CASE STUDY

A New Approach to the Treatment of the Three Symptoms of Ménière’s Disease: Labyrinthectomy and Cochlear Implant in the Same Surgical Procedure

A 59-year-old male presented at our surgery for the first time in 2004 having had 2 or 3 episodes of vertigo per month since 2001. These episodes lasted approximately 1 h and were accompanied by tinnitus and hearing loss in the left ear (LE). Three months prior to this initial consultation, the patient had also suffered from tinnitus and hearing loss in the right ear (RE). Liminal pure tone audiometry showed a bilateral moderate neurosensorial hearing loss (average threshold of 500–4000 Hz of 54 dB frequencies in the LE and of 46 dB in the RE). The brain MRI scan was normal. Tests for LE immunological disease, Lyme disease, and lues were negative.

The patient was diagnosed with bilateral Ménière’s disease (BMD) and was administered treatment with a low-salt diet, diuretics (Torsemide), and Betahistine. When there was no improvement to the patient’s condition, a 6-month treatment with Prednisone was administered, with a maximum of 10 mg and a minimum of 2.5 mg every 24 h. The frequency and intensity of the vertigo episodes did not improve, with the patient presenting an average of 6.25 crises per month lasting more than 20 min. Different alternative therapies were therefore prescribed, in one ear or the other, according to which had a predominance of tinnitus or sensation of otic obstruction for most of the crisis (Fig. 1). In 2010, the patient had 72 vertigo crises lasting over 20 min, tinnitus of 8/10 intensity on the visual analogue scale (VAS), and hearing loss was now bilateral and profound (PTA 95 dB in RE and 85 dB in LE). RE surgical labyrinthectomy (SL) was therefore performed and a Nucleus® CI512 cochlear implant (CI) was inserted in the same surgical procedure. SL was performed by removing all vestibular structures following the classic technique, taking special care to prevent any cochlear damage. An anterior–inferior cochleostomy to the round window was performed, the electrode array was inserted, and the cochleostomy was sealed with muscle.

The vertiginous crises subsequently disappeared and the RE tinnitus considerably lowered in intensity from a score
of 8 to a score of 2 in the VAS. Pure tone audiometry with CI in free field presented a PTA of 30 dB, with disyllabic discrimination in a quiet atmosphere of 92%. In 2012 the patient again presented with a vertigo episode coinciding with variations of intensity and quality of LE tinnitus, and was administered a 27.6 mg/ml dose of intratympanic gentamicin in this ear. He has not presented subsequently with any further vertiginous crises.

Discussion

Satisfactory results in the control of a patient’s vertigo treated with surgical labyrinthectomy are widely documented. Likewise, satisfactory results have been obtained when CI has been used in cases of severe hearing loss when the use of a hearing aid obtained no results, probably because the spiral ganglion cell populations are not affected in Ménière’s disease (MD). Furthermore, the beneficial effect of the CI on tinnitus has been described by several authors and as a result CI offers us the possibility of treating both cochlear symptoms. We may therefore consider that the combination of labyrinthotomy and CI would be an option for treating the 3 typical symptoms of MD.

In our case, the patient had multiple vertigo crises which could not be controlled by the use of pharmacological treatment or intratympanic treatment, and treatment possibilities were thus restricted to vestibular neuromyotax or SL. We were unable to improve the severe auditory problem of the patient with either of the 2 interventions, and we therefore decided to use SL and CI.

One issue to consider is whether to perform the 2 surgical procedures together or separate them over time and perform the second one depending on the disease’s evolution. Recent studies show that the fibrotic histological changes which may occur in the cochlear following laryngectomy may hinder future positioning of the electrode array. Therefore, and to avoid a second intervention, we decided to carry out both interventions (SL and insertion of the CI) in a single surgical procedure. Logically we were to operate on the ear we considered had been causing the crises over time, since the auditory situation was similar in both ears. During the repeated visits of the patient to the hospital we insisted on taking down all the details he could offer us so as to make such a decision. The patient had to note which ear was affected during the crisis, the variation in the quality or intensity of the tinnitus, and/or sensation of otic pressure. As the patient had mentioned the RE during the period prior to surgery, it was decided to operate on that ear.

We have not found any typical MD case in literature in which a complete SL has been performed together with CI insertion in the same surgical procedure. Zwolan et al. performed this on a patient who had profound bilateral hearing loss since birth due to German measles and who years later suffered a vertigo crises, possibly due to delayed endolymphatic hydrops. Morgan et al. inserted a CI in an EMD patient on whom they performed a chemical labyrinthectomy. We consider that it is best to perform the SL and the CI at the same time for the above-mentioned reasons. In our case we gained control of the vertigo crises due to the operated ear, together with a considerable improvement in the tinnitus and hearing problem.

Conflict of Interest

The authors have no conflict of interests to declare.