

Tailored MRI spine for investigation of drop metastases in children with brain tumours.

CHOW Mon Ben, TANG Phua Hwee
Department of Diagnostic and Interventional Imaging
KK Women's and Children's Hospital
SINGAPORE

INTRODUCTION :

The standard MRI spine protocol consists of sagittal and axial T1 and T2 weighted sequences, followed by post contrast sagittal and axial sequences. This results in a long imaging time, particularly as when done together with a full MRI brain study, resulting in imaging time which exceeds 1 hour. Many children are unable to co-operate with such extended imaging times and may require the MRI scan to be done under sedation or general anaesthesia which carry with them a degree of risk.

Aim of this study is to determine the most useful sequences in spine imaging for detection of drop metastases when performed together with MRI brain in the context of intracranial brain tumours.

METHODOLOGY :

All MRI brain and spine imaging done within 24 hours of each other in KK Women's and Children's Hospital were retrospectively reviewed. Cases where drop metastases were present were identified and 2 FRCR qualified radiologists reviewed all the MRI images of these patients separately for drop metastases.

RESULTS :

There were 9 patients having 11 cases of drop metastases, 1 of these patients having 3 separate episodes of combined brain and spine imaging. All 11 cases of drop metastases had sagittal T1, sagittal T2, sagittal and axial post contrast sequences, 10 had axial T1 and T2 sequences, 7 had sagittal STIR and 4 had sagittal T1 fat saturated sequences. Drop metastases were seen on 100% sagittal post contrast sequences of the spine and in 95% of the post contrast axial sequences. Sensitivity of the precontrast sagittal T1, sagittal T2, pre contrast axial T1, axial T2 sequences are 68%, 90%, 80% and 85% respectively. The T2 sequences also showed hyperintense T2 cord signal in 4 cases. Interobserver agreement ranged from 0.9 to 1.0 for the post contrast sequences and 0.7 to 1.0 for the precontrast sequences.

CONCLUSION :

Post contrast sequences are the most useful MRI spine sequences when performed in conjunction with MRI brain for the detection of drop metastases with excellent interobserver agreement. T2 sequences are also useful in demonstrating abnormal cord signal. Limiting MRI spine imaging to these when done in the context of identifying drop metastases improves service efficiency and cost effectiveness while ensuring that diagnostic quality is not compromised. This limited MRI spine protocol has been adopted in the department since March 2015.

ILLUSTRATIVE CASE :

Two year old boy with malignant brain tumour (choroid plexus carcinoma) who underwent MRI under general anaesthesia to check for drop metastases. Images obtained with routine spine MRI protocol in February 2011 are presented.

Using limited spine protocol consisting of sagittal post contrast T1 and sagittal T2 weighted images (**highlighted in orange**) would show the abnormalities, which are the **metastases indicated by blue arrows** and **spinal cord oedema indicated by pink arrows**, cost effectively without compromise of diagnostic quality.

