Total Corpus Callosotomy

Total corpus callosotomy is a neurosurgical procedure that involves complete severing of the **corpus callosum**, the major fiber tract connecting the two cerebral hemispheres, to prevent the spread of epileptic discharges across hemispheres.

Indications

- Medically refractory **generalized epilepsy**
- Frequent and injurious **drop attacks** (atonic seizures)
- **Lennox-Gastaut syndrome**
- **Tonic/tonic-clonic seizures** not amenable to resective surgery
- Intractable epilepsy in **children with diffuse encephalopathies**

Surgical Technique

- **Approach**: Interhemispheric via midline craniotomy
- **Procedure**:
    1. Dissection through the **interhemispheric fissure**
    2. Identification and complete sectioning of the **corpus callosum**:
        - Genu (anterior)
        - Body (mid)
        - Splenium (posterior)
- **Staged option**: Anterior 2/3 callosotomy first; splenium later if needed

Outcomes

- Seizure reduction in **60–80%** of patients
- Most effective against **atonic (drop) seizures**
- Often reduces frequency and severity of generalized seizures
- **Improves quality of life**, reduces risk of falls and injuries

Complications

- **Disconnection syndromes**:
    1. Left-hand **apraxia**
    2. **Alexia without agraphia**
    3. **Alien hand phenomenon**
- Transient **speech and motor deficits**
- Rare: infection, hemorrhage, hydrocephalus

Clinical Notes

- Not curative, but highly beneficial in selected cases
- Requires careful **multidisciplinary evaluation**
- Particularly valuable when **epileptogenic zone is not localizable**

Case reports

In a single-patient illustrative case. Mine et al. from the Kyushu University, Fukuoka, Japan. published in the Journal of Neurosurgery Case Lessons, to report on the first adult case of Dentatorubral-pallidoluysian atrophy (DRPLA)-associated progressive myoclonic epilepsy (PME) undergoing total corpus callosotomy (CC) for refractory seizures. Total CC led to a marked reduction in seizure frequency; tonic seizures and FBTCSs with desaturation resolved by 1 year, improving QOL [1].

Critical Appraisal

- **Strengths**:

– Novelty: First reported adult DRPLA-PME CC case.

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  – Clear epilepsy burden: Longstanding myoclonus, tonic seizures, status
epilepticus with oxygen desaturation.
  – Intervention and outcome: Rapid seizure control post-CC, with sustained
benefit at 1-year follow-up.
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- **Limitations**:

– Single case—limited generalizability.

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  – No control, no comparative analysis vs. anterior CC or other modalities.
  – Cognitive trajectory not objectively quantified pre- vs. post-op.
  – DRPLA is diffuse; CC addresses interhemispheric spread rather than
epileptogenic focus.
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- **Intellectual Rigour**:

– Authors correctly acknowledge palliative intent.

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  – Background supported by PME CC precedent in pediatric and non-DRPLA
cohorts :contentReference[oaicite:1]{index=1}.
  – However, literature discussion could further weigh alternative
interventions (thalamic stimulation, VNS).
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- **Clinical Verdict**:

– Verdict: **6/10** – Interesting and well-documented, but lacks broader context and rigorous outcome measures.

Takeaway for Practicing Neurosurgeons

- For adult DRPLA patients with refractory PME and severe daily seizures, total CC can be a viable palliative option.
- Offers rapid seizure reduction and improved oxygenation and QOL without major additional harm.

Bottom Line

Total corpus callosotomy may be effective palliative therapy in adult-onset DRPLA-related PME when conventional treatments fail.

Citation & Metadata

- **Title**: Total corpus callosotomy for an adult patient with progressive myoclonic epilepsy associated with dentatorubral-pallidoluysian atrophy: illustrative case
- **Full citation**: Mine D, et al. J Neurosurg Case Lessons. 2025 Jul 7;10(1):CASE2576. doi:10.3171/CASE2576.
- **Publication date**: July 7, 2025

WordPress Categories

Case Report, Epilepsy Surgery, DRPLA, Corpus Callosotomy

Tags

PME, DRPLA, callosotomy, adult epilepsy, palliative neurosurgery, case lessons

1)
Mine D, Shimogawa T, Sakai Y, Shigeto H, Okubo S, Sakata A, Watanabe E, Nakamizo A, Yoshimoto K. Total corpus callosotomy for an adult patient with progressive myoclonic epilepsy associated with dentatorubral-pallidoluysian atrophy: illustrative case. J Neurosurg Case Lessons. 2025 Jul 7;10(1):CASE2576. doi: 10.3171/CASE2576. PMID: 40623331.