Protocol session

Liver Dynamic Protocol

Govind CHAVHAN, MD DNB DABR®
Associate Professor and Staff Radiologist
The Hospital for Sick Children,
University of Toronto,
CANADA
Liver Dynamic Protocol

1. Liver dynamic protocol with conventional GBCM

2. Liver dynamic protocol with conventional hepatobiliary contrast agents

3. Choice of contrast media
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Coverage - diaphragm to iliac crests

Good for -
- Liver lesions
- Portal hypertension
- Any mass lesion in the upper abdomen
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Fluid sensitive
- Lesion characterization
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Motion insensitive
- Gross anatomy, vessels, ducts
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Fat content of a lesion or fatty liver
- Gross hemosiderosis
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Lesion detection
- Lesion characterization
- Treatment response and monitoring
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Older children
  - Start of injection
    - 10 sec
  - Breathing instruction (Br In)
  - First RUN 16-36 sec
  - Br In
  - Second RUN 42-62 sec
    - 12 sec + Br In
  - Third RUN 80-100 sec
    - 12 sec + Br In
  - Fourth RUN 120-140 sec

- Equilibrium (1.5-5 min)
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- Smaller children
  - Start of injection
    - First RUN 12-32 sec
  - Second RUN 33-53 sec
  - Third RUN 65-85 sec
  - Fourth RUN 115-135 sec
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE delayed

- MIP Reconstructions
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE/VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE del
11. Ax THRIVE/VIBE
12. Ax T1 TSE fs

Hepatobiliary phase at 20 or 45 minutes
Liver Dynamic Protocol

1. Coronal single-shot T2
2. Ax T2 TSE
3. Ax balanced SSFP
4. Ax in and out-phase
5. Ax Diffusion
6. Ax THRIVE/VIBE pre
7. Dynamic Ax THRIVE /VIBE 4 runs
8. Cor THRIVE/VIBE
9. Ax T1 TSE fs
10. Ax THRIVE/VIBE del

Hepatobiliary phase at 20 or 45 minutes
10. Ax THRIVE/VIBE
11. Ax T1 TSE fs
Choice of GBCM for Liver

- **Children <2 yrs**: Gadovist

- **Children >2 yrs under anesthesia**:
  1. *Multihance* - first choice, Hepatoblastoma, HCC, Embryonal sarcoma. Vessel assessment important for Sx planning
  2. *Primovist* - Likely FNH, mets or adenoma when vessel assessment is not critical

- **Children >7-8 yrs awake**:
  1. *Primovist* - first choice for almost all lesions
  2. *Multihance* - When vessel assessment is important (e.g. pre Sx assessment of HCC), portal hypertension
If you are more interested....

- "pedsMRI" App
- Free download on iTunes and Google Play