

Deep Brain Stimulation

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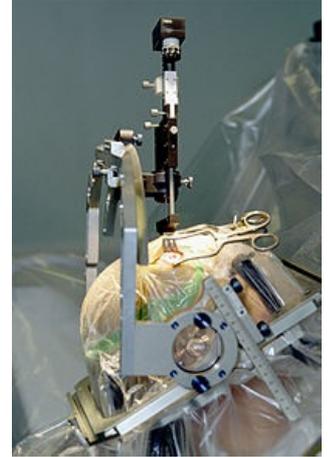
Deep brain stimulation (DBS) is a surgical method, which is used for treatment of some neurological diseases, especially Parkinson's disease and essential tremor, but also other (e.g.: epilepsy). Nowadays, it is a therapy of „*the second choice*“ for patients, who don't have a good reaction on medication. However, DBS can't cure Parkinson's disease (because it is still incurable disease) it may alleviate its symptoms for some period of time. There are just a few specific indications, so not everybody, who suffers from Parkinson's disease can undergo this surgery.

How It Is Done?

The first step is to find the correct place of brain stimulation (target), where the pathological nerve impulses, which are responsible for Parkinson's disease symptoms, are produced. The most common are basal ganglia (*globus pallidus*, *nucleus subthalamicus*) or thalamus. The localization is determined by MRI or CT.

Deep brain stimulation has three main parts - **neurostimulator**, brain electrode and extension. An energy goes from neurostimulator, what is a small packet includes battery and connected to brain electrode by **an extension**. It is usually situated in close to the collarbone, under the skin of a patient. Extension is a wire, which leads under the skin from neurostimulator to electrode. **Brain electrode** is implanted to the target place in brain (as mentioned above) through a small hole in the skull.

The stimulation of the right place leads to block of Parkinson's involuntary movement (tremor, rigidity, walking problems).



Deep brain stimulation



Neurostimulator

Indications

- dystonia or tremor (essential tremor, Parkinson's disease, which do not answer well on medications)
- epilepsy
- in psychiatry (obsessive-compulsive disorder, depression)
- chronic pain
- multiple sclerosis

Contraindications

- people, who have to undergo MRI more often
- people with cardiac pacemaker
- people, who are not able to cooperate with neurostimulator (dementia)
- people, who didn't react well on test stimulation

Adverse Effects

- bleeding into the brain
- infection
- worsening of Parkinson's disease
- dysfunction or migration of the electrode
- paresthesia or muscle contraction
- speech problems
- diplopia or vertigo

The Results of DBS in Parkinson´s Disease

The result **varies from patient to patient** and it is hard to say something in general, but most of the patients after DBS can reduce the amount of medications. There is also very good influence on *dyskinesias*, involuntary movement, which occur after a long-term using Parkinson´s disease treatment. What more, they may improve or even completely disappear.

The duration of effect is still uncertain and we can´t even say before surgery, if there will be any positive effect at all. That is the reason, why is still BDS used just in case, that we can´t help patient with medication.

Links

Related articles

- Parkinson´s Disease
- Essential Tremor
- Hypertonia
- MRI
- CT
- Basal Ganglia

External links

- NINDS (http://www.ninds.nih.gov/disorders/deep_brain_stimulation/deep_brain_stimulation.htm)
- The National Center for Biotechnology Information (<http://www.ncbi.nlm.nih.gov/pubmed/17850194>)
- Medscape Education (http://www.medscape.org/viewarticle/451105_12)

Bibliography

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