

## **Interventional Management of Intercostal Neuritis Secondary to Metastatic Sinus Cancer by Radio Frequency Ablation**

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### **Introduction**

Intercostal neuritis is a well-known pain disorder with multiple etiologies that can lead to chronic and severe pain characterized by irradiating pain that follows a segmental pattern of an intercostal nerve. Several different interventional or surgical techniques have been described to help manage or ameliorate this condition. Stolker et al [1] showed multiple or good long-term results in patients with chronic segmental pain by radiofrequency percutaneous partial rhizotomy. Utility of intercostal nerve conventional radiofrequency ablations following blunt trauma for long-term pain relief was demonstrated in a case report by Engel [2]. Similarly, efficacy has been shown via video-assisted neurectomy of intercostal nerves in patients with intractable cancer pain [3]. Currently, percutaneous radiofrequency ablation of intercostal nerves due to pain from intercostal neuritis secondary to metastatic cancer has not been described. In this report, we detail intercostal nerve radiofrequency ablation using conventional thermal lesions in a patient with metastatic sinus cancer.

### **Report**

Patient A.V. is a 62 year old male with a history of metastatic sinus cancer who had been admitted for obstipation and unrelenting and excruciating pain. He described his pain as being located in his left lower ribs radiating from near his spine to around the to his anterior chest and upper abdomen. His pain does not cross midline. He described his pain as being “dull, aching, and pulling.” He does get some relief with his current pain regimen and it is worsened by movement, deep inspiration, and radiation treatments. The pain has been interfering with activity. His home analgesic regimen consisted of fentanyl patch 50 micrograms every 72hours as well as liquid dilaudid 4-6 mg every 3 hours as needed for pain. While over the course of the first few days in the hospital saw great improvement to the patient’s obstipation, his pain continued and interfered with disposition to home. We were consulted by his primary oncology team for possible interventional therapy. After an in-depth history and physical and review of relevant imaging, a decision was made to move forward with an intercostal nerve radiofrequency ablation in order to help alleviate pain from intercostal neuritis and decrease his opioid requirements.



**Figure 1.** Sagittal view of non-contrast CT image demonstrating left-sided mass measuring at 6.3 cm from midline at approximately T9, T10, and T11 levels.



**Figure 2.** Axial view of non-contrast CT image demonstrating left-sided mass measuring at 7.3 cm from midline.

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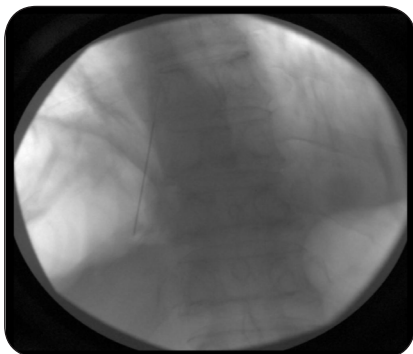
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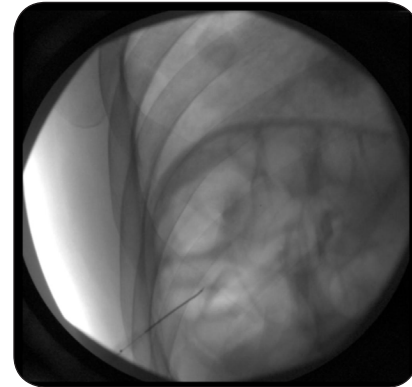
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After a discussion of the relevant risks/benefits and alternative treatment options, informed consent was obtained, the patient was positioned prone on the operating table and standard American Society of Anesthesiology (ASA) monitor were applied. The patient's back was sterilely prepped and draped in usual fashion using Chlorprep. Following review of his most recent CT scan (see above), it was decided that needle placement should be directed at least 8 cm lateral to the vertebral body at the corresponding rib segments in order to avoid the encroaching tumor. The left T9,10,11 rib was identified utilizing intermittent fluoroscopy, and using a sterile ruler, 8 cm was marked out laterally from the patients spinous process at the affected levels. The skin and soft tissues overlying this region was anesthetized using 1 ml of 1% lidocaine. A 20 gauge 5 cm Neurotherm radiofrequency needle with 10mm active tip was directed toward the inferior border of each rib and then walked off inferiorly under intermittent fluoroscopic guidance. AP, lateral and oblique views were utilized to confirm placement. Sensory stimulation was performed at the above level (with 2 microvolts patient noted reproduction of pain). We then injected 1.0 ml of 1% lidocaine mixed with 0.5% marcaine, waited 60 seconds and then performed the thermal lesion protocol of 90 sec at 80 degrees Celsius. The needle was then moved laterally 5 mm and lesioned again as above. This was repeated one other time for a total of 3 burns at each location. The needle was then removed. There were no complications. Vital signs were stable before and after the procedure. The patient reported significant improvement in pain (>50 percent reduction) immediately after the procedure. Following a brief stay in the post-anesthesia recovery unit, the patient was discharged back to the floor to his primary team. He was able to be discharged on post-procedure day #3 with continued significant improvement and slight reduction in opioid requirements that continued for several weeks. Unfortunately, due to the aggressive nature of his disease, his pain continued to worsen at other sites and eventually required implantation of an intrathecal drug delivery system. The patient passed away in home hospice approximately 6 weeks following above procedure.



**Figure 3.** AP fluoroscopic image showing ribs of T9, T10, and T11 on the right as well as ribs T9 and T11 on the left (inferior aspect of overlying marking needle is shown lying over left rib of T11). The rib of T10 on the left cannot be visualized as the lytic nature of the mass has encroached upon that rib.



**Figure 4.** Fluoroscopic image demonstrating needle position over the inferior border of the left T9 rib.

## Discussion

Pain control and minimization of adverse drug effects are important aspects in the management of patients with cancer pain. Pain control is important to both the patient and the patient's family who are often times dealing with a terminal diagnosis. Pain is also a major determinant of and reason for delay in discharge of a cancer patient to home. Interventional techniques such as the one described above can help alleviate pain as well minimize overall opioid usage and thus decrease adverse drug side-effects. Our patient following intercostal radiofrequency thermal ablation saw a profound reduction in pain as well as reduction in opioids. He was able to be discharged to home three days following the procedure. Because of the aggressiveness and spread of his cancer, he is now being evaluated for implantation of an intrathecal drug delivery system to help control his pain and minimize side-effects as his disease progresses.

## References

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