

Dural substitute for long-term imaging of cortical activity in behaving monkeys and its clinical implications.

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Abstract:

We present a transparent silicone dural substitute, which we have been using for the last 7 years for imaging cortical dynamics in awake behaving monkeys. This substitute enabled us to record optically for more than a year intrinsic or voltage sensitive dye signals. It is thin and elastic enough to allow microelectrode to pass through without any damage, using full visual control to target the electrode to the desirable recording site. This implant has proved crucial for maintaining the cortex in a good physiological condition and for preserving its optical characteristics that are necessary for optical imaging. We describe the details of the surgical implantation of the silicone dural substitute, the maintenance of the exposed cortex over long periods of time, the cortical reaction to this implant and its possible clinical implications in humans, and the rehabilitation procedure in monkeys.

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