

# Epidural block and neostigmine cause anastomosis leak

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## Dear editor

I read the article by Phillips entitled, “Reducing gastrointestinal anastomotic leak rates: review of challenges and solutions”, published in the journal of *Open Access Surgery* with enthusiasm and found it crucial for perioperative management of patients with gastrointestinal (GI) surgery, particularly anastomosis. I appreciate the author’s exhaustive search of literature and discussion with some limitation on review basics like methodology, which may affect the reliability of the review findings. The effects of risk factors for anastomosis leak, such as malnutrition, smoking, steroid use, bowel preparation, chemotherapy, duration of surgery, use of pressors, intravenous fluid administration, blood transfusion, and surgical anastomotic technique, were well discussed.<sup>1</sup> However, from anesthesia perspective, there are some other well-studied risk factors that can affect healing of anastomosis wound and cause anastomosis leak. Among others, the effect of neostigmine and epidural block has been reported in many studies since half a century ago.

## Summaries Neostigmine

Neostigmine has commonly been used for reversal of nondepolarizing neuromuscular blockade during general anesthesia. Being an anticholinesterase, neostigmine increases GI motility through the muscarinic effect of acetylcholine.<sup>2</sup> Although atropine is known to oppose the muscarinic effect of neostigmine, anastomosis leak was reported in patients who were injected both neostigmine alone and neostigmine combined with atropine for GI surgery.<sup>3</sup> This adverse effect of neostigmine can be minimized by using halothane anesthesia.<sup>4</sup> Moreover, administration of neostigmine increased the rate of anastomosis leak from 4% to 36%.<sup>5</sup>

## Epidural

Epidural block is used for the perioperative pain management of surgical patients. When it is used for GI surgeries, epidural block has several clinical benefits similar to high spinal blocks.<sup>6-8</sup> However, thoracic epidural block with local anesthetics increases the GI motility, mainly through blocking sympathetic fibers and causing unopposed dominance of the parasympathetic effects.<sup>9</sup> For the perioperative use of vasopressors reported as a risk factor for anastomosis leak,<sup>1</sup> epidural block-induced hypotension

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and shock are some of the main reasons. Results of a review showed that epidural block increased anastomosis risk from 3.4% to 6.0%.<sup>10</sup>

The risk of anastomotic leak can be reduced if all perioperative factors are controlled. Among the perioperative factors, anesthesia-related one should not be overlooked. Use of neostigmine can be minimized by using a depolarizing muscle relaxant that normally does not need reversal with neostigmine. Maintenance of analgesia with epidural opioids also avoids excessive use of local anesthetics that persistently block sympathetic fibers. Finally, challenges and solutions of anastomosis leak should consider the aforementioned factors in reviews to come up with best results and recommendations.

## Disclosure

The author reports no conflicts of interest in this communication.

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