

# Abnormal Granuloma Formation in Intrathecal Pain Pump

Arnav Mohanty, BS, Elijah Paraiso, BS, Ashley Bailey-Classen, DO, Anita Praful Bhansali, MD



## Introduction

Intrathecal pain pumps have been used to deliver medications from an implanted reservoir directly to the spinal intrathecal space via a catheter to provide optimal analgesia<sup>1</sup>. However, there is a rare prevalence of granuloma formation on the tip of the catheter which can lead to severe neurological damage such as paresthesias<sup>2</sup>. The etiology of this is unknown but some hypotheses are that it could be a result of inflammatory reaction to the catheter, trauma of implantation, or a reaction to opioid medication<sup>3</sup>.

## Case

We present a 59-year-old female who presented with a symptomatic granuloma 3.5 months post-implantation of her intrathecal pump with the use of a multidrug admixture. This patient originally presented to an interventional pain specialist looking for other options for her 20+ year history of chronic widespread pain without the use of high dose oral opioids.

Approximately 3.5 months later, she presented to an outside hospital with very vague flu-like complaints, some systemic weakness, and a documented urinary tract infection. When treatment for her UTI did not resolve her symptoms, other sources were sought. A thoracic spine MRI showed a compressive mass at the tip of the intrathecal catheter. Because the level of compression did correlate with some thoracic radiculopathy symptoms she was having, she underwent an uneventful T7-8 laminectomy and resection of an intradural mass. Granuloma was confirmed by pathology. Her intrathecal pump was subsequently turned to a minimal rate. She recovered uneventfully.

## Figure



## References

1. Wilkes D. (2014). Programmable intrathecal pumps for the management of chronic pain: recommendations for improved efficiency. *Journal of pain research*, 7, 571–577. <https://doi.org/10.2147/JPR.S46929>
2. Haering, M., Saleh, C., Jaszczuk, P., Koehler, M., & Hund-Georgiadis, M. (2019). Intrathecal pump catheter-tip granuloma recurrence with associated myelomalacia - How safe is intrathecal analgesic infusion therapy? A case report. *Surgical neurology international*, 10, 62. <https://doi.org/10.25259/SNI-33-2019>
3. Duarte, R. V., Raphael, J. H., Southall, J. L., Baker, C., & Ashford, R. L. (2011). Intrathecal granuloma formation as result of opioid delivery: Systematic literature review of case reports and analysis against a control group. *Clinical Neurology and Neurosurgery*, 114(6), 577–584. <https://doi.org/10.1016/j.clineuro.2011.12.007>
4. Ahmad, F. S., Vittori, M. R., & McCoy, W. H., 4th (2022). Acute-onset, painful, acral granuloma annulare in a 52-year-old female. *JAAD case reports*, 29, 127–130. <https://doi.org/10.1016/j.jdcrr.2022.08.050>

## Discussion

Acute granulomas have been documented in cases of granuloma annulare, located at acral sites, suggesting environmental triggers to be the underlying etiology.<sup>4</sup> This case differs from previous documentation due to the intrathecal pain pump location. It is novel because of granuloma formation occurring within 3.5 months, which is extremely rapid and due to a microdose admixture as opposed to high-dose opioids, which has not been documented elsewhere. This unusually early onset suggests other factors beyond dosing, such as admixture composition or catheter tip dynamics in causing this granuloma.