

Development of a high-grade glioma in a patient with Parkinson's disease treated with deep brain stimulation of the subthalamic nucleus: a case report

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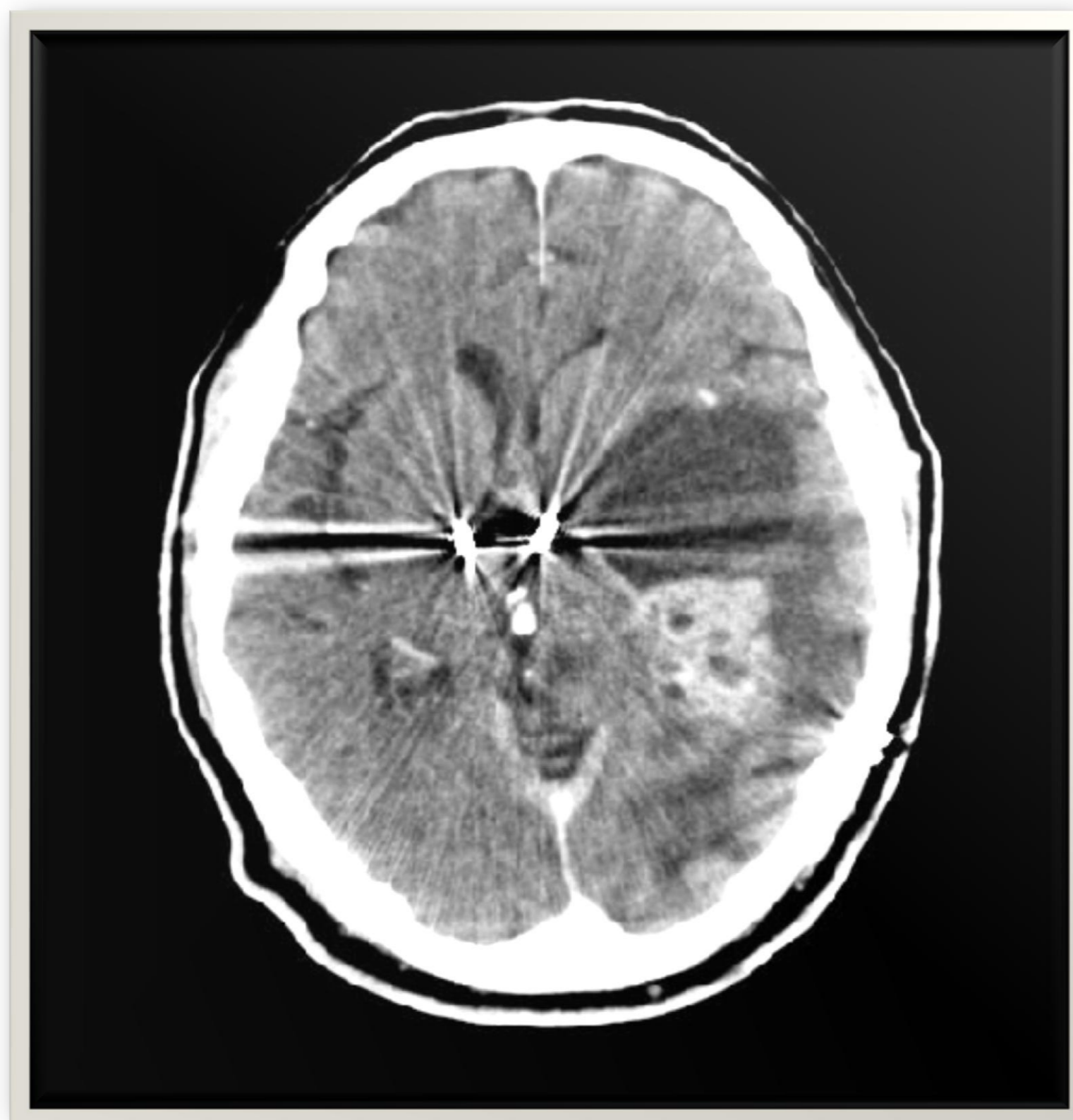
Introduction

Deep brain stimulation (DBS) is an effective therapy for the treatment of advanced Parkinson Disease (PD). It consists in implantation of a pulse generator and bilateral electrodes that transmit electrical stimulation to a target within the basal ganglia, most often the subthalamic nucleus (STN). Complications of this procedure include infections, haemorrhages and neuro-psychiatric disorders; to date, an association with brain tumors has only been described in a single case report.

Case report

We report a case of a 68-year-old man with PD, successfully treated for 7 years with STN-DBS, who presented with confusion, day-time sleepiness, gait difficulties and global slowness. Stimulation parameters were: 3.6 volts on the left STN and 3.4 volts on the right STN, a pulse width of 60 μ s and a frequency of 130 Hz bilaterally; battery was charged and impedances were normal.

The patient was admitted to the hospital and underwent first a computed tomography (CT) scan, that showed the presence of a large space-occupying lesion in the left temporo-parietal region extended to basal ganglia. A contrast CT scan was executed, that confirmed the finding of a high-grade lesion (multicentric glioma).



Given the patient's general conditions, the position and the radiologic characteristics of the lesion, no further assessment or active treatment was pursued. Anti-edema therapy was administered. Since the tumor and the large surrounding edema determined the dislocation of the cerebral electrodes, electrical stimulation was interrupted and antiparkinsonian therapy slightly increased. The patient was transferred to a hospice where he received palliative care and died three months later.

Discussion

To date, a possible association between cochlear implants and glioblastoma has been described, hypothesizing that the low-frequency extraparenchymal electrical stimulation emanating from the transcutaneous link of the prosthesis could induce brain tumors (1). Instead, there is only one other report of a brain tumor in a DBS patient (2).

Conclusions

The development of a high-grade glioma in DBS patients is most probably an incidental finding, considering the rarity of cases reported and the high number of DBS implants worldwide.

References

1. Kalakoti et al, Cochlear implants in the etiopathogenesis of glioblastoma-an interesting observation or independent finding?, Acta Neurochir (2016) 158:907-912
2. Mindermann and Mendelowitsch, Deep brain stimulation and the development of a high-grade glioma: incidental or causal association?, Acta Neurochir (2016) 158:915-917