CASE REPORT

Bupivacaine induced aseptic meningitis following subarachnoid block

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ABSTRACT

All anesthesiologists performing subarachnoid block should be familiar with the possible sources of contamination during the procedure and means to prevent them. Despite following stringent practices of asepsis by the anesthesia care givers there can still be a rare possibility of iatrogenic meningitis due to the spinal anesthesia. We report a rare case of aseptic meningitis succeeding subarachnoid block in our institute, probably by hyperbaric bupivacaine, injected in the subarachnoid space and its subsequent management.

Key words: Meningitis; asepsis; iatrogenic; bupivacaine; subarachnoid; cerebrospinal fluid

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INTRODUCTION

Iatrogenic meningitis following well conducted spinal anesthesia is rare but serious complication.[1] Anesthesiologist performing subarachnoid block should be familiar with the possible sources of contamination and means to prevent them. Despite thorough knowledge and practice of asepsis, meningitis may occur.[1-3] We report a case of aseptic meningitis developing few hours after subarachnoid block, in our institute.

CASE REPORT

A 29 year male, American Society of Anesthesiologists (ASA) physical status I, was scheduled for elective arthroscopic reconstruction of right anterior and posterior cruciate ligaments. There was no evidence of localized or systemic infection. A written informed consent for spinal anesthesia was taken. In operating room, all routine monitors were attached and 18-gauge (G) intravenous (IV) cannula was placed on left dorsum of hand.

Under all aseptic precautions, with the patient in sitting position, skin of lumbar area was painted with 10 % povidone iodine and sterile drape was placed. Local infiltration of skin as done with 2 ml of lignocaine (2%) and a 26G disposable Quinke spinal needle (BD™) was inserted at the L3–L4 spinal interspace. After confirming free flow of cerebrospinal fluid (CSF), 3 ml of hyperbaric bupivacaine (0.5%) was injected in subarachnoid space. Patient was repositioned supine and with confirmation of sensory block till T-10 dermatome level, the surgery was commenced.

After one hour, patient complained of non-positional throbbing headache and was administered inj. diclofenac 75 mg IV. Rest of the intraoperative period was uneventful. Surgery lasted for three hours and thereafter the patient was shifted to post anesthesia care unit (PACU). Six hours later, he became agitated, irritable, somnolent and confused. He had fever, nausea, neck pain and photophobia. There was neck rigidity and positive Kernig's sign. No other focal neurological deficits were observed. Provisional diagnosis of meningitis was made and empirical antibiotics (inj. ceftriaxone 2g IV q 12 hours) were started immediately. Fundus examination, complete blood count, renal function tests, liver function tests and serum electrolytes were within normal limits. Subsequently, a diagnostic lumbar puncture was done and CSF had the following characteristics:

turbid appearance, protein: 45 mg/100 ml, glucose: 40 mg/100 ml, leucocytes: 1000/mm^3 (neutrophils 85%, lymphocytes 15%), negative acid-fast bacilli (AFB) and gram stains. Computerized tomography (CT) and magnetic resonance imaging (MRI) scan of the head and lumbar spine was done and was found to be normal. After 24 hours, patient was afebrile, conscious, oriented with no neurological sequelae. Meanwhile, the culture reports of CSF, blood and urine were found negative for any growth of bacterial pathogens. Antibiotics were discontinued after 48 hours. Thereafter, he remained afebrile, clinically stable with no neurological deficit and was discharge on 5th postoperative day.

DISCUSSION

Post-spinal meningitis should be considered in the differential diagnosis of patients having post-spinal headache, convulsions and changes in mental status.[4,5] Its aetiology includes failure of aseptic techniques, presence of asymptomatic bacteraemia, contamination during puncture through microscopic bleeding and the possibility of aseptic chemical meningitis.[1,6,7]

There are evidence based protocols mentioning the comprehensive measures for maintaining asepsis while performing invasive procedures by the health care providers.[8,9] Besides strictly following these protocols there can still be the possibility of meningitis following spinal anesthesia and need further attention.[8,9]

Aseptic meningitis is a clinical syndrome whose acute onset and clinical symptoms mimic septic meningitis. It is an inflammation of the meninges caused by either viral infection or chemical irritation.[10] Although viruses are the most common cause of aseptic meningitis but viral contamination after spinal anesthesia has not been reported hitherto.[10] Aseptic meningitis has also been attributed to various agents contaminating the subarachnoid space, such as scrub solutions, surgical glove powder, bits of cotton of wrapped syringes, blood or other body proteins or rarely by anesthetic drugs and equipments.[11,12] Occasionally, administration of systemic drugs such as Nonsteroidal Anti-inflammatory Drugs (NSAID), H2 blockers and antibiotics (trimethoprim, sulfadiazine) may cause aseptic meningitis.[10,13] The pathogenesis of drug-induced aseptic meningitis include immunological hypersensitivity (Type 3 or Type 4) to the offending drug or direct irritation of meninges by the intrathecal administration of drugs.10 Quick resolution of symptoms is an important sign that distinguishes drug-induced aseptic meningitis from viral meningitis, in which recovery usually requires 10 to 14 days.[10]

Aseptic meningitis usually presents within 24 hours after dural puncture and is characterized by fever, headache, vomiting, nuchal rigidity and photophobia. The diagnosis is confirmed by typical CSF profile revealing normal glucose, normal to elevated protein, polymorphonuclear leukocytosis and negative bacterial CSF cultures. It requires symptomatic treatment and usually resolves in few days.[1,3,4,10]

Our patient complained of headache within few hours of completion of surgery which was soon followed by fever, vomiting, photophobia and neck stiffness. The use of a fine 26 gauge spinal needle and successful lumber puncture on first attempt virtually rules out the possibility of low-pressure headache. Blood and its contamination of spinal needle contributing to aseptic meningitis are also unlikely cause, as lumber puncture was smooth, a traumatic and accomplished on first attempt under strict aseptic precautions. We preclude the possibility of contamination by the hyperbaric bupivacaine injected in the subarachnoid space since the pre-sterilized ampoules of drugs were used within the stipulated time of manufacturing date. Surprisingly, we observed that the same batch number of the aforesaid drug was used before for subarachnoid blocks in our institute but with no untoward incident or complications. We infer that our patient suffered from aseptic post-spinal meningitis caused by probable direct drug induced meningeal irritation, based on CSF biochemistry, lack of organisms in CSF, lack of positive blood or CSF culture and rapid clinical recovery profile.

CONCLUSION

This patient was discharged in stable clinical condition with diagnosis of post-spinal aseptic meningitis caused probably by the hyperbaric bupivacaine injected in the subarachnoid space. We believe that the rarity of this complication warrants the necessity to share the experience for such cases. This report may caution the anesthesia care providers about the possible complication with one of the commonly used drug used for subarachnoid block and may assist them adeptly in making its early diagnosis and subsequent management strategy.

Conflict of interest: The authors declare that they have no financial or personal relationship(s) which may have inappropriately influenced in writing this paper.

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