The aim of a study of Dho et al. from the Seoul National University Hospital, was to analyze the positional effect of MRI on the accuracy of neuronavigational localization for posterior fossa lesions when the operation is performed with the patient in the prone position.

Ten patients with posterior fossa tumors requiring surgery in the prone position were prospectively enrolled in the study. All patients underwent preoperative navigational MRI in both the supine and prone positions in a single session. Using simultaneous intraoperative registration of the supine and prone navigational MR images, the authors investigated the images' accuracy, spatial deformity, and source of errors for PF lesions. Accuracy was determined in terms of differences in the ability of the supine and prone MR images to localize 64 test points in the PF by using a neuronavigation system. Spatial deformities were analyzed and visualized by in-house-developed software with a 3D reconstruction function and spatial calculation of the MRI data. To identify the source of differences, the authors investigated the accuracy of fiducial point localization in the supine and prone MR images after taking the surface anatomy and age factors into consideration.

Neuronavigational localization performed using prone MRI was more accurate for PF lesions than routine supine MRI prior to prone position surgery. Prone MRI more accurately localized 93.8% of the tested PF areas than supine MRI. The spatial deformities in the neuronavigation system calculated using the supine MRI tended to move in the posterior-superior direction from the actual anatomical landmarks. The average distance of the spatial differences between the prone and supine MR images was 6.3 mm. The spatial difference had a tendency to increase close to the midline. An older age (> 60 years) and fiducial markers adjacent to the cervical muscles were considered to contribute significantly to the source of differences in the positional effect of neuronavigation ($p < 0.001$ and $p = 0.01$, respectively).

This study demonstrated the superior accuracy of neuronavigational localization with prone-position MRI during prone-position surgery for PF lesions. The authors recommend that the scan position of the neuronavigational MRI be matched with the surgical position for more precise localization [1)].

Clinical data of 36 patients with posterior fossa lesions who accepted neuroendoscopy assisted microneurosurgery (NEAM group) in the department of neurosurgery of the First Affiliated Hospital of Chongqing Medical University, from January 2014 to December 2016, were retrospectively enrolled. A total of 113 cases diagnosed with the same lesions and accepted conventional microneurosurgery (non-NEAM group) in the same period were analyzed as control group. The total tumor resection rate, postoperative leakage of cerebrospinal fluid, intracranial infection, operating time and the recovery of facial nerve function were compared between the two groups. Results: Ninety-three patients with acoustic neuroma were analyzed, which were divided into non-NEAM group 78 cases (removed posterior lip of internal auditory canal in different degrees) and NEAM group 15 cases (not removed posterior lip of internal auditory canal). The total tumor resection rate and postoperative facial nerve function had no significant statistical differences between two groups. The operating time of NEAM group was longer than that of non-NEAM group ($P=0.048$, $P<0.05$), but the rate of leakage of cerebrospinal fluid and intracranial infection did not increase. Twenty-seven cases were diagnosed with cerebellopontine angle cholesteatoma. These cases were divided into two groups, 17 cases in non-NEAM group and 10 cases in NEAM group. NEAM group have higher total tumor resection rate ($P=0.014$, $P<0.05$), better short-term postoperative facial nerve function ($P=0.039$, $P<0.05$), and longer operating time ($P=0.015$, $P<0.05$), compared with non-NEAM group. No significant statistical differences were observed on long-term postoperative facial nerve function and postoperative complications. Of the 16 cases diagnosed tentorial meningioma, 10 cases were in non-NEAM group and 6 cases in NEAM group. Six cases in non-NEAM group and 4 cases in NEAM group were total

removal. For the mean operating time, non-NEAM group was (6.6±1.0) hours and NEAM group was (7.1±0.7) hours. Thirteen cases were with fourth ventricular cholesteatoma, which all were totally resected, and 8 cases were in non-NEAM group and 5 cases in NEAM group. For non-NEAM group, 5 cases dissected cerebellar vermis and the mean operating time is (6.0±0.7) hours. However, NEAM group all did not dissect cerebellar vermis and the mean operating time is (6.4±0.4) hours. Conclusions: Neuroendoscopy assisted microneurosurgery for cranial fossa lesions was benefit to totally resect tumor and reduce unnecessary injury. It needed longer operating time, but not increase postoperative intracranial infection [2].

1)
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2)
Li J, Zhong D, Lü D, Huang HY, Du W, Yang J, Wu YT, Xia HJ, Tang WY, Sun XC. [Neuroendoscopy assisted microneurosurgery for posterior cranial fossa lesion]. Zhonghua Yi Xue Za Zhi. 2018 May 8;98(17):1311-1316. doi: 10.3760/cma.j.issn.0376-2491.2018.17.006. Chinese. PubMed PMID: 29764030.