



# Management of a Patient with Explanted Intrathecal Baclofen Delivery System



Joshua Hardy MD<sup>1</sup>, Ryan Choi MD<sup>1</sup>

1. Department of Anesthesiology and Pain Medicine, Virginia Mason Medical Center, Seattle, WA

## Introduction

Intrathecal baclofen is a proven treatment for resistant spasticity associated with cerebral palsy, multiple sclerosis, and spinal cord injury.<sup>1</sup> When the intrathecal (IT) baclofen delivery system must be removed due to infection or failure of the delivery system, the patient is at a high risk of developing severe, life-threatening baclofen withdrawal syndrome. We describe a challenging case of managing a baclofen withdrawal syndrome in a spastic diplegic cerebral palsy patient after removal of an (IT) baclofen pump due to infection.

## Case Report

- A 48-year-old female with past medical history of spastic diplegic cerebral palsy treated with an IT baclofen pump infusion (473.6 mcg/day) s/p recent pump replacement for end-of-battery-life, class 3 obesity, chronic respiratory failure on oxygen, obstructive sleep apnea on BiPAP, heart failure with preserved ejection fraction, pulmonary hypertension, and hip pain on chronic opioid therapy presented to the emergency department with redness and warmth at the incision site of her baclofen pump.
- Physical exam was notable for erythema, warmth, and a small amount of purulent drainage at the baclofen pump incision. Subsequent labs were significant for leukocytosis and a CT scan of the abdomen and pelvis demonstrated increased edema in the adipose soft tissue adjacent to the baclofen pump (Figure 1).
- Patient was admitted for intravenous (IV) antibiotics and evaluation to determine the necessity for removal of the baclofen pump.
- IT baclofen dose was weaned to 355 mcg/day and then 266 mcg/day over the two days prior to removal. While the IT baclofen was weaned, we initiated oral baclofen 20 mg Q6h and IV lorazepam 1 mg Q6h as needed (prn).
- After the pump was explanted, the patient remained intubated and admitted to the intensive care unit due to high risk of respiratory depression and hemodynamic instability in the setting of potential, severe baclofen withdrawal syndrome and her multiple comorbidities.
- Our initial management included oral baclofen 30 mg Q6h, IV lorazepam 4 mg Q12h with 1 mg pushes Q6h prn, propofol infusion (gtt), dexmedetomidine gtt, and opioids given her history of chronic opioid therapy. Our team also obtained daily serum creatine kinase and a comprehensive metabolic panel to monitor for signs of rhabdomyolysis.

## Postoperative course

- POD #4: Extubated.
- POD #6 AM: Developed hyperactive delirium which was treated with **midazolam** 5mg boluses and **baclofen** 40 mg Q6h which improved the patient's condition temporarily.
- POD #6 PM: Became increasingly altered, tachypneic, tachycardic, and hypertensive concerning for baclofen withdrawal and was started on **midazolam** infusion at 3 mg/hour, **phenobarbital** 260 mg IV loading dose with phenobarbital 130 mg IV Q4h, **quetiapine** 50 mg BID, and **haloperidol** 5 mg Q4h prn in addition to the **baclofen** 40mg Q6h and **dexmedetomidine** gtt. The patient's autonomic dysfunction and altered mental status improved with this regimen.
- POD #8: Worsening abdominal pain and acute encephalopathy that resulted in acute respiratory failure requiring re-intubation. CT of the abdomen and pelvis showed small bowel pneumatosis without an identifiable source of obstruction leading to severe sepsis, which was treated with bowel decompression and IV antibiotics. The MRI of the brain was obtained which was consistent with reversible encephalopathy syndrome, which gradually improved with time (Figure 2).
- POD #14: Extubated.
- POD #16: Transferred to a medical/surgical unit for close monitoring while baclofen was down titrated.
- POD #23: Discharged from the hospital on **baclofen** 10 mg Q6h.



**Image 1:** CT abdomen demonstrating increased subcutaneous edema in the adipose soft tissue consistent with infection adjacent to the baclofen pump.

## Discussion

- Baclofen is a gamma-aminobutyric acid (GABA) subtype b agonist that suppresses mono- and polysynaptic reflexes in the central and peripheral nervous system by inhibiting the excitatory neurotransmitter release that cause spasticity.<sup>2</sup>
- Management after IT baclofen pump removal has been discussed in a recent narrative review by Romito et al. and includes restarting oral baclofen and adding supplemental agents such as benzodiazepines, barbiturates, propofol, dexmedetomidine, cyproheptadine, dantrolene and possibly a single intrathecal dose of baclofen if necessary to temporize symptoms.<sup>3</sup>
- It is difficult to anticipate the oral baclofen dose that will be required to prevent withdrawal symptoms after pump removal as there is no intrathecal to oral conversion and oral baclofen has poor blood brain barrier penetration.
- This case demonstrates successful management of a baclofen withdrawal syndrome after IT baclofen pump removal using GABA-mediated pharmacologic agents, aggressive treatment of delirium with multiple antipsychotics, and respiratory support in the intensive care unit.

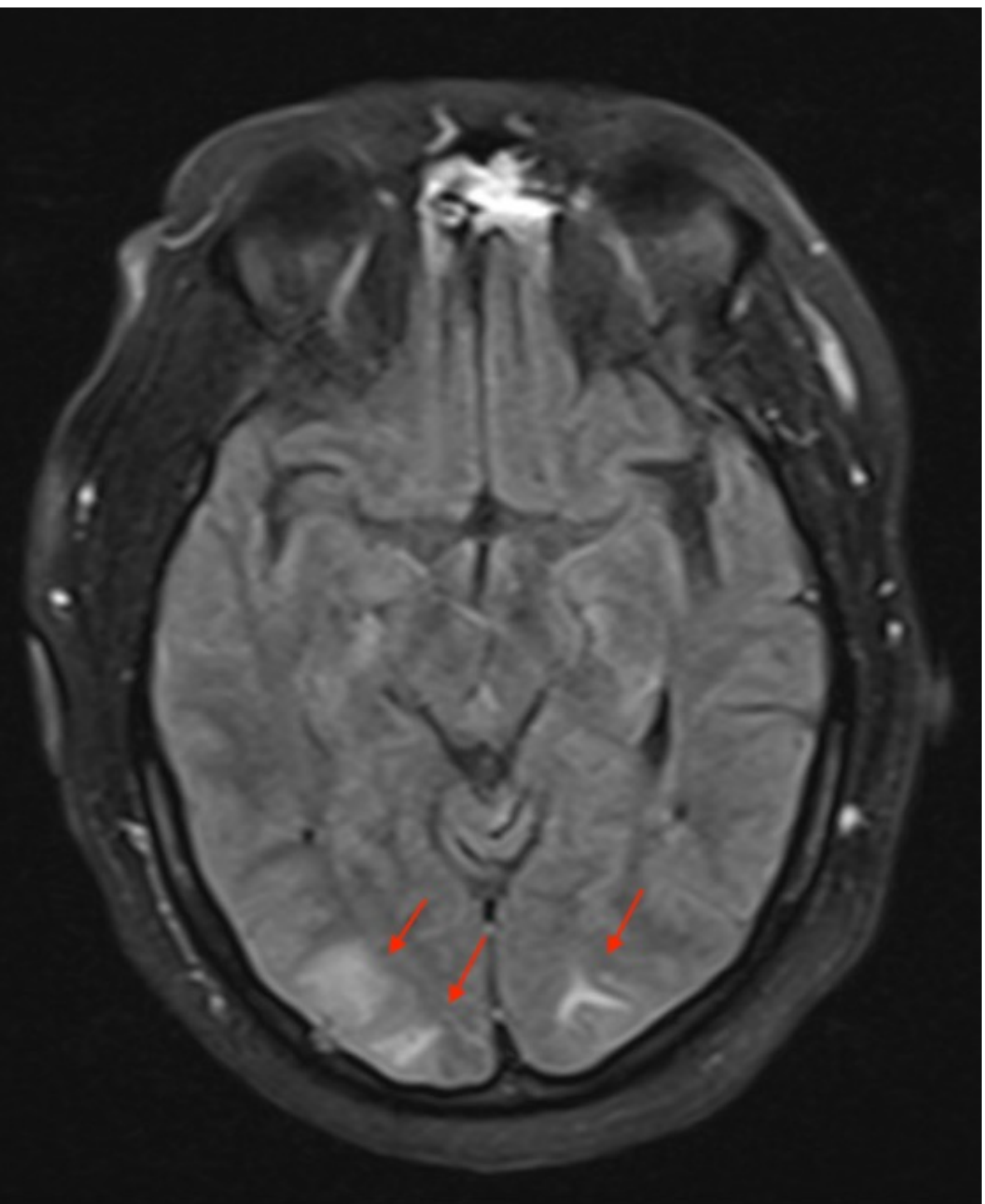


**Image 2:** MRI brain demonstrating T2/Flair hyperintensity within the subcortical occipital and parietal regions with local mass effect consistent with reversible encephalopathy syndrome.

## References

1. Yoon YK, Lee KC, Cho HE, Chae M, Chang JW, Chang WS, Cho SR. Outcomes of intrathecal baclofen therapy in patients with cerebral palsy and acquired brain injury. *Medicine (Baltimore)*. 2017 Aug;96(34):e7472. doi: 10.1097/MD.00000000000007472. PMID: 28834868; PMCID: PMC5571990.  
2. Albright AL. Baclofen in the treatment of cerebral palsy. *J Child Neurol*. 1996 Mar;11(2):77-83. doi: 10.1177/088307389601100202. PMID: 8881981.  
3. Romito JW, Turner ER, Rosener JA, Coldiron L, Udipi A, Nohrn L, Tausiani J, Romito BT. Baclofen therapeutics, toxicity, and withdrawal: A narrative review. *SAGE Open Med*. 2021 Jun 3;9:20503121211022197. doi: 10.1177/20503121211022197. PMID: 34158937; PMCID: PMC8182184.