

CASE REPORTS

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Streptococcus salivarius Meningitis after Spinal Anesthesia

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BACTERIAL meningitis is a rare but very serious complication after spinal anesthesia. In the recent anesthesiology literature there are only a few reports of postspinal meningitis verified with positive Gram staining and culture. We report here a case of *Streptococcus salivarius* meningitis that developed in a 16-yr-old boy within 16 h after an uncomplicated arthroscopy performed during spinal anesthesia.

Case Report

A 16-yr-old previously healthy boy underwent spinal anesthesia for arthroscopy of the right knee because of a meniscus rupture. Preoperatively, he had no clinical signs of infection and he was afebrile.

During induction of spinal anesthesia, the anesthesia resident performing the block wore a mask and gloves and used an autoclave-sterilized dressing pack and sterile disposable needles and syringe. The lumbar skin area appeared normal and was prepared with chlorhexidine-alcohol-solution (Klorhexol, 5 mg/ml; Leiras, Turku, Finland). The lumbar puncture was accomplished with a 27-gauge Quincke needle on the first attempt. Cerebrospinal fluid (CSF) was clear, 3.5 ml hyperbaric bupivacaine, 0.5%, (Marcain Tung; Astra, Södertälje, Sweden) was injected, and satisfactory spinal block was achieved up to the T9 dermatome. The procedure was uneventful. Postoperatively, the patient remained stable and was transferred to the ward after a 4-h follow-up in the recovery room.

Sixteen hours after the surgery, the patient complained of severe headache and nausea and vomited three times. He received 6 mg intramuscular oxycodone (6-deoxy-7,8-dehydro-14-hydroxy-3-O-methyl-6-oxomorphine) and 100 mg intravenous ketoprofen for pain relief. The headache continued and confusion was noted. Computed tomography of the head was performed 20 h after the surgery and results were reported as normal. The patient was transferred to the recovery

room for epidural blood patch for postspinal headache. However, the possibility of meningitis was considered and a lumbar puncture was performed instead, now 24 h after the surgery. The CSF was turbid, diagnosis of meningitis was made, and the patient was transferred to the intensive care unit. Intravenous dexamethasone and intravenous broad-spectrum cephalosporin (ceftriaxone) was started. Laboratory investigations revealed a blood leukocytosis of $23.3 \times 10^9/l$ and the serum concentration of C-reactive protein was less than 10 mg/l. Analysis of CSF indicated an erythrocyte count of 14.4×10^9 (95% polymorphs), a protein concentration of 9.2 g/l (normal range 0.15-0.5 g/l) and a glucose concentration of 2.1 mM (normal range 2.2-4.2 mM). Gram-positive cocci were seen by Gram staining and in bacterial culture *S. salivarius* was found.

On the fourth postoperative day the patient was transferred to an ordinary ward in good condition with slight headache. The patient was discharged home on the thirteenth postoperative day with no residual neurologic deficit.

Discussion

Bacterial meningitis after spinal anesthesia is very rare. There are some reported cases of meningitis after obstetric anesthesia.¹⁻⁴ In most of these cases, however, no bacteria were seen on Gram stain of CSF, and cultures were negative. Bouhemad *et al.*⁵ reported a case of meningitis after combined spinal-epidural analgesia for labor, in which the culture of CSF yielded *S. salivarius* and also a Gram stain of the CSF showed gram-positive diplococci.

Blackmore *et al.*⁶ reported a case of *S. mitis* bacteremia and meningitis after spinal anesthesia in a 76-yr-old man with congestive cardiac failure. Blood culture was positive, but CSF culture was negative. Schneeberger *et al.*⁷ reported four cases of meningitis after spinal anesthesia, but only one was positive in Gram stain and bacterial culture. Recently, Veringa *et al.*⁸ reported a case of iatrogenic meningitis after lumbar puncture caused by *S. salivarius*. He identified the source of infection by isolating *S. salivarius* from a throat swab taken from the neurologist. This bacterium was shown to be identical with that of the patient's isolate by fatty acid profile analysis and PCR fingerprinting.

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Bacterial meningitis after spinal anesthesia can be caused by three possible mechanisms: hematogenous spread, equipment and anesthetic drug contamination, and break in the sterile technique. The source of the bacteria in our patient remained unclear. *S. salivarius* is a commensal of the skin, gastrointestinal tract, genitourinary tract, and oral cavity and paranasal sinuses. It is unlikely that surgery resulted in bacteremia. Even though an aseptic procedure was carefully followed, it is obvious, that the bacterium was introduced to the spinal space during the spinal puncture.

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 postspinal headache. A thorough knowledge and practice of aseptic techniques is crucial in performing spinal and extradural anesthesia.

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Pituitary Apoplexy following Mitral Valve Repair

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POSTOPERATIVE neurologic or neuropsychologic deficits, or both, remain a common cause of disability after otherwise successful cardiac surgery. However, not all deficits are caused by gaseous or atheromatous emboli.

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Case Report

A 56-yr-old, 90-kg man presented for elective mitral valve repair. Mitral valve prolapse was diagnosed initially 4 yr previously. One month before admission, a loud systolic murmur was heard at the cardiac apex; nevertheless, the patient continued to be asymptomatic. Medical history included chronic low-back pain and three lumbar laminectomies. He took no medications other than naproxen. A transthoracic echocardiography revealed normal left ventricular function, left atrial enlargement, mild tricuspid regurgitation, and severe mitral regurgitation, possibly from a torn posterior chorda tendinea.

On the day before surgery, physical examination revealed a fit male, with pupils equally reactive to light and accommodation. The electrocardiogram showed a normal sinus rhythm of 86 beats/min and findings consistent with left ventricular hypertrophy. There was an occasional premature ventricular beat.

After receiving preoperative antibiotic prophylaxis for bacterial endocarditis, anesthesia was induced using intravenous ketamine, fentanyl, midazolam, and succinylcholine. Anesthesia was maintained with isoflurane and fentanyl. Paralysis was maintained with pancuronium. Transesophageal echocardiography confirmed severe mitral regurgitation with a flail posterior leaflet. Venous and arterial cannulae were placed after heparin anticoagulation. Extracorporeal circulation was