012814 MR-US
AMIGO

Cavity Alignment Test
Steve Pieper - 2014-02-15
First use of Slicer for MR US in AMIGO
January 28, 2014

It wasn’t registered.
Initial Registration

- US position provided through OpenIGTLink from Brainlab
- Unexplained mismatch between MR and US
- Question if US volume is internally consistent or if it is distorted
- Unclear match between hyper/hypoechoic US and hyper/hypointense MR regions
First Clues

• Jim suggested segmenting US hyper echoic region for comparison to ventricle
• Looked like a match in shape, but not in registration
• Ron said the thalamus should be in that region under the ventricle
Cavity Alignment Experiment

- Previous resection cavity appeared similar in both volumes.
- Used Editor to segment the cavity in MR and US.
- Used Transforms to visually align cavity models.
- Translation only, $d_{RAS} = (3.16, -2.76, 5.74)$ mm.
- Note that falx and sulci near midline match perfectly now.
Cavity Alignment Experiment

• Further down
Anatomy that is hyperechoic in US becomes visible in MR by changing the windowing

- Steve and Jim suggested that a layered structure would cause the observed hyperechoic image
- Ron identified the choroid plexus inside the ventricle
- Alignment looks very good
Match is even clearer on T1
Before Cavity Alignment

After Cavity Alignment
Summary

• US reconstruction is not overly distorted
• Some US/MR visual differences can be explained
• Analysis could form the basis for automated registration or improved tracker calibration