INTRAOPERATIVE 3T MAGNETIC RESONANCE IMAGING AND QUALITY IMPLEMENTATION: INITIAL 5-YEAR EXPERIENCE
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PURPOSE

• To share initial experiences with the implementation and quality control of intraoperative 3T magnetic resonance imaging (MRI) program in the pediatric neurosurgical population.
INITIAL PLANNING

• Sought need to assist neurosurgical procedures of the brain and spine with integrated imaging at a large regional pediatric hospital

• Involved key groups including hospital administration, the radiology department chair, the head of pediatric neurosurgery, and the neuroradiologists
INITIAL PLANNING

- All aspects of quality and safety were discussed between these departments before physical construction of project.
- Radiologists were integral in assuring safety as a priority during initial setup and were able to lead the rest of the team in obtaining that knowledge.
- Radiology technicians were trained specifically for operation and safety of the intraoperative MRI.
CONSTRUCTION AND SETUP

- Operating room set up for neurosurgical cases only
- MRI resides in separate room with doors that slide open when brought into the OR
  - During MRI use all other doors are automatically locked

Room configuration
Top Right: MRI housing;  Bottom Right: Technologist work area
Left: Operating room
PROCEDURES PERFORMED

• Initially tumor resections only
• Expanded to tumor biopsies
• This was followed with arteriovenous malformation and epilepsy procedures
  • Each procedure was mastered by all team members before deciding to advance to other procedures
ROLE OF THE NEURORADIOLOGIST

• The neuroradiologist is present during scanning, deciding the protocol to use and actively discusses findings with the surgeon during the procedure.

• Additional series for the protocol are not uncommon and is designed by the neuroradiologist in conjunction with the surgeon.

• Decisions including continued use of contrast are considered as well.
SAFETY ISSUES

• Instruments are counted before each use of MRI
  • Techs specifically trained to count everything in room rather than just operating field

• Time-outs include MRI protocols

• Selective entry of staff when MRI is brought into room and when it is used
RESULTS

• Since the implementation of the intraoperative MRI there have been no safety issues that were reportable under standard guidelines
  • Includes errors and near misses
  • This accounts for 450 patients that have been scanned during a 5-year period.

• Additionally less total operation time due to decreased need for reopening has been shown on prior studies

• There has been positive feedback from neurosurgeons on the benefit of having the neuroradiologist overseeing the scans and interpreting in real-time
CONCLUSION

• Planning for intraoperative MRI use needs input from a dedicated multitude of hospital teams

• Having radiologist actively involved with an intraoperative MRI program can help ensure the highest quality of care and safety for patients

• Less OR time, less need for reopening, and an improved relationship between the radiology and surgery teams all contribute to improved patient outcomes and safety
THANK YOU!

• Please e-mail any questions to jormsby@live.com