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BUPRENORPHINE MICROINDUCTION TO MITIGATE WITHDRAWAL SYMPTOMS DURING ABRUPT DISCONTINUATION OF INTRATHECAL FENTANYL: A CASE REPORT

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Background: Intrathecal pumps provide effective analgesia for many patients living with chronic pain. However, pump removal can present significant challenges from the pain management perspective, as patients are often highly opioid-tolerant and at significant risk of withdrawal. Buprenorphine microinduction has shown promise as a strategy for mitigating withdrawal symptoms while avoiding the respiratory depression associated with full agonist opioids. However, reports of its usage in patients undergoing intrathecal pump removal are limited.

Case Report: We present the case of a 56-year-old woman with chronic non-cancer back pain who was successfully transitioned to oral buprenorphine using a microinduction protocol when her longstanding intrathecal pump was abruptly discontinued.

Conclusions: This case demonstrates that buprenorphine microinduction may be a safe and effective method of mitigating opioid withdrawal symptoms in non-cancer pain patients undergoing abrupt intrathecal pump discontinuation.

Key words: Intrathecal pump, buprenorphine, chronic pain

BACKGROUND

Intrathecal pumps have demonstrated efficacy providing analgesia and improving quality of life in patients with chronic pain (1). However, intrathecal pump removal can present significant challenges, as patients are often highly opioid-tolerant with significant analgesic needs (2). Buprenorphine microinduction has shown promise as a method of transitioning patients from intrathecal to oral opioids; however, there are limited reports of its usage in patients with chronic, non-cancer pain.

We present the case of a 56-year-old woman with chronic back pain who was successfully transitioned to sublingual buprenorphine from a chronic intrathecal infusion of fentanyl, bupivacaine, and clonidine. The patient's positive response with minimal withdrawal symptoms highlights the promise of buprenorphine microinduction for intrathecal pump removal in patients with chronic, non-cancer back pain.

CASE PRESENTATION

A 56-year-old woman with a history of chronic back pain secondary to degenerative disc disease status post cervical and lumbar fusions presented to the emergency department due to an alert on her intrathecal pump, indicating that the medication supply was nearly con-

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sumed and required refilling within the next 24 to 48 hours. The pump had been in place for 10 years and was infusing fentanyl (36.3 mcg/h), bupivacaine (575 mcg/h), and clonidine (12.7 mcg/h). The patient reported that the provider who had previously managed her pump had recently retired, and she had been unable to find another specialist willing to manage its refills. The patient had no known history of opioid abuse and, throughout the encounter, demonstrated appropriate situational insight and judgment. She stated that the intensity of her back pain on the numeric rating scale (NRS-11) fluctuated around 7/10 at baseline and was 9/10 upon presentation to the emergency department. Despite attempting to arrange an urgent appointment with a local provider to refill her pump, our team was unsuccessful. After counseling the patient on possible courses of treatment, she elected for surgical removal of the pump with a transition to oral analgesics.

A collaborative plan was developed between the chronic pain and toxicology services, and the patient was started preoperatively on a multimodal pain regimen consisting of scheduled clonidine, acetaminophen, ibuprofen, cyclobenzaprine, and ketamine, in addition to continuing the patient's home gabapentin and oxcarbazepine. This regimen was continued postoperatively, with the addition of a continuous intravenous infusion of lidocaine and as-needed oxycodone and hydromorphone for postoperative pain during the first 24 hours following pump removal. As-needed lorazepam, dicyclomine, and aluminum-magnesium hydroxide suspension were also initiated at the time of pump discontinuation. Buprenorphine microinduction was started 22 hours postoperatively at a dosage of 0.5 mg every 4 hours and continued through postoperative day 1. During this time, the patient's reported NRS-11 pain score intensity ranged from 7-9/10 and she noted a mild tremor as her only new symptom. On postoperative day 2, buprenorphine was increased to 4 mg for a single morning dose and the patient was discharged home later in the day on 8 mg/2 mg of buprenorphine/naloxone every 8 hours, reporting her NRS-11 pain score as 5-6/10 in severity. She expressed satisfaction with the transition from her intrathecal pump and denied any additional symptoms.

DISCUSSION

According to the Centers for Disease Control 2016 National Health Interview Survey (3), approximately 20.4% of adults in the United States live with chronic pain. Pumps implanted in the intrathecal space allow for analgesic delivery directly to the cerebrospinal fluid (CSF) and have been shown to improve pain control and quality of life (1). A survey (4) on the use of intrathecal pumps for pain management found that two-thirds of respondents' intrathecal pump recipients had an indication of chronic non-cancer pain, with morphine being the most commonly used agent.

Despite their efficacy, intrathecal pumps present unique risks and challenges. Intrathecal pump placement is associated with increased mortality compared to alternative therapies among patients with non-cancer pain (5). Complications related to intrathecal pumps include infection, hardware erosion, seroma, CSF leak, and granuloma formation (6). Furthermore, rare cases (7,8) have been reported of opioid-induced hyperalgesia in patients with intrathecal pumps, in which increasing doses of opioids paradoxically worsen pain. Patients may also develop tolerance to opioid drugs, requiring increasingly higher doses to maintain adequate pain control. A study of 28 patients receiving intrathecal morphine for > 4 years found that 36% developed tolerance requiring increasing opioid dosages, with 11% requiring pump removal for this reason (2). Additionally, as highlighted in this case, patients are highly dependent on the prescriber managing their intrathecal pump, with any disruptions in the continuity of care placing them at high risk of severe opioid withdrawal. The need for indefinite pump management should be thoroughly considered when deciding whether to place an intrathecal pump, as well as in the event that a patient moves to a different region or their physician plans to retire.

Partial opioid agonists, such as buprenorphine, present significant benefits over full agonists, including reduced risk of misuse and respiratory depression as well as improvement in mood (9). The process of transitioning patients from full agonist intrathecal pump medications to buprenorphine presents several challenges. Buprenorphine has a particularly high affinity for μ-opioid receptors, allowing it to displace full agonists and cause precipitated withdrawal. For this reason, opioids are generally stopped for 8 to 36 hours prior to buprenorphine initiation (10). However, this abrupt cessation of opioids in chronic pain patients leads to withdrawal symptoms due to abstinence (8). To address these issues, buprenorphine microinduction has gained popularity. This strategy involves the use of small doses of buprenorphine, preventing precipitated with-

drawal while providing relief of abstinent withdrawal symptoms. In a case series (11) of 8 patients transitioned from high-dose opioids to sublingual buprenorphine/naloxone, all 8 patients tolerated microinduction without precipitated withdrawal.

Although buprenorphine microinduction has shown promising results in managing withdrawal symptoms, the literature (12,13) remains limited with no consensus on the use of buprenorphine microinduction in intrathecal pump removal. In one reported case (14), a patient was successfully transitioned from an intrathecal hydromorphone pump to buprenorphine/naloxone, after being unable to tolerate oral oxycodone. In this case, however, oral opioids were initiated over an 8-day period while slowly tapering intrathecal hydromorphone, with the patient reporting intermittent withdrawal symptoms (14). In one of the few reports (6) of buprenorphine microinduction in patients undergoing abrupt intrathecal pump discontinuation, all 3 patients experienced significant withdrawal symptoms.

Our case is one of the first reported in which buprenorphine microinduction was successful in alleviating withdrawal symptoms in a patient undergoing abrupt intrathecal pump discontinuation. This case is unique in that induction was successfully completed over only 3 days following abrupt discontinuation of intrathecal narcotics, with mild tremor as the only reported symptom. This report highlights the potential of buprenorphine microinduction in addressing opioid withdrawal in these highly complex cases, as well as the need for further research into this strategy.

CONCLUSIONS

Intrathecal pump removal is often difficult to manage, as patients are frequently highly opioid-tolerant and may not tolerate oral full agonist opioids, due to the potential for respiratory depression and misuse. This case report demonstrates that buprenorphine microinduction may be a safe and effective method of mitigating opioid withdrawal symptoms as part of a multimodal analgesic strategy in patients undergoing abrupt intrathecal pump discontinuation.

REFERENCES

1. Schultz DM, Orhurhu V, Khan F, et al. Patient satisfaction following intrathecal targeted drug delivery for benign chronic pain: Results of a single-center survey study. *Neuromodulation* 2020; 23:1009-1017.
2. Winkelmuller M, Winkelmuller W. Long-Term effects of continuous intrathecal opioid treatment in chronic pain of nonmalignant etiology. *J Neurosurg* 1996; 85:458-467.
3. Dahlhamer J, Lucas J, Zelaya C, et al. Prevalence of chronic pain and high-impact chronic pain among adults - United States, 2016. *MMWR Morb Mortal Wkly Rep* 2018; 67:1001-1006.
4. Abd-Sayed A, Fiala K, Weisbein J, et al. Intrathecal drug delivery systems survey: Trends in utilization in pain practice. *J Pain Res* 2022; 15:1305-1314.
5. Coffey RJ, Owens ML, Broste SK, et al. Mortality associated with implantation and management of intrathecal opioid drug infusion systems to treat noncancer pain. *Anesthesiology* 2009; 111:881-891.
6. Jackson TP, Lonergan DF, Todd RD, et al. Intentional intrathecal opioid detoxification in 3 patients: Characterization of the intrathecal opioid withdrawal syndrome. *Pain Pract* 2013; 13:297-309.
7. Kalaydjian A, Farah F, Cheng Y, et al. Opioid induced hyperalgesia with intrathecal infusion of high-dose fentanyl. *Pain Pract* 2019; 19:222-223.
8. Singla A, Stojanovic MP, Chen L, et al. A differential diagnosis of hyperalgesia, toxicity, and withdrawal from intrathecal morphine infusion. *Anesth Analg* 2007; 105:1816-1819.
9. Case AA, Kullgren J, Anwar S, et al. Treating chronic pain with buprenorphine-the practical guide. *Curr Treat Options Oncol* 2021; 22:116.
10. Weimer MB, Guerra M, Morrow G, et al. Hospital-Based buprenorphine micro-dose initiation. *J Addict Med* 2021; 15:255-257.
11. Robbins JL, Englander H, Gregg J. Buprenorphine microdose induction for the management of prescription opioid dependence. *J Am Board Fam Med* 2021; 34:S141-S146.
12. Terasaki D, Smith C, Calcaterra SL. Transitioning hospitalized patients with opioid use disorder from methadone to buprenorphine without a period of opioid abstinence using a microdosing protocol. *Pharmacotherapy* 2019; 39:1023-1029.
13. Klaire S, Zivanovic R, Barbic SP, et al. Rapid micro-induction of buprenorphine/naloxone for opioid use disorder in an inpatient setting: A case series. *Am J Addict* 2019; 28:262-265.
14. Crum IT, Meyer Karre VM, Balasanova AA. Transitioning from intrathecal hydromorphone to sublingual buprenorphine-naloxone through microdosing: A case report. *A A Pract* 2020; 14:e01316.