

Articolo sulla Stimolazione stereotattica dell'ipotalamo nei pazienti cronici di CH (Dott. Leone, Ist. Besta - Milano)

"Stereotactic Stimulation of Posterior Hypothalamic Gray Matter in a Patient with Intractable Cluster Headache"

Cluster headache is the most severe form of primary headache.¹ Positron-emission tomography has shown activation of the homolateral posterior inferior hypothalamic gray matter during attacks of cluster headaches, a finding that is apparently specific to the condition,^{2,3} and voxel-based morphometric magnetic resonance imaging (MRI) has documented alteration of the same area,⁴ suggesting that cluster headache may be initiated in this area. We reasoned that stereotactic stimulation of this area might prevent activation and relieve intractable forms of cluster headache. We report on a 39-year-old, right-handed man who had excruciatingly painful daily cluster headaches for five years. The attacks lasted between 30 minutes and 4 hours, occurred two to five times a day, and were associated with striking oculofacial swelling. Ninety percent were on the right side, and the remainder were on the left; they were never bilateral.⁵ Extensive investigation including cerebral MRI, magnetic resonance angiography, and catheter angiography excluded other conditions.⁵ No drugs produced worthwhile benefit.⁵ After a second percutaneous thermal rhizotomy, the right-sided headaches disappeared. Unfortunately, from that moment, the left-sided attacks worsened to mirror exactly those that had previously occurred on the right side. Left trigeminal surgery was contraindicated by the risk of corneal sequelae, which could have left the patient totally blind (he was blind in the right eye as a result of a hemorrhage in the vitreous humor). We proposed the stereotactic implantation of an electrode, targeting the posterior inferior homolateral hypothalamic gray matter.^{2,3,4} After informed consent was obtained, the operation was performed with the patient under local anesthesia. The electrode (model 3089, Medtronic, Minneapolis) was inserted 6 mm posterior to the midpoint between the anterior and posterior commissures, 2 mm left of the midline, and 8 mm below the commissural plane.^{2,3,4} Intraoperative electrical stimulation induced no side effects. The permanent generator (Solettra, Medtronic), embedded in a subclavicular pocket, was connected through a subcutaneous tunnel. Therapeutic stimulation was continuous and unipolar. The position of the permanent electrode was verified by postoperative MRI (Figure 1). When stimulation was provided at a frequency of 180 Hz, a voltage of 3 V, and a pulse width of 60 μ sec, the attacks disappeared after 48 hours. Twice, without the patient's being aware of it, the stimulator was switched off and the left-sided attacks reappeared 48 hours later. When the stimulator was turned on again, the attacks disappeared 48 hours later. Thirteen months after the operation, the patient remains free of pain. The precision and safety of this method suggest that it should be tried in other patients with intractable chronic cluster headaches. Massimo Leone, M.D. Angelo Franzini, M.D. Gennaro Bussone, M.D. Carlo Besta Neurological Institute 20133 Milan, Italy bussone@istituto-besta.it References 1. Headache Classification Committee of the International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia* 1988;8:Suppl 7:1-96. 2. May A, Bahra A, Buchel C, Frackowiak RS, Goadsby PJ. Hypothalamic activation in cluster headache attacks. *Lancet* 1998;352:275-278.[Medline] 3. May A, Bahra A, Buchel C, Frackowiak RS, Goadsby PJ. PET and MRA findings in cluster headache and MRA in experimental pain. *Neurology* 2000;55:1328-1335.[Abstract/Full Text] 4. May A, Ashburner J, Buchel C, et al. Correlation between structural and functional changes in brain in an idiopathic headache syndrome. *Nat Med* 1999;5:836-838.[Medline] 5. Attanasio A, D'Amico D, Frediani F, et al. Trigeminal autonomic cephalgia with periorbital ecchymosis, ocular hemorrhage, hypertension and behavioral alterations. *Pain* 2000;88:109-112.

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