# Rhizotomy

Radiofrequency ablation (RFA) uses thermal energy to destroy tissue surrounding an electrode, resulting in coagulative necrosis of tissue from high temperatures. Optimal tissue destruction occurs between 50 – 90°C [1].

Radiofrequency ablation (RFA) has been well established for the treatment of metastases to the liver and kidneys [2] [3] [4], and within the past few years has been increasingly utilized in management of osseous metastases. In the spine, this treatment has traditionally been limited to lesions within the anterior vertebral body since this location is more accessible and further away from sensitive neural elements [5].

Plasma mediated RFA, the most reported method of tumor ablation within the spine, employs radiofrequency energy to excite electrolytes and create a plasma field that results in the disruption of molecular bonds at relatively low temperatures (40 to 70 degrees Celsius) [6] [7].

The radius of the ablation zone is dependent on the tissue temperature and time the tissue is maintained at that temperature. Accurate temperature measurements are critical to ensure proper tumor kill and also minimize unintended tissue destruction. In the short term, thermal destruction of pain sensitive nerve fibers ceases transmission of pain signals. Tumor cell necrosis has also been implicated in decreasing the cytokine mediated pain pathways involving interleukins and tumor necrosis factor. RFA also delays tumor progression to the sensitive periosteum [8] [9].

see STAR system

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RFA and vertebroplasty (VP) can be successfully combined with iCT (intraoperative computed tomography)-based navigation, which leads to a reduction of radiation to the staff and optimal probe positioning due to 3D navigation [10].

## Dorsal Rhizotomy

see Dorsal Rhizotomy.

## Lumbar radiofrequency ablation

Lumbar radiofrequency ablation

## Radiofrequency rhizotomy

see Radiofrequency rhizotomy.

# Trigeminal Rhizotomy

Trigeminal Rhizotomy

1)
Brace CL. Radiofrequency and microwave ablation of the liver, lung, kidney, and bone: What are the differences? Current Problems in Diagnostic Radiology 2009; 38:135-143
2)
Jakobs TF, Hoffmann RT, Trumm C, Reiser MF, Helmberger TK. Radiofrequencyablation of colorectal livermetastases: Mid-term results in 68 patients. Anticancer Res 2006; 26:671-680.
3)
Lencioni R, Della Pina C, Bartolozzi C. Percutaneous image-guided radiofrequency ablation in the therapeutic managementof hepatocellular carcinoma. Abdom Imaging 2005; 30:401-408.
4)
Hoffmann RT, Jakobs TF, Trumm C,Helmberger TK, Reiser MF. RFA of renal cell carcinoma in a solitary kidney.Abdom Imaging 2008; 33:230-236.
5)
Dupuy DE, Hong R, Oliver B, Goldberg SN. Radiofrequency ablation of spinal tumors: Temperature distribution in the spinal canal. Am J Roentgenol 2000; 175:1263-1266.
6)
Georgy BA. Bone cement deposition patterns with plasma-mediated radiofrequency ablation and cement augmentation for advanced metastatic spine lesions. Am J Neuroradiol 2009; 30:1197-1202.
7)
Georgy BA, Wong W. Plasma-mediated radiofrequency ablation assisted percutaneous cement injection for treating advanced malignant vertebral compression fractures. Am J Neuroradiol 2007; 28:700-705.
8)
Mannion RJ, Woolf CJ. Pain mechanisms and management: A central perspective. Clin J Pain 2000; 16:S144–S156.15.
9)
Cleeland CS, Gonin R, Hatfield AK, Edmonson JH, Blum RH, Stewart JA, Pandya KJ. Pain and its treatment in outpatients with metastatic cancer. N Engl J Med 1994; 330:592-596.
10)
Kavakebi P, Freyschlag CF, Thomé C. How I do it-optimizing radiofrequency ablation in spinal metastases using iCT and navigation. Acta Neurochir (Wien). 2017 Aug 1. doi: 10.1007/s00701-017-3267-0. [Epub ahead of print] PubMed PMID: 28766023.