

MOTOR CORTEX STIMULATION WITH ANATOMY-GUIDED NEURAL TARGETING ALGORITHM IN A SPINAL CENTRAL PAIN. CASE REPORT.

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Introduction

The motor cortex stimulation (MCS) has been reported to be useful in patients suffering from central pain resistant to drugs. On the contrary there are few reports of MCS in patients with motor weakness from nervous system damage. We report a case of pain of the left emibody pain and motor deficit due to spondylotic myelopathy improved after motor cortex stimulation implant with anatomy-guided neural targeting algorithm.

Clinical Material

A 63-year-old man suffering from intractable pain of right emibody as well as motor weakness of left upper limb due to cervical spondylosis; a previous cervical laminectomy was ineffective to improve the symptoms. The Visual Analogic Scale (VAS) preoperative was 9. The muscle strength grading was 3 on upper limb and 4 on leg.

A motor cortex stimulation was carried out by two 16 poles paddles implanted epidurally under neuronavigation (**FIGURE 1**) and intraoperative neurophysiological mapping on cortex corresponding somatotopically to hand and leg.

The paddle on contralateral hand motor cortex was activated using as current output the anatomy-guided neural targeting algorithm as well as the paddle on leg motor cortex. (**FIGURE 2a,b**)



FIGURE 1: planning of neuronavigation on motor cortex strip

After a positive period test of 30 days the MCS was internalized using a 32 poles IPG.



FIGURE 2a, b: implant of two 16 poles paddles on motor area of upper limb and leg

The postoperative CT-scan fusion with neuronavigation findings showed a correct implantation of the paddles (**FIGURE 3 A, B, C, D**)

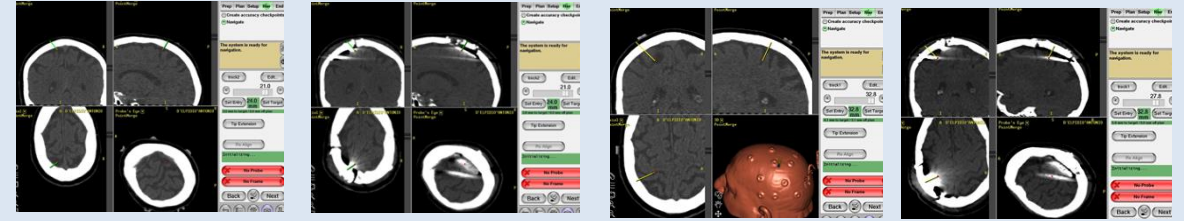


FIGURE 3 A, B, C, D : postoperative CT-scan fusion showing paddle on motor cortex of the leg (**A and B**) and upper limb (**C and D**)

Results

The best result of the current output were recorded with upper limb paddle parameters: poles 1 & 9 positive, 5 & 13 negative, voltage 4 mAmp; PW 100 msec; rate 80 Hz; cyclic stimulation 10' ON, 90' OFF; the parameters applied to leg are the same but poles 1 positive and 5 negative. At last follow-up (one year) the VAS of the leg is 4, the VAS of the upper limb is 7; the upper limb and leg muscle strength grading is 4.

Conclusions

In this case the MCS has been used in patient with central pain of spinal origin on upper limb and leg. The possibility to use multiple paddles with neural targeting algorithm could enhance the coverage of the multiple cerebral areas, mainly the leg area. The improvement of motor performance must be further investigated to explain the relationship between motor defects and sensory pathways. As reported in literature, the worst analgesic result was observed on the limb most affected by the motor defect. It is interesting the motor improvement: the MCS could have a role in the recovery of motor defects.