

# NEUROSURGICAL MANAGEMENT OF PSYCHIATRIC DISORDERS

## INTERNATIONAL CONFERENCE

February 6-7, 2020, Novosibirsk, Russia



On February 6-7, 2020, an International Conference “Neurosurgical Management of Psychiatric Disorders” was held in Novosibirsk, Russia. The event gathered 24 world-class invited speakers and 138 general attendees. The Meeting was organized in the Federal Neurosurgical Center (<https://neuronsk.ru/en/>) in collaboration with the Scientific Research Institute of Physiology and Basic Medicine (<http://physiol.ru/>), Novosibirsk State University (<https://english.nsu.ru/>), and Siberian Branch of the Russian Academy of Sciences (<https://www.sbras.ru/en>)

It was sponsored by the Siberian Association of Neurosurgeons, Brainlab, and Elekta, and endorsed by the International Stereotactic Radiosurgery Society (ISRS). The Chairman of the Conference was professor Lyubomir Aftanas (Novosibirsk, Russia), whereas Drs. Mikhail Chernov (Tokyo, Japan), Jamil Rzaev (Novosibirsk, Russia), and Roberto Martinez-Alvarez (Madrid, Spain) were Co-Chairmen.



Lyubomir Aftanas



Mikhail Chernov



Jamil Rzaev



Roberto Martinez-Alvarez

Nowadays the treatment of psychiatric disorders is mainly based on medical therapy. However, cases of pharmaco-resistance are not uncommon and side effects of drugs are well recognized. It stimulates reviving of interest in application of the neurosurgical options for treatment of psychiatric patients, which has been largely abandoned for a prolonged period of time. Nevertheless, the development of advanced neurophysiological and neuroimaging modalities, first of all functional MRI and tractography, has dramatically extended our understanding of the normal and pathological psychophysiology, in particular

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related to the functioning of neuronal networks and organization of their connectivity. It allows for sufficiently precise prediction of the functional changes after both lesioning and electrical stimulation of the various target structures within the brain, which opens new opportunities for effective and safe application of these minimally-invasive treatment techniques.

Professional Meetings specifically dedicated to psychosurgery are not so often organized, and for the first time such kind of event was held in Russia. The idea of its organization has belonged to Dr. Mikhail Chernov, Ex Officio ISRS Board member and Chair of its Education Committee.

The Faculty was joined by well-recognized experts from Brazil, Canada, China, Italy, Japan, Russia, Spain, and USA. Besides neurosurgeons, the Conference was attended by psychiatrists, radiologists, neurologists, psychologists, and neuroscientists.



Speakers and guests

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The first day of the scientific program was dedicated to plenary lectures, which followed by the specially allocated discussion time.

Professor Kazushi Nishimura (Japan) provided an overview of psychiatric disorders, their classification, and treatment strategies.

Dr. Maria Tikhonova (Russia) and professor Hiroshi Kunugi (Japan) presented their joint report on up-to-date knowledge of pathophysiology of psychiatric disorders with a special emphasis on depression.

Professor Mojgan Hodaie (Canada) shared her extensive experience with tractography and application of this technique for functional neurosurgery and Gamma Knife surgery (GKS).

Three subsequent lectures were dedicated to the history of psychosurgery in the USA (professor Michael Schulder), Japan (professor Takaomi Taira), and Russia (professor Boleslav Lichterman). The development of this field in all these countries was nearly similar, progressing

from the initial widespread interest and high clinical caseloads to nearly complete disregard.



Currently existing options for neurosurgical management of psychiatric disorders with a main emphasis on applications of deep brain stimulation (DBS) were highlighted by professors Antonio De Salles (Brazil), Giovanni Broggi (Italy), and Juan Barcia (Spain), whereas professor Roberto Martinez Alvarez (Spain) shared his 20-year experience with psychiatric indications of GKS.

Subsequent special Symposium on medicolegal aspects and regulatory issues included related presentations from Spain (Roberto Martinez Alvarez), Brazil (Antonio De Salles), USA (Michael Schulder), and Canada (professor Andres Lozano).

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The final plenary lectures on that day indicated perspectives and future developments of psychosurgery, as Andres Lozano highlighted current clinical trials on applications of DBS for treatment of behavior disorders, depression and Alzheimer's disease, as well as opportunities given by such novel modality as MR-guided focused ultrasound (MRgFUS).



Andres Lozano

Professor Konstantin Slavin (USA) presented his view on advancements of the minimally invasive and highly precise ablative procedures, including

GKS and laser interstitial thermotherapy (LITT), new opportunities given by feedback stimulators, miniature electrodes and remote programming systems, as well as possibilities of individualized clinical applications of these devices based on biomarkers, tractography and connectomics data.

The scientific program of the second day included 4 sessions. The first one was dedicated to diagnostic problems with talks on correct diagnosis of psychosomatic disorders (Takaomi Taira), psychiatric mimics (Dr. Jamil Rzaev, Russia), the neuropsychological and neuropsychiatric issues of neuro-oncology practice and differentiation of seizures and pseudoseizures (professor Ian McCutcheon, USA), and diagnosis and correct treatment of delirium (Katsuji Nishimura).

During the second session speakers shared their experience with various treatment techniques, such as connectomics-based targeting (Juan Barcia), optogenetics and surgical treatment of autism (Roberto Martinez Alvarez), vagal nerve stimulation for depression (Konstantin Slavin), and psychosurgical applications of transcranial magnetic stimulation (Giovanni Broggi).

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Next session was specifically dedicated to radiosurgical treatment of psychiatric disorders. Professor CP Yu (China) discussed advantages and disadvantages of GKS in comparison with DBS for treatment of obsessive-compulsive disorders (OCD). From his experience, while DBS is traditionally considered as a minimally invasive technique, the incidence of postoperative infectious complications reaches 4-6%, symptomatic intracranial hematomas 1.1%; the risk of suicides after DBS also increases. In contrast, radiosurgical capsulotomy can be done much safer and with greater cost-effectiveness.

During the next talks, Konstantin Slavin shared his large experience with GKS for OCD underlying advantages and shortcomings of such treatment, whereas colleagues from the Burdenko Neurosurgical Institute in Moscow presented a case report of GKS in a patient with schizophrenia (Dr. Mikhail Galkin) and possible use of LINAC-based radiosurgery for functional indications (Dr. Valery Kostjuchenko).

The last session highlighted current status of psychosurgery in Russia with reports from practicing colleagues representing Burdenko Neurosurgical Institute in Moscow (Drs. Alexey Tomski, Emil Isagulyan, and Oleg Zaitsev), Institute of Human Brain in St. Petersburg (Dr. Andrey Kholyavin and professor Yurii Polyakov), and Ural State Medical University in Ekaterinburg (professor Alexander Shershever).

As was noted by Andres Lozano “It was a remarkable Meeting and served as a form of historical rebirth of psychiatric surgery on the international stage.” The organizers are currently working on preparing of the related Proceedings, which publication as an edited volume of “Progress in Brain Research” is expected in 2021. Moreover, there are plans to organize similar Conference again in 2022.

