Intrathecal Morphine Pump Refill Complications: A Case Report of Possible Medication Overdose

Marielle Araujo, MD, Courtney Aronica, DO, Peter Lascarides, DO

Department of Physical Medicine & Rehabilitation, Donald and Barbara Zucker School of Medicine at Hofstra/ Northwell

Introduction

Intrathecal pain pumps are valuable tools in managing chronic pain, delivering medication directly to the cerebrospinal fluid to achieve precise and efficient pain control. However, as with any medical procedure, complications can arise during refills. One such complication is the inadvertent subcutaneous pocket fill, which can result in excessive medication absorption and overdose symptoms. This case explores the workup and evaluation of a patient with symptoms suggestive of medication overdose following a pump refill.

Case Description

A 76 year-old retired male (65.7kg) with past medical history of chronic back pain managed with intrathecal morphine pump presented to the emergency department for fatigue, back pain and generalized weakness. The patient reports undergoing a pump refill three days prior to presentation. He uses duloxetine in conjugation for pain control and denies recreational drug use. Inpatient pain management was consulted and suspected inadvertent administration of medication around the device. Developing fever in the ED, the patient met SIRS criteria and admitted for further work-up. To assess for pocket fill vs pump related complications a CT abdomen and spine were ordered as well as contacting the device manufacturer. The CT abdomen assessed for infection or spillage around the pump and CT spine assessed for proper position and infection at the intrathecal catheter tip. Both were negative for these concerns, however did show findings suggesting colitis. Inpatient team interrogated the pump and noted proper functioning. He was observed for opiate overdose. After antibiotic initiation fever and leukocytosis resolved. He was subsequently discharged on antibiotics for colitis and follow-up with pain management to further assess pump reservoir volumes.

Intrathecal Pump Complications

During an intrathecal morphine pump refill, a subcutaneous pocket fill refers to the unintended accumulation of medication in the subcutaneous tissue surrounding the pump site. This can lead to suboptimal drug delivery and potential complications of overdose or underdosing. [1]

Assessment for pocket fill involves careful inspection and palpation of the pump site, looking for signs of swelling, tenderness, or warmth. In cases of suspected pocket fill, imaging studies, such as ultrasound or CT scans, may be employed to visualize the extent of the issue. These imaging techniques can help identify fluid collections. [2, 3, 4]

Actions to address subcutaneous pocket fills include aspiration of the pocket under ultrasound guidance. The actual volume in the reservoir should be assessed by aspirating and comparing it to the expected volume. Lastly, patients should be monitored for signs of withdrawal or overdose. [2, 3, 4, 5, 6]

Troubleshooting intrathecal pumps involves addressing various other potential complications to ensure the optimal functioning of the drug delivery system. Other complications include catheter issues, programming malfunction, and infection. [7]

Catheter complications include kinking, malposition, or dislodgment. In these cases, imaging studies, such as MRI or CT, are valuable for assessing the catheter's position and integrity. Programming issues, including incorrect dosages or pump malfunctions, can be identified through careful pump interrogation, allowing for adjustments or corrections to be made. Infection, a serious concern, may present with local symptoms like redness or swelling at the pump site or systemic signs like fever. Timely intervention involves a combination of clinical assessment, blood tests, and potentially imaging studies to confirm the presence of infection. [7,8]

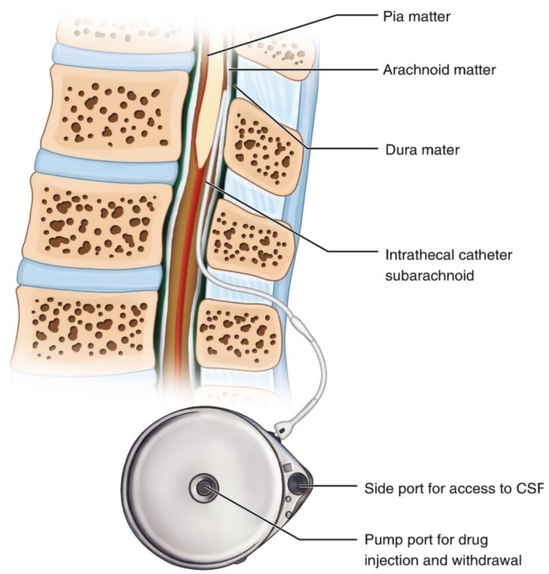

Figure 1.
Overview of intrathecal drug delivery system including pump port for drug access and refill procedures [9]

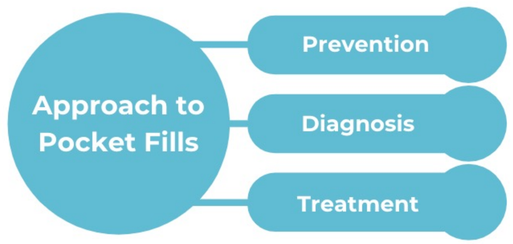

Figure 2.
Schematic on the approach for understanding, preventing, and assessing subcutaneous pocket fill following pump refills.

Discussion

On average, patients undergo several pump refills per year, with the frequency varying based on individual needs. To prevent pocket fills, adherence to sterile refill techniques, proper catheter and pump maintenance, and regular follow-up appointments for assessment are crucial. Education of both healthcare providers and patients on early recognition of symptoms and prompt reporting is essential for effective management and prevention of complications associated with intrathecal pump therapy.

Conclusion

This case report underscores the importance of thorough work-up in the setting of potential intrathecal pump complications. Healthcare providers should be aware of potential complications and prepared to manage them effectively to ensure the safety and well-being of patients.

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