

Deep Brain Stimulation Treatment for Genetic Parkinson's Disease: A Case Report

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Received: 19 September 2023, Accepted: 24 October 2023, Published online: 28 March 2024

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Abstract

Parkinson's disease (PD) is the second most common neurodegenerative disease and its prevalence has been projected to double over the next 30 years. The diagnosis of PD is bradykinesia and resting tremor or rigidity. PD is a progressive neurodegenerative disease with both motor and nonmotor symptoms. There are many medical options for the treatment of PD but levodopa remains the mainstay. Deep brain stimulation (DBS) is a safe neurosurgical symptomatic treatment for eligible patients with advanced disease in whom medical therapy fails to provide adequate symptom control and a good quality of life or in whom dopaminergic drugs cause severe side effects such as dyskinesias. In this case report, a 44-year-old female patient with a history of tremor and genetic Parkinson's disease, who presented to the clinic with the complaint of excessive increase in tremor in recent years, firstly with drug treatment and then with DBS treatment is reported.

Keywords: Deep Brain Stimulation, Parkinsonism, Parkinson's Disease

Suggested Citation: Akçay G, Kuzu Mumcu M, Gülensoy B, Sorar M, Yılmaz A. Deep Brain Stimulation Treatment for Genetic Parkinson's Disease: A Case Report. Mid Blac Sea Journal of Health Sci, 2024;10(1):119-122.

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INTRODUCTION

Parkinson's disease (PD) is a movement disorder that is difficult to diagnose and treat but is common among neurological diseases (1, 2). Currently, there isn't a specific test to diagnose Parkinson's disease. Resting tremor, bradykinesia, rigidity and loss of postural

reflexes are generally considered the cardinal signs of PD. PD patients have motor and non-motor symptoms. Medical management of PD patients is difficult due to the limited availability of drug therapy and the fact that levodopa is the mainstay of treatment. However, levodopa-induced dyskinesia is commonly seen in Parkinson's patients treated with levodopa (2). This side effect usually occurs after a long period of treatment. Different surgical approaches, including unilateral pallidotomy and deep brain stimulation (DBS), give very good results in PD patients who cannot be managed with medication alone (2). DBS is a safe neurosurgical symptomatic treatment for suitable patients with advanced disease in whom medical therapy fails to provide adequate symptom control and a good quality of life or in whom dopaminergic drugs cause severe side effects such as dyskinesias (2). In this case report, a 44-year-old patient with genetic Parkinson's disease was admitted to the clinic with complaints of foot dragging, difficulty walking, and tremor on the left side. The patient, who also had diphasic dyskinesia, was treated with the method as a result of not responding to apomorphine treatment.

CASE

A 44-year-old female patient with genetic Parkinson's disease with a history of foot dragging, difficulty walking, and left-sided tremor presented to the clinic with the

complaint of an excessive increase in tremor, especially in the last 2.5 years, although she had tremor for many years. The patient also had diphasic dyskinesia. The patient who did not benefit from apomorphine was treated with the DBS method after she responded to Levodopa. A brain pacemaker was implanted, and DBS surgery was performed (Fig. 1 and Fig. 2).

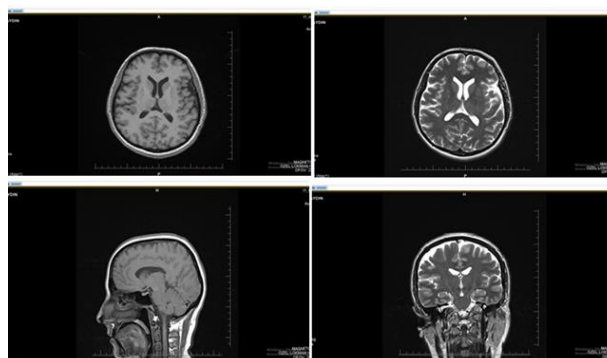


Figure 1. Pre-operative MRI

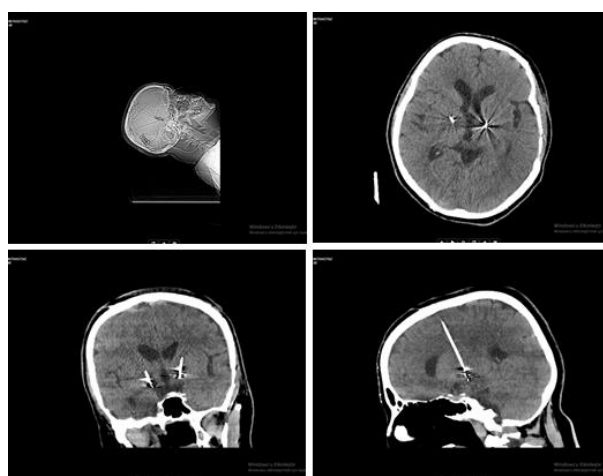


Figure 2. Post-operative CT

In six months after DBS treatment, his symptoms regressed markedly and no complaint of diphasic dyskinesia was observed. While the baseline Unified Parkinson's Disease Rating Scale (UPDRS) motor score was 23, the score was 7 in the 6th month after DBS treatment. The patient complained of leg pain,

and pregabalin 2*225 mg was started. At the end of the second year, intermittent pain in both legs did not improve or progress with DBS adjustment. In addition, while rigidity and bradykinesia in bilateral hands were 0/0, resting tremor was present in the right hand + resting tremor and there was no postural instability.

DISCUSSION

PD is a common movement disorder with motor and non-motor symptoms that is difficult to treat among neurological diseases (1). PD is a progressive neurodegenerative disease caused by the loss of dopaminergic neuronal cells in the substantia nigra pars compacta (3). Medical management of PD patients is difficult due to the limited availability of drug therapies such as levodopa (1). In addition, after a long period of treatment with levodopa in Parkinson's patients, side effects such as levodopa-induced dyskinesia occur (2). Different surgical approaches, including DBS, give very good results in PD patients who cannot be managed with medication alone. It has been a therapeutic option for the treatment of PD for over 30 years (4). It is an effective treatment modality in advanced patients in whom medical therapy fails to provide adequate symptom control and a good quality of life or in whom dopaminergic drugs cause severe side effects such as dyskinesias (2). In a clinical trial, DBS treatment applied to patients with mid-stage Parkinson's disease showed improvement in quality of life, reduction in drug use and

improvement in motor scores (5-7). Deuschl et al. showed that DBS treatment was effective even at an earlier stage of PD (7). In this study, a patient with genetic Parkinson's disease and a history of foot dragging, difficulty walking, and left-sided tremor was treated with the DBS method. Similar to other studies in the literature, in our study, it was shown that a favorable response could be obtained with DBS treatment in a drug-resistant patient despite a genetic history.

CONCLUSION

In conclusion, the patient who had tremors for many years and did not respond to levodopa and pramipexole, Pramipexole, Ciprolex and Benexol, recovered after DBS treatment. The DBS method is an effective treatment for Parkinson's patients who do not respond to Parkinson's drugs such as Levodopa.

Ethics Committee Approval: The presented study is qualitative and consent was obtained by giving information about the study by one-to-one interviews with the subjects who agreed to participate. The study was carried out by paying attention to the Declaration of Helsinki.

Peer-review: Externally peer-reviewed

Author Contributions: Concept: GA Design: GA, MKK, BG, MS, AY, Data Collection and Processing: GA, MKK, BG, MS, AY Analysis

and Interpretation: GA Writing: GA, MKK, BG, MS, AY

Conflict of Interest: The authors declared no conflict of interest.

Financial Disclosure: The authors declared that this study has not received no financial support.

Acknowledgements: The authors would like to thank the people who all nurses in this study.

with early motor complications. *N Engl J Med*, 2013. 368(7): p. 610-22.

7. Deuschl G, Schüpbach M, Knudsen K, Pinski MO, Cornu P, Rau J, et al., Stimulation of the subthalamic nucleus at an earlier disease stage of Parkinson's disease: concept and standards of the EARLYSTIM-study. *Parkinsonism Relat Disord*, 2013. 19(1): p. 56-61.

REFERENCES

1. Reich SG, Savitt JM, Parkinson's Disease. *Med Clin North Am*, 2019;103(2):337-350.
2. Hariz M, Blomstedt P. Deep brain stimulation for Parkinson's disease. *J Intern Med*, 2022;292(5): 764-778.
3. Church FC., Treatment Options for Motor and Non-Motor Symptoms of Parkinson's Disease. *Biomolecules*, 2021;11(4):612.
4. França, C., Carra RB, Diniz JM, Munhoz RP, Cury RG. Deep brain stimulation in Parkinson's disease: state of the art and future perspectives. *Arq Neuropsiquiatr*, 2022;80(5 Suppl 1):105-115.
5. Charles D, Konrad PE, Neimat J, Molinari AL, Tramontana MG, Fider SG, et al., Subthalamic nucleus deep brain stimulation in early-stage Parkinson's disease. *Parkinsonism Relat Disord*, 2014;20(7):731-7.
6. Schuepbach WM, Rau K, Knudsen J, Volkmann P, Krack L, Timmermann TD, et al., Neurostimulation for Parkinson's disease