

# Acute Deafness After Spinal Anesthesia

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## Abstract

We report a case of acute deafness after spinal anesthesia.

## CASE REPORT

A seventy six year old patient received for a total knee replacement a combined spinal and epidural lumbar anesthesia at the height L<sub>3/4</sub>. She got 3,5 ml bupivacaine 0,5% intrathecal; the epidural catheter was put in 15 cm from skin level. Neurological diseases or hearing defects weren't listed in case history.

Within two hours the surgery was practiced without difficulties. Following the surgery a Patient Control Analgesia (PCA) – pump administering 4 ml ropivacaine 0,2%/h was connected to the epidural catheter. Additionally, the patient was able to receive boli of 5 ml ropivacaine 0,2% all 30 minutes at most.

Due to the above mentioned therapy the patient was painless and no complications took place.

After an increased mobilization out of bed starting at the 4<sup>th</sup> postoperative day the patient suddenly complained about severe unilateral deafness. 15 hours later she also complained about a headache reinforcing in upright position.

Due to frequent bolus requirements of app. 10 ml ropivacaine 0,2% (20 mg) by the patient during several days the unilateral deafness was explained as a central sign of overdosing the ropivacaine. As a result the PCA – pump was taken away.

During four days the patient got app. 400 mg of ropivacaine a day up until that point of time.

The thought of a possible complication concerning the spinal anesthesia wasn't taken into account until a position – related headache appeared. Within five days the hearing ability recovered very well and on account of the administration of

dipyrone the headache vanished after two days.

## DISCUSSION

In medical literature temporary unilateral deafness of the inner ear is discussed as a controversial complication following spinal anesthesia. Thus, Panning [4] sees no need for a patient to be routinely enlightened about the risk of temporary deafness prior to spinal anesthesia due to the low incidence of that particular complication.

Dreyer, however, conducted a prospective study which projects an incidence rate of 16% - a frequency which would make patient enlightenment about potential postoperative deafness mandatory.

The unilateral deafness described in Dreyer's publication appeared on the second day after spinal anesthesia and disappeared three days later without any therapy. The unilateral deafness, which usually concerns typically the low and the medium frequencies, is attributed to a decreased pressure in the subarachnoid space due to a loss of liquor [2].

This results in a modification of the endolymphatic pressure difference and therefore triggers a change in the oscillatory characteristics of the basilar membrane.

Another study-group examined the incidence of temporary deafness following general and spinal anesthesia. They concluded that the intraoperatively administered fluid volume played a key role whereas the anesthesiological procedure itself could not be established as a contributing factor [4].

Constantinidis [1] et al. present a case with unilateral cochlear dysfunction and sensorineural hearing loss after inguinal hernia operation under controlled anesthesia.

According to Constantinidis [1] et al., however, spinal anesthesia seems to generate a higher incidence of acute unilateral deafness. In that respective case, unilateral deafness did not appear until the fourth postoperative day. As a consequence, the physicians in charge did not instantly attribute this symptom to the spinal puncture.

They rather considered it to be a side effect of the continuously administered local anesthetic.

It was not until the onset of a typical postspinal headache and the persistence of unilateral deafness after discontinuation of the local anesthetic that a loss of liquor was considered as a potential cause.

The fact that the symptoms occurred four days after surgery can be explained by the protracted immobilization of the patient, which made it impossible for the patient to assume an upright position to sit or walk.

Our case indicates that the possibility of a loss of liquor has to be taken into account even in a case of delayed postoperative partial deafness.

Another interesting point is, that hearing loss developing after spinal anesthesia is more frequent and severe in the young than in the elderly patients [3]. In this study it is again hypothesized that the cerebrospinal fluid leakage after dural puncture plays an important role regarding the developing of a hearing loss after spinal anesthesia.

Additionally, it has to be emphasized that temporary unilateral deafness can be regarded a not uncommon complication few doctors seem to be aware of. Further studies need to answer the following question: Is unilateral deafness only a result of spinal anesthesia or can this complication also be attributed to general anesthesia?

Divergent opinions regarding this issue seem to prevail in current medical literature.

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