Endoscopic biopsy and third ventriculostomy

Eleven cases were admitted to Alexandria main university hospital from 2013 to 2016 presenting with pineal region tumors and hydrocephalus. Mean age at diagnosis was 11 years (1-27 years). All cases had ETV and biopsy using rigid ventriculoscope through a single trajectory from a burr hole planned on preoperative imaging. Follow-up period was 7-48 months.

RESULTS: All 11 cases presented with hydrocephalus and increased intracranial pressure manifestations. Histopathological diagnosis was successful in 9 out of 11 cases (81.8%). Three cases were germ-cell tumors, two cases were pineoblastomas, two cases were pilocytic astrocytomas, and two cases were grade 2 tectal gliomas. Five of the ETV cases (45.5%) failed and required VPS later on. Other complications of ETV included one case of intraventricular hemorrhage and a case with tumor disseminated to the basal cisterns.

CONCLUSION: In our series, we were able to achieve ETV and biopsy through a single trajectory and a rigid endoscope with results comparable to other studies in the literature ¹⁾.

he images of 30 consecutive pediatric patients with varying degrees of ventriculomegaly were reviewed. Three-dimensional models were created using radiological analysis of anatomical detail and preoperative MRI scans in order to simulate 3 frequently quoted ETV trajectories for rigid neuroendoscopes. These trajectories were characterized based on the frequency and depth of tissue displacement to structures such as the fornix, caudate nucleus, genu of the internal capsule, and thalamus. The results are stratified based on ventricle size using the frontal horn ratio (FHR).

RESULTS: Eloquent areas were displaced in nearly all analyzed entry points (97%-100%). Stratifying the data based on ventricle size revealed that (1) lateral structures were more likely to be displaced in cases of intermediate ventriculomegaly (FHR < 0.4) using all 3 trajectories, whereas (2) the fornix was less likely to be displaced using more posteriorly placed trajectories for severe ventriculomegaly (FHR > 0.4). Allowing for minimal (2.4 mm) tissue displacement, a more posterior entry point was less traumatic for severe ventriculomegaly.

CONCLUSIONS: There is no single best ETV trajectory that fully avoids displacement of the eloquent periventricular structures. Larger ventricles require a more posteriorly placed entry point in order to reduce injury to the eloquent structures, and intermediate ventricles would dictate a medial entry point. These results suggest that the optimal entry point should be selected on a case-by-case basis after incorporating ventricle size².

To assess the histologic accuracy of endoscopic biopsy samples of the pineal region. Pineal region tumors usually present with acute hydrocephalus. Histologic diagnosis is paramount, as it greatly influences treatment. Endoscopic techniques can combine histologic diagnosis with relief of the obstructive hydrocephalus in a single operation. Because pineal region tumors can be heterogeneous, initial biopsy samples may not represent the most aggressive portion of the tumor.

METHODS: This retrospective study reviews our experience of endoscopic third ventriculostomy combined with biopsy of the lesion. The histologic diagnosis as a result of the initial biopsy was compared with the final histologic diagnosis to establish the accuracy of the endoscopic biopsy

sample in aiding diagnosis.

RESULTS: Forty-seven patients underwent an endoscopic third ventriculostomy. All but 1 patient underwent a concurrent biopsy of the space-occupying lesion and 39 of 46 patients (85%) had a histologic diagnoses. In the remaining 7 patients (15%), the histology was negative; in 6 cases, the second attempt to obtain a histologic diagnosis was successful (2 repeat endoscopic biopsy samples, 2 resections, 2 stereotactic biopsy samples). In 1 patient a presumed low-grade tectal tumor was followed up with sequential scanning. Twenty-eight patients underwent subsequent operations (24 resections, 4 stereotactic biopsies). In 6 of 28 patients (21%), the histologic report was amended after the second procedure.

CONCLUSIONS: The endoscopic biopsy sample yields an accurate histologic diagnosis for most pineal region tumors, with a positive histologic sample in about 85% of patients. However, the results must be interpreted cautiously, as the heterogeneous nature of these tumors may lead to an approximately 21% error rate in the initial tumor diagnosis ³⁾.

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