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ADVANCES IN ANESTHESIA

Evidence Basis and Practical Management of Postoperative Thoracic Epidural Analgesia

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Key points

- Thoracic epidural analgesia (TEA) after major thoracic or abdominal surgery provides documented benefits that improve physiologic recovery and increase patient satisfaction.
- The decision to use TEA should be made in the context of rapidly changing practice protocols and alternative approaches that are designed to enhance the patient recovery process.
- The effectiveness of TEA is improved by dedicated protocols that include interventions to minimize catheter malfunction and side effects and maximize analgesic effectiveness.
- Thoracic epidural catheter management is a dynamic process that requires a balance of team-based protocols and ongoing patient-specific decision making.

EVOLUTION OF THORACIC EPIDURAL ANALGESIA

The current role of anesthetic management in surgical recovery was foreshadowed at the start of the twentieth century when George Crile, surgeon and a Cleveland Clinic founder, advocated his technique of "anoci-association" to

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improve surgical outcomes [1,2]. The parallels between Crile's approach to surgical recovery and current practice are remarkable:

Components of Crile's Anoci-association	Crile's approach Circa 1915	Current Approach Circa 2015
Minimize surgical trauma	Gentle manipulation, sharp dissection	Laparoscopic, robot-assisted surgery
Minimize patient stress response	Liberal injections of local anesthetic	Use of epidural and regional blocks
Minimize postoperative pain	Neurolytic blocks after surgery	Continuous catheter and multimodal analgesia techniques
Minimize effect of general anesthesia	Use nitrous oxide, avoid ether	Electroencephalogram-guided anesthesia, total intravenous anesthesia

During the 1930s and 1940s, Walter Cannon [3] and Hans Selye [4] provided the physiologic underpinnings for Crile's results with the introduction of their concepts of "homeostasis" and "stress," respectively. The next advance took place when what might be called the modern era of perioperative anesthetic management became a reality in the 1970s. By then administration of local anesthetics into the epidural space to provide surgical or obstetric anesthesia had been known for decades. In the 1970s, adoption of thoracic epidural anesthesia and TEA into clinical practice became a reality with (1) improvements in epidural catheter design, (2) case series reports of postoperative epidural analgesia [5,6], and (3) the publication of Bromage's classic textbook on epidural analgesia [7].

Shortly thereafter the introduction of neuraxial analgesia [8] and, more recently, the development of hospital-based acute pain services (APSs) [9] have furthered the popularity of TEA. With the constant and rapid introduction of new techniques and surgical approaches, TEA remains an evolving practice that requires continuous evaluation, re-evaluation, and adaptation.

CURRENT PRACTICE

Many profoundly important changes in surgical care have appeared in rapid succession coincident with changes in management of postoperative pain. Some of the more obvious developments that should be incorporated into a contemporary decision-making paradigm include

- Widespread use of laparoscopic and thoracoscopic techniques for major surgery
- Development of enhanced recovery after surgery (ERAS) protocols for specific procedures
- Acceptances of alternative techniques for postoperative analgesia, such as transversus abdominis plane (TAP) blocks and thoracic paraveterbral blocks
- Widespread use of ultrasound guidance to improve the efficacy of peripheral nerve blocks