Journal of Otology & Rhinology
ISSN 2324-8785
2020
Vol.09 No.6

Stereopsis effect in otosurgery

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Abstract

Statement of the Problem: The study and application of three-dimensional measurement is a new area in microsurgery which allows reducing the amount of intraoperative injuries as well as detailing the anatomical structures expanding the possibilities of surgical access. Using stereopsis phenomenon with virtual reality glasses is promising and useful practice in surgical procedures on the middle ear. Clinical Practice: This study included eight cadaver dissections performed on the temporal bone using two different scopy options. Four cadaver dissections were performed using traditional endoscopy which has proved its superiority to a microscope. The disadvantage of traditional endoscopy is the lack of immersion which is an important component in determining the relationship between the anatomical formations of the tympanic cavity. Four cadaver dissections were performed using our proposed method, based on the stereopsis phenomenon using a special camera adapter fixed on the endoscopic tube, which transmitted the video image to virtual reality glasses. It was found that the experiment participants experienced an immersion effect caused by the stereopsis phenomenon. The results of the study were evaluated by the NASA TLX scale for workload index assessing. Conclusion & Significance: Operators showed a lower level of the workload index using the proposed version of scopy based on the phenomenon of stereopsis in virtual reality glasses during dissection of the temporal bone. The participants felt the effect of immersion during the manipulations on the middle ear, as well as noted a more physiological ratio of the optical axis between the surgeon's eyes and working tools. The three-dimensional visualization of the surgical field based on the phenomenon of stereopsis using a virtual reality glasses allows perceiving the spatial depth of the wound thereby expanding the possibilities of surgical intervention and improving operator productivity.

Biography:

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Speaker Publications:

1. Otolithiasis in hearing-improving operations, St. Petersburg, Russian otorhinolaryngology. - 2019.- №2 (99). S. 64-69 J.V. Privalova, D.M. Kuzmin, A.S. Zhorina
2. An innovative method for visualizing the surgical field Materials of the III All-Russian Congress of the National Medical Association of Otorhinolaryngologists of Russia Nizhny Novgorod, 2019 - P.80-82.
3. Otolithiasis after stapedoplasty Materials of the VIII International St. Petersburg Forum of Otorhinolaryngologists of Russia April 23-25, 2019 C.148-149
4. MSCT of the temporal bones as a method for assessing the surgical treatment of otosclerosis Materials of the VII International St. Petersburg Forum of Otorhinolaryngologists of Russia April 25-27, 2018 C.145-146, Kuzmin D.M., Pashchinin AN, Zhorina AS, Privalova Zh. IN.
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3rd Online Edition of European Conference on Otolaryngology and ENT; Webinar- July 25-26, 2020.

Abstract Citation:

D.M. Kuzmin, Stereopsis effect in otosurgery , 3rd Online Edition of European Conference on Otolaryngology and ENT; Webinar- July 25-26, 2020.