

True Knot in Epidural Catheter. Report of a Case

Jorge Andrés Garabito-López*

Resident of Second Year of Neuroanesthesiology, National Institute of Neurology and Neurosurgery "Manuel Velasco Suárez", Mexico City, Mexico

***Corresponding Author:** Jorge Andrés Garabito-López. Resident of Second Year of Neuroanesthesiology, National Institute of Neurology and Neurosurgery "Manuel Velasco Suárez", Mexico City, Mexico.

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Abstract

Epidural anesthesia is a technique that is performed blindly and therefore is not free of complications, among them, a rare complication is the formation of a true knot. We discuss the case of a pregnant woman in whom an epidural block with a true knot formation was placed, which was surgically removed. Conclusion: If an epidural catheter cannot be removed easily, maneuvers described for removal should be applied and imaging studies such as CT or MRI may be used to determine the shape and position of the catheter and whether the catheter has communication with the outside must be extracted surgically.

Keywords: Epidural Anesthesia; Complication; Laminectomy; Knotted Epidural Catheter

Introduction

The use of epidural block is widely used to provide analgesia and anesthesia in various surgical and obstetric procedures, as well as in the treatment of postoperative pain and chronic pain. Since it is an invasive procedure performed blindly, it is not exempt from complications. A rare event secondary to neuraxial block with catheter placement is the formation of a true knot or knot at the tip of the catheter and which may represent a challenge at the time of removal, which may even become surgical.

Clinical Case

A 21-year-old woman scheduled for cesarean section due to pregnancy of 38.4 weeks of gestation + gestational hypertension + cephalo-pelvic disproportion.

Gesta 1, hemotype A +. Laboratories November 12 2013: hemoglobin 10.6 g/dL, hematocrit 34 mL/dL, platelets 336,000/mm³, prothrombin time (TP) 10.3s, partial thromboplastin time (TPT) 27.6s, international normalized ratio (INR) 0.89, leukocytes 10.5 x 10⁹/L, weight 104 kilograms, height 1.70 meters, body mass index (BMI) 35.9 kg/m², heart rate 110 beats per minute, blood pressure 147/88 millimeters of mercury, respiratory rate 18 breaths per minute.

A mixed neuraxial block (epidural/subarachnoid) was performed and the patient was positioned in the left lateral decubitus position. After the sterile technique, puncture was performed in space L3-L4 with Tuohy needle # 17, epidural space was located with Gutierrez drop technique at the first attempt, through the Tuohy needle was inserted Whitacre needle # 27 obtaining clear cerebrospinal fluid (LCR), hyperbaric bupivacaine 7.5 mg/1.5 mL was administered, during the placement of epidural catheter there is resistance to the passage, which solves with a little pushing force, without presenting resistance after its final placement, it is proved permeability and fixed. The patient is positioned supine and Crawford wedge is placed, reaching metameric block T4 with a latency of two minutes.

The transanesthetic occurs without eventualities; seven hours after the anesthetic event, the impossibility of removing the catheter is reported, several unsuccessful attempts were made by specialists in anesthesiology; the patient did not report pain or neurological symptoms.

Magnetic resonance imaging of the lumbar spine was performed, observing the presence of the catheter in the epidural space and surgical removal was decided, exploring the medullary canal (Figure 1).

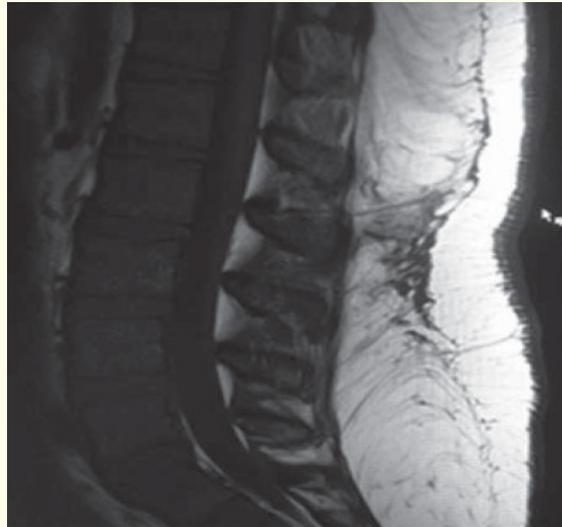


Figure 1: Magnetic resonance, sagittal section, showing the presence of an epidural catheter after an attempt to remove it.

The procedure is performed under general anesthesia with sevoflurane as the inhaled agent, ventral decubitus position, having as a reference the disabled catheter; a lumbar midline incision is made, and then dissected by planes, the epidural catheter is located in the yellow ligament at the level of L3-L4, extracting it, confirming the presence of a true knot approximately 2 - 3 cm from the distal end of the catheter (Figure 2-5). Transanesthetic period attends without eventualities, closing by planes, postsurgical period runs without eventualities and then passes stable to gynecology-obstetrics floor.



Figure 2: The catheter is shown prior to the incision for removal.



Figure 3: Incision by planes until reaching the binding site by means of a lumbar midline approach.



Figure 4: Removal of an epidural catheter with the presence of a true knot in the distal part.



Figure 5: Knotting at approximately 2 cm from the distal part of the epidural catheter.

The patient remained under observation for two days without the presence of sensory-motor alterations, which is why we decided to discharge from the anesthesiology, neurosurgery and obstetrics-gynecology department.

Discussion

Among the complications of the epidural block we can cite: inadvertent puncture of the dura, placement of the anesthetic agent within the vascular or intrathecal space, the impossibility of placing the catheter in the epidural space, the formation of a knot, and rupture of the catheter.

The entrapment incidence of the epidural catheter is low and it is estimated at 0.003 to 0.005% [1]; The incidence of epidural catheter knotting is difficult to estimate, since most cases of knotting reported in the literature are only case reports in patients for obstetric analgesia as in neuraxial block 0.0015% [2,3], with the formation of knots in the last 3 centimeters to the catheter (distal part) [4].

The most important risk factor for the formation of a knot is the length of the catheter introduced, although this measure has been controversial, being more likely to appear when the catheter is introduced more than 5 cm in the epidural space. It is considered as a safety range between 3 and 4 cm, but knotting has been reported in the literature at 1.5 cm distance from the tip of the catheter; Another question to consider is the flexibility of the catheter and the material from which it is made [4,5].

Several maneuvers have been recommended at the time of having difficulty for the removal of the epidural catheter once it has been tried and resistance to its exit has been found, among which have been postulated [2]:

1. Perform slow movements, continuous and with a constant pressure to avoid rupture, having to apply a force of between 130 to 1,000g. It has been reported cases where 0.5g of traction force has been applied to the epidural catheter presenting rupture, being that in most of the literature it is mentioned that from the 2.6 kg of traction force the rupture of the same occurs.
2. Try to remove the catheter at least one hour later.
3. Telling the patient to adopt the same position in which the catheter was placed during the extraction maneuver.
4. Telling the patient to adopt the lateral decubitus position.
5. Introduction of saline solution through the catheter in order to maintain a constant internal diameter, turgid and lubricated that allows to slide more easily.

Surgical removal of the epidural catheter is indicated in cases of symptoms of irritation to nerve structures or that the epidural catheter has communication with outer space due to the risk of infection to the central nervous system.

Conclusion

Despite being the most used anesthetic technique, it is still a blind technique, which entails risks and complications, which are underestimated for several reasons, among which are the failure to report such cases and the lack of knowledge for the resolution of this complication. The guidelines for their withdrawal must be present in each procedure performed and the withdrawal must be exclusive of the anesthesiology department of each institution.

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