

Broken Needle during Spinal Anesthesia: How Can It Happen and How to Take It?

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Abstract

Broken spinal needle case rarely happened during anesthesia. A needle that was used was modified to minimize complication. Risk factors of the case might be caused by the type of needle, insertion technique, patient's position during anesthesia, and patient's body mass. If it happens, the needle's fragment must be extracted to prevent further unwanted complication.

Keywords: Spinal anesthesia; Obesity; Broken spinal needle; Mobilization

Introduction

Spinal anesthesia is one of the most frequently used and the most favorite regional anesthesia technique on obstetric and lower abdominal surgery. Risk factors of broken spinal needle are the type and the size of the needle that's used during anesthesia [1-3], the used technique during spinal needle reposition [2,4], patient's position and body mass [2,5,6]. It's recommended to know the predictive complicating factors that might happen during regional anesthesia, use of USG for difficult cases [5], proper technique for needle fragment extraction, and clear informed consent to patient and the patient's family might prevent further complication [2,4]. We report two broken spinal needle cases that happened on an obese woman with pre-labor rupture of membrane and a man with varicocele.

Case Report

First case, a 25-years old woman, 120 kg, 155 cm (Body Mass Index 49.9 kg/m²), with pre-labor rupture of membrane in her 36/37 weeks gestation, complained about vaginal discharge. There was no comorbid found. Physical examination, vital signs, respiratory and other systems were within normal limits and spinal examination showed no abnormalities. Patient was scheduled to undergo emergency caesarian section with subarachnoid blockage using lidocaine 5% as the opted anesthesia technique. After standard monitoring device was applied and 2 lpm oxygen was given, the patient was put into the lateral decubitus position; intervertebral marking was done at the L3-L4 level. After aseptic disinfection and draping using sterile surgical drape, 1 ml of lidocaine 2% was injected into sub dermal as local anesthesia. Next, 25 G spinal needle was inserted with median approach, blood was obtained (+) and the needle was planned to be extracted, when the patient suddenly moved because of uterus contraction, but the needle still remained inside. When the patient finally calmed down the needle was re-extracted, but resistance was felt. Attempt to extract the needle was done again by rotating it, but wasn't successful. The next attempt was done by pulling the needle more gently, and no resistance was felt. It turned out that the spinal needle was broken and the fragment was

left inside. The patient and her family were notified about the broken spinal needle during the spinal anesthesia procedure when the patient had uterus contraction and then suddenly moved. The fragment outside was \pm 3 cm. After that, the caesarian section was still performed but with general anesthesia, and surgery to remove the remaining fragment inside was scheduled after the caesarian section. The baby was born, weighting 3200 gram with APGAR score [7,8].

After the baby was born and the caesarian section was done, patient was put into the prone position and was performed emergency conventional x-ray on the operating room to determine the location of the remaining fragment. The spinal needle fragment was found at L3-L4 level with the outer tip located within the subcutaneous layer (superficial from the fascia). The surgery to remove the spinal needle fragment was performed. The patient was put into the supine position again, and then the patient was extubated. Serial follow-ups were conducted for 6 months through telephone call. There was no neurological deficit found in the patient (Figure 1).

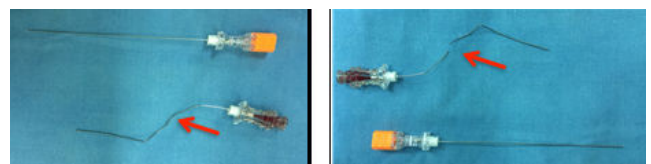


Figure 1: Picture of the spinal needle with 3 cm remaining fragment outside (arrow shows the breakage point).

Second case, a 26-year-old patient, 83 kg, 160 cm (Body Mass Index 32.42 kg/m²) with grade 2 left and right varicoceles. Left and right varicocelectomy was scheduled for the patient. The patient had no comorbid. Vital signs and physical examination were within normal limits, and there was no spinal deformity. Regional anesthesia with subarachnoid blockage was chosen as the anesthesia technique using 2 ml lidocaine 5% in sitting position. After standard monitoring device was applied, aseptic disinfection and draping using sterile surgical drape were performed. The patient was injected with 1 ml of lidocaine

2% for local anesthesia, after that 26G spinocain was inserted using paramedian approach at L3-L4 level. During the insertion of spinal needle, suddenly the patient moved because of discomfort, when repositioning was done and the needle was about to be extracted, resistance was felt. The anesthesiologist then consulted this problem to a senior anesthesiologist, and then the lower limbs were put into straight position. The needle was extracted slowly during positioning. The needle was extracted intactly but bended. After that, the spinal anesthesia was taken over by the senior anesthesiologist. Four spinal anesthesia attempts were done, but the patient remained uncooperative. The patient was sedated with 2 mg of midazolam, and the spinal needle insertion finally succeeded. Patient's follow-ups were performed for 1 week, there was no neurological deficit found (Figure 2).

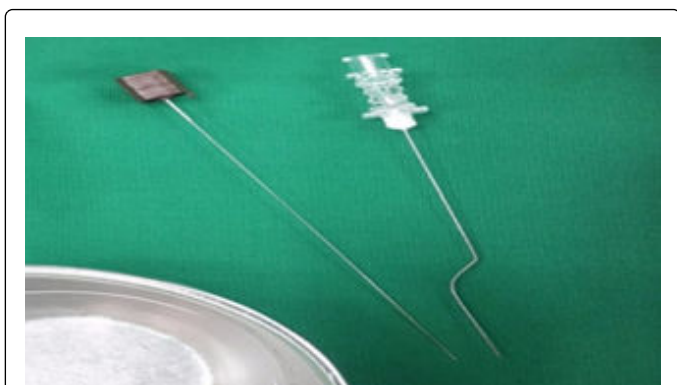


Figure 2: The spinal needle that was restrained, but managed to be extracted intactly.

Discussion

Spinal anesthesia is one of the most famous and widely used anesthesia techniques, mostly used in obstetric and lower abdominal surgery, this technique is simple and very easy to use if well-supervised. The most common complication of this technique is post-dural puncture headache [1,7,8] many literatures stated that this complication can be avoided with the use of smaller needle, even though previously it was believed that smaller needle could cause more problems because it is easier to bend and break inside [2,3,9] but this happens rarely. If broken spinal needle eventually happens and the fragment is left inside the patient's body [2,3,9] this might harm the patient because it can cause the fragment to migrate further and damage the nerve and granuloma formation might occur because of the foreign object [10,11].

What situations that might cause broken spinal needle? And what further actions that must be taken?

Previous reports stated that any types of spinal needle might be bended even though it was not forcibly inserted and this might happen because of the difficulty to palpate the landmark for needle insertion, especially in obese patients. Obesity may cause difficulty at identifying anatomical landmark for insertion site, causing alteration of the needle's direction into the wrong direction or not as intended [5,12]. This can be prevented by using USG guide during spinal anesthesia for obese patients [4,5].

In the first case, there are some predictive factors that might cause spinal needle breakage. The factors are emergency situation, obese patient that could cause failure at anesthesia, in this case puncture the blood vessels, sudden movement of the patient that caused the needle to bend, and also pulling the needle by altering the needle's direction and rotating it. Some authors suggested using larger needles while considering the risk and benefits that might be accompanied with extra complications. In the first patient, with considering some factors such as obesity, general anesthesia was chosen as the alternative option [4]. Because of a possibility for the fragment to move further and could cause nerve damage, needle fragment must be extracted immediately through surgery.

In the second case, the predictive factors that might cause the needle to break were the uncooperative patient's movement when he sat and also the attempt to extract the restrained needle with force might cause needle breakage. By straightening the lower limb, the sitting patient was fixated and couldn't move, so the needle could be extracted more easily and instantly without having to rotate the needle [13,14].

Conclusion

From both cases, it must be underlined that informed consent and explanation about the possible complication during spinal anesthesia were very important. It needs team communication and patient's cooperation to follow the anesthesiologist's instructions of what to do during spinal anesthesia. It will make the patient in a more stable condition. If resistance is felt, do not mobilize the needle by rotating it or by forcibly pulling it. If spinal needle breakage happens, surgery to extract the remaining fragment must be performed immediately. If it is possible, use USG guiding spinal anesthesia for obese patients to identify the landmark of insertion site, and use conventional x-ray to identify the location of the spinal needle fragment.

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