



Oral Presentations

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Head-Mounted Display: Surgical Informatics Portal of the Future

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Introduction: Head-mounted displays (HMDs) have facilitated efficient and intense decisions for fighter pilots over the past 30 years. This paper reviews developments over the decade since their introduction to our skull base lab, highlighting the current state-of-the-art device which is ideally suited to the rigorous demands of endoscopic skull base team surgery.

Methods: A brief review of advances in HMD applications from the skull base lab to clinical practice is followed by a description of the current HMD device applied to trans-sphenoidal approaches to the skull base. Information technology in the form of stereotactic radiologic guidance is readily controlled by the surgeon through a boom microphone. Picture-in-picture features allow insertion of any digital view from a wide variety of imaging and neurophysiologic monitoring. Discussion of future applications and technology advances including the development of a three-dimensional endoscope small enough for skull base surgery.

Results: A clinical series of endoscopic trans-sphenoidal surgery combined with new minimally invasive skull base team surgery approaches highlight the unique advantages of the HMD as a "portal" for surgically relevant digital information provided when desired in a "real time" mode. Ergonomic improvements, including true line-of-sight endoscopic work with displays rivaling the most advanced television monitors, offer an immediate advantage of the technology in demanding minimally invasive skull base team surgery. The offer of a digital stereoscopic view

in the near future to primary surgeons and remote assistants and observers enhances the role for this technology in the skull base operating suite.

Conclusion: The HMD offers a “portal” for digital information, which, combined with ergonomic advantages and the potential for stereoscopic three-dimensional imaging, makes an attractive operative tool in the repertoire of the modern skull base surgical team.