Cauda Equina Syndrome and Profound Hearing Loss After Spinal Anesthesia with Isobaric Bupivacaine

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Case Report

A 33-yr-old man in good health with no preexisting neurologic deficits presented for anorectal surgery under spinal anesthesia. Skin was cleansed with spinal polyvidone iodized at 5% (LTD/UK expiration 06/2006). With the patient in the sitting position, 2.5 mL of isobaric bupivacaine 0.5% (Multi M: expiration date 10/2006) was administered via a 22-gauge needle (Spinocan; Braun) at the L3-4 level. Clear cerebrospinal fluid was obtained on the first attempt without any blood or paresthesia. The equipment and drugs were prepackaged sterile kits and had been stored at 4°C. The patient was placed in the lithotomy position and in the Trendelenburg position. He reported transient attacks of vertigo lasting a few minutes immediately after bupivacaine administration. Within 10 min, the sensory level was noted to be T10 and complete lower extremity motor block was achieved. Surgical blood loss was not significant. Successful surgery was performed within 90 min. Six hours after administration of the spinal anesthetic, the patient was noted to have bilateral sensorimotor deficits of the lower extremity and impaired sensation to pinpicks in the perianal region. Urinary and fecal incontinence were also observed. A myelogram and a computed tomography scan performed the next day showed imaging within normal limits. Lumbosacral magnetic resonance imaging was not performed because this technology was not available. Cauda equina syndrome was diagnosed.

In addition to cauda equina syndrome, the patient experienced bilateral hearing loss. Audiometric testing was performed 3 mo and 6 mo after the spinal anesthetic using a diagnostic audiometer AF 12. The aural deficit was assessed by audiometry, and pure tone thresholds were recorded in frequencies 125 Hz to 8 kHz. Hearing loss was defined as a loss at 3 or more frequencies of 10 db. The hearing loss was bilateral and affected the low speech frequencies and the left side more than the right. The audiogram revealed worsening of 10 db pure tone average at the 0.5, 1, 2, 3, 4, 5, and 6 Hz hearing thresholds. These findings are consistent with a cochlear pathology induced by the lumbar puncture for spinal anesthesia.

Lower extremity weakness was still present 21 mo postoperatively, and the patient required catheterization and was unable to have a bowel movement spontaneously. In addition, the profound hearing loss persisted.

Discussion

We describe a case of cauda equina syndrome characterized by urinary and fecal incontinence, perianal sensory loss and lower extremity weakness after routine spinal anesthesia with 0.5% isobaric bupivacaine. The patient simultaneously developed a persistent hearing loss. Although these major complications...
rarely occur after spinal anesthesia, our patient developed both (8–11).

The exact etiology of hearing loss after spinal anesthesia is unknown (12,13). However, some studies suggest that hearing loss can result whenever cerebrospinal fluid leakage occurs (14,15). Decreasing of perilymphatic pressure leads to acute endolymphatic hydrops (5), a histologic marker for Ménière’s syndrome (16). This syndrome is characterized by spontaneous attacks of vertigo, sensory hearing loss, aural fullness, and tinnitus (17). These symptoms were noted in the present case. Hearing loss after spinal anesthesia is typically related to needle size and is more frequent in young patients. In the present case, the patient was 33 years old and a 22-gauge needle was used (4,6,18).

The potential etiologies of cauda equina syndrome include direct or indirect trauma, lithotomy position, infection, and spinal cord compression (19). The lithotomy position by producing maldistribution of local anesthetic is a risk factor for cauda equina syndrome (20,21). In our case, no cause of spinal cord or nerve root compression was observed on the computed tomographic scan. Injections into the cord can readily produce bilateral deficits. Such cases are generally but not always associated with paresthesias at the time of lumbar puncture. In the present case no paresthesias were elicited with needle placement (22,23). However, the possibility of direct trauma cannot be excluded. In our case, the thoracic sensory level block was bilateral and reached T10 within 10 min after spinal anesthesia with 2.5 mL of isobaric bupivacaine; thus, maldistribution seems unlikely. Thus the explanation for cauda equina syndrome is uncertain and consequently speculative. Magnetic resonance imaging, which may have been helpful in assessing the potential etiologies, was not available.

In summary, we report two rare and serious complications of spinal anesthesia in the same patient after uneventful block performance.

References