Apraxia of lid opening

Apraxia of lid opening (ALO) is an inability to initiate voluntary eyelid opening following a period of eyelid closure, with normal function at other times. Manual lifting of the eyelid often resolves the problem and the lid is able to stay open.

Involuntary eyelid closure (IEC) may occur after subthalamic nucleus deep brain stimulation of the in Parkinson's disease (PD) and is often categorised as apraxia of lid opening (ALO), albeit the appropriateness of this term is under debate. To gain insight into the hitherto undefined pathophysiology of IEC after STN-DBS, Weiss et al., performed a comprehensive clinical and electrophysiological characterisation of lid function in a total of six PD patients.

The study was carried out in six PD patients who developed IEC after STN-DBS. They underwent neurological examination and electromyography recording of activity in the orbicularis oculi muscle (OO) upon varying stimulation patterns. Intraoperative studies were performed in one patient.

Increasing STN-DBS intensity induced IEC in four patients, whereas it improved the condition in two. Needle EMG showed tonic hyperactivity of the OO in STN-DBS induced IEC, while variable patterns of OO activity (irregular and tonic) were seen in patients with STN-DBS-relieved IEC. Intraoperative analysis in one patient showed evidence for IEC being induced by activation of corticobulbar fibres.

They identified two groups of IEC after STN-DBS based on clinical and EMG patterns: (1) STN-DBS induced IEC associated with tonic OO overactivity and (2) STN-DBS relieved IEC presenting with variable EMG patterns. The findings provide relevant information on pathophysiology of STN-DBS related IEC and implications for its therapeutic management [1].

Goto et al.,reported that globus pallidus internus deep brain stimulation on the right side markedly alleviates ALO as well as gait freezing in a patient with Parkinson's disease [2].

1)
Weiss D, Wächter T, Breit S, Jacob SN, Pomper JK, Asmus F, Valls-Solé J, Plewnia C, Gasser T, Gharabaghi A, Krüger R. Involuntary eyelid closure after STN-DBS: evidence for different pathophysiological entities. J Neurol Neurosurg Psychiatry. 2010 Sep;81(9):1002-7. doi: 10.1136/jnnp.2009.196691. Epub 2010 Jun 20. PubMed PMID: 20562465.

2)
Goto S, Kihara K, Hamasaki T, Nishikawa S, Hirata Y, Ushio Y. Apraxia of lid opening is alleviated by pallidal stimulation in a patient with Parkinson's disease. Eur J Neurol. 2000 May;7(3):337-40. PubMed PMID: 10886319.