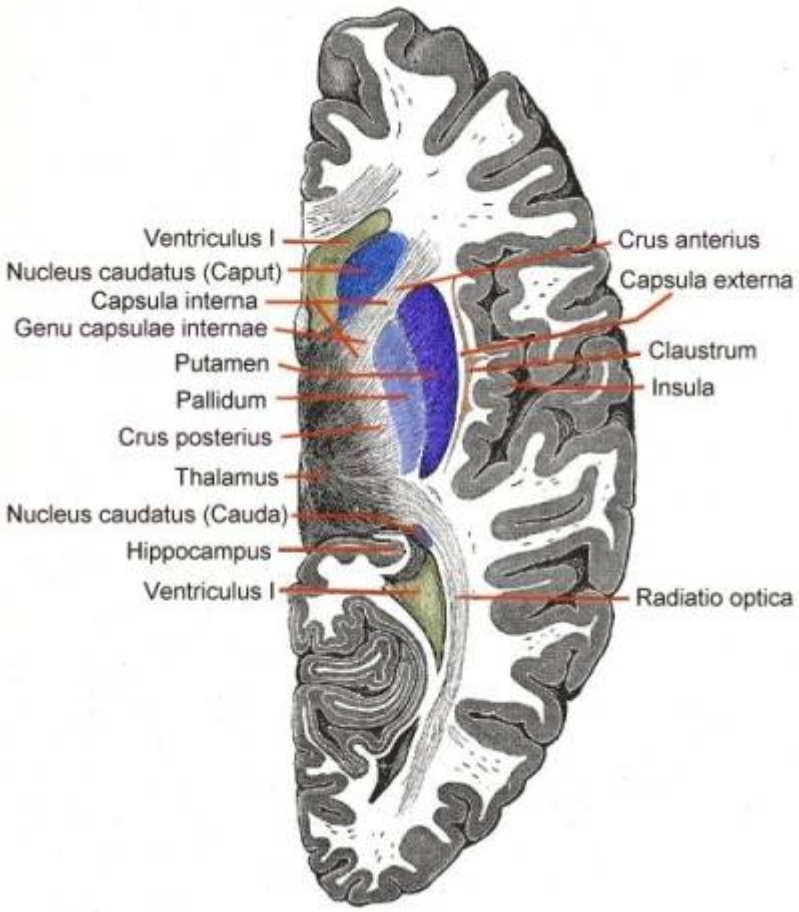
Crus posterius

The posterior limb or crus posterius is the part behind the genu, between the thalamus and lenticular nucleus.



The choice of surgical approach during resection is dictated by the location of the displaced normal thalamus and posterior limb of the internal capsule (PLIC). Diffusion tensor imaging and white matter tractography can identify the location of the PLIC in relation to the tumor and may be useful in planning the operative trajectory.

Diffusion tensor imaging was used to localize the PLIC on preoperative MR imaging in 6 children undergoing resection of thalamic pilocytic astrocytoma.

After review of the standard T2-weighted MR imaging sequences, the anticipated position of the PLIC was determined. This result was compared with the location of the PLIC determined by a blinded radiologist with the use of DT imaging. The utility of DT imaging in determining the surgical approach to a thalamic JPA, degree of resection, and neurological outcomes were all evaluated.

Diffusion tensor imaging confirmed the expected location of the PLIC as approximated on conventional T2-weighted images in all 6 cases. In 1 patient in particular, unexpected medial deviation of the PLIC was identified, and this proved useful in tailoring the approach to a more lateral trajectory. Gross-total resection of all cystic and solid tumor components was confirmed on postoperative imaging in all cases. All patients experienced mild to moderate worsening of neurological status immediately following resection, but 4 of 6 patients were back to their preoperative baseline at 6-month follow-up.

Diffusion tensor imaging and white matter tractography successfully identified the white matter fibers emanating from the precentral gyrus within the PLIC in children with thalamic JPAs prior to surgery. Diffusion tensor imaging served as a valuable tool for stereotactic planning of operative approaches to thalamic JPAs. Localizing the position of the PLIC helped minimize potential neurological morbidity and facilitated gross-total resection. [1].

Stimulation of the posterior limb of the internal capsule is safe and effective in treating patients with chronic neuropathic pain affecting the lower limb. The procedure may be a more targeted treatment method than motor cortex stimulation or other neuromodulation techniques in the subset of patients whose pain and spasticity are referred to the lower limbs [2].

1)
Moshel YA, Elliott RE, Monoky DJ, Wisoff JH. Role of diffusion tensor imaging in resection of thalamic juvenile pilocytic astrocytoma. J Neurosurg Pediatr. 2009 Dec;4(6):495-505. doi: 10.3171/2009.7.PEDS09128. PubMed PMID: 19951034.
2)
Franzini A, Messina G, Levi V, D'Ammando A, Cordella R, Moosa S, Prada F, Franzini A. Deep brain stimulation of the posterior limb of the internal capsule in the treatment of central poststroke neuropathic pain of the lower limb: case series with long-term follow-up and literature review. J Neurosurg. 2019 Aug 16:1-9. doi: 10.3171/2019.5.JNS19227. [Epub ahead of print] PubMed PMID: 31419792.