PAIN MEDICINE CASE REPORTS

ISSN 2768-5152

Volume 6, Number 4, pp. 145-148

"Will I Be Able to Get a Cremation?" A Concern of a Cancer Patient With an Intrathecal Drug Delivery System

Benedict Moran, BS[1], Anna Grosse, RN[1], Rebecca Speltz Paiz, MD, PhD[1], Angela M. McArthur, MPH[2], Drew Rosielle, MD[3], and Vasudha Goel, MBBS[1]

Background: Intrathecal drug delivery systems (IDDS) may pose additional restrictions on terminal cancer patients in their end-of-life planning. The patient provided HIPAA compliant consent for the inclusion of their clinical information in this report.

Case Report: A 62-year-old male with recurrent metastatic spindle cell carcinoma to the ribs and thoracolumbar junction with vertebral compression fracture had an IDDS implanted to manage cancer-related pain. The patient had approached a funeral home to plan his last rites with a preference for cremation. However, the funeral home advised the patient that special precautions were not required for cremation with an IDDS.

Conclusion: The medical device disposal process can be improved through formal communication between the medical team members and the funeral home directors. Device disposal education can ensure safe disposal and prevent cremation-related adverse events.

Key words: Intrathecal drug delivery systems, palliative care, end of life, cremation

BACKGROUND

Recent advances in cancer pain management incorporate the use of drugs delivered through implantable devices such as intrathecal drug delivery systems (IDDS) in carefully selected patients. IDDS allows targeted delivery of concentrated medications via a catheter into the intrathecal space connected to an implanted reservoir. Currently, there is minimal guidance regarding adequate handling and disposal of these devices after a patient's death. Removal of the devices may present occupational hazards to the morticians, environmental hazards due to improper disposition, and potential for medication misuse or drug diversion. Suitable device disposition may also add additional stress to the grieving family. Below, we present a case involving cancer-related pain in a patient nearing end of life. We highlight some of the challenges he experienced during end-of-life conversations. The University of Minnesota IRB does not evaluate single case reports, and informed consent was obtained from the patient to disseminate information. In addition, a written Health Insurance Portability and Accountability Act of 1996 (HIPAA) authorization has been obtained from the patient.

CASE REPORT

The patient provided HIPAA compliant informed consent for the inclusion of their clinical information in this report.

A 62-year-old male with recurrent metastatic spindle cell carcinoma to the ribs and thoracolumbar junction with

From: [1]Department of Anesthesiology, University of Minnesota, Minneapolis, MN; [2]Anatomy Bequest Program, University of Minnesota, Minneapolis, MN; [3]Department of Internal Medicine, University of Minnesota, Minneapolis, MN

Corresponding Author: Vasudha Goel, MBBS, E-mail: vgoel@umn.edu
Disclaimer: There was no external funding in the preparation of this manuscript.
Conflict of interest: Each author certifies that he or she, or a member of his or her immediate family, has no commercial association (i.e., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted manuscript.
Accepted: 2022-06-02, Published: 2022-07-31

vertebral compression fracture had an IDDS implantation for cancer-related pain management. Higher doses of intrathecal medications (hydromorphone 12.48 mg/day, bupivacaine 49.94 mg/day, and ziconotide 4.46 mg/day) were required to achieve adequate cancer-related pain control. As the disease progressed, the patient became less responsive to radiation and chemotherapy, which prompted palliative care, chronic pain, and radiology oncology team members to meet with family and initiate end-of-life conversations. The patient expressed a preference to pursue cremation after death, and he contacted a funeral home and informed them of his implanted medical device. The funeral home advised the patient that special precautions were not required for cremation with an IDDS. The patient then communicated this information to his healthcare team, which prompted the healthcare team to reach the funeral home and the mortician to formulate a device extraction and safe disposal plan.

All the stakeholders were educated using the framework shown in Fig. 1. The medications were not emptied from the reservoir due to the patient's death at home. Instead, the device was explanted by the mortician and was sent back for medical device recycling.

DISCUSSION

IDDS is increasingly utilized to treat spasticity, to deliver chemotherapy drugs, and to manage pain in carefully selected patients (1). Targeted drug delivery using FDA-approved medications through an IDDS has been revolutionary in managing chronic pain conditions such as sciatica, chronic abdominal, back pain, and complex regional pain syndrome. Targeted intrathecal drug delivery typically uses a smaller dose of medications than intravenous administration to have the same desired effect while minimizing side effects associated with systemic therapy. IDDS is also utilized to administer chemotherapy in cancer patients and baclofen therapy in patients with severe spasticity (2,3). However, the presence of an IDDS may cause confusion regarding post-mortem care due to a lack of awareness of the manufacturer's recommendations. Specifically, the funeral home personnel may not be aware of the implant site, type of drugs in the devices, their side effects, and how to dispose of them safely.

From a patient's perspective, post-mortem planning often includes advance funeral plans. Cremation is a method of body disposition that exists as an alternative to traditional burial practices involving a coffin or casket. It is projected that cremation rates may exceed burial rates due to changes in preferences and technological advances in green cremation (4). The cremation process involves placing a body within an industrial furnace to incinerate

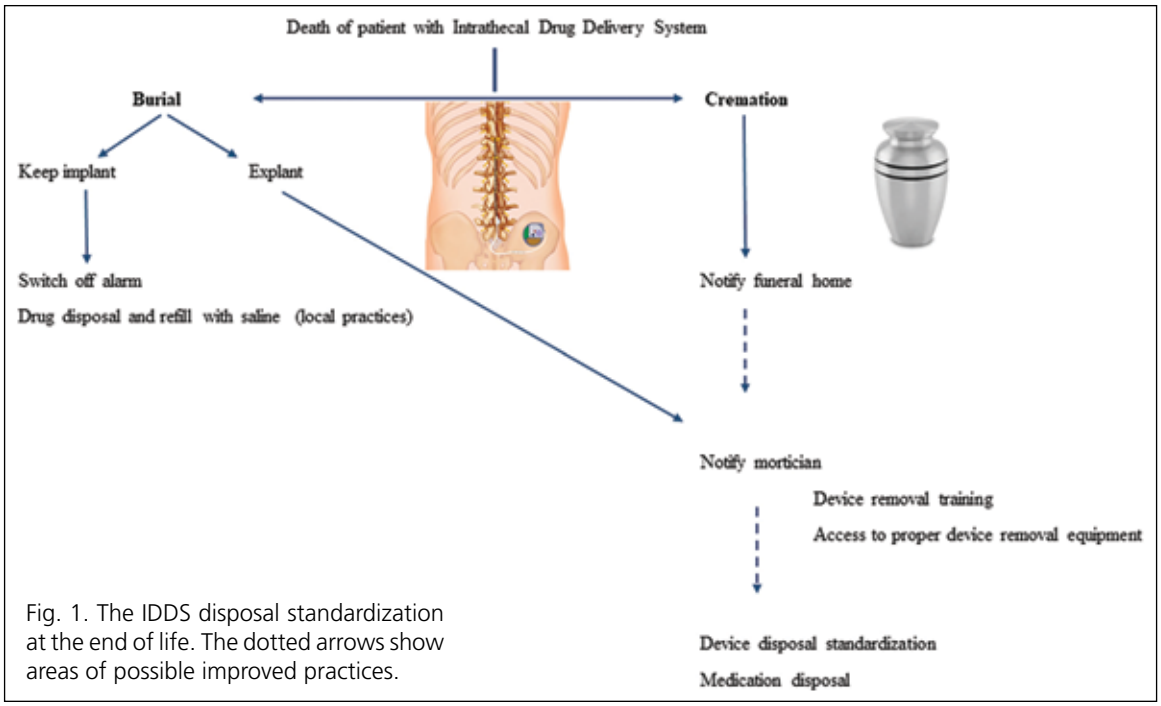

Fig. 1. The IDDS disposal standardization at the end of life. The dotted arrows show areas of possible improved practices.

the remains into gas, ash, and mineral fragments. Post-mortem remains are typically sent to crematoriums with minimal modifications, and thus objects non-native to the body, such as medical devices, may be present during the incineration process. Many implantable devices contain a power source that can explode during cremation (5,6). Device explosions may cause damage to the cremation chamber and pose additional risks to the morticians. Device explosion is thought to be due to gas formation in the pulse generator and the melting of the battery resulting in an uncontrolled chemical reaction. Green cremation or alkaline hydrolysis is an alternative to traditional cremation. The alkaline hydrolysis process breaks down the body into liquid remains and soft bones during green creation. The medical devices are unaffected by the process and need not be removed.

The industry provides limited guidance and resources on the safe disposal of IDDS (7,8). We summarize our areas of concern and recommendations for post-mortem IDDS management in the flow chart (Fig. 1) and Table 1. Currently, only US Drug Enforcement Administration (DEA) designated officials can receive or dispose of controlled substances, and there is no guidance on safe medication disposal from IDDS. There is a need for less stringent guidelines for morticians to dispose of controlled substances safely. The National Funeral Directors association recommends training its members on the use of naloxone and recognizing the symptoms of opioid overdose in case of exposure to potent opioid drugs. Clinical teams should consider emptying the reservoir when large concentrated doses of opioid medications are present in IDDS at the time of death. If the reservoir cannot be emptied, the morticians should be informed of potent drugs to minimize exposure.

CONCLUSION

There is an opportunity to improve the experience of grieving families at the end of life of patients with IDDS. Adequate education will improve patient engagement, safety for our morticians, and environmentally safe disposal of controlled substances.

Contribution Statement

All authors have read the final version of the manuscript and have approved it for submission. The submission is the original work of the authors listed on the manuscript, and the manuscript is not under consideration elsewhere. The following are the contributions of each author

BM: This author has helped with planning, conduct, reporting, conception, design, acquisition of data, and interpretation of data, manuscript preparation, and submission.

DR: This author has helped with planning, design, and critical review.

AMM: This author has helped with planning, design, and critical review.

RSP: This author has helped with planning, design, and critical review.

AG: This author has helped with planning, design, and critical review.

VG: This author has helped with planning, conduct, reporting, conception, design, acquisition of data and interpretation of data, manuscript preparation, and submission.

Table 1. Dilemmas faced by various groups in caring for patients with IDDS. Potential solutions are also listed in the table.

Stakeholder	Problem	Solution
Patient and family	Added stress while grieving for the loss of a loved one. Family members may not be aware of IDDS implant.	Use of identification cards and adequate standardized education on IDDS therapy.
Funeral home	Lack of protocols for facilitating device extraction. Lack of consistent communication with the mortician.	Education on the need for IDDS extraction based on patient preference or if considering cremation. Information collected from families should be shared with the mortician.
Mortician	Not aware of IDDS treatment for the deceased. Ambiguity regarding device explanation. Explant hazards exist from cutaneous exposure of concentrated medication in IDDS. Rising cremation rates raise the chances of device explosions.	Training for proper device removal and access to tools for safe disposal.
OSHA, EPA, and the FDA	Lack of standard practices relating to device and medication disposal.	Partnering with pharmacy and industry for safe disposal.

EPA, Environmental Protection Agency; FDA, Food and Drug Administration; OHSA, Occupational Safety and Health Administration.

REFERENCES

1. Bruel BM, Burton AW. Intrathecal therapy for cancer-related pain. *Pain Med* 2016; 17:2404-2421.
2. Kwong YL, Yeung DY, Chan JC. Intrathecal chemotherapy for hematologic malignancies: Drugs and toxicities. *Ann Hematol* 2009; 88:193-201.
3. Saval A, Chiodo AE. Intrathecal baclofen for spasticity management: A comparative analysis of spasticity of spinal vs cortical origin. *J Spinal Cord Med* 2010; 33:16-21.
4. Trends in funeral service. National Funeral Directors Association. Accessed August 15, 2021. https://nfda.org/news/trends-in-funeral-service
5. Gale CP, Mulley GP. Pacemaker explosions in crematoria: problems and possible solutions. *J R Soc Med* 2002; 95:353-355.
6. Abrahams M. Improbable research: the problem of exploding pacemakers. The Guardian. Accessed August 15, 2021. www.theguardian.com/education/2012/apr/23/improbable-research-pacemaker-exploding-cremation
7. Synchromed device manual. Accessed Auguest 15, 2021. https://manuals.medtronic.com/content/dam/emanuals/neuro/M961343A_b_014_view.pdf
8. Prometra II manual. Flowanix. Accessed Auguest 15, 2021. https://flowonix.com/sites/default/files/pl-31790-05_-_prometra_ii_programmable_pump_ifu_us_commercial.pdf