Complications of Bacterial Meningitis: The Utility of Diffusion-weighted Imaging

Francisco Garcia-Morales, MD *
Toshio Moritani, MD
Akio Hiwatashi, MD
Sven Ekholm, MD
Leena Ketonen, MD, PhD
Per-Lennart Westesson, MD, PhD, DDS

University of Rochester Medical Center, NY
*VA Medical Center Dallas, TX
DWI in complicated course of bacterial meningitis

• 11 patients
• 6 males
• 5 females
• Age R=7 days to 81 years
DWI in complicated course of bacterial meningitis

- Group B streptococcus 2 pt
- Strepto Pneumoniae 3 pt
- E coli 2 pt
- St meningitides 1 pt
- Bacillus sp 1 pt
- Fusibacterium 1 pt
- ? 1 pt
MR patient evaluation

- DWI and ADC maps (b=0, 1000sec/mm², 3 orthogonal orientations)
- T1, T2-weighted images
- Gd-enhanced T1-weighted images
- FLAIR
- MRA
MR examination related to clinical presentation

- 9 pt  = 2-6 days
- 2 pt  = 15-20 days
Results

- Different degree of brain infarction = 6 pts

- Brain infarction in bilateral fronto-parietal or parieto-occipital cortices = 3 pts.
Brain Infarction
Brain Infarction
MRA COW

![Image 1]

![Image 2]
DWI

ADC
Results

- Different degree of brain infarction = 6 pts
- Brain infarction in bilateral fronto-parietal or parieto-occipital cortices = 3 pts.
- Bilateral basal ganglia, deep white matter or corpus callosum = 3 pts.
DWI
DWI
Results

• **Purulent meningitis** = 4 patients
  Convexity Hyperintensities with decrease ADC compared to CSF
DWI
Results

• Purulent meningitis = 4 patients
• Subdural empyema = 1 patient
• Epidural empyema = 1 patient
• Periorbital abscess = 1 patient
Results

• Purulent meningitis = 4 patients
• Subdural empyema = 1 patient
• Periorbital abscess = 1 patient
• Lemierre’s syndrome = 1 patient
Lemierre’s syndrome

- R jugular vein thrombosis
- R sigmoid sinus thrombosis
- R cavernous sinus trombophlebitis and abscess formation
- Severe narrowing of the R ICA and watershed infarction.
DWI          ADC
DWI

ADC
Conclusions

- DWI and ADC maps are useful to characterize complications of meningitis such as:
  - Cerebral infarction
  - Purulent leptomenigitis
  - Subdural empyema
  - Cavernous sinus abscess formation