

## Use and indications of the Robotized Stereotactic Assistant System in pediatric neurosurgery

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**Background:** The aim of this paper is to describe the application of the Robotized Stereotactic Assistant System (ROSA, Medtech©) in different fields of pediatric neurosurgery including epilepsy surgery, movement disorders surgery, and endoscopic surgery.

**Methods:** The evaluation and clinical use of the stereotactic robot and the retrospective review of 19 consecutive procedures that underwent surgery by the ROSA System are reported. The surgeries assisted by the robot included: endoscopic hypothalamic hamartoma (HH) disconnection (7 procedures; 6 cases), septostomy for obstructive hydrocephalus (1 case), and frameless functional procedures comprising Stereo EEG (5 cases), stereotactic biopsy (2 cases), pallidotomy (4 cases). The age range was between 2 and 16 years.

**Results:** Prior to its clinical use a phantom study was undertaken to demonstrate an application accuracy of 1.2mm (SD 0.4mm). The 19 consecutive procedures assisted by robotized system concluded well and no postoperative complications were observed. According to the Delalande classification of HH the seizure outcome was Engel I and II in 5 out of 6 patients. The postoperative MR in whole pallidotomy series matched with the surgical planning, and in both biopsies the histology showed a low grade glioma. The SEEG accuracy on the 5 patients was consistent with the phantom results. The septostomy case had a resolution of the left lateral ventricle enlargement.

**Conclusions:** The ROSA system is a simple and accurate device that can be routinely use in pediatric neurosurgery. It resulted safe and effective in frameless stereotactic procedure reducing the surgery length and excluding the exposure to ionizing radiation. The use of ROSA in endoscopic procedures that need high precision is strongly recommended.