Percutaneous Radiofrequency Ablation for Metastatic Spinal Disease: An Innovative Minimally Invasive Technique by Using a Navigational Spine Tumor Ablation System

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- No disclosures

Focal Palliative Treatment of Bone Metastases

- **Radiation Therapy:**
  - **EBRT:** Standard of Care for bone met palliation
    - *Rate and degree of pain relief,*
    - *Requires interruption of chemotherapy and multiple fractions*
    - *Maximum tolerable dose limitations*
  - **SBRT:**
    - Faster and more efficient pain relief
    - *Immobilization of painful patients for planning and treatment*
    - *Associated with increased risk of fracture Boehling et al (20%) ; Rose et al (40%)*
- **Surgical intervention**
  - Neurologic deficit instability requiring decompression, stabilization, corpectomy
  - *Invasive, risk/benefit*
- **Minimally Invasive Ablative Therapy**
  - Acute pain relief
  - Complimentary to Conventional Radiotherapy
  - *Access, Navigation has limited adoption*

Dupuy et al. Cancer 2010. *Rosenthal and Callstrom. Radiology 262: No 3, March 2012*

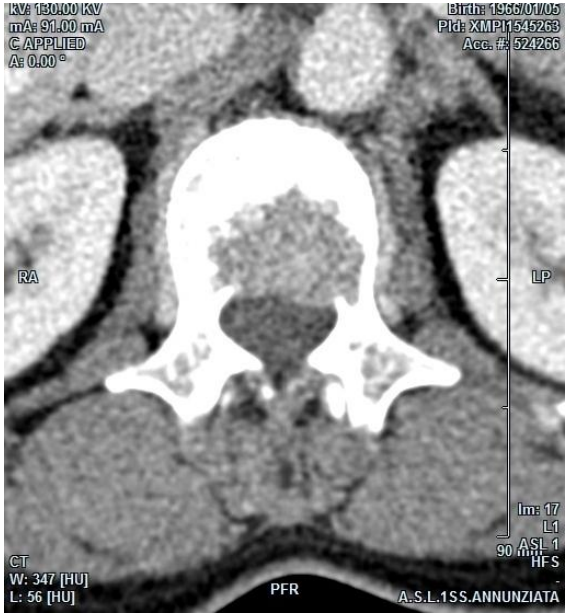
Objectives:

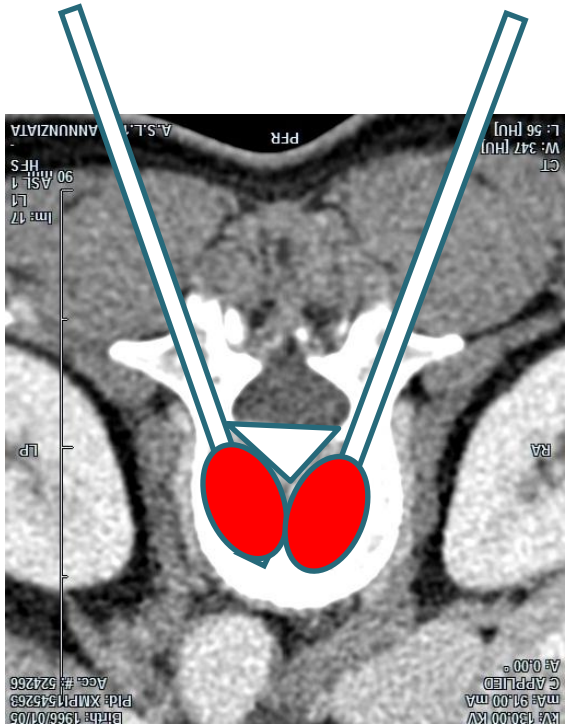
Retrospectively evaluate feasibility, safety and effectiveness of radiofrequency ablation (RFA) using the

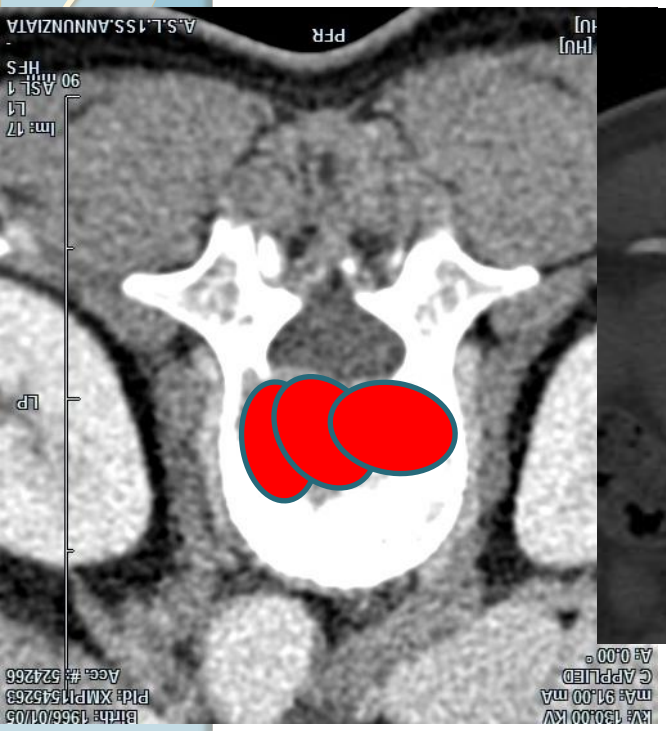
Spinal Tumor Ablation (STAR) System in palliative treatment of painful vertebral metastases.

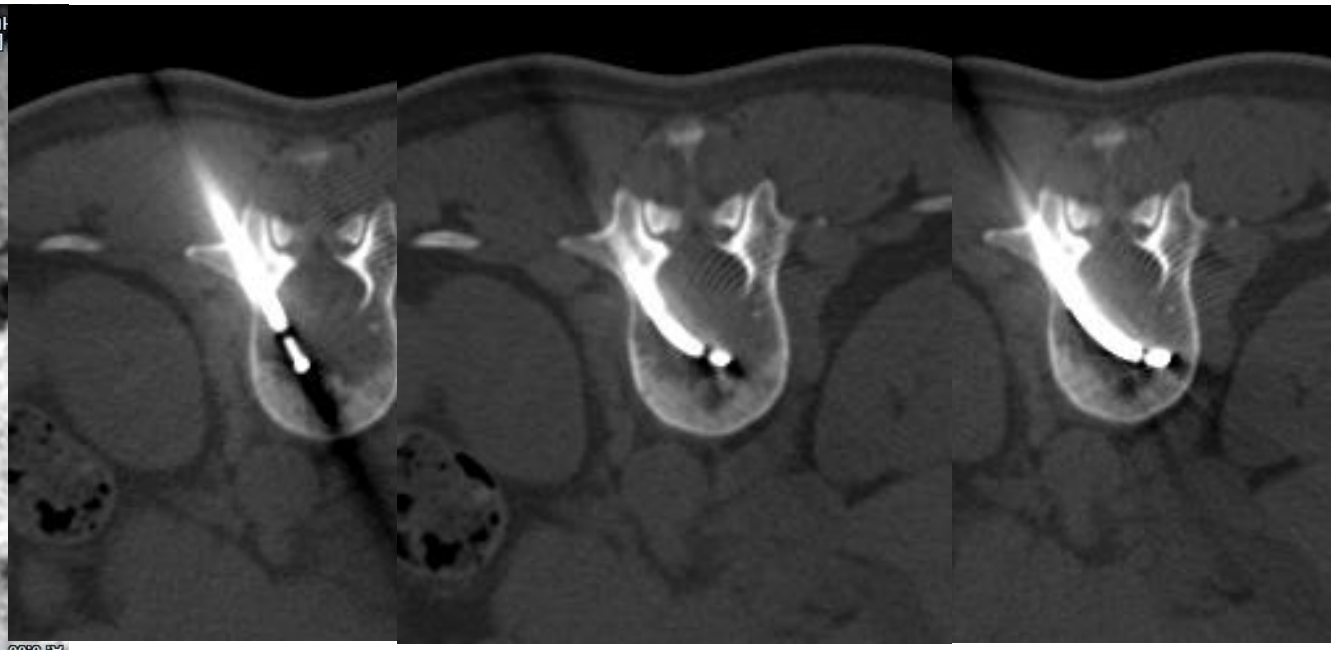
Access and Navigation has limited adoption in the treatment of spinal metastases.

F/49 single mts L1
from breast cancer



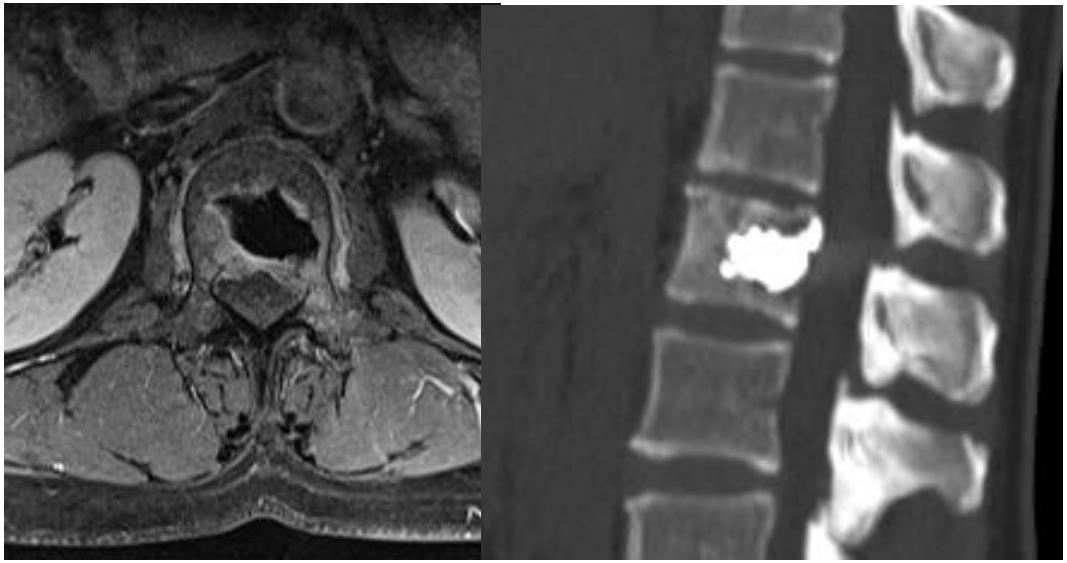




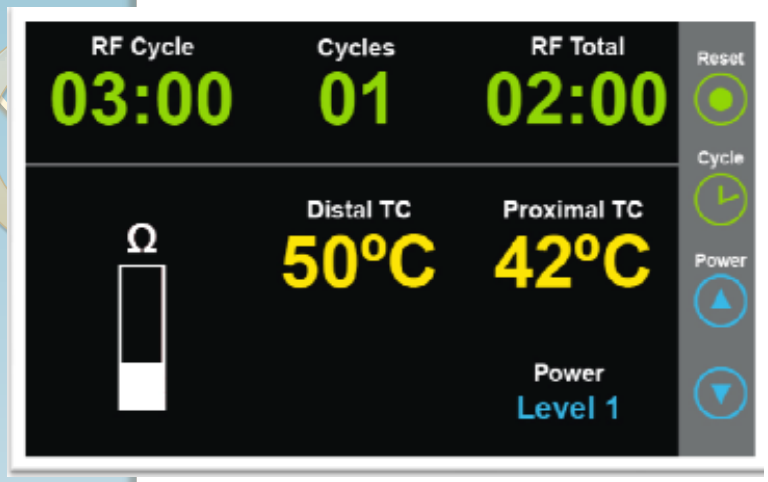


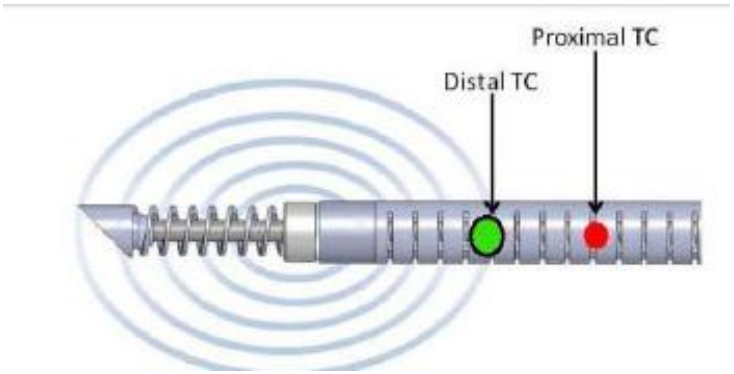
Spinal Tumor Ablation (STAR) System

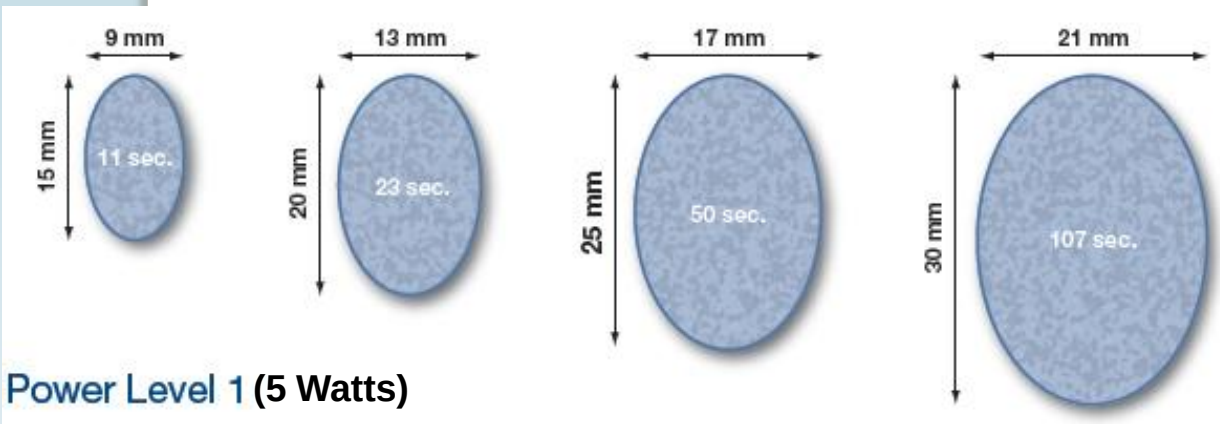
Result after combined
RFA and Vertebroplasty



STAR system







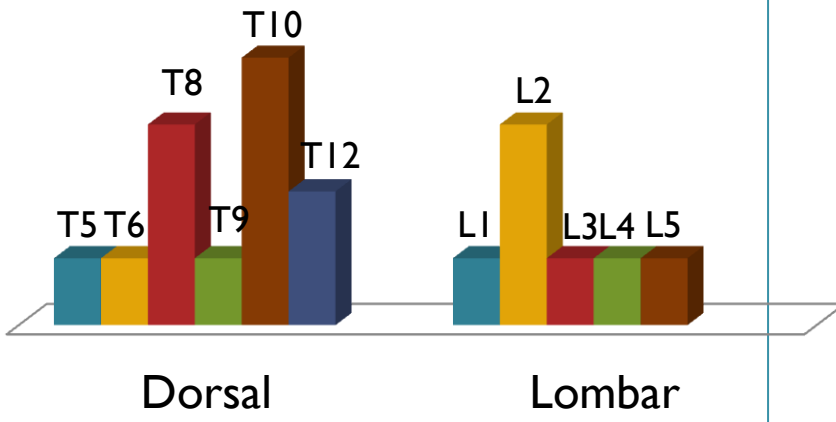
Power Level 1 **(5 Watts)**

Methods and Materials

- **16** Patients treated:
  (mean age 56 yr (36-81)
- **19** vertebral metastases

12 thoracic
7 lombar

Site of the treatment



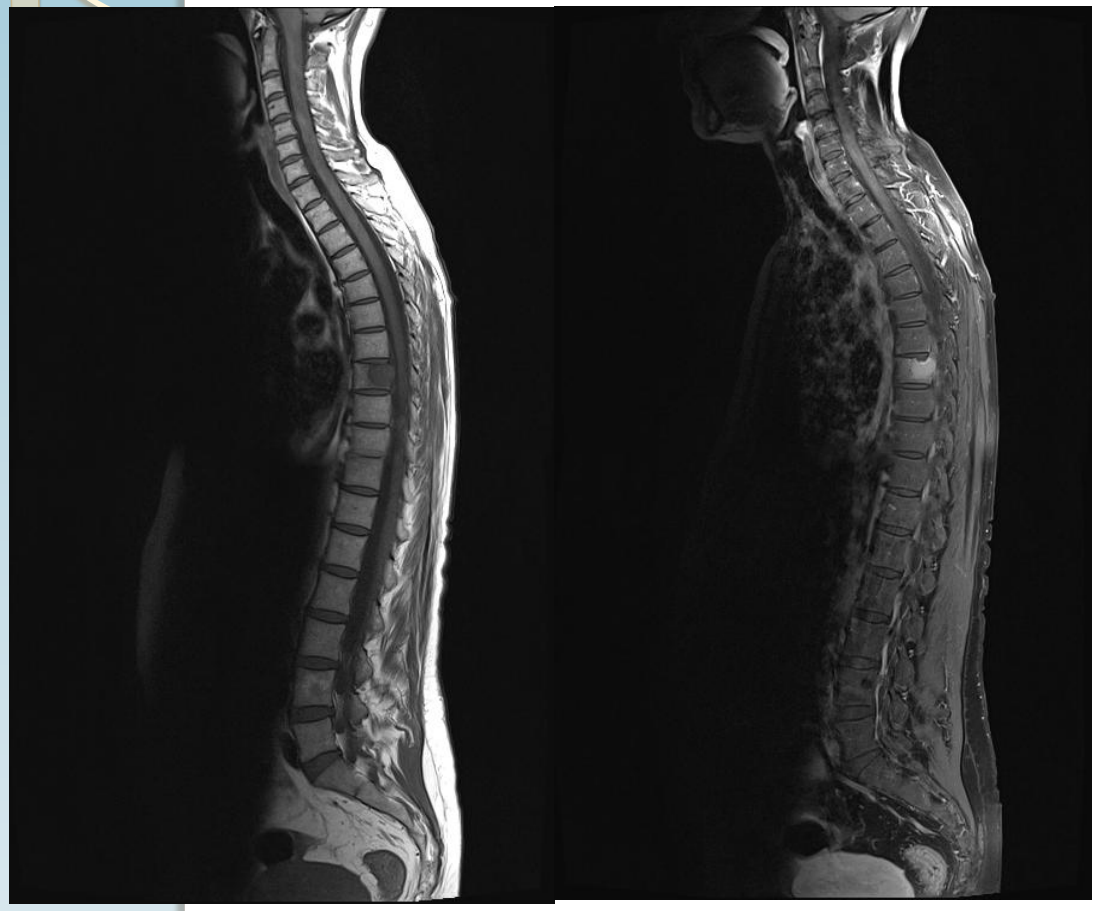
Average Pain was **6.7** (VAS from 4.1 to 8.2)

14 of 16 patients underwent PMMA augmentation

Median F.U. 10 months (3-13).

Case 1

39 Year old patient with spinal metastases after Breast Cancer
Pain, functional disability VAS 7 (0 – 10)



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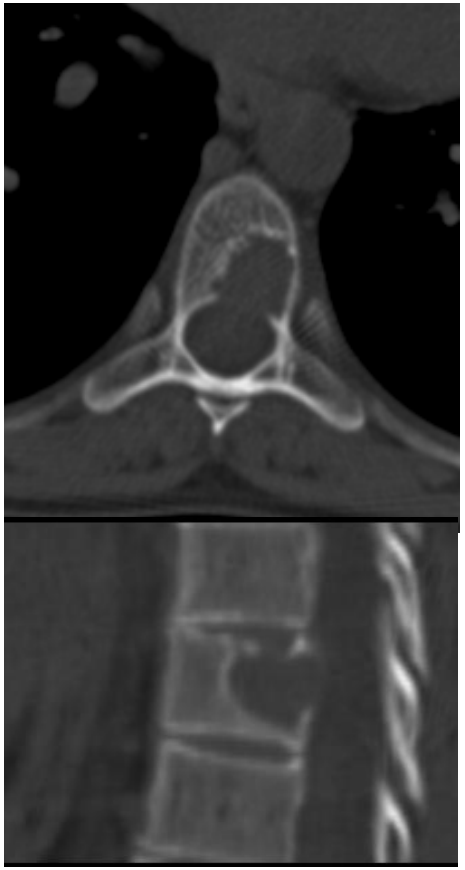
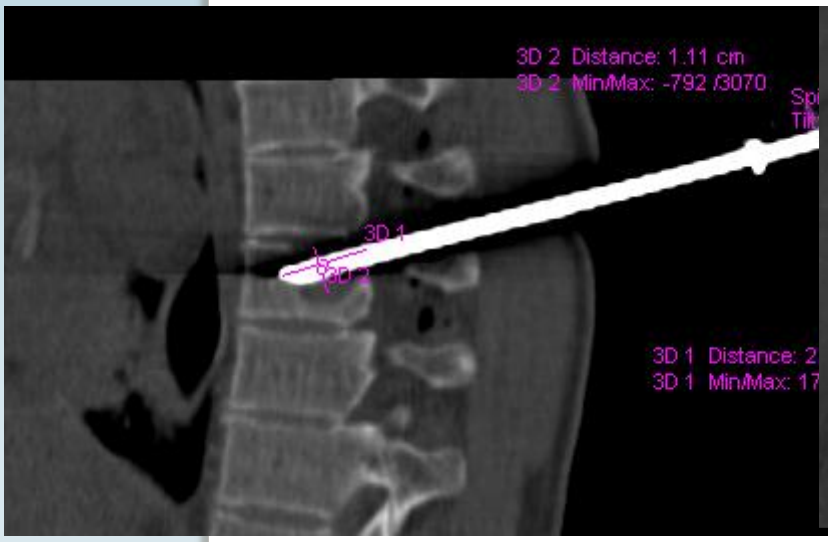
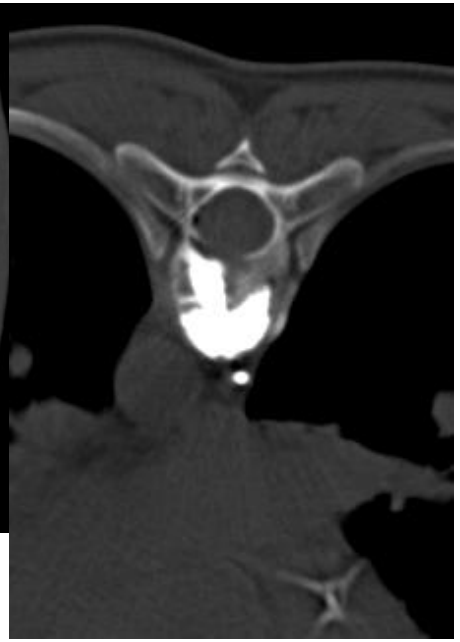


May 2014


2 Distance : 1.71 cm
2 Min/Max : 12/334
2 Pixel count : 38
1 Distance : 1.77 cm
1 Min/Max : 8/390
1 Pixel count : 40


3D 2 Distance: 1.11 cm
3D 2 Min/Max: -792 /3070
3D 1
3D 1 Distance: 2
3D 1 Min/Max: 17

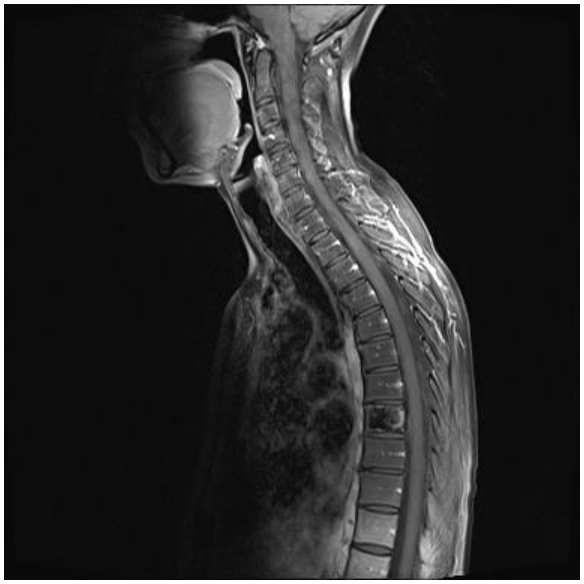


May 2014 (RT)

11 months

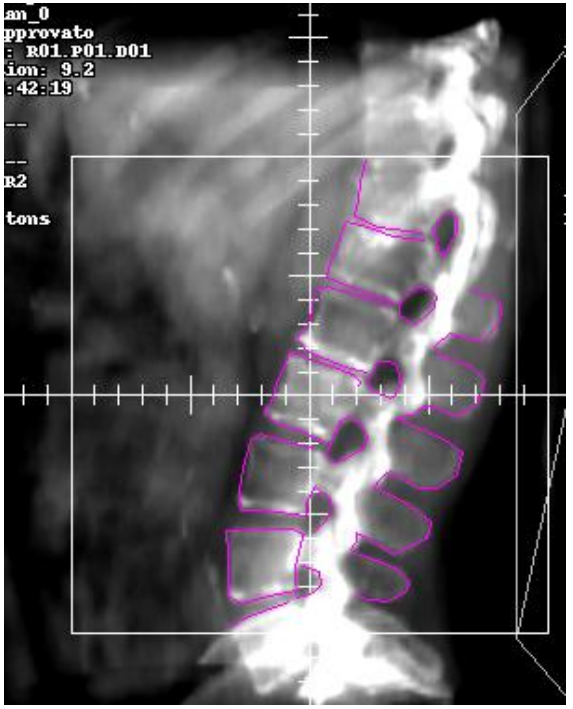
13 months

8 months



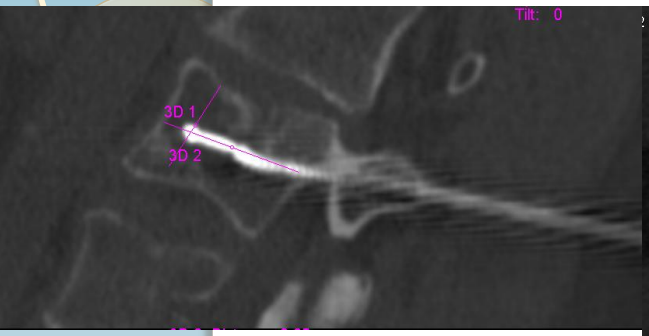
Case 2

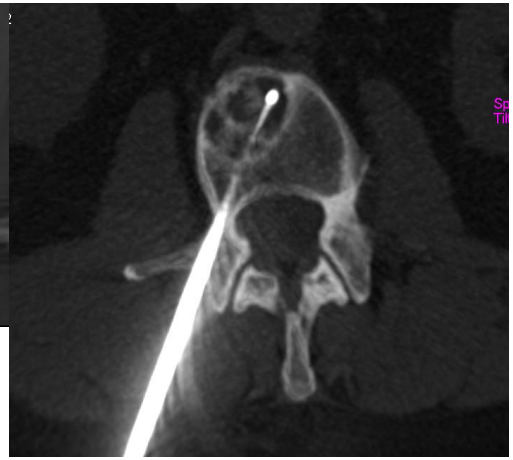
45 Year old patient with a single spinal metastasis after Breast Cancer - **VAS 7**



Radiotherapy before RFA

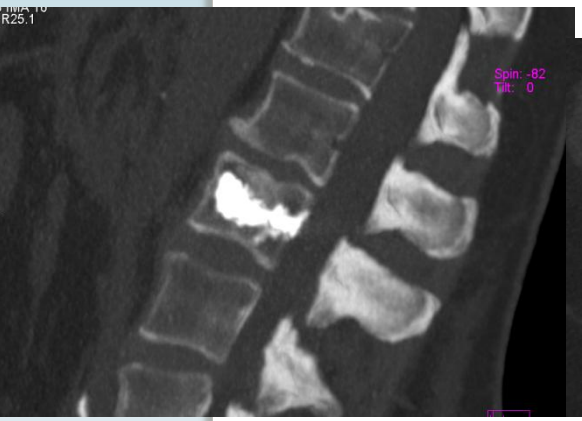
Persistent pain! Vas 4

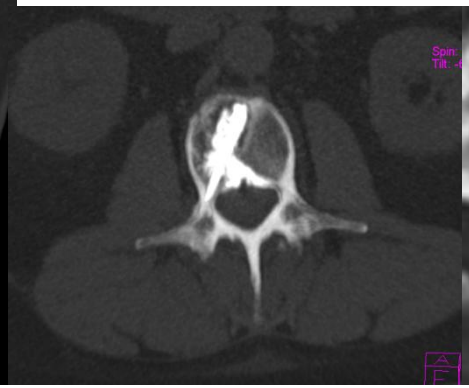


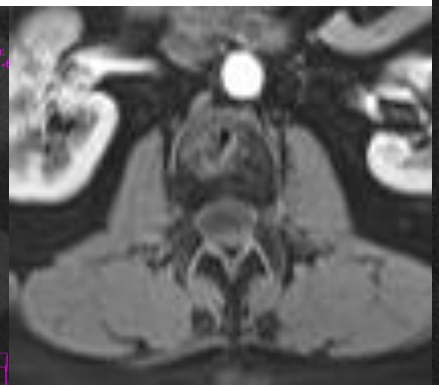


STAR

Vas 0
Complete lack of C.E.

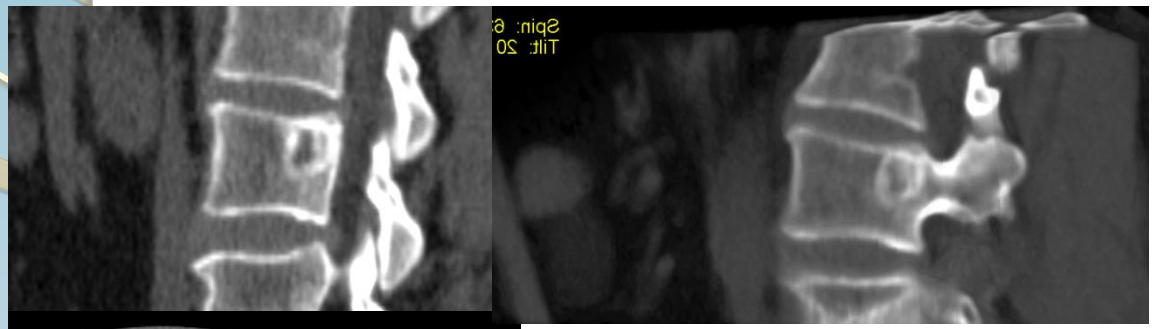


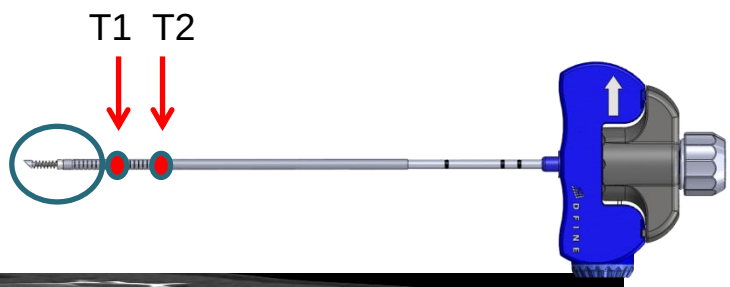


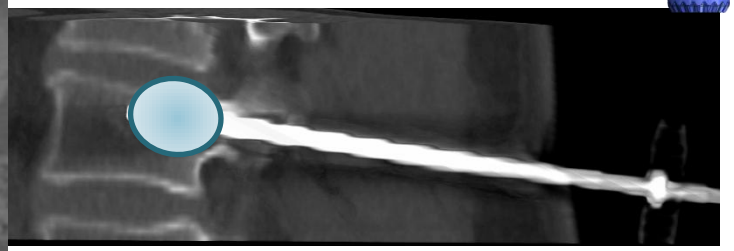


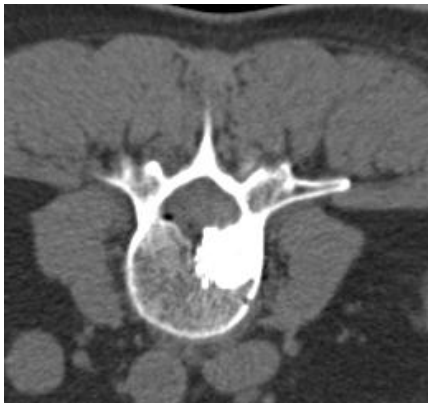
Case 3

55 Year old patient with a single spinal metastasis after Breast Cancer - VAS 5

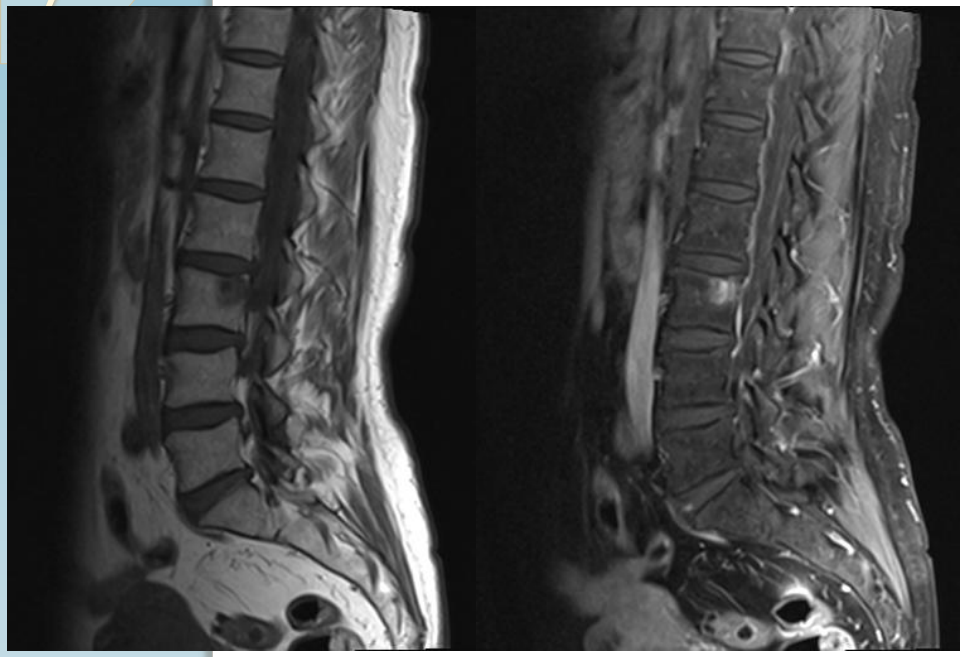




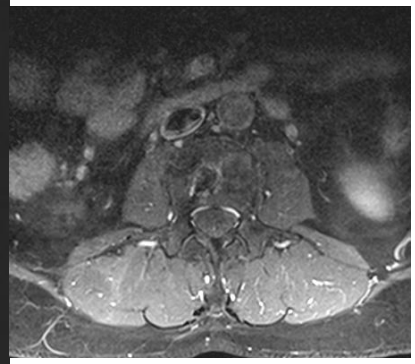




Before ablation



After ablation



Results

- Technical Success 100%
- Complications (none)

- **Pain relief** (before; 1 week and 6 months after)

VAS decreases from 6.7 (range 4.1 – 8.2)
to 1.3 (range 0 to 2.8)

No **local relapse**

No **tumor progression** in the treated site

Median F.U. 10 months (3-13 months)

Conclusions

- Use of a navigational RFA device to treat metastatic spinal lesions is a safe and effective procedure which allowed reduction of local tumor burden with significant pain relief and good local control of the metastasis.

- Targeted RFA seems to be a promising alternative for patients who are not candidates for surgery.

Thanks

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