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Case Report

A Rare Complication of Knotted Epidural Catheter Inserted for Labour Analgesia: Case Report

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Abstract

We present an uncommon complication of knotted epidural catheter which was inserted to one patient for labour analgesia. Adjustment of the catheter length while sitting the epidural proved to be difficult during the procedure. Various common techniques described in the literature were unsuccessful in our patient. Post-delivery a lumbosacral computed tomography showed the catheter had a coiled tip in situ. The catheter was later removed surgically and seen to be intact without shearing or breakage. It is important to be aware of such potential complication as excessive traction on a knotted catheter may result in breakage of the catheter. It can also results in shearing and tearing injury of the surrounding tissues and vessels. Practitioners should be mindful that such a complication can still occur despite simple and straightforward procedure during insertion of epidural. In such circumstances, surgical intervention should be considered as an option to prevent further harm to the patient.

Keywords: Epidural; Labour analgesia; Knotted epidural catheter; Computed tomography

Introduction

Epidural analgesia is a common modality employed in many hospitals throughout the world for the patient in labour. Serious complications are rare but can be debilitating to the patient and it is crucial to detect potential problems and to take the appropriate corrective action in a timely fashion.

Case Presentation

A 27-year-old 70 kg primigravida presented to the labour room at 40 weeks and 9 days of gestation in early labour. She was admitted to the ward for induction of labour with Prostin insertion, which further needed an amniotomy and was sent to the labour room during the first stage of labour. She was being referred to the anaesthetic team for epidural analgesia. Explanation of the procedure and complications was explained to the patient. Patient also consented for the epidural analgesia.

Discussion

The epidural was inserted by an anaesthesia registrar under aseptic technique. It was inserted at the vertebral L3/L4 interspace *via.* midline approach, and the catheter was inserted after feeling a "give" with a loss of resistance syringe filled with air. The catheter was threaded at 9.5 cm and insertion was easy with minimal resistance. Skin-to-space distance was at 6.5 cm. While attempting to adjust the catheter depth, the medical officer noticed it became harder to withdraw the catheter midway. The senior anaesthetist was immediately called to attend the case. Initially various techniques were employed to try to release the stuck catheter such as putting the patient in the flexion and extension positions but all were unsuccessful. Lateral flexion and rotation were also seems to be ineffective. Resistance in the catheter was felt when saline was injected into the catheter. After discussion with the consultant anaesthetist, consultant obstetrician and the patient, a decision was made to allow labour to proceed first and would attempt removal again after the delivery. During the labour process, neurological examination was done regularly by the on call anaesthesia doctor and no neurological deficits were detected throughout. However, the patient eventually had to undergo an emergency caesarean section for poor labour progress and general anaesthesia was given instead of spinal anaesthesia in view of above complications. After the baby was delivered via caesarean section, second attempt was made again to remove the catheter under general anaesthesia in theatre. The patient was put in the lateral position with hip flexion to try to remove the epidural catheter but was also unsuccessful. Patient was then extubated with a plan for radiological imaging to identify the position and level of the epidural catheter. A Computed Tomography (CT) scan of the lumbosacral spine was done which showed the following: Epidural catheter traversing the soft tissue and muscle at the level of L3/L4 with its tip coiled lateral to the right L3/L4 facet joint between the erector spinae and quadrates lumborum muscle (Figure 1). Patient was then referred to Orthopaedic team for removal of the catheter under general anaesthesia. The catheter was successfully removed after skin incision made and we noted that the epidural catheter has form a knot around 3 cm from the catheter tip (Figure 2). The patient was well post-operatively with no neurological deficit. She was discharged home the following day with a follow-up appointment at our anaesthetic clinic for assessment. Subsequent follow-up in clinic showed no neurological complications and she was being discharged from anaesthetic clinic.

Although the complication of knotted epidural catheter is reported to be extremely rare with the incidence of 0.0015% [1]. The incidence of knotted catheters has been reported before in literature. Hence it is

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Figure 1: Sagittal view CT lumbosacral showing the position of the knotted epidural catheter.

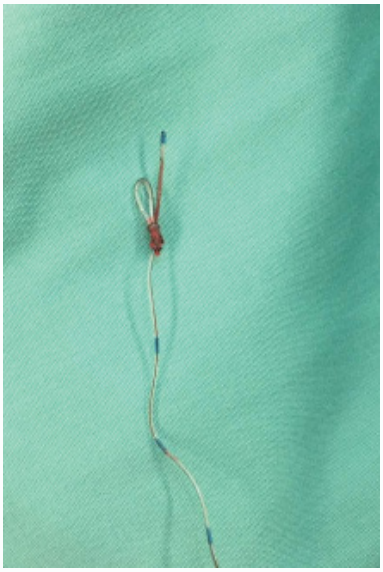

Figure 2: Knotted epidural catheter removed.

important for the operator to know how to deal with this situation and to avoid causing further harm to the patient. In general, the options of removal can be varies from simple such as gentle constant pressure removal with body manoeuvre, to more invasive method for example surgical removal under local anaesthesia or general anaesthesia. Which method to use depends heavily on the bedside assessment, as forced removal of catheter will result in further complications such as catheter snap or break before complete removal, or it can results on shearing or tearing of surrounding tissues and vessels. If such complication occurred, a very careful assessment and management of the complication is essential. The utmost important things to do is to inform a more senior anaesthetist and ask for assistance. During insertion of epidural, It has been suggested that catheter should not be inserted more than 5 cm into epidural space to avoid knotting, however a knot that formed in less than 3cm insertion has been reported before [2], which suggest that other factors play a role other than the depth of catheter in forming a knot. The knot formed could be a simple or double knot [2,3], with the latter expected to be more complicated in removal. In the event of problematic catheter removal, the most simple and straightforward method to try would be a constant and gentle force of withdrawing the catheter. As it has been reported to be successful method if the knot formed was small enough [4]. A few body manoeuvres mentioned earlier can also be employed in the initial phase in order to ease the withdrawal [5]. However, should such manoeuvres failed, it may be advisable to consider the possibility of catheter forming a knot and impossible to be removed by pulling out. It should be suspected if there is stretching or tightening of the catheter upon withdrawal. In this situation the only way to remove the catheter is by surgical intervention. It usually can be done *via.* blunt dissection under either local anaesthesia or general anaesthesia [6]. Beforehand any further attempt made, it is advisable to consider radio imaging to identify the exact location of the catheter first rather than using blind technique. In this case, after the initial attempt to release the catheter under various body manoeuvre failed, we made second attempt to remove under general anaesthesia with the hope that under the effects of muscle relaxation during general anaesthesia, as one group of authors stated before that it might be easier to be removed under muscle relaxation [7,8].

Conclusion

Since the patient undergoing general anaesthesia for caesarean section, we took this opportunity to try remove the catheter. Unfortunately, this did not prove to be effective in our patient. Hence, we decided to abort the procedure and opted for further imaging and investigation to prevent additional complications. Excessive force to remove a knotted catheter can cause further complications such as shearing, tearing or catheter snap which make the removal even more difficult.

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