

IATROGENIC MENINGITIS AFTER SPINAL ANESTHESIA

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Abstract- Bacterial meningitis after spinal and epidural anesthesia is a very rare but serious complication. We report a case of meningitis developing a number of hours after a spinal block for Caesarean section. No organism was grown but the CSF pattern was suggestive of bacterial meningitis. Severe neurological sequelae were present after three months of hospitalization. Meningitis is a serious complication and its early diagnosis and effective treatment is essential. Meningitis should always be considered as a possible differential diagnosis in patients suspected of having post spinal headache, convulsion and changes in mental status. A thorough knowledge and practice of aseptic techniques is crucial in performing spinal and epidural anesthesia.

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Key words: Bacterial meningitis, spinal anesthesia, epidural anesthesia

INTRODUCTION

However rare, the iatrogenic bacterial meningitis is a serious complication of spinal and epidural anesthesia performed for surgical procedures. The mortality rate is high (1); even those patients who recover from the acute phase of the disease would suffer from persistent complications such as neurological disorders.

Since the entry into the spinal canal to serve any purpose would undermine the natural defense of the central nervous system, the risk of infectious agents' penetration leading to meningitis would increase. Infection can be transmitted to the cerebrospinal fluid (CSF) in such cases in two main manners. The first is caused by the inobservance of aseptic techniques which lets the external infectious agents enter the CSF. The second comes into existence when the bacteria in the patient's blood at the time of lumbar puncture

access the subarachnoid space due to the microscopic bleeding caused by the insertion of the needle.

The epidemiologic evidence fortunately shows that the prevalence of post lumbar puncture meningitis is not greater than ordinary population (1). In the two retrospective studies on over 2700 and 505000 patients who received extradural block during delivery, only 2 cases of anesthetic related infections have been reported (2-3). The incidence of postspinal bacterial meningitis is less than 4.5 per 100,000 (4). Various strains of viridans streptococcus (a mouth commensal) are the dominant causative organism in post dural puncture meningitis (PDPM); other causal organisms found in PDPM include *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Enterococcus faecalis*. However, in 36% of patients, no organism was isolated or reported (5). In one study on 60 cases of iatrogenic meningitis, only 2 patients were left with neurological sequelae (6), as opposed to 25% of cases with community-acquired meningitis (7).

Here we report a case of meningitis developing a number of hours after a spinal block for Caesarean section.

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CASE REPORT

A 33 year old woman in good general health, gravida 2, para 1, was admitted at term in labor for a Cesarean section due to the same procedure in her first delivery. No history of pregnancy complications was reported.

The patient received anesthetic agents consisting of 50 mg of spinal lidocaine 5% and 20 mg of pethidine, totaling to 1.4 CC. It was injected to her by an experienced anesthesiologist, who was wearing a gown, sterile gloves and a facemask. After cleansing of the skin with iodine, the anesthetic agents was injected in the L3 and L4 space using an orange 25-gauge disposable spinal needle with having the patient in the sitting position.

The Cesarean section was carried out after the required level of spinal anesthesia had been assured. During the procedure, the patient's vital signs were checked using cardiac monitoring and pulse oxymetry while she was provided with oxygen through the mask. To remedy hypotension, 5 mg of ephedrine was injected. The patient was conscious all through the section and after delivery, at the end of the section, 1 mg of midazolam was injected for sedative purpose. The patient was then sent to the recovery.

After the patient complained from the pain in the surgical region, she was transferred to the ward being fully conscious and having intact lower limb movements as well as natural vital signs. The patient received IV antibiotic, and sedatives, when she complained from pain. Upon admission, the hemoglobin was 13.6 mg/dl, the leukocyte count was $9.6 \times 10^9/L$ and the platelet count was $219 \times 10^9/L$. Prothrombin time and partial thromboplastin time were normal.

About 5.5 hours after the section, the patient dramatically lost consciousness following convulsive attacks. It was so severe that her level of consciousness by Glasgow Coma Scale (GCS) was decreased to 3/15; anisocoria was detected with the partial dilatation of the right pupil which showed sluggish reaction to light. The patient had neither doll's eye movement nor corneal reflex. The plantar reflex was mute; the patient had no spontaneous breathing and her muscular tone decreased.

The brain computed tomography (CT) scan at this stage was reported to be normal. The patient was consequently sent to the ICU. Later, the pupils gradually found their normal sizes, but were without reaction to light. The mental state rose to 6/15. A diagnostic lumbar puncture was performed under sterile condition. The CSF had the following characteristics: pleocytosis of 2470 leukocytes/mm³, of which 90% were polymorphonuclear and red blood cell count of 50/mm³. CSF had blurred appearance but the culture was negative. Analysis of CSF revealed elevated total protein and decreased glucose level. Blood culture was negative in three episodes.

Vancomycin and ceftazidime was prescribed in meningeal dosage. Thyroid function test, liver function test and any other analysis for vasculitis were normal. In next brain CT scan, brain edema was detected and subsequently some reticular images were found in superior regions of brain which was conforming to superior sulcus.

In the process of recovery, the level of consciousness was gradually raised so much that she was able to open her eyes spontaneously but did not obey the orders. Left limbs, specially the left lower limb, were moving by painful stimulation. Some convulsive attacks happened during admission and they were controlled by anticonvulsive drugs like diazepam, midazolam and phenobarbital.

Tracheostomy and jejunostomy were performed because of long-term admission and low level of consciousness as well as the need for ventilation. After three months, she had spontaneous eye opening. The upper and lower limbs were moving by painful stimulation but there was no response to sound and no verbal communication. She was discharged on the condition that her jejunostomy and Foley catheter would still remain.

After 2 months, her family sued her physicians but after evaluation of the case at the legal medicine commission, all physicians were exonerated.

DISCUSSION

Regional anesthesia is being increasingly used for Caesarean section and pain relief during labor. The exact incidence of infectious complications

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associated with both epidural and spinal anesthesia is unknown. However, several retrospective studies have estimated this incidence as being very low, from 0 to 0.04% (8).

Three explanations are possible for CSF infection after spinal anesthesia: break in sterile technique with direct introduction of bacteria, hematogenic spread, and even less likely, primary contamination of equipment and anesthetic drug.

It is important to consider bacterial meningitis after spinal anesthesia despite the lack of apparent causative factors. Therefore, full aseptic precautions are essential.

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