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Clinical differences in spinal opioid efficacy

The case report describes a patient who presented with two simultaneously-occurring but distinct pain syndromes. Epidural morphine controlled the pain from the abdominoperineal resection, while the pain from a deep venous thrombosis was not masked. Such differential effects of epidural morphine on pain of varying origin supports physiological observations on the specificity of the site of action of spinal opioids.

Epidural narcotics can be administered for various types of acute and chronic pain conditions.¹⁻⁶ However, compared with other treatment modalities, their use is unique in that profound pain relief may be demonstrated in certain circumstances, but not in others. This case report describes a patient who presented with two simultaneously occurring but distinct pain syndromes, and who exhibited differential benefit from epidural morphine.

Case report

A 53-year-old 63 kg caucasian woman, a former anaesthetic nurse, was scheduled for total proctocolectomy with Koch's pouch formation. She was in good general condition despite a 15-year history of ulcerative colitis treated with steroids and nutritional supplements. Previously she had had two general anaesthetics without problems being noted. However, there was a history of thrombophlebitis complicating her multiple pregnancies. Preoperative laboratory investigation included normal haemoglobin concentration and coagulation profile.

During the preanaesthetic visit she consented to receive a balanced anaesthetic employing an epidural catheter, in concert with a general anaesthetic for comfort. She was premedicated with lorazepam 3 mg PO and was brought to the anaesthetic induction room in a relaxed condition.

Key words

ANAESTHETIC TECHNIQUES: epidural, opiates;
COMPLICATIONS: thrombosis; PAIN: postoperative;
PHARMACOLOGY: narcotics, spinal; VEINS:
thrombophlebitis.

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After appropriate monitoring was established, an epidural catheter was placed at the L₂₋₃ space with no blood, CSF or paraesthesia detected. The epidural catheter was advanced 4 cm, then its position was tested with 3 ml of 0.5 per cent bupivacaine with adrenaline 1:200,000. Conduction anaesthesia was established with incremental injections to a total dose of 25 ml 0.5 per cent bupivacaine with adrenaline 1:200,000. Anaesthesia was demonstrable to a T8 level. The patient was then taken to the operating room, anaesthesia was induced with thiopentone and her trachea was intubated with the aid of vecuronium. Anaesthesia was maintained with N₂O/O₂ with one per cent halothane inspired. She was placed in the lithotomy position with 15° Trendelenburg for the duration of the procedure. Since she responded to the upper abdominal incision, CO₂ lidocaine with adrenaline 1:200,000, 10 ml, was injected via the epidural catheter. After 3½ hours, 5 mg epidural morphine was injected. Total anaesthetic time was six hours and she was extubated awake.

In the Recovery Room the patient was given 3 mg morphine IV for moderate discomfort. After satisfactory recovery, she was transferred to the Observation Unit for further monitoring while epidural morphine 5 mg q8h was employed.

The following morning the patient was alert and oriented but complained of right leg and calf pain. The right calf was swollen, tender and a positive Homan's sign was elicited. A venogram confirmed deep venous thrombosis. In spite of the findings, the surgeon elected not to anticoagulate the patient. At the same time she denied either abdominal or perineal pain. The same situation continued with respect to her pain until the third postoperative day when the epidural morphine was discontinued. On the fourth postoperative day, she developed abdominal discomfort that was effectively managed by intramuscular meperidine. Meperidine alleviated her pain from deep venous thrombosis as well. Unfortunately, the meperidine therapy was complicated by confusion and disorientation, and was discontinued. Her subsequent recovery was uneventful (Table).

Discussion

There are clinical differences in spinal opioid efficacy. This case clearly showed that epidural morphine did not mask pain from deep venous thrombosis, while at the

same time it did provide excellent pain relief after abdominoperineal resection.

The rationale for the use of epidural opioids is based upon the theory that pain modulating systems exist at the spinal cord level.⁷⁻¹⁰ The substantia gelatinosa is particularly rich in pre- and postsynaptic opioid receptors which are stimulated in the physiological state by enkephalins. Enkephalins in turn inhibit release of substance P which is a known pain neurotransmitter.⁴ While opioid receptors and enkephalins are also involved in pain modulation at higher levels of the central nervous system, their accessibility at the spinal cord makes their pharmacological stimulation attractive.

Little is known about the efficacy of spinal opioids in different pain syndromes, although variations are common.¹¹ It is said that dull pain is blocked better with epidural morphine than sharp, acute pain. This may have a physiological explanation because epidural morphine has been shown to be efficacious in reducing dull pain transmitted by C" fibres and of questionable value in relieving acute, sharp pain transmitted by an "A-delta" fibres.⁹ One possible explanation is differential fibre stimulation related to activation of different classes of nociceptors. Alternatively, there may be a differential effect of opioids on subpopulations of opioid receptors located in the substantia gelatinosa.¹² Finally, modulation at the spinal cord level of pain-coding information by bulbospinal adrenergic pathways, adenosine, neurotensin, cholinergic receptors, GABA and somatostatin has to be considered.¹²

In this case epidural morphine did not mask the pain from deep venous thrombosis while providing full relief from the pain due to the abdominoperineal resection. If this report is confirmed by similar observations in other patients with deep venous thrombosis, it may suggest a further advantage of epidural opiates over systemic narcotics in providing analgesia for surgical patients at risk of this complication.

In summary, this report illustrates a differential effect of epidural morphine on pain of various aetiologies occurring in a single patient, and lends support to the clinical efficacy of this technique in defined pain syndromes.

TABLE: Effects of epidural morphine 5 mg q8h on abdominal and calf pain.

	OR Day	1st Day	2nd Day	3rd Day	4th Day
Epidural morphine	Yes	Yes	Yes	No	No
Abdominal pain	Yes	No	No	No	Yes
Calf pain	No	Yes	Yes	Yes	Yes

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Résumé

Voici l'histoire d'une patiente souffrant simultanément de deux types de douleur distincts. Nous avons réussi à soulager la douleur causée par une résection abdomino-périnéale du rectum avec de la morphine par voie péridurale, sans toutefois occulter la douleur associée à une thrombophlébite profonde. L'effet sélectif de la morphine péridurale sur des douleurs d'origines diverses peut trouver son explication dans l'existence de plusieurs sites d'action spécifiques au niveau rachidien.