

# Diagnosis Of Un-Recognized Durotomy From Lumbar Discectomy Using Audiometry: A Technical Note

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## Citation

T Williams, P Kerr, S Gowrie-Mohan. *Diagnosis Of Un-Recognized Durotomy From Lumbar Discectomy Using Audiometry: A Technical Note*. The Internet Journal of Spine Surgery. 2004 Volume 1 Number 1.

## Abstract

A discectomy case example is used to highlight a novel, non-invasive technique for detecting a possible dural tear. Hearing loss, a now recognised feature of cerebrospinal fluid leakage is shown to reverse following subsequent use of a blood patch.

## INTRODUCTION

The frequency of inadvertent cerebrospinal fluid (CSF) leak secondary to lumbar discectomy varies from 1- 17%<sup>(1,2,3)</sup>. A proportion of these going unnoticed at the time of surgery. This technical note highlights how hearing loss confirmed by audiometry serves as an indicator of a dural tear. Subsequent management is with a blood patch<sup>(6)</sup>.

## CASE REPORT

A 37 year-old woman presented with a four-month history of left sciatica. A MRI scan confirmed a prolapsed intervertebral disc at the L4/5 level. A standard L4/5 discectomy under direct visualization was performed. No dural tear or CSF leak was noted at the time of operation. Initial post-operative progress was uncomplicated, with good relief of leg pain and she was discharged on the second postoperative day

On the sixth postoperative day the patient complained of headache, photophobia and hearing loss. Neurological examination and routine laboratory tests were normal. She was readmitted with the suspicion of a CSF leak. Pure tone audiometry was performed confirming bilateral reduction in hearing of between fifteen and twenty decibels, most marked in the lower frequency range (250 - 1000Hz). An epidural blood patch resulted in swift resolution of her headache and visual disturbances. Her auditory symptoms persisted slightly longer but an audiogram 24 hours after the epidural blood patch showed a notable improvement of the hearing defect (Figures 1&2).

Figure 1

Figure 1: Left Ear pre & post-epidural audiograms

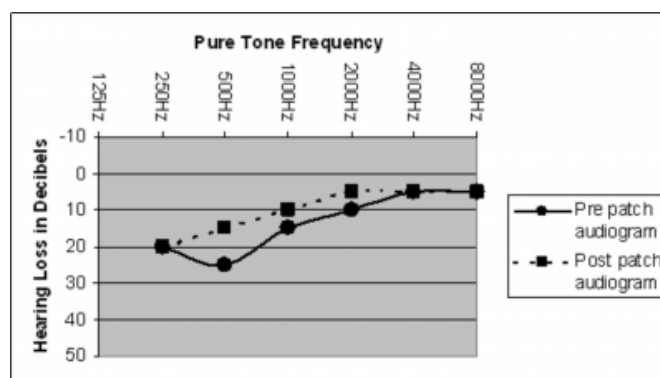
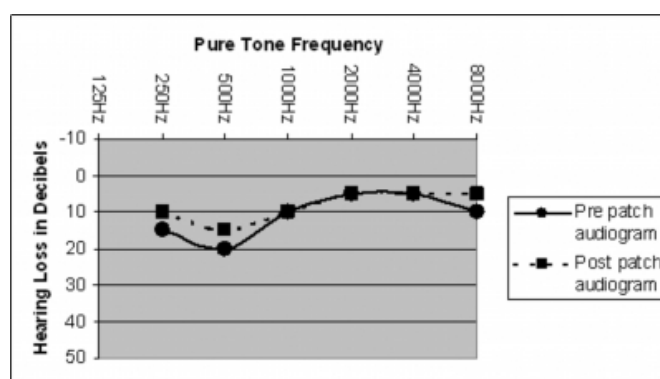


Figure 2

Figure 2: Right Ear pre & post-epidural audiograms



## DISCUSSION

Durotomy is a recognised complication of spinal surgery with a published incidence of between 1-17%. This is usually obvious at the time of surgery, but delayed leaks or tiny perforations do go unnoticed. In this case a simple, non-invasive technique for detecting a CSF leak was successfully

used.

The presence of a hearing loss as a consequence of CSF leakage is well established<sup>(4)</sup>. The pathophysiology proposed involves inner ear hydromechanics. The cochlear aqueduct is a communication between the CSF in the subarachnoid space and the perilymph within the cochlear. Bi-directional flow or diffusion within the duct allows synchronous changes of the perilymph pressure in response to changes in the CSF pressure. A reactive change in the endolymph volume causes the reversible hearing loss. Supporting this, Carlborg et al<sup>(5)</sup> found that obliteration of the aqueduct, in animal models, resulted in a much more protracted regulation of perilymph pressure in response to lowered CSF pressure.

### **CONCLUSION**

Inadvertent durotomy following lumbar discectomy may lead to hearing loss readily confirmed by audiometry. Once

the diagnosis of CSF leakage is confirmed, routine treatment with a blood patch typically results in resolution of the hearing deficit after just 24 hours.

### **References**

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