Robotic surgery in otorhinolaryngology – our experience

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Robotic surgery is an advanced technique that has significantly improved minimally invasive surgical procedures in the head and neck area. The development of robotic surgical systems began in the 1980s as part of a military research with the aim of developing a system for performing surgical procedures remotely. The first significant step in the application of robotics in head and neck surgery was made in 2005, when McLeod and Melder successfully used the Da Vinci robotic system for the resection of a vallecular cyst. The transoral robotic approach (TORS) was officially approved by the FDA in 2009 for the treatment of early-stage oropharyngeal carcinoma. Since then, indications have expanded rapidly, including tumors of the hypopharynx, parapharyngeal space, and supraglottis, as well as surgery of the thyroid and parathyroid glands. The Da Vinci system stands out as the most versatile system with advanced visualization and exceptional precision. The Da Vinci robotic system provides key advantages: three-dimensional visualization with high-resolution 3D display, precise bimanual instrumentation with the wrist, tremor filtration with the automatic removal of unwanted movements, movement scaling for microsurgical interventions, and individual camera control. These innovations allow the surgeon to overcome the limitations of conventional endoscopic surgery, including wrist-free instrumentation and two-dimensional visualization. The robotic system is most often used for a transoral robotic approach (TORS) in the treatment of oropharyngeal tumors, tongue base tumor resection and surgical treatment of obstructive apneas. In thyroid surgery, a transaxillary approach (RATS) and transoral approach (TORT) are used. KBC Zagreb introduced robotic surgery in otorhinolaryngology as a pioneering institution in the region. During the lecture, we will present a series of cases representing the first robotic procedures performed through a transoral approach at KBC Zagreb, demonstrating the technical aspects, indications, perioperative course and results. Robotic surgery in otolaryngology represents a significant advance in the treatment of patients with head and neck diseases, enabling precise, safe, and minimally invasive treatment of complex conditions with better functional and aesthetic results.

Key words: transoral robotic surgery, obstructive apnea, Da Vinci