

WHAT IF ROBOTS DID BRAIN SURGERY?

HOW A ROBOTIC DEVICE IS GAINING KUDOS AS A RELIABLE AND ACCURATE SURGICAL ASSISTANT.

She thinks the head of her newborn baby is the softest, most delicate thing she had ever held in her hands. On the top of his little head are two soft spots, gaps between plates of bone that should allow his brain to grow inside the skull.

She strokes his head gently and closes her eyes. "I hope he is allowed time for his brain to grow," she prays, kissing the top of his head. Her baby has epilepsy and doctors have said without brain surgery, his chances of survival are slim. But how, she thinks, can neurosurgeons operate in such a small and fragile space?

Enter **ROSA™**, a robotic device designed for cranial procedures that require surgical planning. Using preoperative data such as MRI scans that are imported into ROSA™ software, the device acts like a GPS for the brain with a robotic arm that was designed to be as dexterous as a human. It gives the neurosurgeon constant control over the position of the endoscope – a long thin tube with a camera attached used to examine inside the body – with millimetric accuracy. Once the tube reaches the operable area, ROSA™ software switches to a different mode, allowing the surgeon to move the endoscope in an intuitive manner within a pre-planned safe zone, ensuring critical structures and healthy tissues will remain untouched and the procedure is minimally invasive.

Paediatric neurosurgeon Doctor Olivier Delalande has been using ROSA™ for over five years. He says it allows for faster surgical

planning, shorter times in operating theatres – and therefore less anaesthesia and exposure to ionizing radiation. He recommends its use in procedures requiring a high degree of accuracy. It has made possible some cranial interventions on very young infants that were not feasible using traditional techniques.

ROSA™ is capable of assisting in a range of procedures on people of all ages, from biopsies to deep brain stimulation in the treatment of Parkinson's disease, and keyhole surgery. She is very busy: more than 2,500 procedures have been carried out by the fifty or so ROSA™ robots assisting in hospitals around the world.

The brainchild of Bertin Nahum and a team of researchers and surgeons at Medtech, the French company he founded in 2002. Mr. Nahum's first robot, BRIGIT™, was a specialist in knee surgery who was sold to the American company Zimmer Inc in 2006. The funds were then used to develop ROSA™.

As robotics engineer, Mr. Nahum says he fell into the medical area by chance during a university project. "I never set out to work in health, but when I started to see the potential of what robotics could do, there was no choice," he says.

"We are just at the beginning. Robotics will keep driving surgery forward for decades to come."

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