# Subdural motor cortex stimulation

Motor cortex stimulation (MCS) is considered to be useful in the treatment of some types of chronic neuropathic pain. The use of subdural electrodes has been seldom reported [1) 2) 3) 4) 5) 6) 7)]

Subdural or intrasulcal stimulation allows a more focused stimulation with lower current intensities. This advantage, however, is counterbalanced by a higher complication rate with regard to epileptic seizures, subdural or intracerebral hemorrhages, and wound infections [8)].

## Indications

### Neuropathic pain

Subdural motor cortex stimulation in 18 consecutive patients (12 male) between 2000 and 2010, with a mean age of 63 years (11-91). The mean follow-up was 86 months (20-140 months). Delavallée et al. identified the central sulcus by using classical anatomic landmarks and neuronavigation (BrainLab system; BrainLAB, Inc., Redwood City, CA). An elongated craniotomy (3 cm in length, 1 cm in width) was performed followed by linear opening of the dura mater. An eight-polar plate electrode (Specify Lead, 3998; Medtronic, Minneapolis, MN) was then slipped smoothly through this linear opening. In patients with interhemispheric electrodes (patients 2 and 17), we performed a parasagittal craniotomy of 4 cm length and 2 cm width. At last follow-up assessment, 14 patients had a favourable outcome (77.7 %): 10 patients with excellent relief of pain (>80 %), 1 with good relief of pain (60-80 %) and 3 with satisfactory relief of pain (50-60 %). Four patients showed bad results (<50 %). We did not observe any late complications specific to SD MCS.

They report an efficacy at least as good as epidural MCS, with no complications specific to subdural MCS, even with prolonged follow-up. The data are insufficient to actually prove a lower energy use in SD MCS [9)].

### Induced topographic plasticity

Induced topographic plasticity using continuous high-frequency cortical electrical stimulation (cHFCS) in eloquent areas within a tumor, allowed increased tumor removal. This results open the possibility to induce plasticity before the resection of brain tumors near eloquent areas, in order to increase the extent of resection [10)].

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