**Clinical evolution following localized resections of the primary sensory cortex for refractory seizures: the issue of eloquent versus indispensable cortical regions**

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**Introduction.** Epileptogenic zones often affect eloquent cortex in patients with drug refractory seizures, raising the issue of whether or not curative surgery would be advisable considering possible sequelae. The primary sensory cortex (S1) is considered an eloquent cortical region, yet - despite being a fairly common site of epileptogenic lesions - the type and evolution of deficits following localized resections of S1 are not clearly documented. Here, we report the clinical evolution over months to years of patients prospectively followed after localized epilepsy surgery resecting S1.

**Methods.** Five patients undergoing resective S1 surgery between 2014 and 2022 were examined at discharge and at several points during evolution. A structured telephone interview at the time of this writing complemented the evaluations. We focused on sensory complaints, particularly paresthesia, dysesthesia and proprioceptive deficits indexed by difficulties performing fine targeted hand movements and controlling the affected foot. Whether patients followed a neuro-rehabilitation program was also noted.

**Results.** Five adults (three men) were evaluated for a month to 8 years after the procedure. Imaging and prolonged EEG recordings showed that three of them had type II focal cortical dysplasia (FCD) localized to S1 and two had congenital gliotic lesions, with extension of the epileptogenic tissue to S1. Before operation, all five reported sensory auras in the beginning of their seizures, followed by motor symptoms or disconnection. After resection of S1, four out of the five patients are seizure free and one still has seizures without a sensory aura.  At discharge following surgery, all had related neurological symptoms and signs, including proprioceptive deficits such as disturbance of fine movements with the affected hand and difficulties to walk because of insecurity with positioning the affected lower limb (5/5), tactile (4/5) or combined tactile and thermalgesic hypoesthesia (1/5). One complained of painful leg and foot dysesthesia.  Deficits persisted to a significant degree for one month to two years, but mostly resolved after six months. At the last contact, the four patients operated for more than six months had recovered full function of the right hemibody, with subjective improvements between 70 and 90%, three of whom had intensive neuro-rehabilitation therapies.

**Conclusion.** Resection of S1, as expected, led to sensory abnormalities. The rate and extent of recovery, however, suggest that S1 should be considered an eloquent, but not an indispensable cortical region. This is important, as epileptogenic zones may involve S1 and resective epilepsy surgery has a potential curative impact, transforming the lives of people with refractory seizures.