

**PARKINSON'S DISEASE.  
NEUROSURGICAL STEREOTACTIC TREATMENT AS A COMBINED  
TREATMENT**

**Constanța Dogaru, Sergiu Borodin, Andrei Peciul, Alexandru Ciobanu**

(scientific coordinator: Dan Lîsii)

Institute of Neurology and Neurosurgery

**Abstract**

PD is a chronic and progressive disorder of the central nervous system. For patients with Parkinson's disease who have become unresponsive to pharmacotherapy or have developed severe motor complications due to medical therapy, a number of symptomatic neurosurgical interventions are available: thalamotomy, thalamic stimulation and pallidotomy. Neurosurgical therapies may increasingly complement and extend pharmacologic management of Parkinson's disease.

**Rezumat**

***Boala Parkinson. Tratatamentul stereotactic neurochirurgical ca tratament combinat***

Boala Parkinson este o boală degenerativă a sistemului nervos central. Pentru pacienții cu BP ce nu prezintă un raspuns pozitiv la tratamentul conservator - medicamentos, iar dereglările motorii sunt datorate tratamentului farmacoterapeutic, sunt recomandate câteva abordări neurochirurgicale de stimulare cerebrală profundă și lezională, acestea fiind: talamotomia, stimularea talamică și palidotomia. Tratatamentul neurochirurgical în BP eventual intensifica, potențează și complimentează tratamentul farmacologic.

**Introduction**

Parkinson's disease (PD) is a neurodegenerative disorder that primarily affects voluntary, co-ordinated movement. It is a disease of late middle age, usually affecting those over the age of 50. Although the discovery of PD is often attributed to James Parkinson and his 1817 monograph entitled *The Shaking Palsy*, descriptions of parkinsonian syndromes date back to the ancient Ayurvedic literature of India, from 4500 to 1000 BC.<sup>1</sup> The first breakthrough in PD research was in the 1960s, when the dopamine hypothesis and levodopa therapy were introduced. There has since been much progress in disease definition and diagnosis, surveillance, knowledge of etiology and disease progression, and treatment. Although the cause of PD is not yet known and a cure has not been found, the past few years of research have led to a greater understanding of the disease. As well as providing an overview of PD, this report focuses on the recent advances and the future directions of PD research.<sup>2</sup>

**Morbidity**

According to a recent World Health Report, PD affects 3,765,000 individuals worldwide, and the condition is diagnosed in 305,000 people per year.<sup>3</sup> In 1996, there were 2,635,000 people with PD who were chronically disabled and 58,000 deaths. The literature in the past has been quite consistent in reporting higher PD rates in primarily Caucasian populations as compared with Asian or black populations. The authors concluded that environmental factors were more important than genetic factors in this group of men, since Asian incidence rates reported previously were lower. All studies showed incidence rates that increased linearly with age up until the age of 75. At this point, the incidence rate in most groups either plateaued or continued to increase linearly.<sup>4-5</sup>

**Mortality**

International mortality rates increase with age and are consistently higher among males. Recently published mortality rates show that rates are similar in European countries and lower in Japan.<sup>6</sup> There has been a steady increase in mortality rates among older populations (>75 years) and declining rates among younger populations (<65 years).<sup>7</sup>

## Methods and materials

The data collected from 1988 till 2002, all the interventions have been performed in the 1<sup>st</sup> Republican Hospital and the Neurology and Neurosurgery Institute of Moldova. During this period 93 stereotactic interventions were performed for 71 patients. In 47 cases of PD – 17 women and 30 men have been operated, in a few cases reoperation was necessary, overall 56 stereotactic interventions were performed. All patients were undergoing pharmacotherapy for several years, having a slight improvement of none. Taking pills for over 2 years before the interventions was one common trait. The efficacy of pharmacological treatment in all patients was poor alternated by motor complications. Stereotactic treatment was performed as a choice after a full range of conservatory treatment.

The choice of nuclei for thalamotomy in Rigid, Tremor, and Mixed form of PD:

Nucleus	Rigid form	Tremor form	Rigid-tremor form	Tremor-rigid form
VOA	3 (5,5%)			
VOP		4(7,1%)	9(16%)	10 (17,8%)
VIM		3 (5,3%)		8 (14,2%)
VOA-VOP	1 (1,8%)		3 (5,3%)	
VOP-VIM				4(7,1%)
VOP-SubTh		2 (3,5%)		2 (3,5%)
VOA-VOP-VIM				2 (3,5%)
VL (Talarach)				5 (9%)

The clinical efficiency for the patients was estimated at 71,4 % very good result, for 14,2 % good result, in 3,6 % poor result, in 3,6 % no efficacy, in 3,6 % aggravation, and 3,6 % with lethal result. Clinical forms of PD reported diverse results. For the rigid form of PD the average was of 75% very good to 25% poor result. The tremor form resulted in 70% very good result, 20% overall good and poor result, and 10% (1 patient) with aggravation. Mixed form – rigid-tremor resulted with 71,5% very good results, good results for 16,6%, for 4,8% there was no efficacy, 2,4% resulted with aggravation, and in 2 patients (4,8%) with lethal result.<sup>8</sup>

## Discussions

Although there is no cure for PD, both pharmacological and surgical treatments are available.

The main treatment for PD is pharmacological and includes different drugs designed to either increase the amount of dopamine in the brain or suppress the overactive cholinergic system (anticholinergics). As dopamine cannot cross the blood-brain barrier, an alternative to administering this neurotransmitter was levodopa. Levodopa, a precursor to dopamine, has long been the standard treatment of PD; however, it causes adverse effects such as nausea, vomiting and orthostatic hypotension. Although there seems to be wide agreement that levodopa increases survival rates. Levodopa therapy initially works well, but after several years the majority of patients have either developed response fluctuations (wearing off and on-off phenomena) or dyskinesias (abnormal involuntary movements).

In addition to drug therapy, there are three surgical procedures used for the treatment of PD. These are ablative surgery, deep brain stimulation and fetal tissue transplantation.

## Conclusions

Ablative surgical procedures involve placing a lesion in a circuit of either the globus pallidus (pallidotomy) or the thalamus (thalamotomy). Since dopamine normally modulates an inhibitory influence of the basal ganglia to the thalamus, a dopamine deficiency would result in less inhibition. A lesion would correct this situation in that it would mimic dopamine in terminating nerve signals from the globus pallidus to the thalamus. Thalamotomies have been found to be successful for individuals with severe tremor.

Since PD patients vary with respect to their symptoms and disease severity, individuals will respond differently to the same treatment. Health care professionals must thus work alongside their patients to devise the best possible care.

### **Bibliography**

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## **ASPECTE CHIRURGICALE ACTUALE DE TRATAMENT ENDOSCOPIC AL HEMATOAMELOR TRAUMATICE SUBDURALE CRONICE (reviul literaturii)**

**Anatolie Gumeniuc**

Institutului de Neurologie și Neurochirurgie

### **Summary**

#### ***Contemporary neurosurgical treatment of chronic posttraumatic subdural hematomas using endoscopic approach***

Chronic subdural hematoma (CSDH) is one of the commonest conditions requiring neurosurgical intervention.

A consequent choice of clinic and paraclinic methods of examination, the management and the volume of surgical treatment, influence the reducing of lethality in treatment of late posttraumatic supratentorial subdural hematomas from 28,6% to 1.1%.

Surgical treatments for CSDH include removal of hematoma by craniotomy, irrigation by burr-hole with or without drainage, drainage by a closed system without irrigation, subdural-peritoneal shunt, neuroendoscopic evacuation.

#### **CONCLUSIONS:**

-The treatment of late posttraumatic subdural hematomas using endoscopic methods raise the visualization of hematoma cavity by penetrating visceral capsula for restoring the liquorodynamics.

-The endoscopic coagulation is a better procedure than the classic methods, because the new hemorragies are avoided.

-The mini invasive neurosurgical intervention offers a better medico-financial balance.

### **Rezumat**

Hematoamele subdurale cronice este una din entitățile patologice care necesită intervenție chirurgicală.