1. Neurology. 2016 Feb 16;86(7):651-9. doi: 10.1212/WNL.0000000000002370. Epub 2016

Jan 20.

\*\*Duplicate\*\*

**Long-term efficacy and tolerability of bilateral pallidal stimulation to treat**

**tardive dyskinesia.**

OBJECTIVE: To confirm the efficacy and safety of deep brain stimulation (DBS) of

the internal part of the globus pallidus in improving severe tardive dyskinesia

(TD).

METHODS: Nineteen patients with severe pharmacoresistant TD were included. All

were assessed at baseline and at 3, 6 (main outcome measure), and 12 months, and

in the long term (6-11 years) for 14 patients, after bilateral pallidal DBS,

using motor scales (Extrapyramidal Symptoms Rating Scale [ESRS], Abnormal

Involuntary Movement Scale [AIMS]), cognitive scales, and a psychiatric

assessment. At 6 months, a double-blind ESRS evaluation was performed in the

stimulation "on" and stimulation "off" conditions.

RESULTS: At 6 months, all patients had a decrease of more than 40% on the ESRS.

The efficacy of the procedure was confirmed by a double-blind evaluation. This

improvement was maintained at 12 months (ESRS: decrease of 58% [21%-81%];

AIMS: decrease of 50% [7%-77%]) and in the long term (ESRS: decrease of 60%

[22%-90%];

AIMS: decrease of 63% [14%-94%], n = 14). All the subscores of the ESRS

(parkinsonism, dystonia, and chorea) and of the AIMS (facial, oral, extremities,

and trunk movements) improved. Despite psychiatric comorbidities at baseline,

cognitive and psychiatric tolerability of the procedure was excellent. No

cognitive decline was observed and mood was improved in most of the patients.

CONCLUSIONS: Pallidal DBS procedure should be considered as a therapeutic option

in disabling TD refractory to medical treatment.

CLASSIFICATION OF EVIDENCE: This study provides Class II evidence that in

patients with severe pharmacoresistant TD with implanted pallidal leads, the

stimulation "on" condition significantly improved ESRS scores compared to the

stimulation "off" condition.

© 2016 American Academy of Neurology.

DOI: 10.1212/WNL.0000000000002370

PMID: 26791148 [Indexed for MEDLINE]

2. Neurol Neurochir Pol. 2016;50(2):114-22. doi: 10.1016/j.pjnns.2016.01.004. Epub

2016 Jan 16.

**Deep brain stimulation for intractable tardive dystonia: Literature overview.**

BACKGROUND: Tardive dystonia (TD) represents a side effect of prolonged intake

of dopamine receptor blocking compounds. TD can be a disabling movement disorder

persisting despite available medical treatment. Deep brain stimulation (DBS) has

been reported successful in this condition although the number of treated

patients with TD is still limited to small clinical studies or case reports. The

aim of this study was to present the systematical overview of the existing

literature regarding DBS for intractable TD.

METHODS AND RESULTS: A literature search was carried out in PudMed. Clinical

case series or case reports describing the patients with TD after DBS treatment

were included in the present overview. Literature search revealed 19 articles

reporting 59 individuals operated for TD. GPi was the target in 55 patients,

while subthalamic nucleus (STN) was the target in the remaining 4. In most

studies the motor part of Burke-Fahn-Marsden Dystonia Rating Scale (BFMDRS) was

improved by more than 80% when compared to preoperative BFMDRS scores.

CONCLUSIONS: The performed literature analysis indicates that bilateral GPi DBS

is an effective treatment for disabling TD. The response of TD to bilateral GPi

DBS may be very rapid and occurs within days/weeks after the procedure. The

efficacy of bilateral GPi DBS in TD patients is comparable to results achieved

in patients with primary generalized dystonia.

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Partner Sp. z o.o. All rights reserved.

DOI: 10.1016/j.pjnns.2016.01.004

PMID: 26969568 [Indexed for MEDLINE]

3. Brain Stimul. 2018 Nov-Dec;11(6):1368-1377. doi: 10.1016/j.brs.2018.08.006. Epub

2018 Sep 11.

\*\* Duplicate from other search\*\*

**Neurostimulation in tardive dystonia/dyskinesia: A delayed start, sham**

**stimulation-controlled randomized trial.**

INTRODUCTION: Growing evidence suggests that pallidal deep brain stimulation

represents a potential new therapeutic avenue in tardive dystonia/dyskinesia,

but controlled and blinded randomized studies (RCT) are missing. The present RCT

compares dystonia/dyskinesia severity of pallidal neurostimulation in patients

with tardive dystonia using a delayed-start design paradigm.

METHODS: Dystonia/dyskinesia severity was assessed via blinded videos following

pallidal neurostimulation at 3 (blinded phase) and 6 months (open extension

phase). Primary endpoint was the percentage change of dystonia severity

(Burke-Fahn-Marsden-Dystonia-Rating-Scale, BFMDRS) at 3 months between active

vs. sham neurostimulation using blinded-video assessment. Secondary endpoints

comprised clinical rating scores for movement disorders. Clinicaltrials.gov

NCT00331669.

RESULTS: Twenty-five patients were randomized (1:1) to active (n = 12) or sham

neurostimulation (n = 13). In the intention-to-treat analyses the between group

difference of dystonia severity (BFMDRS) between active vs. sham stimulation was

not significant at 3 months. Three months post-randomisation dystonia severity

improved significantly within the neurostimulation by 22.8% and

non-significantly within the sham group (12.0%) compared to their respective

baseline severity. During the open-label extension with both groups being

actively treated, significant and pronounced improvements of 41.5% were observed

via blinded evaluation. Adverse events (n = 10) occurred in 10/25 of patients

during the 6 months, mostly related to surgical implantation of the device; all

resolved without sequelae.

CONCLUSION: The primary endpoint of this randomized trial was not significant,

most likely due to incomplete recruitment. However, pronounced improvements of

most secondary endpoints at 3 and 6 months provide evidence for efficacy and

safety of pallidal neurostimulation in tardive dystonia.

Copyright © 2018 Elsevier Inc. All rights reserved.

DOI: 10.1016/j.brs.2018.08.006

PMID: 30249417 [Indexed for MEDLINE]

4. Parkinsonism Relat Disord. 2017 Aug;41:58-65. doi:

10.1016/j.parkreldis.2017.05.010. Epub 2017 May 19.

\*\*Duplicate from other search\*\*

**Long-term follow-up of bilateral subthalamic deep brain stimulation for**

**refractory tardive dystonia.**

BACKGROUND: No effective treatment for tardive dystonia (TD) has been well

established. Deep brain stimulation (DBS) can ameliorate motor manifestations in

primary dystonia, and may also be an effective approach for TD.

OBJECTIVES: This study aimed to illuminate the long-term efficacy and safety of

subthalamic nucleus (STN)-DBS in treating TD.

METHODS: Ten patients with refractory TD underwent STN-DBS therapy and were

assessed by the Burke-Fahn-Marsden dystonia rating scale (BFMDRS), Abnormal

Involuntary Movement Scale (AIMS), Hamilton Depression Scale (HAMD), Hamilton

Anxiety Scale (HAMA), and the Short Form (36) Health Survey (SF-36) at four time

points: pre-operation, 1 week post-operation, 6 months post-operation, and at a

final long-term postsurgical follow-up time point.

RESULTS: The mean follow-up time was 65.6 ± 30.4 months (range, 12-105 months).

At the first follow-up, BFMDRS motor and disability scores had improved by

55.9± 28.3% and 62.6± 32.0%, respectively, while AIMS scores improved by

53.3± 26.7%. At the second follow-up, BFMDRS motor and disability scores

improved further, by 87.3± 17.0% and 84.3% ± 22.9%, respectively, while AIMS

scores improved by 88.4 ± 16.1%. At the last follow-up, this benefit was

sustained and had plateaued. Quality of life was improved significantly at the

long-term follow-up, and the HAMA and HAMD scores displayed a significant

reduction that persisted after the first follow-up.

CONCLUSION: STN-DBS may be an effective and acceptable procedure for TD, leading

to persistent and significant improvement in both movement and psychiatric

symptoms.

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DOI: 10.1016/j.parkreldis.2017.05.010

PMID: 28552340 [Indexed for MEDLINE]

5. No Shinkei Geka. 2017 Nov;45(11):971-976. doi: 10.11477/mf.1436203631.

**[Bilateral Pallidotomy for Tardive Dystonia:A Case Report].**

[Article in Japanese]

Tardive dystonia is a movement disorder related to the use of

dopamine-receptor-blocking drugs. Several reports have shown that deep brain

stimulation of the globus pallidus internus(GPi-DBS)is effective in treating

tardive dystonia. However, a few reports demonstrated the efficacy of ablation

of the GPi(pallidotomy). We herein report a case of tardive dystonia

successfully treated with bilateral pallidotomy. A 32-year-old man developed

severe tardive dystonia 10 years after the chronic use of antipsychotic drugs.

Withdrawal of the drugs and botulinum toxin injections were ineffective. The

patient underwent bilateral pallidotomy for tardive dystonia because of

rejection of the implanted DBS devices. Significant improvement was observed,

with a 95% decrease in the Burke-Fahn-Marsden Dystonia Rating

Scale(BFMDRS)movement score, and no severe adverse events occurred. Symptomatic

relief persisted for nine months. Pallidotomy is a feasible and efficacious

procedure for tardive dystonia treatment without the use of hardware

implantations.

DOI: 10.11477/mf.1436203631

PMID: 29172202 [Indexed for MEDLINE]

6. Neurology. 2009 Jul 7;73(1):53-8. doi: 10.1212/WNL.0b013e3181aaea01.

\*\*Duplicate\*\*

**Long-term effects of pallidal deep brain stimulation in tardive dystonia.**

OBJECTIVE: High-frequency stimulation of the globus pallidus internus (GPi) is a

highly effective therapy in primary dystonia. Recent reports have also

demonstrated almost immediate improvement of motor symptoms in patients with

tardive dystonia after pallidal deep brain stimulation (DBS). Here, we show the

long-term effect of continuous bilateral GPi DBS in tardive dystonia on motor

function, quality of life (QoL), and mood.

METHODS: Nine consecutive patients undergoing DBS for tardive dystonia were

assessed during continuous DBS at 3 time points: 1 week, 3 to 6 months, and last

follow-up at the mean of 41 (range 18-80) months after surgery using established

and validated movement disorder and neuropsychological scales. Clinical

assessment was performed by a neurologist not blinded to the stimulation

settings.

RESULTS: One week and 3 to 6 months after pallidal DBS, Burke-Fahn-Marsden

Dystonia Rating Scale (BFMDRS) motor scores were ameliorated by 56.4 +/- 26.7%

and 74.1 +/- 15.8%, BFMDRS disability scores by 62.5 +/- 21.0% and 88.9 +/-

10.3%, and Abnormal Involuntary Movement Scale (AIMS) scores by 52.3 +/- 24.1%

and 69.5 +/- 27.6%, respectively. At last follow-up, this improvement compared

with the presurgical assessment was maintained as reflected by a reduction of

BFMDRS motor scores by 83.0 +/- 12.2%, BFMDRS disability scores by 67.7 +/-

28.0%, and AIMS scores by 78.7 +/- 19.9%. QoL improved significantly in physical

components, and there was a significant improvement in affective state.

Furthermore, cognitive functions remained unchanged compared with presurgical

status in the long-term follow-up. No permanent adverse effects were observed.

CONCLUSION: Pallidal deep brain stimulation is a safe and effective long-term

treatment in patients with medically refractory tardive dystonia.

DOI: 10.1212/WNL.0b013e3181aaea01

PMID: 19564584 [Indexed for MEDLINE]

7. J Neurosurg. 2019 Oct 11:1-13. doi: 10.3171/2019.6.JNS19548. Online ahead of

print.

**Clinical outcomes of pallidal deep brain stimulation for dystonia implanted**

**using intraoperative MRI.**

OBJECTIVE: Lead placement for deep brain stimulation (DBS) using intraoperative

MRI (iMRI) relies solely on real-time intraoperative neuroimaging to guide

electrode placement, without microelectrode recording (MER) or electrical

stimulation. There is limited information, however, on outcomes after

iMRI-guided DBS for dystonia. The authors evaluated clinical outcomes and

targeting accuracy in patients with dystonia who underwent lead placement using

an iMRI targeting platform.

METHODS: Patients with dystonia undergoing iMRI-guided lead placement in the

globus pallidus pars internus (GPi) were identified. Patients with a prior

ablative or MER-guided procedure were excluded from clinical outcomes analysis.

Burke-Fahn-Marsden Dystonia Rating Scale (BFMDRS) scores and Toronto Western

Spasmodic Torticollis Rating Scale (TWSTRS) scores were assessed preoperatively

and at 6 and 12 months postoperatively. Other measures analyzed include lead

accuracy, complications/adverse events, and stimulation parameters.

RESULTS: A total of 60 leads were implanted in 30 patients. Stereotactic lead

accuracy in the axial plane was 0.93 ± 0.12 mm from the intended target.

Nineteen patients (idiopathic focal, n = 7; idiopathic segmental, n = 5; DYT1, n

= 1; tardive, n = 2; other secondary, n = 4) were included in clinical outcomes

analysis. The mean improvement in BFMDRS score was 51.9% ± 9.7% at 6 months and

63.4% ± 8.0% at 1 year. TWSTRS scores in patients with predominant cervical

dystonia (n = 13) improved by 53.3% ± 10.5% at 6 months and 67.6% ± 9.0% at 1

year. Serious complications occurred in 6 patients (20%), involving 8 of 60

implanted leads (13.3%). The rate of serious complications across all patients

undergoing iMRI-guided DBS at the authors' institution was further reviewed,

including an additional 53 patients undergoing GPi-DBS for Parkinson disease. In

this expanded cohort, serious complications occurred in 11 patients (13.3%)

involving 15 leads (10.1%).

CONCLUSIONS: Intraoperative MRI-guided lead placement in patients with dystonia

showed improvement in clinical outcomes comparable to previously reported

results using awake MER-guided lead placement. The accuracy of lead placement

was high, and the procedure was well tolerated in the majority of patients.

However, a number of patients experienced serious adverse events that were

attributable to the introduction of a novel technique into a busy neurosurgical

practice, and which led to the revision of protocols, product inserts, and

on-site training.

DOI: 10.3171/2019.6.JNS19548

PMID: 31604331

8. Tijdschr Psychiatr. 2015;57(2):125-31.

**[Severe treatment-resistant tardive dystonia: is deep brain stimulation a**

**treatment option].**

[Article in Dutch]

BACKGROUND: Severe tardive dyskinesia or dystonia (TD) are side-effects of

dopamine-blocking agents, most of which are antipsychotics. A small subgroup of

patients develop a severe debilitating treatment-resistant form of TD.

AIM: To assess the effects and side-effects of deep brain stimulation (DBS) in

this subgroup of TD patients.

METHOD: We searched PubMed and Embase using the search terms 'tardive' and 'deep

brain stimulation'. We found 19 articles containing data referring to 52

patients. Using the Burke Fahn Marsden Dystonia Rating Scale (BFMDRS), the

Abnormal Involuntary Movement Scale (AIMS) and the Extrapyramidal Symptoms

Rating Scale (ESRS) we calculated the average improvement in the patients'

condition.

RESULTS: On all the scales the improvement was statistically significant (p <

0.00001), the average improvement being 67% to 78%. In only 4% of the patients

was there a deterioration in the psychiatric disorder.

CONCLUSION: DBS seems to be an effective treatment for treatment-resistant TD

and the side-effects seem to be limited. However, the evidence is limited

because our conclusion is based on case-reports and on small-scale trials

without randomisation or blinding.

PMID: 25669951 [Indexed for MEDLINE]

9. Neurosurg Focus. 2004 Jul 15;17(1):E4. doi: 10.3171/foc.2004.17.1.4.

**Microelectrode-guided implantation of deep brain stimulators into the globus**

**pallidus internus for dystonia: techniques, electrode locations, and outcomes.**

Object. Deep brain stimulation (DBS) of the globus pallidus internus (GPi) is a

promising new procedure for the treatment of dystonia. The authors present their

technical approach for placement of electrodes into the GPi in awake patients

with dystonia, including the methodology used for electrophysiological mapping

of the GPi in the dystonic state, clinical outcomes and complications, and the

location of electrodes associated with optimal benefit. Methods. Twenty-three

adult and pediatric patients who had various forms of dystonia were included in

this study. Baseline neurological status and improvement in motor function

resulting from DBS were measured using the Burke-Fahn-Marsden Dystonia Rating

Scale (BFMDRS). Implantation of the DBS lead was performed using magnetic

resonance (MR) imaging-based stereotaxy, single-cell microelectrode recording,

and intraoperative test stimulation to determine thresholds for

stimulation-induced adverse effects. Electrode locations were measured on

computationally reformatted postoperative MR images according to a prospective

protocol. Conclusions. Physiologically guided implantation of DBS electrodes in

patients with dystonia is technically feasible in the awake state in most cases,

with low morbidity rates. Spontaneous discharge rates of GPi neurons in dystonia

are similar to those of globus pallidus externus neurons, such that the two

nuclei must be distinguished by neuronal discharge patterns rather than by

rates. Active electrode locations associated with robust improvement (> 50%

decrease in BFMDRS score) were located near the intercommissural plane, at a

mean distance of 3.7 mm from the pallidocapsular border. Patients with

juvenile-onset primary dystonia and those with the tardive form benefited

greatly from this procedure, whereas benefits for most secondary dystonias and

the adult-onset craniocervical form of this disorder were more modest.

DOI: 10.3171/foc.2004.17.1.4

PMID: 15264773 [Indexed for MEDLINE]

10. J Neurosurg. 2018 Oct 19;131(3):839-842. doi: 10.3171/2018.5.JNS1840.

**Staged bilateral pallidotomy for dystonic camptocormia: case report.**

Camptocormia is a rare, involuntary movement disorder, presenting as truncal

flexion while standing or walking, and is mainly observed as a feature of

Parkinson's disease (PD) and primary dystonia. Deep brain stimulation (DBS) of

the globus pallidus internus is effective for refractory camptocormia observed

with PD or dystonia. However, the effectiveness of pallidotomy for camptocormia

has not been investigated. The authors report the case of a 38-year-old man with

anterior truncal bending that developed when he was 36 years old. Prior to the

onset of the symptom, he had been taking antipsychotic drugs for schizophrenia.

There were no features of PD; the symptom severely interfered with his walking

and daily life. He was given anticholinergics, clonazepam, and botulinum toxin

injections, which did not result in much success. Because of the patient's

unwillingness to undergo implantation of a hardware device, he underwent staged

bilateral pallidotomy with complete resolution for a diagnosis of tardive

dystonic camptocormia. The Burke-Fahn-Marsden dystonia rating scale subscore for

the trunk before and after bilateral pallidotomy was 3 and 0, respectively. No

perioperative adverse events were observed. Effects have persisted for 18

months. Bilateral pallidotomy can be a treatment option for medically refractory

dystonic camptocormia without the need for device implantation.

DOI: 10.3171/2018.5.JNS1840

PMID: 30497197 [Indexed for MEDLINE]

11. Stereotact Funct Neurosurg. 2010;88(5):304-10. doi: 10.1159/000316763. Epub 2010

Jun 24.

\*\*Duplicate\*\*

**Long-term benefit sustained after bilateral pallidal deep brain stimulation in**

**patients with refractory tardive dystonia.**

BACKGROUND/AIMS: Tardive dystonia (TD) can be a highly disabling, permanent

condition related to the use of dopamine-receptor-blocking medications. Our aim

was to evaluate the long-term effect of bilateral pallidal deep brain

stimulation (DBS) for TD.

METHODS: Five consecutive patients with disabling TD who underwent stereotactic

placement of bilateral globus pallidus internus DBS leads were included. All

patients had a history of mood disorder or schizophrenia previously treated with

neuroleptic medication, with a mean duration of motor symptoms of 10.2 years.

Dystonia severity was measured using the Burke-Fahn-Marsden Dystonia Rating

Scale (BFMDRS) movement score by a blinded neurologist reviewing pre- and

postoperative videotaped examinations.

RESULTS: The mean baseline movement BFMDRS score was 49.7 (range 20-88).

Overall, we observed a mean reduction of 62% in the BFMDRS movement score within

the first year after surgery. Persistent improvement in dystonia (71%) was seen

at the last follow-up ranging from 2 to 8 years after surgery.

CONCLUSION: Our experience suggests that pallidal DBS can be an effective

therapy with long-term benefits for patients with TD.

2010 S. Karger AG, Basel.

DOI: 10.1159/000316763

PMID: 20588082 [Indexed for MEDLINE]

12. Life (Basel). 2021 May 24;11(6):477. doi: 10.3390/life11060477.

**Long-Term Follow-Up of 12 Patients Treated with Bilateral Pallidal Stimulation**

**for Tardive Dystonia.**

Tardive dystonia (TD) is a side effect of prolonged dopamine receptor antagonist

intake. TD can be a chronic disabling movement disorder despite medical

treatment. We previously demonstrated successful outcomes in six patients with

TD using deep brain stimulation (DBS); however, more patients are needed to

better understand the efficacy of DBS for treating TD. We assessed the outcomes

of 12 patients with TD who underwent globus pallidus internus (GPi) DBS by

extending the follow-up period of previously reported patients and enrolling six

additional patients. All patients were refractory to pharmacotherapy and were

referred for surgical intervention by movement disorder neurologists. In all

patients, DBS electrodes were implanted bilaterally within the GPi under general

anesthesia. The mean ages at TD onset and surgery were 39.2 ± 12.3 years and

44.6 ± 12.3 years, respectively. The Burke-Fahn-Marsden Dystonia Rating Scale

(BFMDRS) performed the preoperative and postoperative evaluations. The average

BFMDRS improvement rate at 1 month postoperatively was 75.6 ± 27.6% (p < 0.001).

Ten patients were assessed in the long term (78.0 ± 50.4 months after surgery),

and the long-term BFMDRS improvement was 78.0 ± 20.4%. Two patients responded

poorly to DBS. Both had a longer duration from TD onset to surgery and older age

at surgery. A cognitive and psychiatric decline was observed in the oldest

patients, while no such decline ware observed in the younger patients. In most

patients with TD, GPi-DBS could be a beneficial therapeutic option for long-term

relief of TD.

DOI: 10.3390/life11060477

PMCID: PMC8225108

PMID: 34074009

13. Acta Neurol Scand. 2009 Apr;119(4):269-73. doi:

10.1111/j.1600-0404.2008.01115.x. Epub 2008 Oct 25.

**A double-blind study on a patient with tardive dyskinesia treated with pallidal**

**deep brain stimulation.**

BACKGROUND: Tardive dyskinesia (TD) is a neurological disorder typically induced

by long-term exposure to neuroleptics. Deep brain stimulation (DBS) of the

globus pallidus internus (GPi) may represent a therapeutic alternative for TD,

which is often resistant to conservative treatment.

AIMS OF THE STUDY: This report's objective is to present a case of TD

successfully treated with DBS, as well as to indicate a putative role of brain

perfusion scintigraphy as a helpful tool correlating functional imaging findings

with clinical responsiveness to DBS.

METHODS/RESULTS: A 42-year-old male patient suffering from refractory TD

underwent bilateral GPi DBS surgery. Post-operative Burke-Fahn-Mardsen Dystonia

Rating Scale (BFMDRS) and Abnormal Involuntary Movement Scale (AIMS) total

scores have been reduced by 90.7% and 76.7% respectively on the 6-month

follow-up assessment. Brain perfusion scintigraphy, performed post-operatively

in the two stimulation states, revealed a decrease in cerebral blood flow,

during the 'on-DBS', compared with the 'off-DBS' state.

CONCLUSIONS: Clinical improvement of this patient, correspondent to previous

studies, suggests that continuous bilateral GPi DBS may provide a promising

treatment option for TD. Furthermore, this report could imply, as no previous

such comparison study exists, a possible correlation between brain functional

imaging findings and the movement disorder's response to DBS.

DOI: 10.1111/j.1600-0404.2008.01115.x

PMID: 18976318 [Indexed for MEDLINE]

14. Neurol Neurochir Pol. 2016 Jul-Aug;50(4):258-61. doi:

10.1016/j.pjnns.2016.04.006. Epub 2016 Apr 26.

\*\*Duplicate of other search\*\*

**Deep brain stimulation of the internal globus pallidus for disabling**

**haloperidol-induced tardive dystonia. Report of two cases.**

AIM: Tardive dystonia (TD) represents a side effect of prolonged intake of

neuroleptic drugs. TD can be a disabling movement disorder persisting despite

available medical treatment. Deep brain stimulation (DBS) has been reported

successful in this condition although the number of treated patients with TD is

still limited to small clinical studies or case reports. In this study, we

present 2 additional cases of patients after bilateral globus pallidus internus

(GPi) stimulation.

METHODS: The formal assessment included the Burke-Fahn-Dystonia Rating Scale

(BFMDRS). The preoperative and postoperative functional and motor parts of this

scale were compared in each patient. The postoperative assessments were done

every 6 months.

RESULTS: Both patients underwent successful bilateral GPi DBS for TD. The

postoperative motor score improved by 78% at 24 months in patient 1 and 69% at

12 months in patient 2. There were no surgical or hardware-related complications

over follow-up period.

CONCLUSION: Our experience indicates that bilateral GPi DBS can be an effective

treatment for disabling TD. The response of TD to bilateral GPi DBS is very

rapid and occurs within days after the procedure.

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Partner Sp. z o.o. All rights reserved.

DOI: 10.1016/j.pjnns.2016.04.006

PMID: 27375139 [Indexed for MEDLINE]

15. Mov Disord. 2008 Oct 15;23(13):1929-31. doi: 10.1002/mds.22100.

**Bilateral deep brain stimulation of the globus pallidus internus in tardive**

**dystonia.**

Tardive dystonia is a disabling movement disorder as a consequence of exposure

to neuroleptic drugs. We followed 6 patients with medically refractory tardive

dystonia treated by bilateral globus pallidus internus (GPi) deep brain

stimulation (DBS) for 21 +/- 18 months. At last follow-up, the

Burke-Fahn-Marsden Dystonia Rating Scale (BFMDRS) motor score improved by 86%

+/- 14%, and the BFMDRS disability score improved by 80% +/- 12%. Bilateral

GPi-DBS is a beneficial therapeutic option for the long-term relief of tardive

dystonia.

(c) 2008 Movement Disorder Society.

DOI: 10.1002/mds.22100

PMID: 18785227 [Indexed for MEDLINE]

16. J Psychiatr Res. 2007 Nov;41(9):801-3. doi: 10.1016/j.jpsychires.2006.07.010.

Epub 2006 Sep 8.

**Mood improvement after deep brain stimulation of the internal globus pallidus**

**for tardive dyskinesia in a patient suffering from major depression.**

Deep brain stimulation (DBS) has the unique characteristic to very precisely

target brain structures being part of functional brain circuits in order to

reversibly modulate their function. It is an established adjunctive treatment of

advanced Parkinson's disease and has virtually replaced ablative techniques in

this indication. Several cases have been published relating effectiveness in

neuroleptics-induced tardive dyskinesia. It is also investigated as a potential

treatment of mood disorders. We report on the case of a 62 years old female

suffering from a treatment refractory major depressive episode with comorbid

neuroleptic-induced tardive dyskinesia. She was implanted a deep brain

stimulation treatment system bilaterally in the globus pallidus internus and

stimulated for 18 months. As well the dyskinesia as also the symptoms of

depression improved substantially as measured by the Hamilton Rating Scale of

Depression (HRSD) score and the Burke-Fahn-Marsden-Dystonia-Rating-Scale

(BFMDRS) score. Scores dropped for HRSD from 26 at baseline preoperatively to 13

after 18 months; and for BFMDRS from 27 to 17.5. This case illustrates the

potential of deep brain stimulation as a technique to be investigated in the

treatment of severe and disabling psychiatric and movement disorders. DBS at

different intracerebral targets being actually investigated for major depression

might have similar antidepressant properties because they interact with the same

cortico-basal ganglia-thalamocortical network found to be dysfunctional in major

depression.

DOI: 10.1016/j.jpsychires.2006.07.010

PMID: 16962613 [Indexed for MEDLINE]