration (continuous infusion) are similar to intravenous administration, but with a moderate dose-sparing when given by PCEA as compared to PCIA. This dose sparing (25-33%) may be insufficient to affect bowel motility. This compares to the addition of NSAIDs to parenteral morphine which also results in a 30-40% dose sparing,

equally insufficient to accelerate bowel recovery. The bowel is very sensitive with respect to inhibitory effects of opioids as ileus will appear faster than the analgesic effects. The analgesic/constipation ratio seems to be 4:1. At least 60% opioid dose sparing should be mandatory before this might have a positive effect upon bowel motility. Therefore the commonly realized dose-sparing effect of <40% is not enough in this context. In fact only morphine may appear to cause enormous dose-sparing when changing from the parenteral route to the epidural route. The most spectacular acceleration of bowel function recovery, first food intake and hospital discharge i.e. 4-6 days has been reported in oncological abdominal surgery and used morphine in the epidural mixture (22,23). Addition of morphine 0.1mg/h i.e. 2.4mg /day seems to be sufficient to improve LA induced analgesia (24). Other studies (28), especially those using morphine as the opioid to be combined with a LA, appeared to offer the best results, only occasionally achievable with the more lipophilic substances.

Addition of other substances to the epidural mixture such as epinephrine, clonidine or ketamine is hardly been the focus of studies, if any, with respect to their effects upon bowel activity.

Finally, most authors believe that the discussion with respect to restoration of bowel motility becomes irrelevant due to the conversion to laparoscopic techniques in the first place. Home discharge is faster after laparoscopic procedures in such a way that it may become extremely difficult to demonstrate the effect or additional benefit of the analgesic technique. In the search for alternatives, faster bowel function recovery has been found with intravenous lidocaine infusion as compared to placebo, according to some studies similar to epidural analgesia (25-27). Simultaneously, epidurals are put more and more in a bad daylight as the mostly superior analgesic quality is ignored while the drawbacks of epidurals, though well-known for decades, are suddenly highlighted such as hypotension, pruritus, urinary retention, reduced bowel perfusion and costs.

In conclusion, more studies are mandatory to clear out possible beneficial or rather endangering effects of epidural analgesia upon the healing and strength of the anastomosis, the effects of adding opioids or other adjuvant substances to the local anesthetic in the epidural mixture upon the proven benefit of the latter upon bowel motility, risk/benefit ratio of placing epidurals for laparoscopic procedures and the effects of alternative, less invasive techniques upon bowel function while providing equal analgesic quality. Last but not least, surgeons should be encouraged to determine more clear hospital discharge criteria i.e. home-readiness milestones even if the patient stays in the hospital, based on an individual patient check-list rather than

inspired by tradition, fixed length of stay for a certain procedure, hospital/regional policy, pre-interventional information given to the patient or patient expectations.

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