RA TECHNIQUES IN SPINE SURGERY: TARGETING A DECREASE IN THE USE OF MORPHINE DERIVATES

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The number of spine surgeries being performed has exponentially increased in the last two decades. This rapid growth is mainly attributed to the epidemic of chronic low back pain in developed countries, as well as the introduction of minimally invasive surgical technique that allows more complex spine procedures to be performed safely. Many institutes have protocolized their perioperative management of patients undergoing spine surgery.

However, a widely accepted enhanced recovery after surgery (ERAS) pathway for spine surgery has yet to be developed. Early studies suggested ERAS spine protocol enables faster recovery, increased patient satisfaction, reduction of hospital length of stay and healthcare expenditure. There are three major anesthetic considerations for adult patients undergoing complex spine surgery, namely: blood loss, pain management, and position-related complications.

Complex spine surgery was ranked among the top six most painful procedures. Poor pain control has been shown to be associated with increased risks of wound healing, hospital-acquired infections, length of stay, and delayed mobilization. Pain following spine surgery can result from mechanical irritation, nerve compression, or postoperative inflammatory processes. It can be generated from different structures such as vertebrae, discs, ligaments, muscles, dural sleeves, and capsules of the facet joint. Innervation of these pain generators is from the dorsal rami of spinal nerves. Opioids are commonly used as effective analgesics for the management of severe pain disorders. However, their widespread use is restricted because of their side effects such as nausea, vomiting, and respiratory distress, and acquired tolerance.

Preemptive multimodal analgesic regimens that rely on the synergistic action of nonopioid agents given in lower doses have been used to improve postoperative pain management and reduce opioid consumption. Protocols for reducing pain after lumbar surgery recommend the use of regional anesthesia techniques to reduce opioid analgesic use to the minimum. Interfascial plane blocks have the potential to provide extended postoperative analgesia and to reduce opioid consumption and neuraxial-related motor block to a minimum.

In order to reduce opioid use, loco-regional and local anesthesia were introduced. In spine surgery, loco-regional techniques were limited to epidural catheters and spinal and epidural morphine. Neuromuscular block and peripheral nerve block of the ventral ramus of the spinal nerves have gained in popularity and have been used to provide effective analgesia for a variety of surgeries, including spine surgery. The Toracolumbar interfascia plane (TLIP) block was first described by Hand et al. in 2016 as an easy, safe way of providing analgesia for lumbar spine surgery, decrease postoperative VAS scores, and reduce opioid consumption after lumbar spine surgery. In addition, the TLIP block significantly reduces the side effects of nausea. Further studies are needed to testify these benefits, and more high-quality RCTs are still necessary and urgently required for further research.

Ultrasound-guided erector spinae plane blockade (ESP) was first developed by Forero in 2016 as an easy, safe way of managing thoracic neuropathic pain. Since that time, this block has gained in popularity and has been used to effectively provide analgesia for a variety of surgeries, including spine surgery. Theoretically, inflammation between the erector spinae muscle and the transverse process provides anesthesia of the dorsal ramus at the same vertebral level. Since the local anesthetic is injected into a plane, the solution can spread both caudally and cranially via the thoracic fascia, resulting in anesthesia of the dorsal ramus of the spinal nerves above and below the injected level. Potential benefits of the lumbar ESP include the ease of performance with clear landmarks for ultrasound anatomy. The technique is inherently safe, as the target site for injection is a muscular plane and there is practically no risk for mechanical nerve contact. Other benefits include the possible reduction in perioperative opioid consumption. The ESP is performed in patients under anticoagulant therapy or with coagulopathies. Furthermore, hemodynamic instability due to sympathetic blockade, as with epidural and spinal anesthesia, occurs rarely. Possible risks...
consist primarily of local anesthetic systemic toxicity. Since substantial doses are considered necessary, there is a clinically significant risk for local anesthetic systemic toxicity, as with any high-voltage fascial block. For this reason, patients need to be monitored according to American Society of Regional Anesthesia guidelines with Intralipid available at all times.

Some meta-analysis demonstrates that ESP is effective in reducing postoperative pain intensity and postoperative opioid consumption in spine surgery. Furthermore, ESP is easy to perform and has few complications. Therefore, for the management of postoperative pain following spine surgery, preoperative ESP is a good choice. More studies are still needed in order to explore doce.

Both the ESPB and TLIP blocks have shown to provide adequate analgesia after lumbar spinal surgery. Clinicians can choose either the TLIP block or the ESPB for pain control after lumbar spinal surgery based on their clinical experience and choice. Currently there is no consensus as to the superiority of one over the other.

Retrolaminar block (RLB) was first reported in 2006 as an alternative approach to PVB. RLB is performed with US imaging or the landmark technique. The needle is inserted at a puncture site 1–1.5 cm lateral to the target spinous process and advanced caudally or cranially until it contacts the lamina. Local anesthetics are injected on the lamina at doses of 20–30 ml. RLB can be performed with the US-guided, in-plane insertion technique. The sagittal plane with a linear US probe allows for visualization of the laminae or transversus process, and the needle is advanced using the in-plane technique.

The retrolaminar block has been successfully used in spinal surgery, although the large number of publications that we have on the ESP block have left this approach relegated.

Although everything indicates that regional techniques will be a fundamental pillar in ERAS protocols for spinal surgery, there is no consensus regarding which is the best technique to control postoperative pain in these patients. More studies are needed to reach definitive conclusions in this regard.

REFERENCES