

# Sudden deafness after dental surgery

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BMJ 1991;303:1034

"Sudden unilateral or bilateral impairment of hearing is a symptom, not a disease,"<sup>1</sup> and it must be considered as an emergency that requires thorough investigation and treatment. The annual incidence of sudden hearing loss is 5-20 cases per 100 000 population.<sup>2</sup>

## Case reports

Four patients with sudden onset of deafness presented to our department over the past three years. Each gave a history of unilateral deafness after a dental procedure. The table shows details of these patients.

## Comment

The first factor that can be assessed from the medical histories of these patients is the side of the dental procedure. This may be important as three out of the four cases had an ipsilateral hearing loss, though the site (upper or lower) is evidently not important. Both age and sex are irrelevant, and the form of anaesthesia cannot play a prime role as three patients had local anaesthesia and one had general anaesthesia. Thus the only common factors were opening the jaw widely and undergoing a dental procedure. This could have led to deafness in several ways.

If physical trauma were to account for inner ear damage it could take several forms. Direct trauma on the part of the dentist is possible but unlikely. Those patients who required drilling would have been exposed to a small degree of noise, which is well transmitted from teeth to the ear, but the product of noise intensity and the duration of drilling seems slight in comparison to that leading to industrial noise-induced deafness or to the amount that dentists are exposed to.<sup>3</sup>

There are several channels of communication between the teeth and the ear. Nocioceptive afferents

of the trigeminal nerve might be involved in a reflex effect on the inner ear; or there might be an autonomic reflex—possibly through antidromic fibres—duplicating inappropriately in the branches of the internal auditory artery. Another channel is provided by the vascular system. Dental extraction is known to release microemboli into the circulation, and these can include potentially pathogenic bacteria. The tendency to unilaterality seen in our series could be explained by proximity and local communicating vessels.

The venous system could also provide channels of direct communication. These channels could offer toxic agents access to the ear. Three patients had local anaesthesia, and it is usual to use a vasoconstrictor in all dental surgery; this could induce localised vasospasm of the cochlear division of the internal auditory artery. Experimental studies of microembolism of this vessel have produced varying degrees of endolymphatic hydrops.<sup>4</sup> Ototoxicity is a second possibility as localised concentrations of these agents in tissue would be high. However, local anaesthetics (especially lignocaine) have been used to treat Ménière's disease with no reported deleterious side effects.<sup>5</sup>

Although none of these hypotheses can explain the cause of deafness in all the patients in our series, if any of them were the cause of even one case it would be expected that for every case of severe hearing loss there would be many less severe cases and that the association would have been recognised. We believe that the association between dental surgery and a sensorineural hearing deficit has not previously been described. Perhaps the recognition of this loss is obscured by a gradual onset and by the lapse of time between dental treatment and the detection of asymmetrical hearing loss.

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(Accepted 29 May 1991)

Characteristics of patients with sudden hearing loss after a dental procedure

Case No	Age	Sex	Side of procedure	Anaesthesia	Upper or lower teeth	Procedure	Time of onset of deafness	Associated symptoms	Outcome
1	68	M	Left	Inferior dental nerve block (2% lignocaine and 1:80 000 adrenalin)	Lower	Restoration	7 Days	None	Sensorineural deafness
2	14	M	Left	Local infiltration (2% lignocaine and 1:80 000 adrenalin)	Upper	Restoration	1 Day	Tinnitus, vertigo, nausea	Sensorineural deafness
3	67	F	Left	Local infiltration (prilocaine hydrochloride 3% and felypressin 0.03 IU/ml)	Upper	Restoration	6 Hours	Tinnitus, vertigo, nausea	Sensorineural deafness
4	10	F	Left and right	General anaesthesia (halothane and nitrous oxide)	Upper and lower	Extraction	3 Days	Transient left facial palsy	Sensorineural deafness