Delayed Severe Dizziness Due to Electrode Paddle Migration After Auditory Brainstem Implantation: A Case Report

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INTRODUCTION

Cochlear implantation is often not beneficial for patients with neurofibromatosis 2-related schwannomatosis (NF2) due to the absence of a usable cochlear nerve from tumor growth or management. Auditory brainstem implantation (ABI) is an alternative surgical procedure utilized to improve auditory perception. Non-auditory side effects (NASE) are a potential complication related to both surgery and device use. We report a unique delayed complication involving severe dizziness due to electrode paddle migration.

CASE DESCRIPTION

A 24 y female with NF2 presented with a right sided collision tumour and ipsilateral sensorineural hearing loss. She had a history of nervous system tumours and left-sided ABI. We proceeded with a translabyrinthine resection her right tumour with simultaneous ABI placement. Post-operative recovery was uneventful without NASE during the first year of follow-ups. She experienced improved communication with 4% improved scores with vision alone and 68% with lip-reading on closed-set testing using CID Sentences. She began to experience severe debilitating dizziness one-year post-surgery in relation to device use.

INVESTIGATIONS

Repeat MRI after the onset of severe dizziness revealed that the ABI electrode paddle had migrated from the foramen of Luscka. The fat graft placed intra-operatively had atrophied when compared to the immediate post-operative MRI. The new position of the paddle was appreciated at the flocculus.

INTERVENTION

Given the patients debilitating dizziness, along with the MRI findings, we counselled her to discontinue ABI use. Thereafter, the patient's dizziness significantly improved.

DISCUSSION

While NASE of ABI are well-documented, our case represents an uncommon, delayed complication. Colletti et al. (2010) reported acute post-operative dizziness in 19% of ABI patients, which resolved within weeks. Our patient's severe dizziness occurred one-year post-implantation, even after a period of successful auditory use. We hypothesize that fat atrophy in the surgical cavity led to paddle lateralization and displacement. The paddle was identified at the cerebellar flocculus, likely stimulating the oculomotor neurons. This pathway is responsible for coordination of eye movements and balance typically from vestibular inputs. Our patient did not have peripheral vestibular inputs (no vestibular organs/nerves) from either side due to previous surgeries. However, the effects from the ABI paddle stimulation caused vestibulo-ocular reflex instability and dizziness.

CONCLUSION

A documented case of this nature, with supportive radiographic imaging, is unprecedented in the literature. ABI paddle placement may be dynamic in NF2 patients influenced by disease progression and treatments. Reimaging holds value when troubleshooting performance changes post ABI. This novel case underscores a delayed complication of ABI in NF2 patients, emphasizing the importance of patient counseling and consideration of reconstruction materials as they relate to long-term device positioning.

REFERENCES

Colletti, V., Shannon, R. V., Carner, M., Veronese, S., & Colletti, L. (2010). Complications in auditory brainstem implant surgery in adults and children. Otology & Neurotology, 31(4), 558-564.

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FIGURE 1. CISS sequence immediately post-op from right ABI. Arrow shows shadow of paddle in the cochlear nucleus.

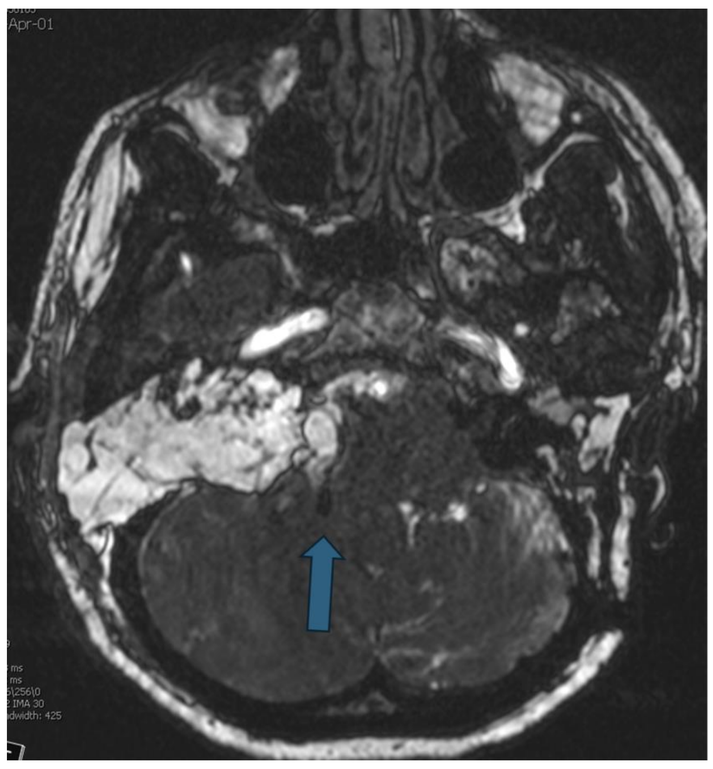

FIGURE 2. MRI T1-weighted scan with gadolinium immediately post-op from right ABI. Arrow shows shadow of paddle in the cochlear nucleus.

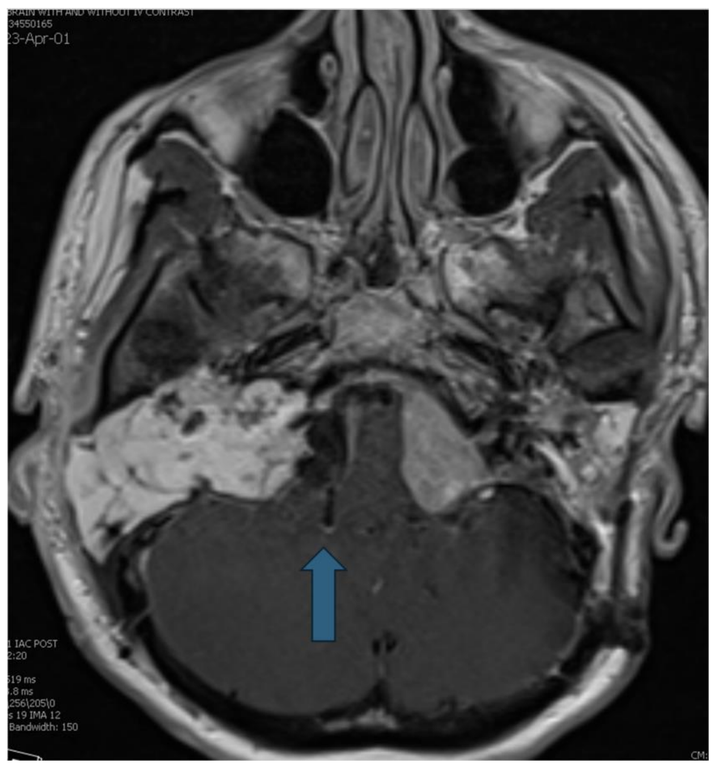

FIGURE 3. CISS sequence one-year post-op from right ABI. Arrow shows shadow of paddle migrated out of the cochlear nucleus near the flocculus, along with post-op fat receding.