ANALGESIA SUBDURAL – HAVERÁ LUGAR PARA ESTE TIPO DE ANALGESIA?

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Palavras-chave:
- Analgesia Epidural;
- Espaço Subdural

Resumo

As injeções subdurais permanecem uma complicação pouco reconhecida da anestesia do neuroeixo.

Este caso refere-se a um homem de 81 anos, ASA II, com fratura de múltiplas costelas, em que se efetuou tentativa de colocação de um cateter epidural torácico para analgesia.

Após administração de 5 mL de ropivacaína 0,2% pelo cateter foi iniciada uma perfusão a 5 mL/h. Vinte minutos depois o doente apresentava um bloqueio sensitivo alto, sem evidência de bloqueio motor. Foi efetuada uma radiografia do tórax que confirmou o posicionamento subdural do cateter.

O cateter foi deixado no espaço subdural e a perfusão foi alterada para ropicavaína 0,1% a 2 mL/h, tendo o doente permanecido hemodinamicamente estável, com dor controlada, sem necessidade de analgesia de resgate, desperto e sem depressão respiratória.

Existe evidência que suporta o uso de cateteres acidentalmente inseridos no espaço subdural para administração de analgesia contínua, já que na tentativa de efetuar nova técnica epidural, o cateter pode posicionar-se novamente no espaço subdural.

O anestesista deve estar alerta para possíveis complicações que podem resultar da manutenção de um cateter no espaço subdural.

SUBDURAL ANALGESIA - IS THERE A ROLE FOR THAT KIND OF ANALGESIA?

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Keywords:
- *Analgesia, Epidural*
- *Subdural Space;*

Abstract

Subdural injections remain a less well recognized complication of neuraxial anesthesia.

We attempted to do a continuous thoracic epidural block for analgesia after traumatic multiple rib fractures. 5 mL of ropivacaine 0.2% was given and an infusion started at 5 mL/h. Twenty minutes after, the patient presented symptoms of high sensory block, with no evidence of motor weakness. Subdural catheter position was radiologically confirmed by a thoracic x-ray.

The catheter was left in the subdural space and the infusion was changed to ropivacaine 0.1% at 2 mL/h and the patient remained hemodynamically stable, maintaining pain control, with no need for supplemental analgesia, and without any sedative effects or respiratory depression.

There is evidence to support the use of inadvertently inserted subdural catheters to provide continued analgesia. The attempt of an additional epidural placement may be unsuccessful and the subdural placement may recur. However, the anesthetist must be aware of possible complications.

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INTRODUCTION

According to Collier, when performing an epidural block there are four possible sites into which an epidural needle or catheter may be unintentionally placed: intravascular, subarachnoid, subdural and intradural.[1,2] Subdural injections are well documented in radiologic literature for many years. The first case of accidental subdural block in anesthetic practice was published in 1969, but a radiologically confirmed subdural was only reported in 1975.[3]

Collier[2] defends that there is no single subdural space, but

rather multiple potential "subdural planes" that result from trauma to the arachnoid, which is corroborated by a recent study carried out by Reina *et al*[4] that assigns those "acquired subdural spaces" at the reduced number of specialized junctions among neurothelial cells that seal the dura-arachnoid interface. Moore *et al*[5] add that the position of the catheter in these planes may determine the spread of injectate and the subsequent clinical manifestations.

CASE REPORT

A thoracic epidural block was attempted for analgesia after the diagnosis of traumatic multiple rib fractures on an 81 year-old male, with history of hypertension, dyslipidemia and thrombophlebitis on the right leg and with no anesthetic complications related to previous surgeries.

Epidural catheter insertion technique consisted of right lateral position and paramedian approach at T4-5 interspace. Epidural space was identified on first attempt, by an experienced anesthetist, with 18 G Tuohy needle by loss of resistance to air technique, at 8 cm. The needle was introduced with the bevel pointed cephalad, and no rotation was made. A 20 G multi-orifice epidural catheter was introduced 5 cm into the epidural space and secured with adhesive dressing at 13 cm mark after negative aspiration test for blood and cerebrospinal fluid.

A test dose consisting in 3 mL lidocaine 2% with adrenaline was given after negative aspiration and it was negative for intravascular and intrathecal position. An inicial 5 mL of ropivacaine 0.2% bolus was administered, followed by an infusion of ropivacaine 0.2% at 5 mL/h. Twenty minutes after, patient started to complain of decreased sensation of the lower body, tongue paresthesia, dysarthria, hypotension (73/25 mmHg) and bradycardia (35 bpm). No evidence of motor weakness was observed. Signs and symptoms were fully reverted with iv ephedrine (40 mg), iv atropine (0.5 mg) and local anesthetic infusion suspension. Fifteen minutes after the infusion was stopped, no pin-prick sensation loss was detected. A further aspiration test was negative.

The catheter position was radiologically confirmed with a thoracic x-ray with contrast administration through the catheter, which showed a contrast spread compatible with a subdural catheter position, with "railroad track" appearance and longitudinal cephalad distribution (Fig. 1).

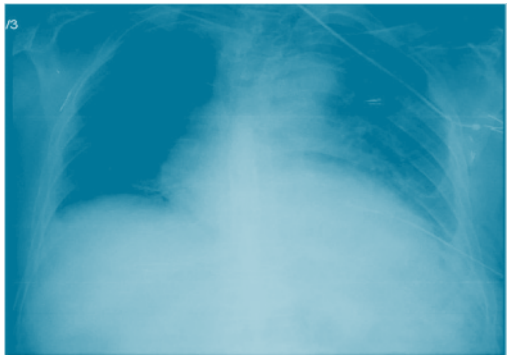

Figure 1: Thoracic x-ray with contrast administration through the catheter.

We chose to change the ropivacaine infusion to 0.1% at 2 mL/h. Perfusion was maintained during 48 h and the patient remained hemodynamically stable, with controlled pain and without new abnormal sensibility loss episodes.

DISCUSSION

Although a number of case reports of accidental subdural injection have been published, the incidence of this complication after epidural is considered low.[6]

Many factors are recognized that may predispose to a subdural blockade: the use of long-beveled needle, the use of multi-hole epidural catheters, needle rotation, obstetric patients, previous back surgery or recent lumbar puncture.[1,2] In our clinical report, the multi-hole catheter could have contributed to subdural catheter placement.

A subdural block should be considered when there is: negative cerebral spinal fluid aspiration test; extensive spread of sensory or motor blockade with small doses of local anesthetic; poor quality nerve block, as segmental distribution, delayed onset and short duration of motor blockade.[1,2,5]

Epidural catheters may also migrate to subdural space after initial successful epidural analgesia and there should be a high level of suspicion, since epidural blocks seem more likely to produce accidental subdural injection than spinal blocks.[1]

As in our case, the subdural block usually has a slow onset (15 to 20 minutes) and commonly lasts for up to 2 hours, followed by a full recovery. The sensory block is usually high and disproportionate to the volume of drug injected.[5] On the other hand, in some case reports, inadequate or completely absent sensory block is obtained.[7]

Motor and sympathetic fibers are commonly spared due minimal spread of local anesthetic to the ventral nerve roots.[4] These findings explain the easily treated hypotension, as well as the absent of motor and respiratory weakness, in our patient, in opposition to the total spinal blockade, in which the paralysis occurs abruptly, resulting in sudden apnea.[1,8] Although these are the characteristics most frequently observed, there are reports of very distinct manifestations.[6,9] Subdural block presentation depends on the local anesthetic spread, which is conditioned by the anatomic variability that occurs in this space. This justifies the great heterogeneity of clinical manifestations, making it difficult to be diagnosed.[4,6]

Complications of subdural injections are mainly related to the lower capacity of this space, since a small volume of fluid can produce a significant space-occupying lesion and cause neural damage,[6] or can rupture the arachnoid membrane, and can cause a total spinal block.[8]

The presence of deliberately injected contrast in the subdural space is required to confirm the subdural catheter placement..[6] Mostly of the subdural injections contrast is seen as a dense collection confined to the posterior aspect of the spinal canal, typically with a great longitudinal extent and spreading mainly in a cephalad direction.[5] The spread is not affected by a change in posture and can be unilateral.[9] This can easily be distinguished from: the subarachnoid space, in which the contrast rapidly descends in the cerebrospinal fluid and appears

less opaque; and from the epidural space because a wide distribution is seen which tends to flow outward through the intervertebral foramina.[6]

There is evidence to support the use of inadvertently inserted subdural catheters to provide continued analgesia,[10-14] as the attempt of an additional epidural placement may be unsuccessful and the subdural placement may recur. The first case, was reported by Miller *et al*[11] in 1989, 1 mg of morphine injected in the subdural space, provided analgesia for 22 h. Chadwick *et al*[2] obtained similar effect with the subdural administration of 2-4 mg morphine, which resulted in 36 h of satisfactory analgesia without any respiratory depression. Collier[13] describes a c-section, in which intraoperative management and postoperative analgesia was provided by a subdural block. Another similar case report[14] describes the effectiveness of 8 mL lidocaine 2% administered in the subdural space in a fractionated manner to perform a c-section, and the maintenance of postoperative analgesia with 2 mg of morphine, without any requirement for supplemental analgesia in the following 36 h, with no respiratory depression or sedative effects. Fukushige[10] used a catheter unintentionally introduced into the subdural space at T7-8 interspace for clinical anesthesia of a gastrectomy and for postoperative analgesia with an infusion of bupivacaine 0.25% at 2 mL/h with no need for supplemental analgesia.

In our case, the administration of ropivacaine 0.2% at 5 mL/h resulted in hypotension, bradicardia and a high sensory block level. When the ropivacaine infusion was reduced to 0.1% at 2 mL/h, no hemodynamic instability was detected, maintaining success in pain control.

Subdural blockade remains a less well recognized complication of neuroaxial anesthesia. It is necessary a high suspicious level, since the test dose, routinely administered, misses the subdural placement position, which may delay the recognition of this complication. The anesthetist should be alert because the early detection can prevent severe complications.

A few reports prove the anesthetic and analgesic efficiency of subdural block, however, there are possible complications, specially the potential total spinal blockade. The fact that most of the reported cases are accidental injections makes it difficult to establish the effective doses with minimal side effects.

Although further studies are needed to improve the knowledge of this clinical entity and clarifying the role of the subdural space in neuraxial anesthesia, we believe that subdural analgesia should be considered an option.

Conflicts of interest

None.

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