

LUMBAR RADIOFREQUENCY ABLATION CANNULA AND PROBE COMPLICATIONS: SOURCE FOR POTENTIAL FOREIGN BODY

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Background: Radiofrequency ablation is a common approach for treating axial low back pain stemming from facet arthropathy. Many well-published complications have been addressed in the literature. This case demonstrates a hardware malfunction and underscores the importance of vigilance toward protocols to maintain radiofrequency probes during sterilization and reuse.

Case Report: In our case, the patient underwent a successful bilateral 2-level neurotomy. At the completion of the procedure, we removed all instruments and found that the probe was no longer attached to the connector. Multiple postprocedure x-rays were negative for a foreign body; the probe was later found in the cannula intact. This case report illustrates a rare potential complication for foreign body retention in an outpatient setting.

Conclusion: Appropriate maintenance and handling of reusable probes during sterilization and use must be exercised. Alternatives include the use of disposable probes and connector cables.

Key words: Radiofrequency ablation, foreign body, probe

BACKGROUND

Lumbar radiofrequency ablation (RFA) is well documented in the literature for the treatment of lumbar facet pain (1). Lumbar facet interventions, which include intraarticular injections, are the second most common procedure in pain practices. There has been a substantial increase in utilization of RFA (2,3). A multitude of complications have been studied including theoretical concerns about degeneration of the multifidus and other spinal muscle atrophy, interference in pacemaker-dependent patients with cardioverter-defibrillators or stimulators (4), damage to spinal nerves, vascular injury, worsening pain or neuritis, and tissue burns (5). Foreign body materials such as probe dislodgment in the cannula have not been extensively discussed. The patient

described in this case study is one with axial low back pain related to lumbar facet degeneration undergoing a repeat RFA with a potential complication of foreign body retainment requiring retrieval.

CASE

This is a case of a 48-year-old man with a past medical history of bilateral posterior facetectomy, decompression, and transforaminal interbody fusion from L4 to the sacrum for spinal instability, stenosis, and nerve root impingement. The patient is well known to our pain management center for persistent axial back pain and noted to have a normal exam except for bilateral facet loading above the level of his fusion. He had undergone previous RFA to the facets of L2-3 and L3-4 over

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6 months ago with meaningful benefit. After the RFA, he had an improvement in his activities of daily living, decreased pain scores, less usage of pain medications, and improved mood and sleep throughout his duration of benefit. He presented to the clinic for similar pain and had successful diagnostic medial branch blocks to L2-3 and L3-4. The treatment plan included repeat RFA to the medial branches innervating the facet joints. The Kimberly-Clark Radiofrequency Probe Kit (Kimberly-Clark Corporation, Neenah, WI) was used for the procedure. The procedure required 3 radiofrequency cannulas and reprocessed probes with connectors for each side for a 2-level facet neurotomy. The left side was performed without complication, including appropriate sensory/motor and impedance checks. During the procedure it was noted that one of the probes and connectors was loose, yet it had appropriate power, impedance, and thermal readings. The procedure was repeated for the right side. Upon attempted removal of the last probe, it was noted that the connector was no longer attached to the probe. X-rays were taken to see if the probe had become dislodged or fractured inside the patient; x-rays were negative. Upon inspection of the cannula, it was found that the reusable probe was embedded within the cannula (Fig. 1). The patient was followed up and found to have ongoing benefit from the procedure.

DISCUSSION

After a thorough search, our case was found to be the first to report the possibility of foreign body retainment following lumbar RFA ablation for chronic pain. In 2004, Fitzgibbon et al (6) looked at data from the American Society of Anesthesiologists Closed Claims Project in order to identify liabilities related to chronic pain management. The study looked at ablative procedures, which included radiofrequency. Among ablative procedures, 17 claims were made between the years of 1970 to 1999; however, none were found to be due to retained instruments. As stated before, RFA does have a number of complications, with vascular and nerve injury being the most common, yet RFA remains a safe and viable procedure with these complications being very unlikely (5,6). Interestingly, we were able to find one case of a retained foreign object after biopsy and RFA of a 9-mm painful sclerotic periarticular osteoblastoma of the right femoral head, but the needle tip lost was that of the biopsy needle (7).

In our case, we typically use reusable probes and connectors after appropriate sterilization. It appears that during handling of the probes and the connector, connections may have become loose and dislodged in the patient or provided inadequate delivery for thermal ablation. Though rare, foreign body reactions have

been shown to occur, with local inflammatory reactions, material embolisms, and migrations all being possible mechanisms. Inflammatory reactions can occur within 6 to 24 hours of infiltration and can lead to granuloma formation (8). If concerned about foreign body retainment, x-ray may be the best initial step for visualization, especially when fluoroscopy is readily available. However, if this fails and concern for retainment remains high, computerized tomography (CT) or magnetic resonance imaging (MRI) should be considered (8). If the retained object is found, consultation with neurosurgery should be considered.

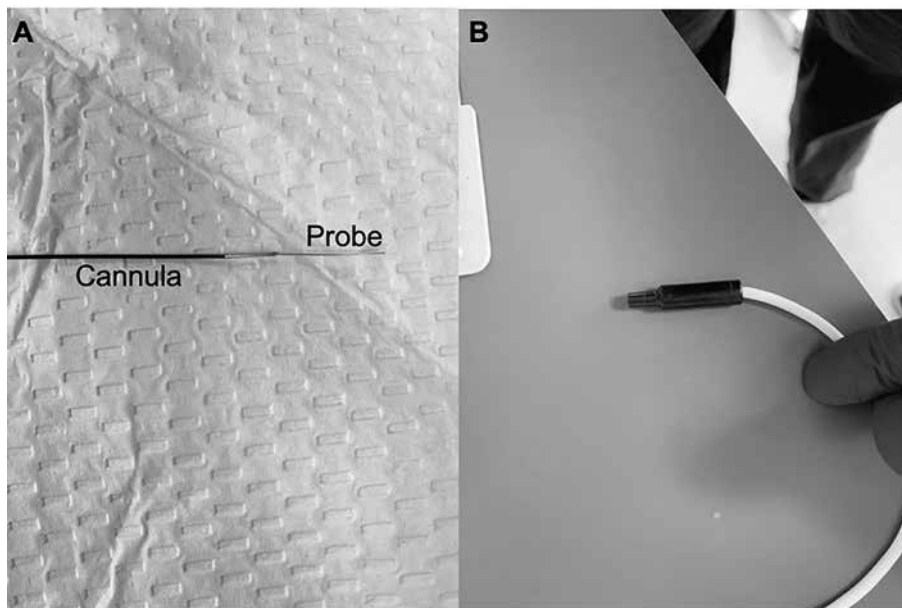


Fig. 1. A) Radiofrequency probe lodged within the cannula (22-gauge, 100-mm). B) Radiofrequency connector no longer connected to the lesioning probe.

CONCLUSION

This case demonstrates a unique and rare case of potential foreign body retainment. Though this complication is unlikely, it is important to have proper diagnostic imaging, such as x-ray. If no definite resolution is found, CT or MRI with neurosurgical consult might be necessary. If the diagnosis is missed, the patient has an increased risk for granuloma formation. Finally, when using reusable instruments, it is important to maintain vigilance toward the level of deterioration – including

proper servicing – in order to reduce the risk of harm to patients. At our institution, we have transitioned to the use of disposable probes and no longer utilize reprocessed ones. In theory, this should further reduce the risk of this rare complication.

Author Contributions

- KD: writing, editing, research
- NP: writing, research, images
- AM: writing, editing

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