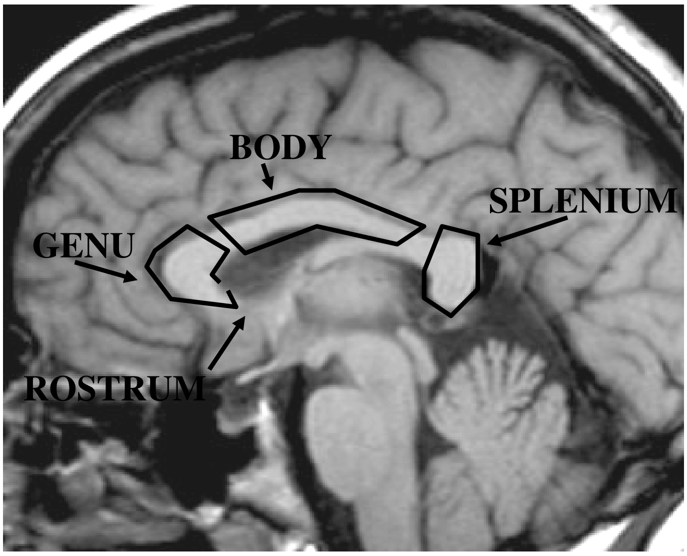
The Normal Corpus Callosum



This is a mid-sagittal T1-weighted image of a normal brain showing the four regions of the corpus callosum.

This and all images are courtesy of UC Regents and the Brain Development Research Program at UCSF (http://www.ucsf.edu/brain/callosum/callosum.htm), directed by Dr. Elliott Sherr.

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Radio feature on Agenesis of the Corpus Collosum

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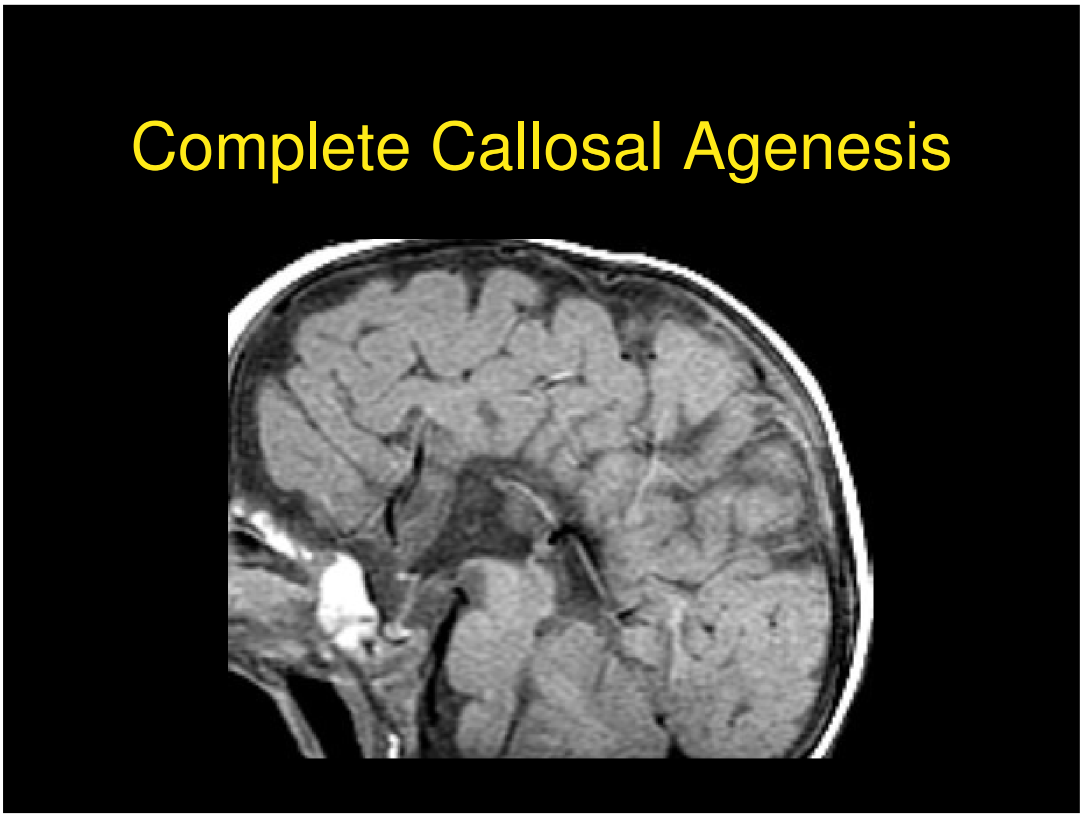

This is the same mid-sagitall plane in a patient who is completing missing the corpus callosum.

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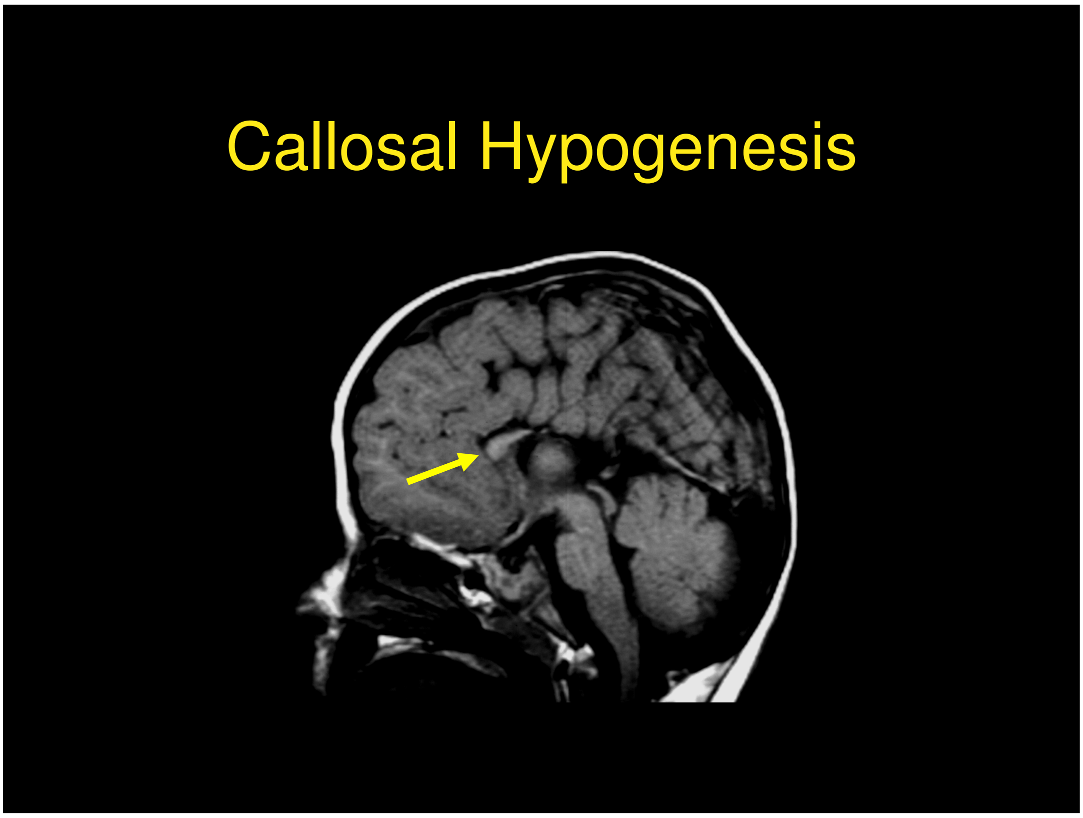

In this individual, part of the corpus callosum is still present. This can be referred to as callosal hypogenesis or partial ACC.

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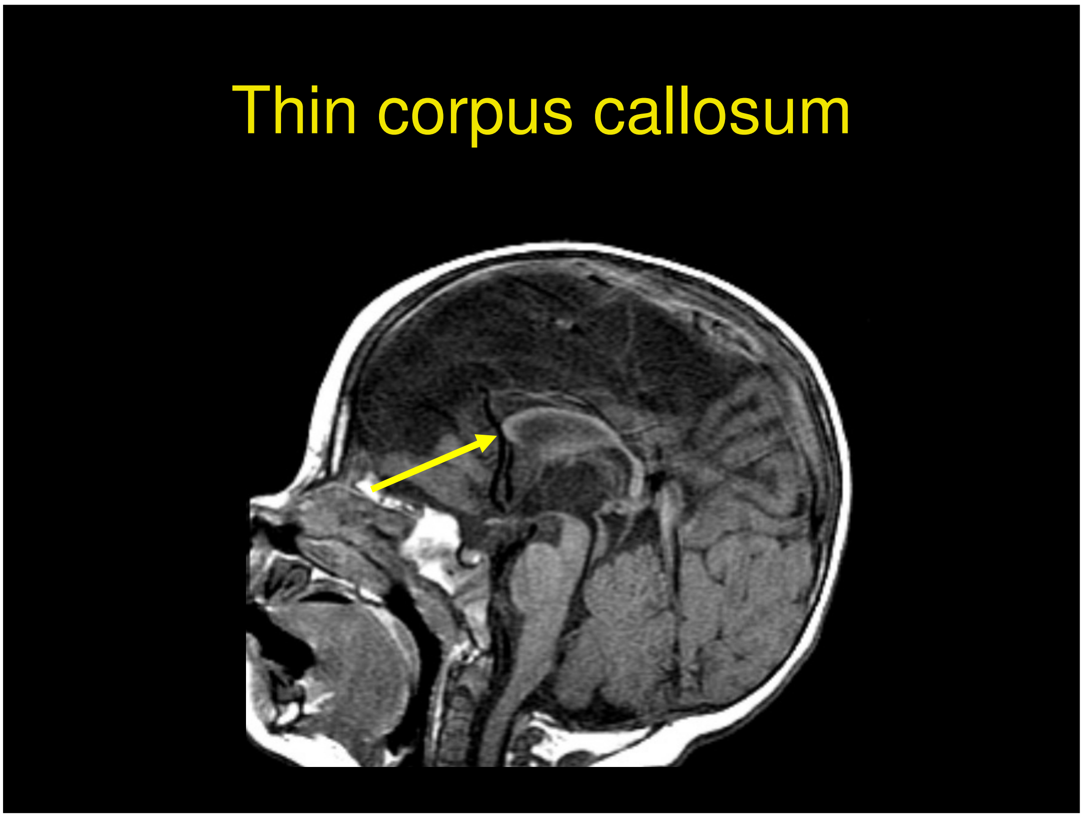

In this case the corpus callosum has all four parts, but is thin throughout. This may be caused similar genetic causes as ACC, or may be caused by genetic pathways that control white matter more generally. Understanding this group will be the most difficult.

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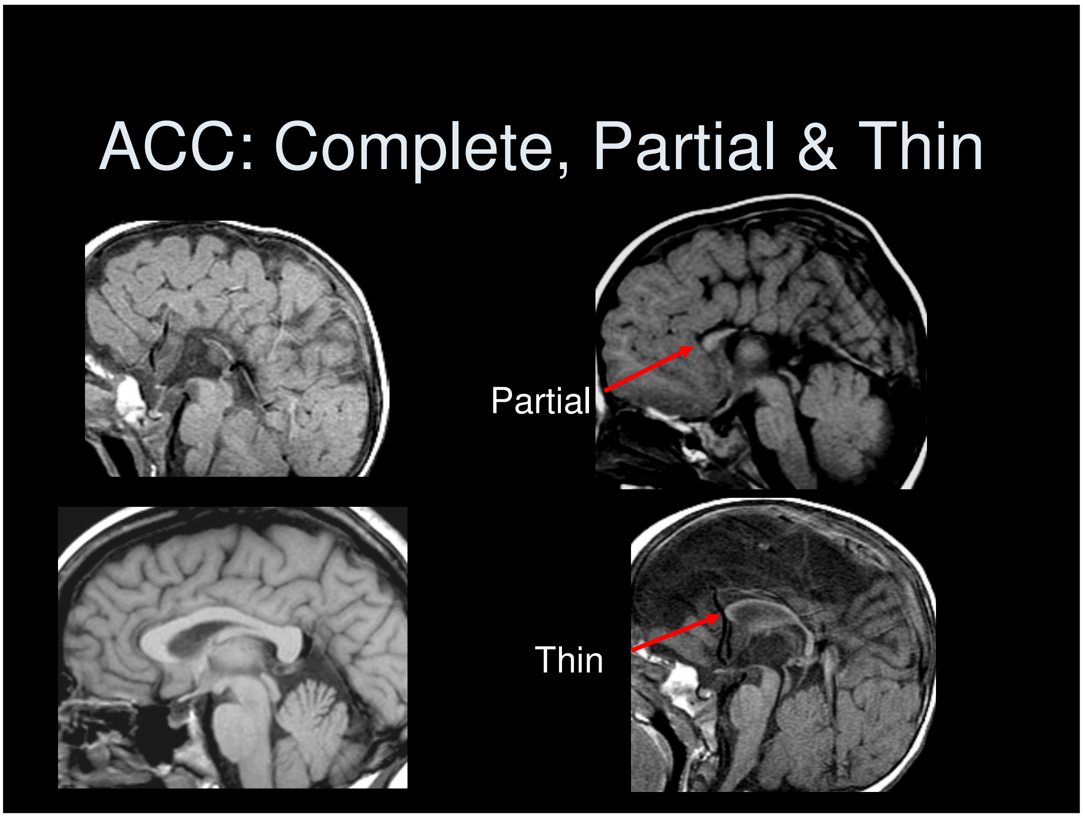

This is a summary slide of the priors.

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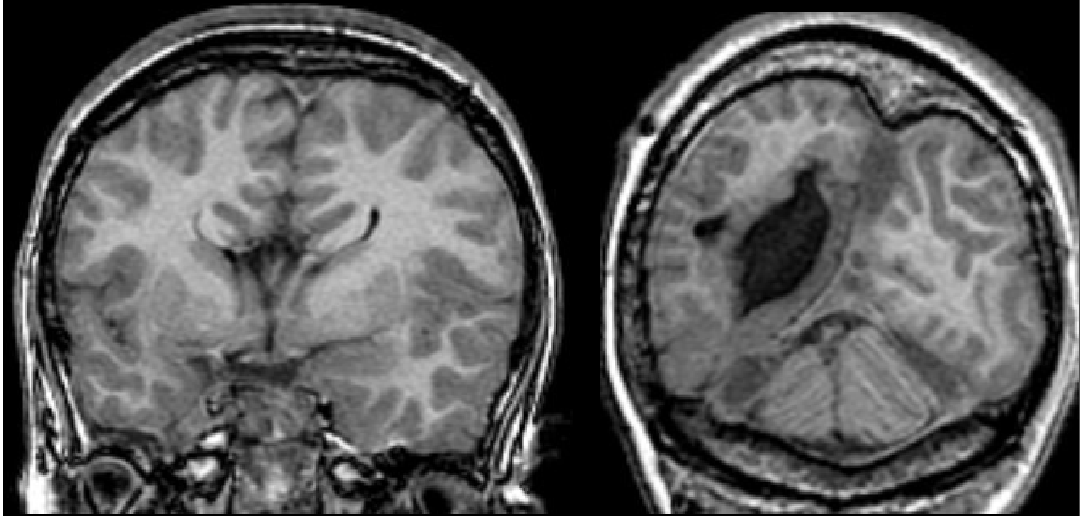
ACC and Gray Matter Heterotopia



In addition to ACC, many of brain changes can be found. In this slide two coronal brain images are shown. The first on the left shows complete ACC. The second, which is further back in the brain, shows an enlarged ventricle and grey matter (signifying neurons) lining the ventricle.

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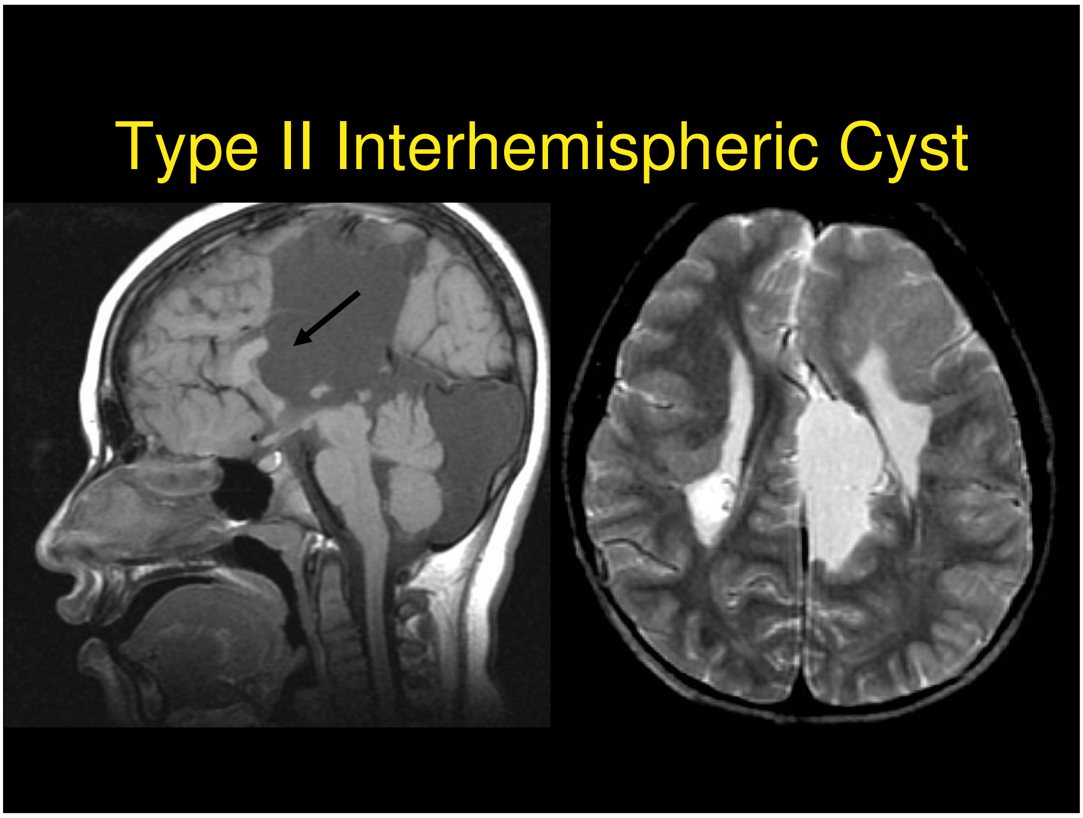

When a corpus callosum normally develops, a bridge of cells forms in the middle of the brain that allows the corpus callosum fibers to cross. In this case, instead of a bridge of cells, a cyst forms, preventing the callosal fibers from crossing (except in the front of the brain--arrow). The image on the left is mid-sagittal, the one on the right is axial.

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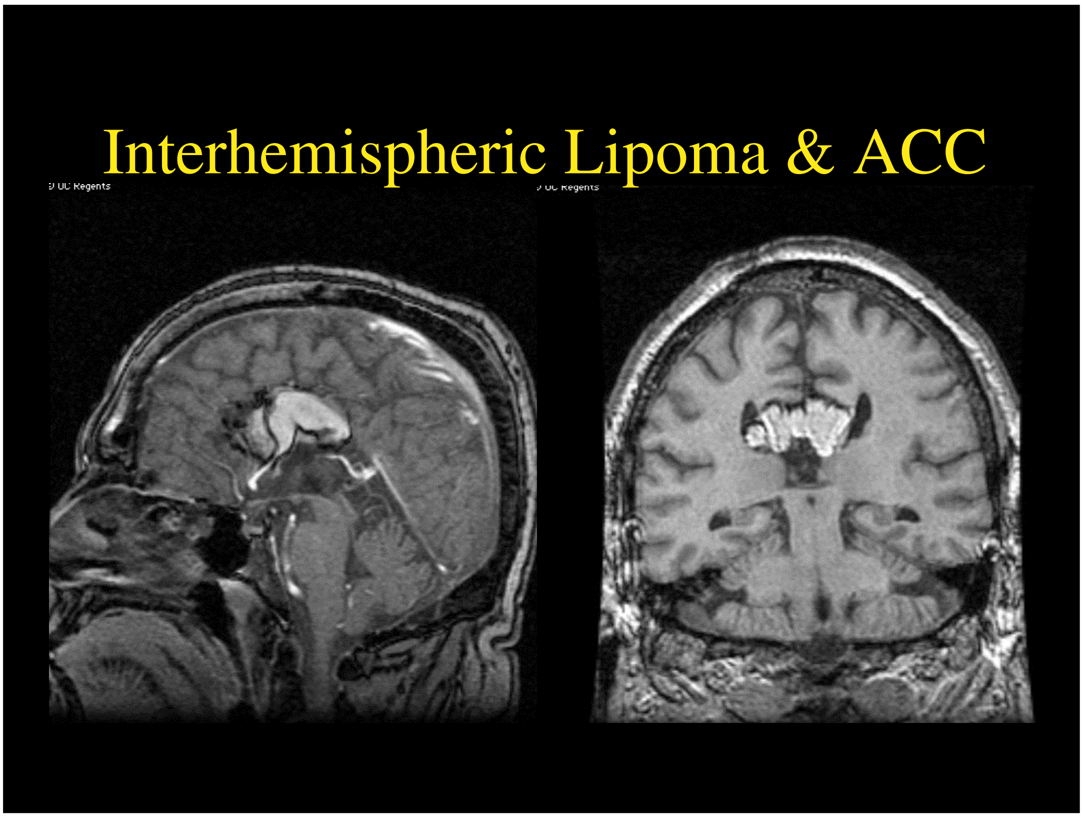

Another example of disruption of the formation of the midline bridge. In this case, we presume that, instead of maturing to form bridge cells, that the midline forms into fat cells (lipoma).

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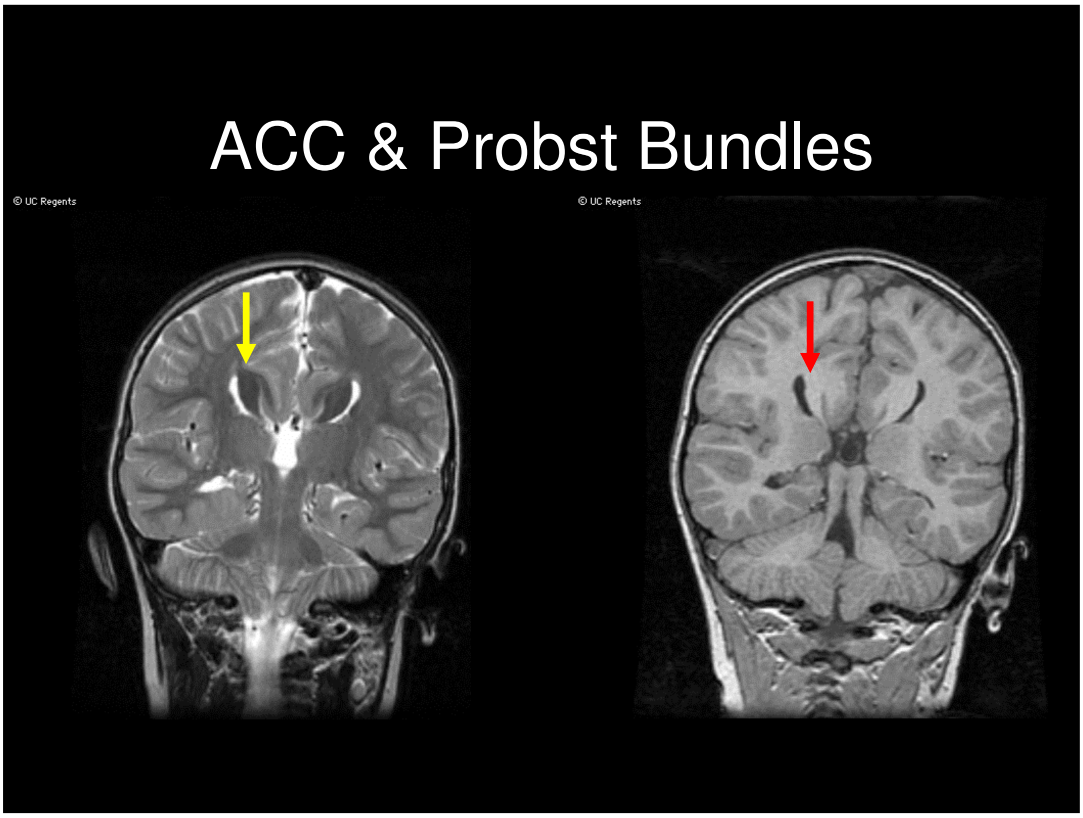

In many cases when the corpus callosum does not form, the fibers reach the middle and then are unable to cross. These fibers then turn and run forward to back (and back to forward) in the brain. These are referred to as Probst bundles and are noted with the arrows in these two coronal T2 (left) and T1-weighted (right) images.

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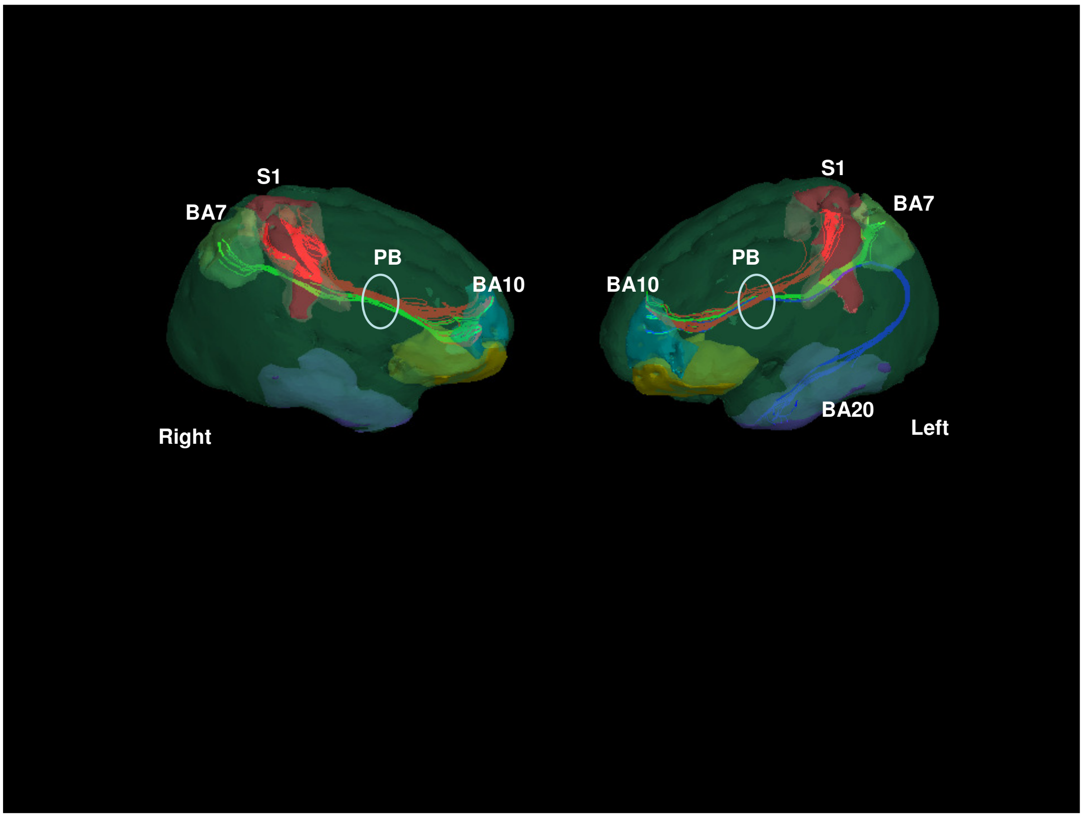

These images demonstrate the utility of a new method of MR imaging, called diffusion tensor imaging (DTI) with tractography. These new tools track the diffusion of water within nerve cells and can map out the pathways that large bundles of nerve fibers traverse. The fibers displayed here are a subset of the Probst bundles, for the first time giving us a detailed picture of their distribution and which region of the brain are interconnected. PB=probst bundle, BA=brodman area, S1=the principle somatosensory region of the parietal cortex. Images courtesy of Drs. SungWon Chung, Pratik Mukherjee, Roland G. Henry and Elliott H. Sherr.

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