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A Rare Presentation of Broken Epidural Catheter

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Abstract

We routinely use epidural catheters for intra operative and post operative analgesia. Although there are many known complications of epidural catheters, breakage of the catheter is a rarely encountered but well known complication. We report one such event in post operative period and its successful management.

Keywords: Epidural catheter; Epidural space; Documentation; Counselling.

Introduction

Epidural catheter removals are routinely uncomplicated. There can be instances where the catheter can break as a result of impact on catheter during insertion or removal. As most of the catheters are made up of inert material so it is assumed that they will not cause any harm if retained into the epidural space. Surgical interventions are therefore done as a last resort. We report a similar case of retained broken catheter in the epidural space which was managed conservatively and followed regularly over time with no dreaded complication.

Case report

A 55 year old male, diabetic and hypertensive, was posted for right tibia plating. Pre-anaesthetic check up and informed consent was taken for the surgical procedure. Combined spinal epidural was planned and explained. After checking the integrity of 18 G combined epidural set, L2-L3 epidural space was located at 5 cm from skin, in sitting position via median approach using loss of resistance to air. A 29 gauge (G) spinal quincke's needle was passed through it to reach the subarachnoid space and 3 ml of injection bupivacaine heavy was injected. The spinal needle was removed and the epidural catheter was threaded easily through tuohy needle, to be fixed at 10 centimetres (cm) mark. The catheter was used successfully intra-operatively as well as post operatively to provide analgesia for two days. On the third day when we attempted to remove the catheter with the patient on her side, we encountered resistance at the skin insertion site. Changing the position of patient did not help. With slight traction the catheter was stretched and removed but we found that distal part of the catheter was missing. After informing the patient and surgeon, Magnetic resonance imaging (MRI) lumbar spine with Computed tomographic scan (CT scan) correlation was done (Fig. 1). Study revealed no evidence of foreign body on MRI scans, however on CT correlation there was a linear hyper-density seen in the dorsal epidural space at the level of lower end plate of L2-L3 vertebra. A neurosurgery opinion was also taken. As the patient was neurologically intact, no intervention was planned. The patient and the family were counseled and proper documentation of the events, neurological examination findings and CT/MRI reports was done. He was discharged with a plan for regular follow-up in neurosurgery OPD and was advised to report in case of any new adverse neurological symptoms like tingling, paresthesia, loss of bladder/bowel control, weakness in limbs, paralysis, etc.

Discussion

Epidural catheter breakage is an infrequent event and usually not reported. Very few cases have been reported till date. Bonica et al in 1957 reported first case of epidural catheter breakage [1]. The catheter can be caught up in the epidural space, migrate intrathecally or in subcutaneous tissue or might get curled around a nerve root. The most common time of breakage is during removal. Asai et al [2] tested the tensile strength required to break the epidural catheter and found that as little as 860 grams (gm) of weight may snap the catheter, thus reinforcing the need to not pull on catheters forcefully.

Further, a number of factors affect subsequent management. If the catheter is located just beneath the skin then removal is mandatory as bacteria can easily track the catheter remanant [3]. Previous reports revealed that an urgent surgical intervention is needed in cases of breakage of the catheter into the intrathecal space [9] or migration of the catheter [4,5], as it may lead to pathologies such as lumbar stenosis and radiculopathy [6,7,8].

The epidural catheter is considered to be an inert material and is unlikely to cause any foreign body reaction. Chances of migration [4], are low unless the fragments are retained intradurally [9]. Imaging is therefore very much vital before any surgical intervention. More recently, it has been proposed that improved quality epidural catheters are available which maintains its integrity during intra-operative and post-operative period. Such catheters eliminate the necessity for an additional surgical procedure in order to remove a portion of the retained epidural catheter [4]. Such catheters exhibit good handling properties with an adequate tensile

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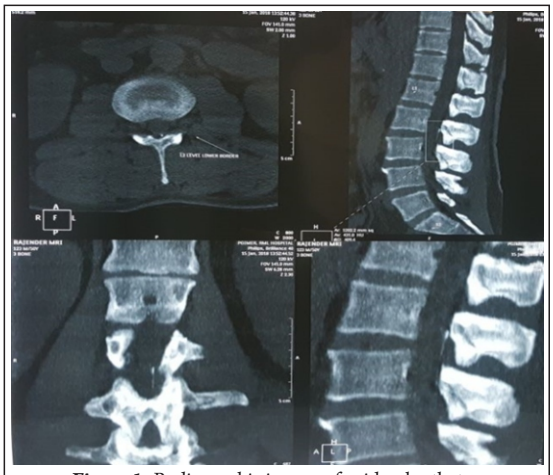

Figure 1: Radiographic images of epidural catheter.

strength. They are biodegradable and dissolve with time upon contact with the moisture in the body and cause no foreign body reaction [4].

Apart from these new and improved catheters in use, certain precautions are to be followed during insertion and removal of the catheter to avoid such complications. During insertion, if resistance is encountered the catheter should never be withdrawn through needle. Both should be removed as single unit. Insertion of excessive length of catheter should be avoided to prevent coiling, knotting and entrapment of catheter. The catheter should be checked prior to insertion for manufacturer defect and sharp bevel tip should be ruled out???

If resistance or stretching of catheters occurs while attempting withdrawal, it is recommended to place the patient in the same position as they were at the time of insertion. A flexed lateral decubitus position is reported to be more effective than the sitting position, with the withdrawal forces being as much as 2.5 times greater in the sitting position. In the event of difficult catheter removal, it has been suggested that the efforts should be discontinued for 15–30 minutes to allow for tissue relaxation. Sometimes, epidural catheter saline injection can be tried with application of simultaneous slow but firm traction??? Lastly, removal should always be done by trained anesthesiologist or trained personel is recommended [10].

In most cases, the current standard of care for retained segments of a temporary epidural catheter is to leave them alone unless the patient is symptomatic, because surgical removal can sometimes do more harm than good [11]. The patient should be thoroughly counselled and explained about likelihood of signs and symptoms that patient may encounter in future such as paresthasia, tingling, limb weakness, loss of bowel/bladder control. Regular follow up visits and proper documentation is must. Looking to the above data, we counseled the patient and decided to keep the broken catheter. In our case, the patient was followed up for a period of two years during which he had no complaints. All the neurological examination findings were documented on each follow up.

Broken epidural catheter is definitely annoying for doctor as well as patient. We should take strict precautions while inserting and removing of these catheters. From our case, we can conclude that if breakage of the epidural catheter occurs despite taking the said precautions, surgery should be kept as last option if the patient is neurologically fit. All needed is proper documentation, imaging and counseling of the patient and family. There is a possibility of neurological symptoms that can develop over months to years, so the patient should be advised for regular follow up. Patient should be fully trained about how to identify such symptoms early at home so that treatment can be initiated at the earliest if need arises.

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