“What is the future of minimally invasive surgery in otorhinolaryngology: computer assisted navigation, 3D-surgical planner, augmented reality in the operating room with 'in the air' surgeon's commands as a “biomechanics” of the new era in personalized contactless hand-gesture non-invasive surgeon-computer interaction?”

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The use of modern technologies in head and neck surgery in the last 30 years (e.g., FESS, NESS, and robotic surgery) has enabled surgeons to demonstrate spatial anatomic elements in the operating field, which was quite inconceivable before. We are focused on development of personal-3D-navigation system and application of augmented reality in the OR, management of image 2D-3D-video-medical documentation (virtual endoscopy/VE), and control marker-based virtual reality (VR) simulation in real time during real operation with *per viam* contactless 'in the air' surgeon's commands. Navigation-LM-VE-VS suggests that real and virtual objects definitely need to be integrated by use of real 'in the air' control with simulation of virtual activities that requires real-time visualization of 3D-VE motions, following the action of the surgeon that may be moving in the VR area. It is achievable with simple hand gestures of the surgeon, which do not differ in any way from all other natural everyday hand or body movements. In this way, the surgeon can predict the course of the surgery. He 'travels' through the virtual space, 'plays' without additional body, head and/or hand gesture changes. Simply, the surgeon coordinates his right hand movements, thus enabling, with contact free commands, the course of their preference or needs through the world of 3D-model, VE or VS, without stopping the endoscopic (Endo) procedure in process (the Endo is held by the left hand in the real surgery field). With this, all assumptions that the surgeon/telesurgeon is positioned in this virtual world which they entirely control but which realistically does not exist are achieved. This approach has not yet been used in ORL-H&N Surgery, not even in general surgery.

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