

SMRT Student Scope Submission

Title and Author(s)	
☐	Include Title of your submission and any collaborator as co-authors Title: Pediatric Medulloblastoma Authors: Reed Fricke RT (R) Supervisor Name / Affiliation: Adam Stevens BS RT (R)(MR)(CT) University of Nebraska Medical Center, CT/MRI Program Director Date of Submission: May 4, 2006
Introduction or Patient History	
☐	This is a 5-month-old female patient who at 2 months of age presented with a large head circumference. At 2 months of age she had undergone a MRI for this condition. The findings of this scan showed agenesis of the corpus collosum but the study was otherwise normal. At approximately five months of age she had become irritable, nauseated, and had right eye problems. She underwent a CT scan of the head, which showed severe hydrocephalus and was referred to a specialist. The head CT was repeated for the specialist. When that CT was repeated it showed a mass involving the posterior fossa region. Upon these results, an MRI of the brain and T-Spine only were obtained to further evaluate the severity of the mass and look for any additional masses. More on the findings will be discussed later.
Patient Preparation and Scan Set up	
☐	The patient's parents were screened regarding their child's past medical history to insure that a MRI was safe to be administered. The parents were explained the procedure that was going to be administered and signed the appropriate consent for this infant to have this exam. All MRI safety and procedure guidelines were followed in normal fashion. The patient was scanned on a General Electric Signa Excite 1.5 tesla scanner. The patient was placed supine, head first on the scanner table. At this time altered earplugs due to the patient size were given. Blankets were given to the patient to increase her comfort. The patient's head was positioned in the Med Rad Neurovascular 8-channel head coil. Sponges were placed around the head to reduce motion artifact and a strap was drawn across the patient to ensure patient safety and also reduce movement. Next the patient was land marked at the outer canthus and was advanced into the scanner so the exam could begin.

MR Imaging Parameters	
-----------------------	--

Sequence	Type	TR	TE	FOV	T/S	Matrix	NX	Band
3 Plan Loc								
Sag T1	SE	450	14	20	5/1	256x192	2	15.62
Ax T2	FRFSE-XL90	3000	83.6	20	5/1	320x256	2	20.8
Ax Flair*	FSE IR	9002	132	20	5/1	256x192	1	15.6
Ax T1	SE	550	14	20	5/1	256x192	2	15.6
Diffusion	SE/EPI	1000 0	104	20	5/1	128x128	2	167
Ax MPGR	MPGR	600	30	20	5/1	256x192	1	3.9
Cor T2	FRFSE-XL90	3500	8705	22	5/1	320x256	2	20.8
Tensor	SE/EPI	8300	99.5	26	5/0	128x128	1	250
Sag T1+C	SE	550	20	24	5/1.5	256x192	2	15.6
Cor T1+C	SE	400	20	22	5/1	256x192	2	15.6
Ax T1+C	SE	400	20	22	5/1	256x192	2	15.6

Sag- Saggital

IR-Inversion Recovery

EPI- Echo Planar Imaging FRFSE-XL90-Fast

Recovery Fast Spin Echo

Findings and Discussions

The MRI scan confirmed what was known on the CT scan, but more importantly, it gave a precise and detailed look at the composition of the mass and the extent of its involvement throughout the brain. The mass exhibited contrast uptake on the post-contrast sequences in a heterogeneous fashion. The location of the mass is centered on the midline within the superior posterior fossa. The mass, however, shows that portions of it have infiltrated throughout the cerebellum and also involve the mid-brain tectum. The mass shows multiple micro cysts throughout. The brain MRI scan also reveals cerebellar cortex thickening and inferior cerebellar tonsillar herniation. As a result of the spread of the mass it has occluded the cerebral aqueduct in the brain and also closed off the fourth ventricle, which in result has lead to severe non-communicating hydrocephalus. From the previous discussion it can be concluded that the mass could either be a high-grade anaplastic astrocytoma or a medulloblastoma. The patient was taken to surgery because of these findings. In surgery the tumor was resected and tissue samples were taken of the tumor and were pathologically examined. The pathology report showed the tumor was a medulloblastoma. Upon doing some research I have found that this kind of tumor it is a rapid growing tumor that occurs in twenty percent of children's brain tumors making it the most common brain tumor in children. Symptoms often involve nausea due to hydrocephalus, headaches, balance, eye, speech problems, and dizziness. This patient had a number of these symptoms. This tumor rises from the fourth ventricle and is located between the cerebellum and the brain stem. The treatment for this tumor is surgery (tumor resection); chemotherapy and radiation therapy. These treatments depend upon the many different factors of the tumor. Patients prognosis with medulloblastoma has greatly increased over the years as it is said that 8 out of 10 patients are tumor free after 5 years of treatment.

Conclusions

The 5-month-old female who presented with extreme hydrocephalus was later shown to have a mass in the posterior fossa. A MRI was obtained to evaluate the mass and after the results of the MRI the infant was taken to surgery to resect the tumor. Upon a pathologic report it was determined that the mass was a medulloblastoma that resulted in severe hydrocephalus to the patient.

References

Hellbusch MD, Leslie. Pathology Dictation. The Nebraska Medical Center. 8 March 2006.

Packer MD, Roger. "Medulloblastoma." The Childhood Brain Tumor Foundation. 11 April 2006. <
<http://www.childhoodbraintumor.org/02revisionMedullo.htm>>

Swartzbaugh MD, Joanna. History and Physical Dictation. The Nebraska Medical Center. 7 March 2006

"Understanding Medulloblastoma." 5 June 2005.
Medulloblastoma.org. 11 April 2005. <
<http://medulloblastoma.org/articles/understanding.php>>

White MD, Matthew. MRI Dictation. The Nebraska Medical Center. 8 March 2006.

Please see next page for images.

Images

