

Sequestered caudal catheter in a child: An anesthetic nightmare and surgical dilemma

ABSTRACT

The usage of epidural infusion for intraoperative and postoperative pain relief is widely used in certain pediatric anesthetic practice because of the effectiveness and advantages. However, there is drawback for these techniques due to its potential complications such as inadvertent intrathecal placement, local anesthetic toxicity, catheter migration, infection, and breakage of epidural catheter. Though occur infrequently, epidural catheters have been known to snap during insertion or removal. The retained catheter tip may lead to multiple complications, including nerve injury, infection, and even catheter migration. Although there are literatures recommend options for management of removal of retained catheter, there are limited reports of these occurrences, especially among children. We report a case of sequestered sheared epidural catheter segment in a child, aiming to share this experience for the future management of patients under similar condition.

Key words: Breakage; children; retained caudal catheter; sequestered; sheared

Introduction

Caudal epidural analgesia is widely used in certain pediatric anesthetic practice because for its effectiveness of pain relief. The avoidance of opioids has an advantage on respiratory function. Epidural catheters are usually removed without complications. On some rare occasions, excessive tension may cause breakage.^[1-4] In these occasions, there is a lack of guidelines and small number of cases reported, especially in pediatric age group. Hence, it becomes a dilemma to decide whether to leave or surgically remove^[1] the sequestered catheter.^[5] This report aims to share an experience in this setting.

Case Report

This was a case of a 2-year-old girl, who was born full term via spontaneous vaginal delivery. She presented with prolonged obstructive jaundice, steatorrhea, and generalized itchiness. Ultrasound abdomen and contrast-enhanced computed tomography (CT) scan discovered her to have choledochol cyst and she was scheduled for portoenterostomy (KASAI procedure), liver biopsy and on-table cholangiogram.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Eu CS, Kumar SV, Ali S, Hassan SK. Sequestered caudal catheter in a child: An anesthetic nightmare and surgical dilemma. Saudi J Anaesth 2017;11:86-8.

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/1658-354X.197333	

CHONG SOON EU^{1,2}, SHYAMALA V. KUMAR¹, SAEDAH ALI¹, SHAMSUL KAMALRUJAN HASSAN¹

¹Department of Anaesthesiology and Intensive Care, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan, ²Department of Anaesthesiology and Intensive Care, Advanced Medical and Dental Institute, Universiti Sains Malaysia, Bertam, 13200 Kepala Batas, Penang, Malaysia

Address for correspondence: Dr. Chong Soon Eu, Department of Anaesthesiology and Intensive Care, Advanced Medical and Dental Institute, Universiti Sains Malaysia, Bertam, 13200 Kepala Batas, Penang, Malaysia. E-mail: sechong@usm.my

She received caudal epidural catheter (Perifix® ONE Paed; B. Braun, Germany) insertion where skin to space distance was 1.5 cm. In left lateral position, the catheter was advanced 10 cm with minimal twisting, measuring at approximately the T7 dermatome. Ultrasound guidance was used to locate the space and confirm cephalad movement of the catheter tip during advancement. Surgery was uneventful; patient was extubated and discharged back to ward after a day of observation in Intensive Care Unit. The epidural infusion was functioning well postoperatively with continuous infusion 2–4 ml/h and the pain was well-controlled.

On the 2nd day after surgery, epidural catheter was planned to be removed. However, resistance was encountered while removing the catheter, even with full flexion of the trunk. When the patient was repositioned to an extension, the epidural catheter suddenly “fell off.” The end segment was found to have sheared off, and about 6 cm was left inside space. The segment appeared to be twisted and crimped before breaking [Figure 1]. No remnant of the catheter noted around the skin area [Figure 2].

After informing the surgeon and patient’s parents, an urgent MRI thoracolumbar and complimentary non-contrast CT scan spine was performed immediately. CT scan showed that the catheter tip was retained from upper border of L4 vertebra down to the posterior part of the thecal sac at the level of S4 vertebra [Figure 3]. The retained catheter segment was approximately 6 cm in length. No other remnant of the catheter noted in the rest of the visualized thoracic and lumbar region.

On the 3rd day after surgery, the patient started to develop persistent vomiting and fever. Total white count increased from 17.15 to $23 \times 10^9/L$. There was no neurological deficit. Differential diagnosis includes pathology from laparotomy, sepsis, or the retained catheter tip. This is because sequestration of a segment of epidural catheter can lead to infection or even catheter migration.

CT brain urgent was done and revealed normal finding without mass effect or hydrocephalus. Repeated CT scan spine showed no catheter migration; no other abnormal findings noted in the rest of the visualized thoracic and lumbar region. There was also no focal swelling or collection.

The fever subsided, but her vomiting persists. On the 18th postoperative day, she underwent relaparotomy and found to have adhesions. Adhesiolysis, small bowel resection, and side-to-side anastomosis was done, and

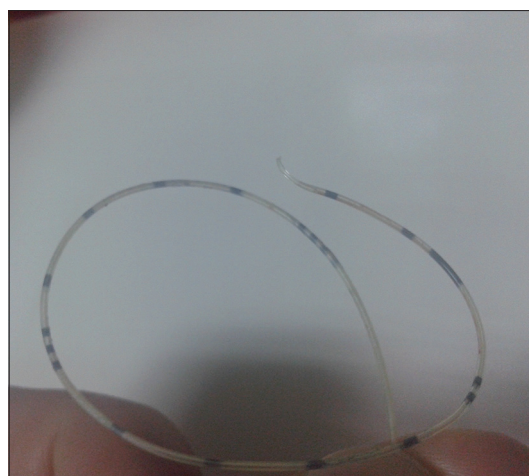


Figure 1: The segments appeared to be twisted and crimped before fracturing

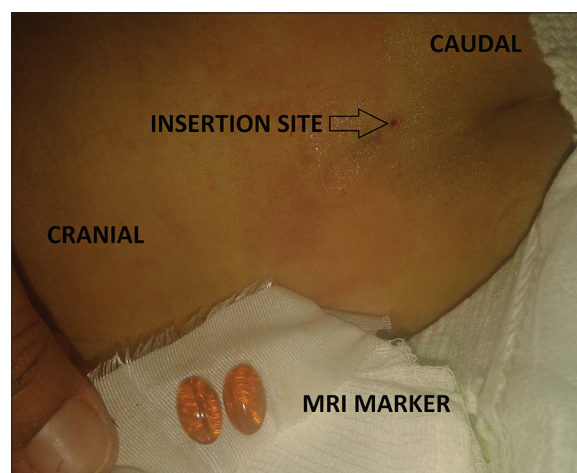


Figure 2: No remnant of the catheter could be found near the insertion site

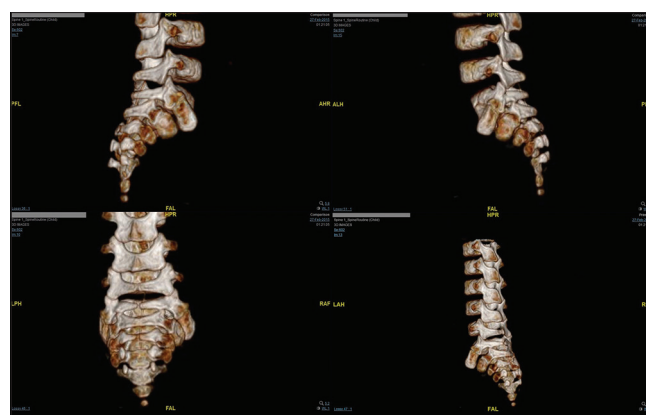


Figure 3: Three-dimensional reconstruction of spine computed tomography scan showing catheter tip was retained from lumbar vertebra down to the posterior part of the thecal sac at the level of S4 vertebra

she was extubated well on the second postoperative day. Subsequently, she was discharged home well 9 days after re-laparotomy.

Considering that the patient remained asymptomatic, and the risk of surgery is high, the pediatric surgery, neurosurgery, spine surgery, and anesthesiology team decided to let the fragment remain *in situ* and continue to follow-up the patient. Patient's parents were advised to report any adverse symptoms.

Upon review in the clinic for the past 1 year, our patient has been well and did not complain of any symptoms of complication.

Discussion

Possible causes for catheter fragmentation include curling/kinking/knotting and manufacturing defect.^[4] Even with ultrasound guidance during catheter insertion, catheter breakage occurred on our patient.

The recommendations for insertion or removal of catheters should be strictly followed to prevent shearing.^[3,4] It should always be reminded to the practicing anesthetist and the trainees during insertion and removal as it is always neglected until the shearing occurred.

Current literature suggests that sequestered fragments are sterile and unlikely to cause neurological complications. It is generally accepted that fragments are safe to leave in place as long as there are no neurological symptoms or signs.^[2,3]

If the patient develops neurological symptoms, catheter migration into the subarachnoid space, or if the catheter tip

emerges out of the skin, exploratory laminectomy should be recommended.^[6]

The presence of a fragment should be documented and clearly informed to the patient's caretakers and surgeons. Even though rare, the symptoms may develop months or years later, and is a potential medico-legal issue. Therefore, the patient should be followed up in the outpatient setting. Surveillance imaging, for example, CT scan may be beneficial.

We would also suggest to strictly avoid any form of twisting of the catheter during insertion. Insertion or removal of catheter should be abandoned if there is any form of resistance felt.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Abouhashem S. Surgical removal of broken epidural catheter. Saudi J Anaesth 2013;7:96-8.
2. Carneiro S, Pinto C. Sheared epidural catheter: What now? Eur J Anaesth 2013;30:125.
3. Pant D, Jain P, Kanthod P, Sood J. Epidural catheter breakage: A dilemma. Indian J Anaesth 2007;51:434-7.
4. Joselyn A, Bhalla T, Schloss B, Martin D, Tobias J. A case report of a retained and knotted caudal catheter. Saudi J Anaesth 2014;8:424-7.
5. Mitra R, Fleischmann K. Management of the sheared epidural catheter: Is surgical extraction really necessary? J Clin Anesth 2007;19:310-4.
6. Hobaika AB. Breakage of epidural catheters: Etiology, prevention, and management. Rev Bras Anesthesiol 2008;58:227-33.