

Introduction

iMRI is rapidly becoming one of the tools used in pediatric oncologic neurosurgery because of its ability to document extent of resection and eliminate the need for further imaging and returns to the operating room.

Methods

Retrospective analysis of all posterior fossa brain tumors operated on at Boston Children’s Hospital (BCH) between January 1, 2006, and November 30, 2017. We reviewed clinical data, operative notes, number of iMRI scans performed, pathological diagnosis, complications and extent of resection. IRB was obtained.

Results

We identified 270 patients - 106 juvenile pilocytic astrocytoma (JPA), 70 Medulloblastoma, 25 Ependymoma, 37 Glioma other than JPA and 32 miscellaneous pathologies. For all cases, gross total resection (GTR) was achieved in 184(68.1%) cases, near-total resection (NTR) in 17(6.3%), subtotal resection (STR) in 61(22.6%) and the remainder were biopsied. The use of iMRI more than once in the same operation was more common in the JPA group (22.6%).The surgical objective was GTR in JPA 90/106(84.9%), ependymoma 24/25(96%) and medulloblastoma 70/70(100%).

The actual resection was GTR 79/90(74.5%) JPA, 48/70 (68.6%) medulloblastoma, 20/25 (80%) ependymoma; NTR 7 (6.6%) JPA, 6 (8.6%) medulloblastoma; STR 21 (19.8%) JPA, 14 (20%) medulloblastoma, 5(20%) ependymoma.

There were 8 cases of posterior fossa syndrome (2.96%) - (5/70 medulloblastoma (7.1%), 1/25 ependymoma (4%) and 2/106 JPA (1.9%)).

The iMRI identified unanticipated complications in 5/270 cases, 1.9%; and the need to perform more resection to achieve the surgical objective in 48/270 cases, 17.8%.

Due to using iMRI, separate postoperative imaging could be avoided in 85.2% of the patients, eliminating the need for sedation/GA. Postoperative imaging was performed in only 40/270 (14.8%).

Conclusions

iMRI was valuable in achieving the preoperative surgical objective in roughly 75% of patients, avoiding the need for reoperation and immediate postoperative baseline imaging.

Learning Objectives

Discuss the role of the iMRI in neurosurgical practice and the value added.