ROSA™ SEEG

ROSA™ presents a new milestone for SEEG procedures by offering increased efficiency, security and flexibility compared to traditional frame-based surgeries.

Stereotactic implantation of depth electrodes has demonstrated numerous advantages over other options such as placement of subdural grids for exploration of drug-resistant epilepsy. It enables more accurate diagnosis of epileptogenic zones and benefits from a low complication rate of less than 1%. However, the traditional stereotactic frame approach represents a burden to the patient, by complicating the surgical workflow and increasing OR-time.

ROSA™'s next generation robotic technology circumvents all these issues by providing an integrated solution for SEEG that guarantees accurate electrode placement. It allows for streamled procedure and increased patient comfort.

This innovative robotic system implements a fully frameless approach carried-out in three simple steps. First, the surgical planning is performed by inputting desired implantation trajectories on preoperative 3D MR acquisitions using ROSA™'s dedicated software. Then, the system is brought into the OR and the registration is performed. Finally, the robot is used to automatically position an instrument on the preplanned trajectory. The surgeon can then drill his surgical access point and implant the electrodes through the instrument holder.

ROSA™'s markerless automatic registration eliminates the need to attach patient fiducials before imaging. This technology is based on an ultra-precise optical distance sensor that is coupled to the robot arm and scans the patient's face. This allows any recent MR of CT dataset to be used for surgery, thus simplifying the surgical workflow by enabling flexible planning of the image acquisition.

"Our initial experience with the use of ROSA indicates that robotic assistance provides a potential platform for increasing the safety and feasibility of SEEG procedures."

Frameless Stereotactic Robot Assistance in Epilepsy Surgery: Gwyneth L. Hughes MD; Tsulee Chen MD; Ryan Brennan MD; Benjamin Rosenbaum MD; William E. Bingaman MD; Jorge Alvaro Gonzalez-Martinez MD, PhD

Cleveland Clinic – CNS 2011

«Utilizing the Markerless Automatic Registration feature of ROSA™ eliminates the need for a stereotactic frame, thus simplifying both the surgical workflow and pediatric procedures like SEEG."

Prof. KEHRLI,
CHU Strasbourg (France).

ROSA™'s automatic instrument guidance enables fast and accurate electrode implantation. The robot moves from one trajectory to the other in a matter of seconds. This enables considerable OR-time savings with procedures lasting 1.5 to 3h instead of 4 to 6h with a frame-based approach.

Furthermore, the robot provides a stable and rigid support offering optimal drilling and electrode implantation conditions. The instrument guide's position can be adjusted along the trajectory using ROSA™'s haptic manipulation mode. This allows the surgeon to manually bring the guide to the optimal drilling distance while ensuring it remains aligned with the planned trajectory.

Ultimately, and as underlined by Prof. KEHRLI (CHU Strasbourg), ROSA's unique combination of features reduces operating time and minimizes patient exposure.

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