

*The* ROYAL MARSDEN  
NHS Foundation Trust

# *Imaging & Guided Local Treatments for metastatic Sarcoma*

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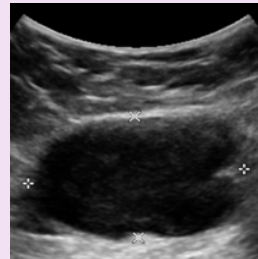
# Imaging Sarcoma

## Morphology

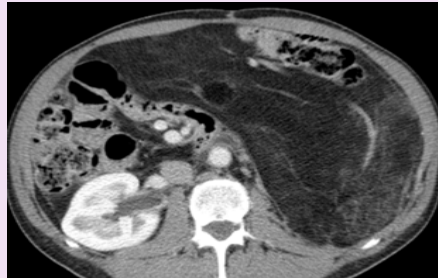
*X-ray*



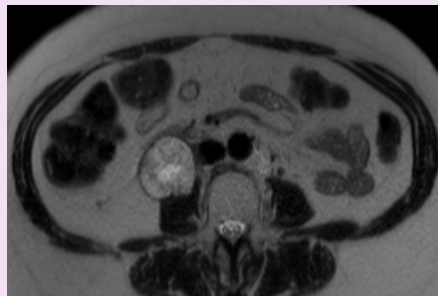
*US*



*CT*



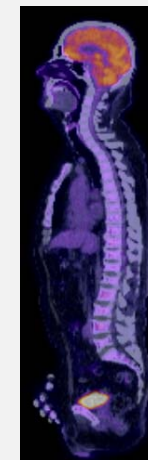
*MRI*



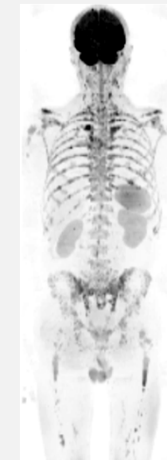
## Function



*MDP Bone Scan*  
*Bone turnover*

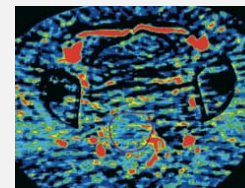


*FDG PET/CT*  
*Glucose metabolism*

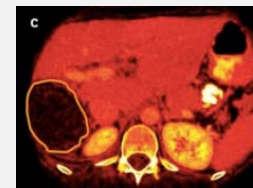


*DW MRI*  
*Cellularity*

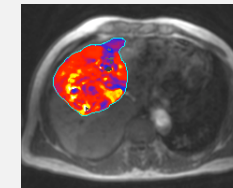
## Blood Supply



*Dynamic CE CT*



*Dual Energy CT*



*Dynamic CE MRI*

# *Follow up Imaging*



*CXR*

*10 days  
background  
radiation*

*CT*

*400 CXRs  
3.6 years  
background  
radiation*

*FDG PET/CT*

*1000 CXRs  
9 years  
background  
radiation*

*Risk of inducing cancer in  
a 40 year old is 1 in 1425*



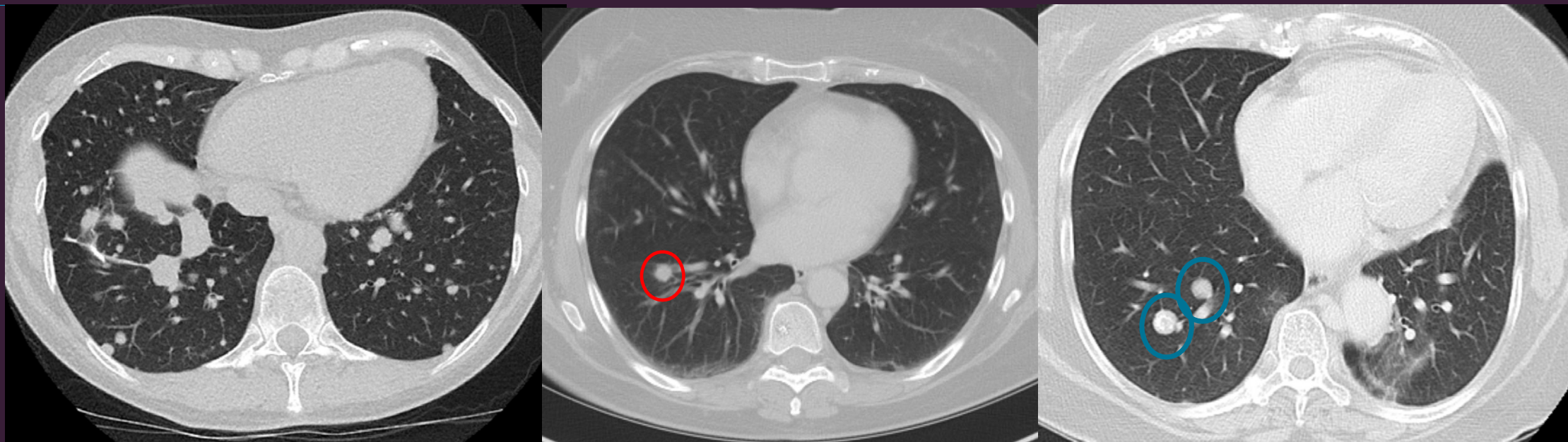


## *Follow up Imaging*

- High Risk Patients (Grade, size, site)
- Recurrence 2-3 years
- Follow up every 3-4 months first 2-3 years
- Every 6months until 5 years
- Yearly thereafter (? 10yrs)
- Low Risk Patients (Grade, size, site)
- Recurrence Later
- Follow up every 4-6 months first 3-5 years
- Annually there after



# Recurrence





Contents lists available at ScienceDirect

Clinical Oncology

journal homepage: [www.clinicaloncologyonline.net](http://www.clinicaloncologyonline.net)



### Original Article

## Effect on Survival of Local Ablative Treatment of Metastases from Sarcomas: A Study of the French Sarcoma Group



- 281 patients with oligometastatic disease (1-5 metastases, any grade/histology)
- 164 received local treatment (77.9% surgery , 16.4% RFA)
- Lung metastases 71.5%
- Liver metastases 10.6%
- Other 19.2% (Lymph nodes 7.1%, Soft tissue 4.6%, subcutaneous 3.6%, bones 3.2%, peritoneal 4.3%, cerebral 1.8%)





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## Original Article

## Effect on Survival of Local Ablative Treatment of Metastases from Sarcomas: A Study of the French Sarcoma Group



- 43.6% of the patients 1 local treatment
- 28.7% of patients 2-3 local treatments
- 2.8% of the patients 4-5 local treatments
- 0.7% of the patients at least 6 local treatments





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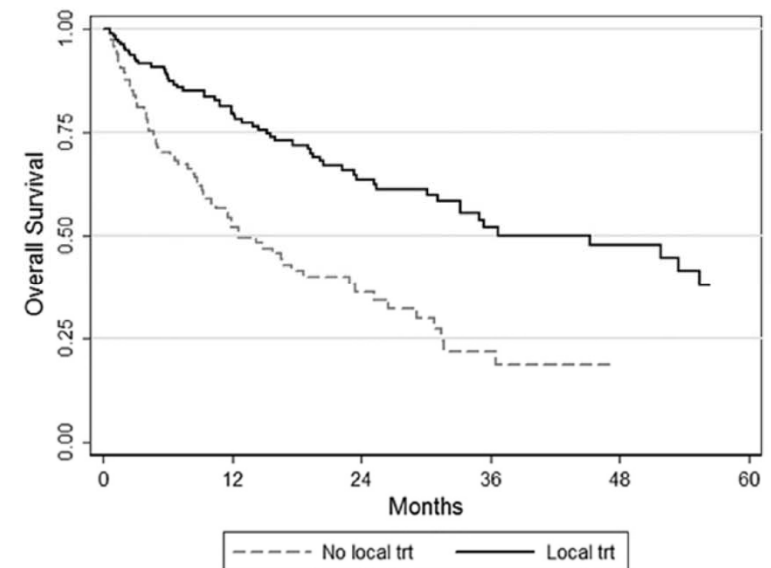


- Two year OS 52.4%
- Local treatment group OS 63.6%
- Non local treatment group OS 36.3%
- Local treatment on multivariate analysis

Adjusted for the propensity score was a

Favourable prognostic factor

(HR Z 0.48, 95% CI Z 0.29e0.79;  $p < 0.004$ )



**Fig 2.** Overall survival according to local treatment status ( $P < 0.0001$ ).



## RESEARCH

## Open Access



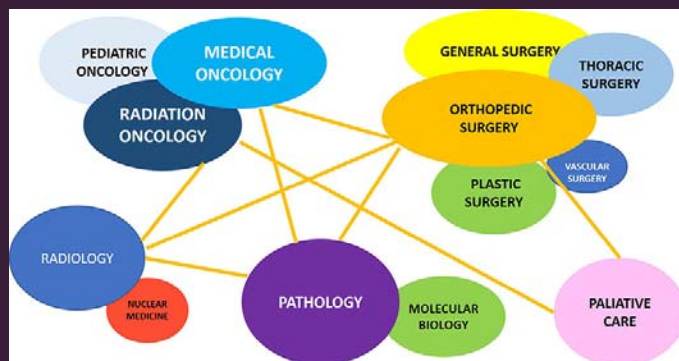
# Pulmonary Metastasectomy versus Continued Active Monitoring in Colorectal Cancer (PulMiCC): a multicentre randomised clinical trial

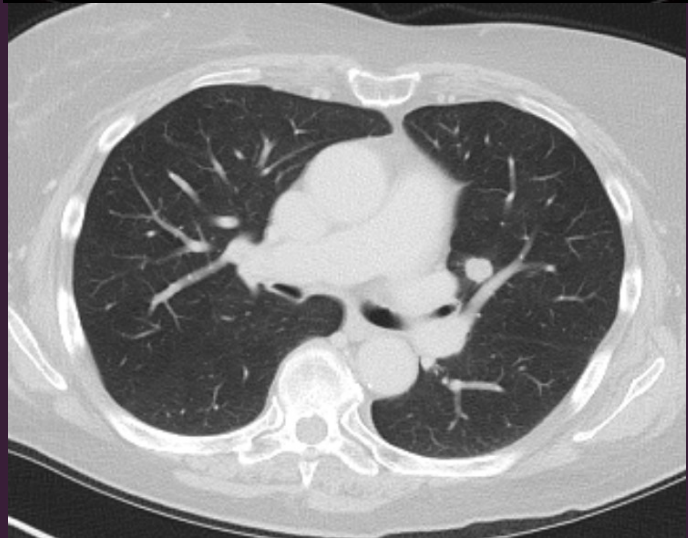
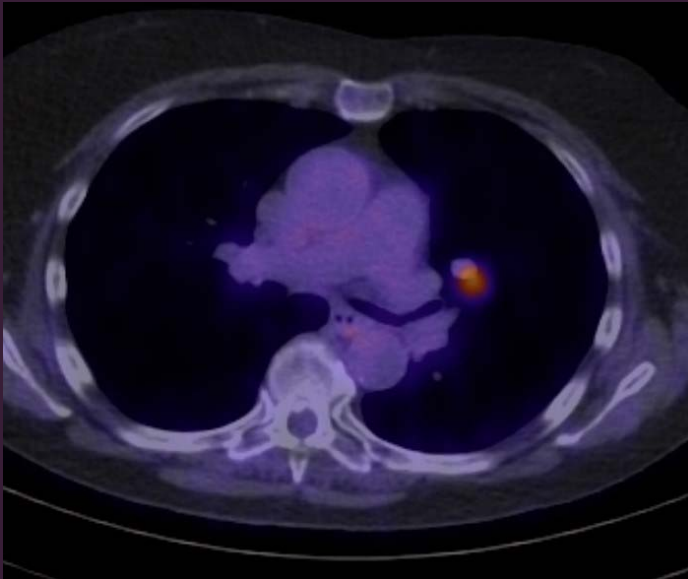
- Only 65 patients randomised, instead of 600
- Closed after six years in 2016.
- Survival surgical group 38% at 5 years
- Survival surveillance group 29% at 5 years





## *Multidisciplinary Sarcoma team*





- 73yr old Female
- DFI 18 months
- Solitary metastasis adjacent to upper division Lingula bronchus
- Required Lobectomy
- Too central for SBRT
- MDT decision for ablation



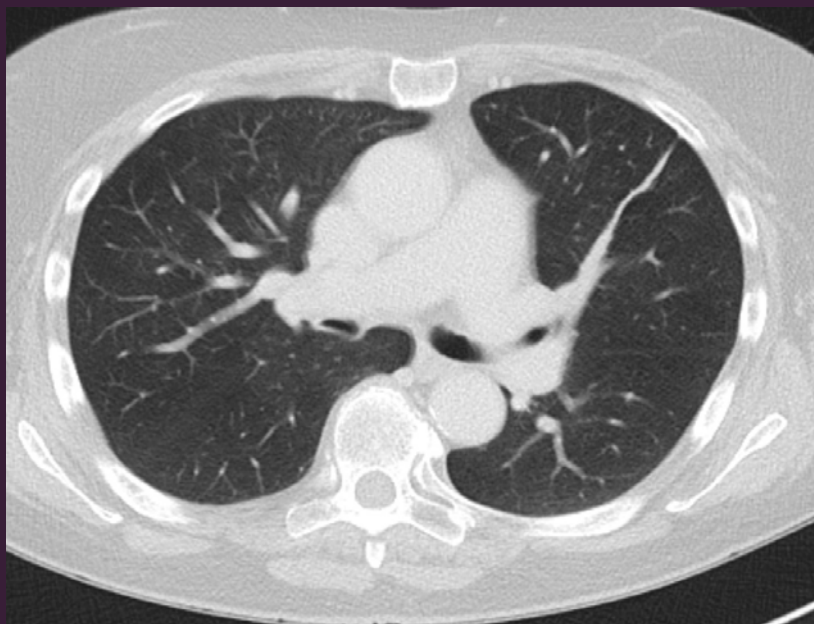




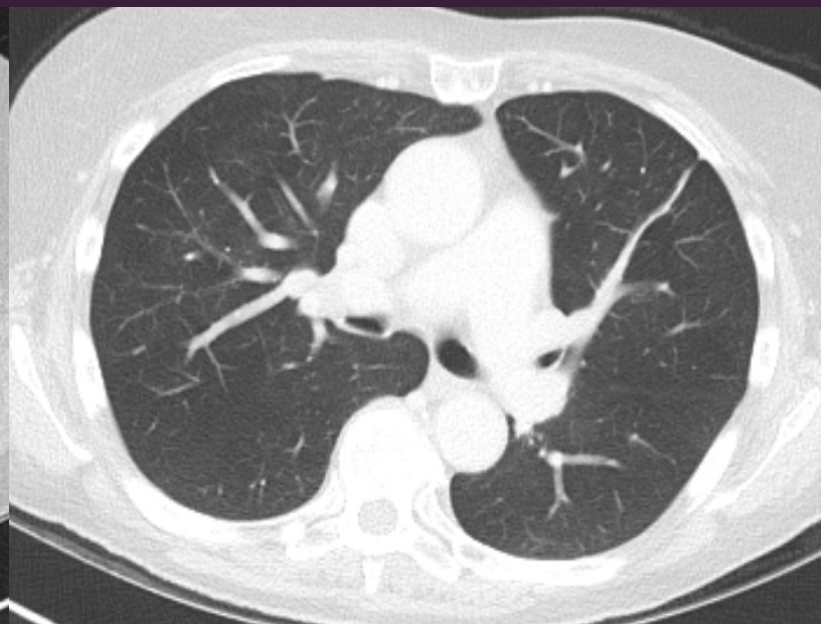
*CT 4 months*



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*CT 2 years*



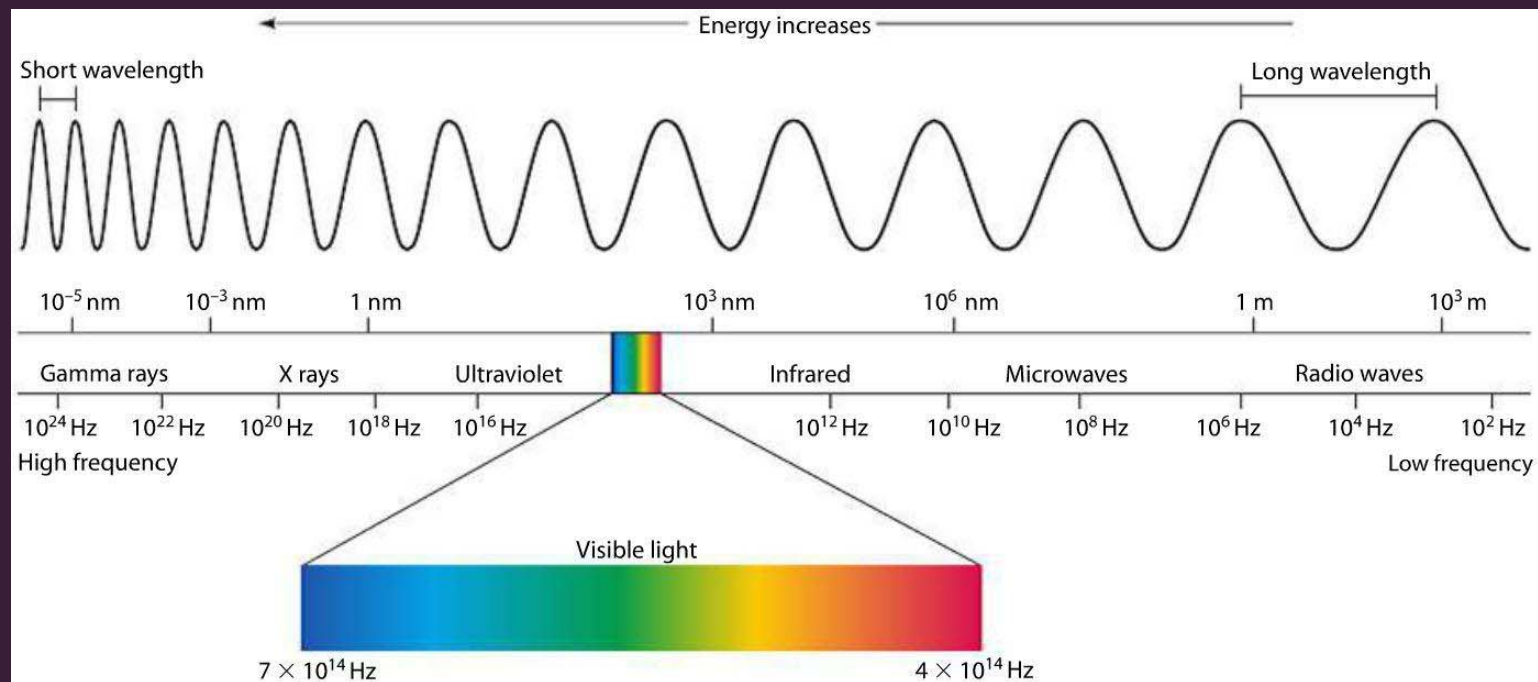
*CT 3 years*





## What is thermal ablation: RFA & MWA

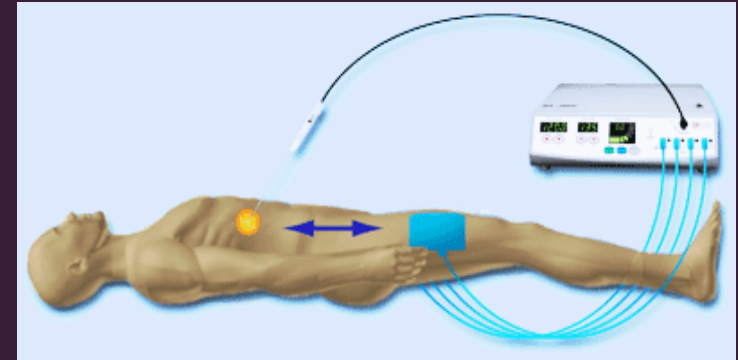
### 1) Percutaneous thermal tumour destruction: tissue stays in!





# How Does RFA works?

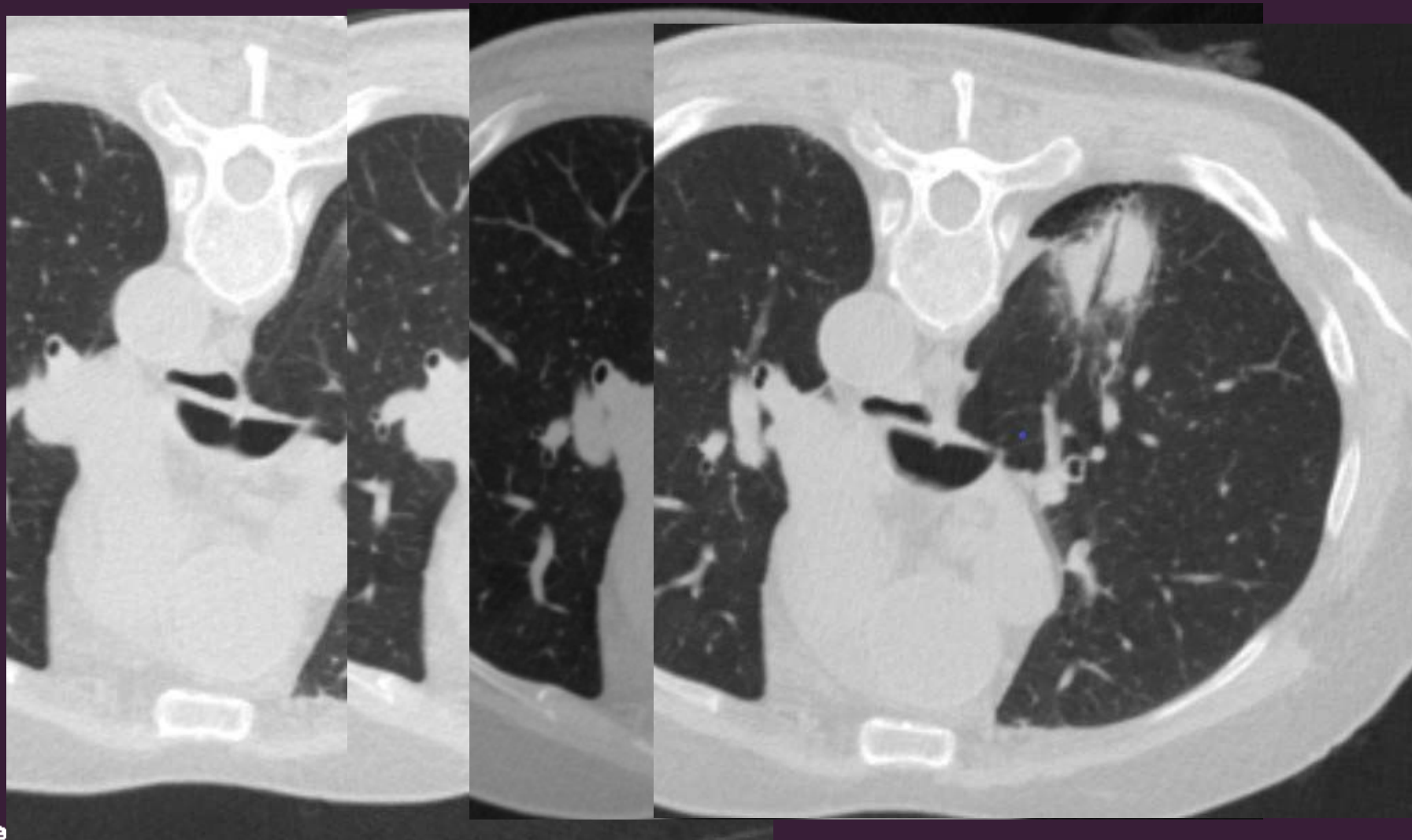
- Pt becomes electrical circuit.
- • Generator produces AC at 300-500 kHz (RF range).
- • Ionic agitation.
- • Frictional heating.
- • Protein denaturation, desiccation, coagulation necrosis.
- • Impedance rises.

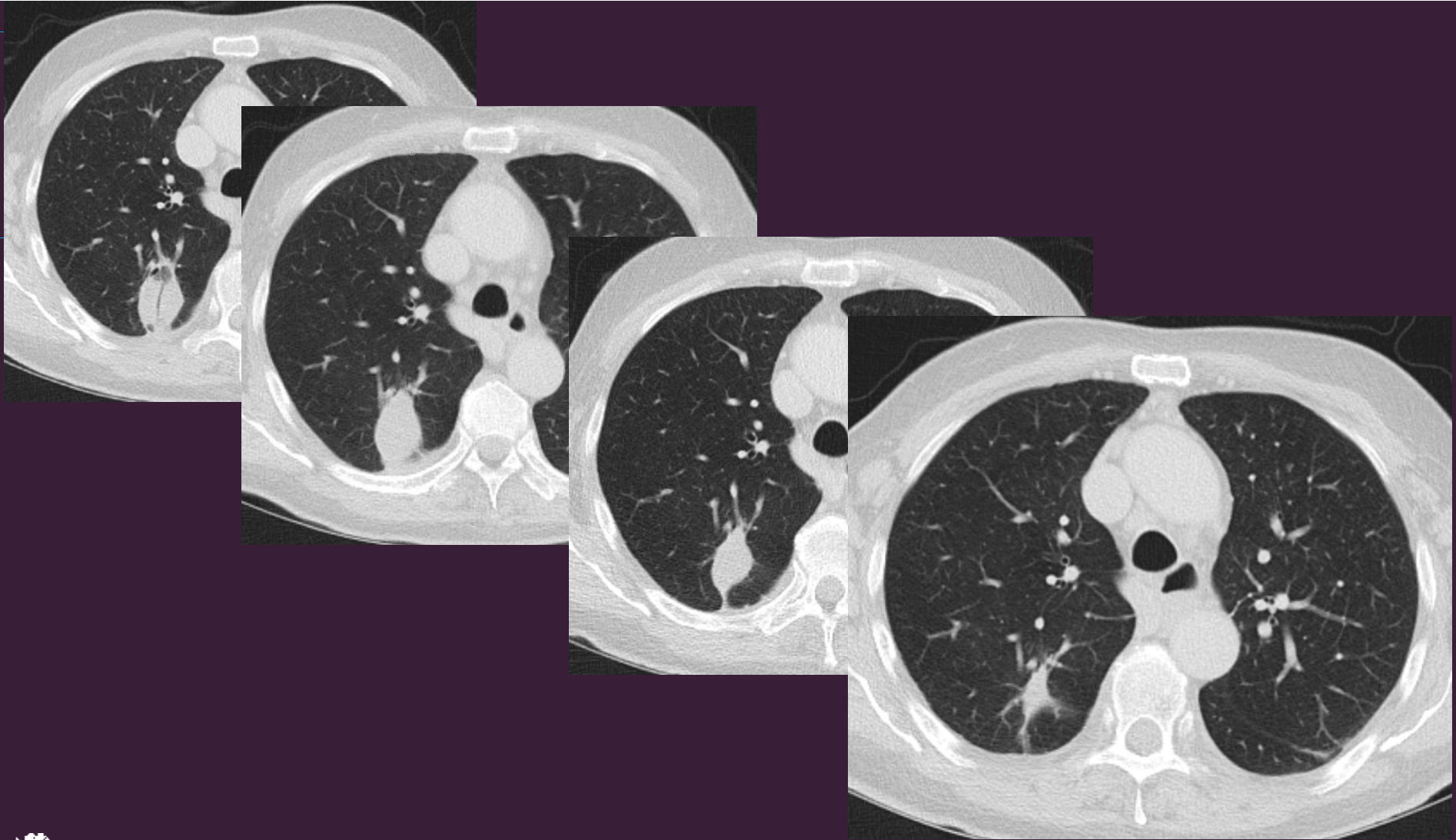


## **Radiofrequency ablation is a valid treatment option for lung metastases: experience in 566 patients with 1037 metastases**

- Sarcoma patients at 5years
- Local control 91.4%
- OS 41.5%
- PFS 15%
- SMALL LESIONS MAJORITY less than 3cm





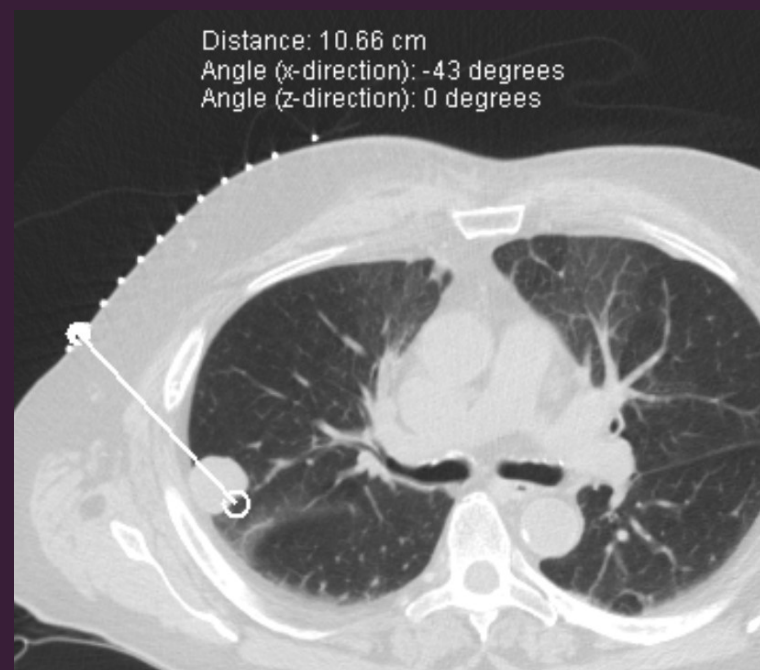
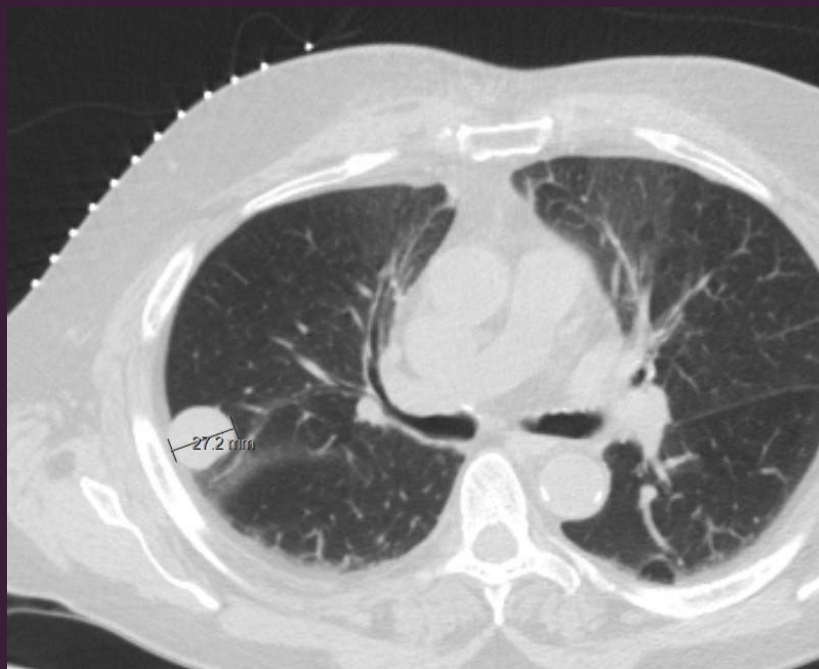


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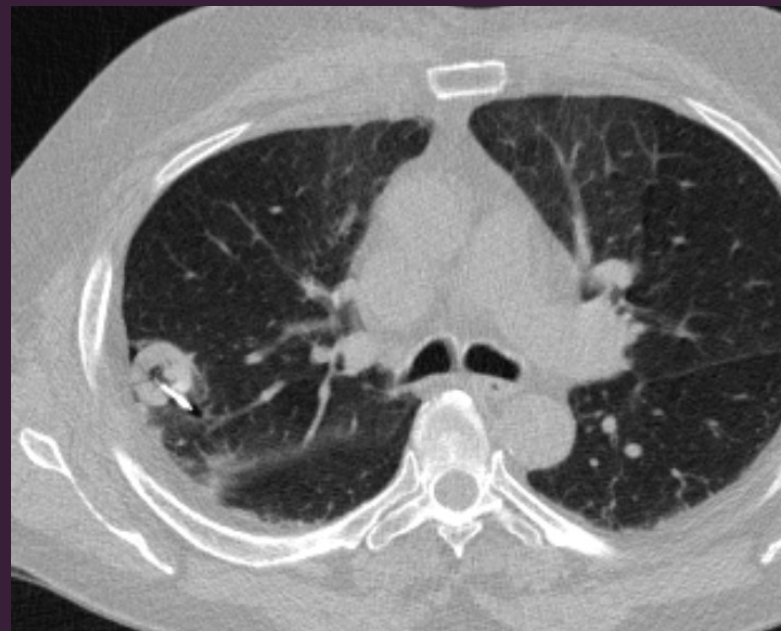
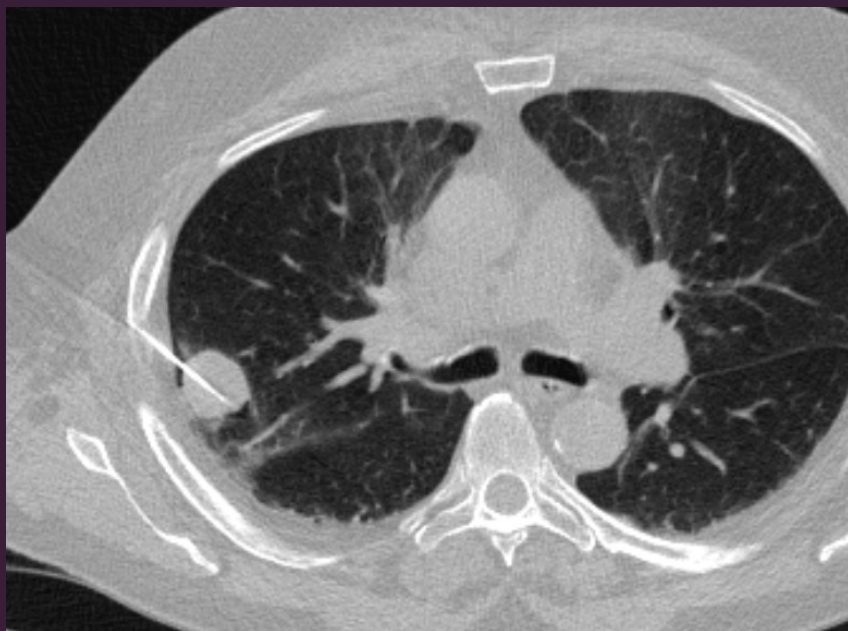
## MWA Lung Ablation Advantages over RFA

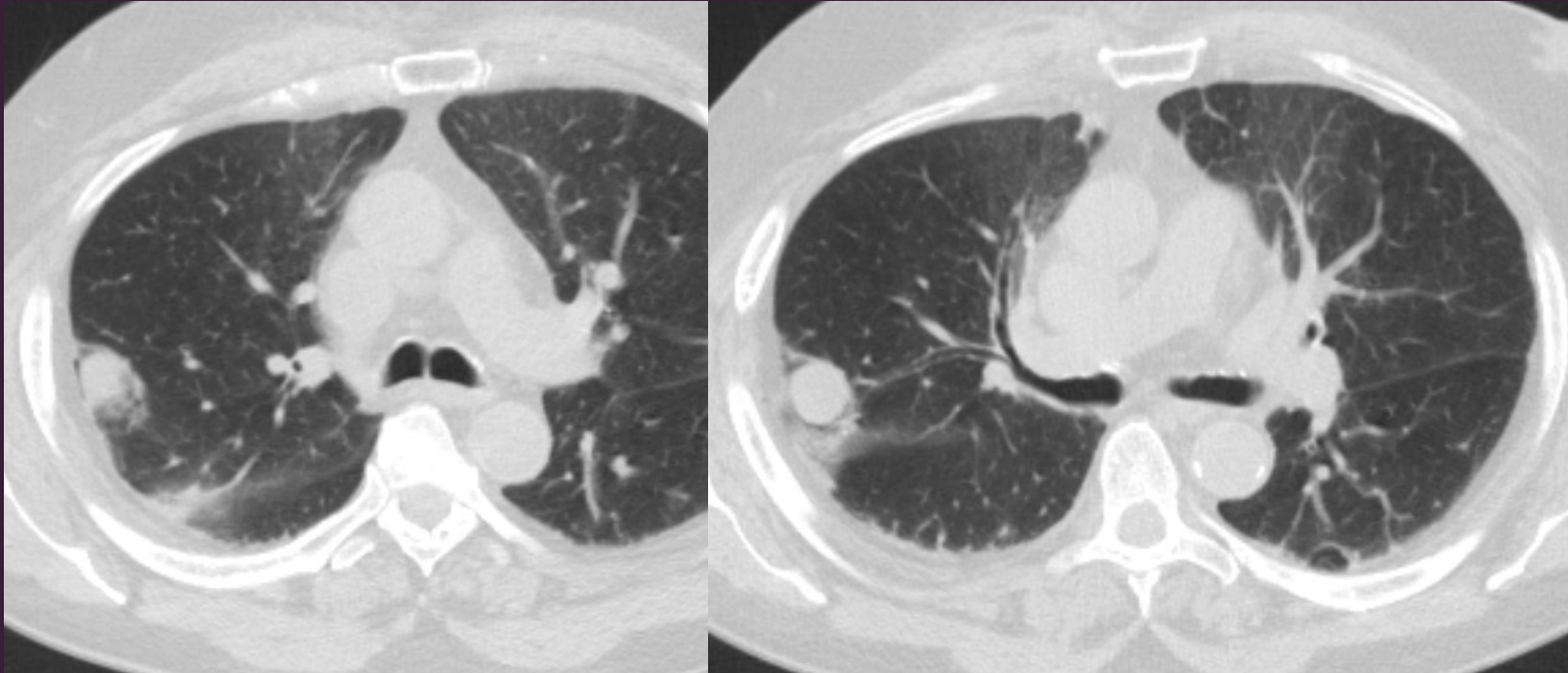
- Not affected by impedance of surrounding tissues (especially important in the lungs due to the high impedance and insulation caused by the air)
- Ablation can be carried out at higher temperatures
- Less affected by heat sink effect
- Larger ablation zones
- Faster
- Multiprobe placement larger more spherical lesions.

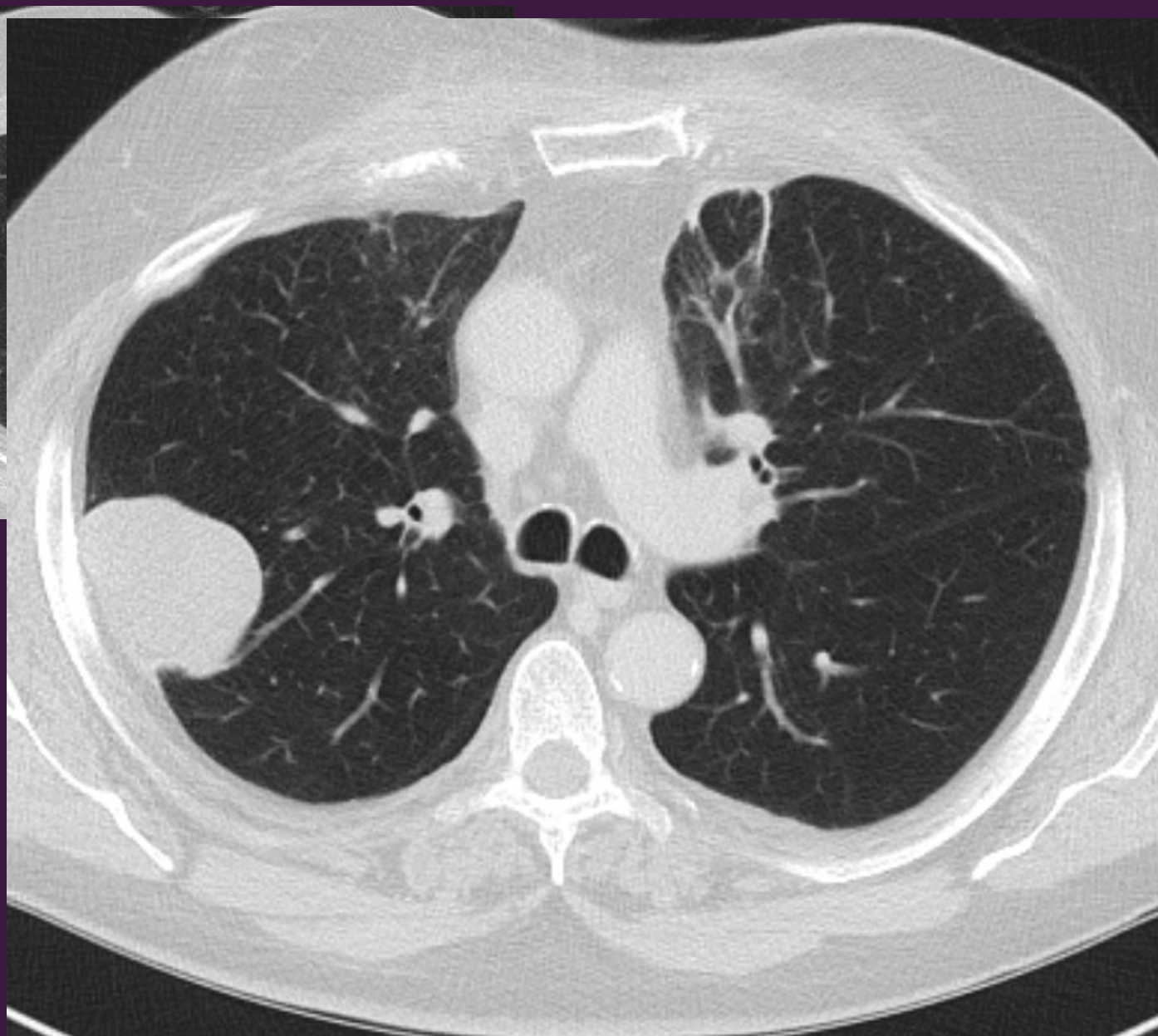
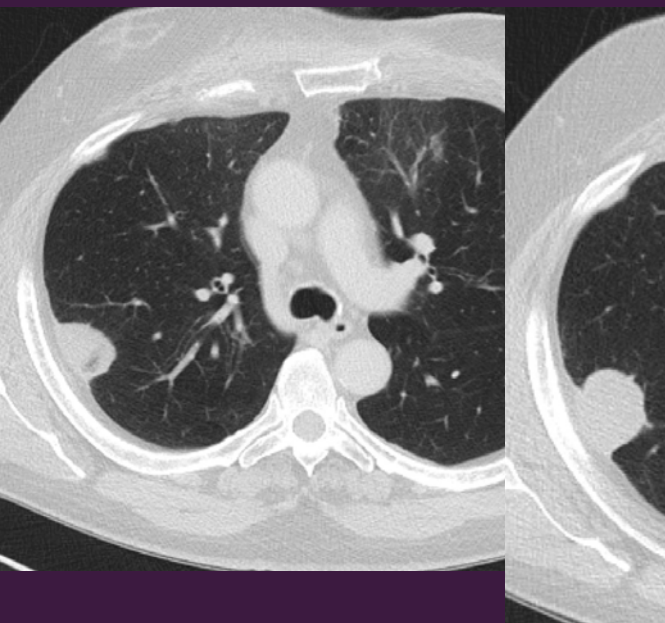




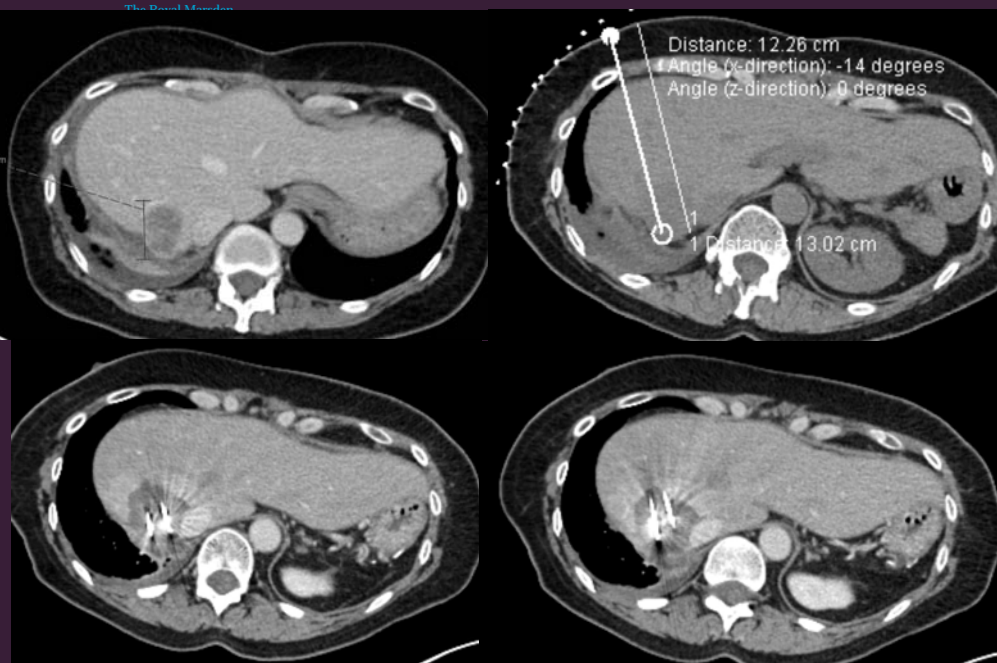




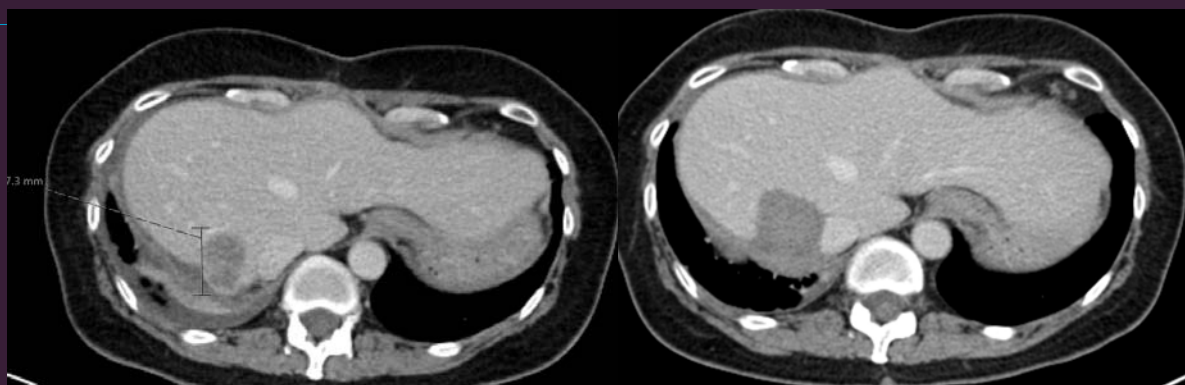




The Dandel Metastasis



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*IRE (Nanoknife) lesions close to bile ducts and main vessels*

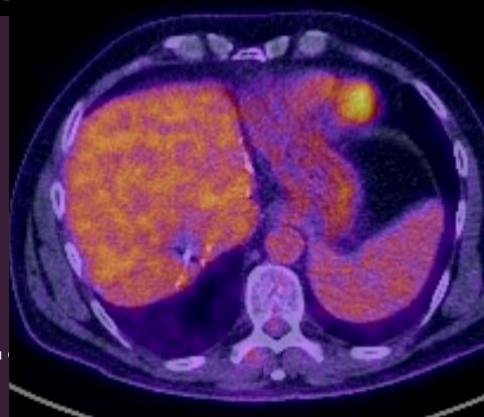
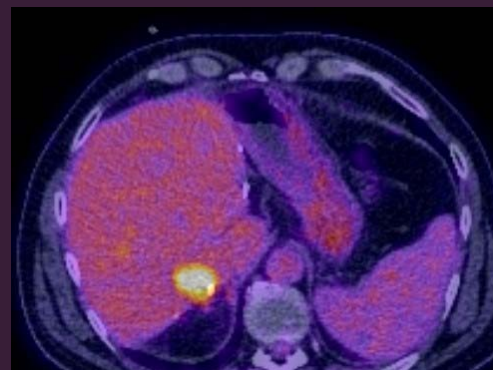
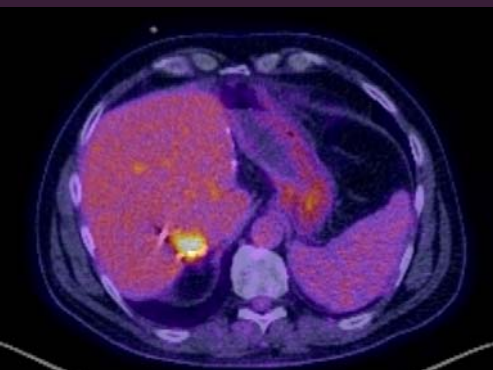


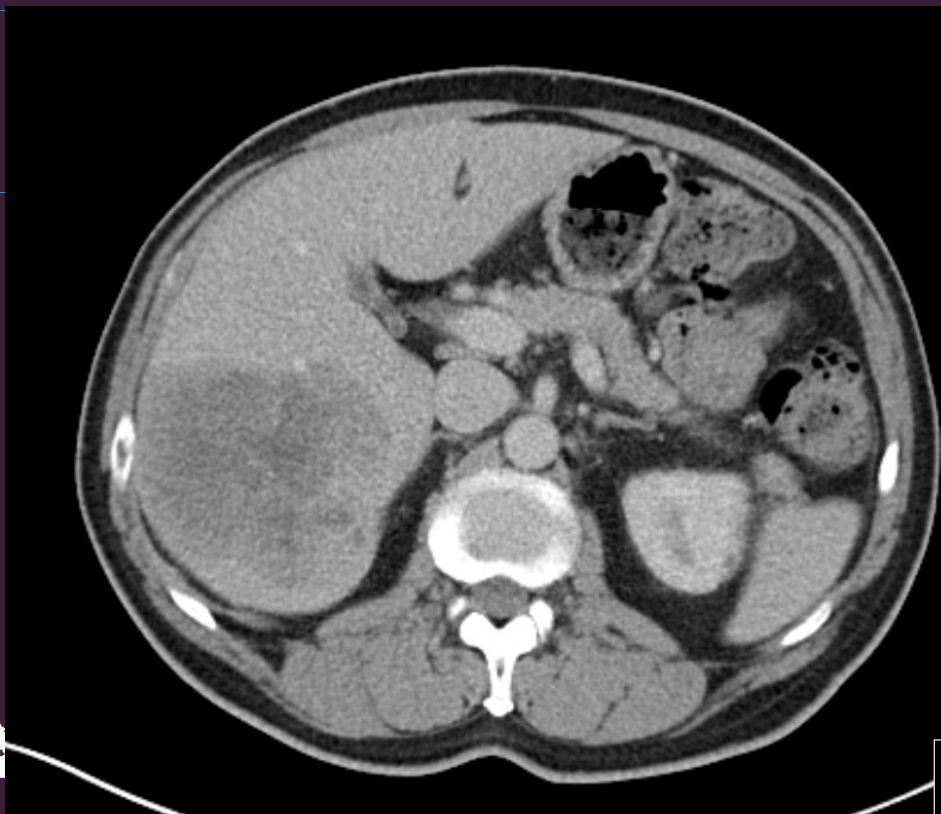


The Royal Marsden



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- Mar 2014 lump right calf
  - Oct 2014 lump increase in size
  - Nov 2014 MRI and resection
- Solitary Fibrous Tumor  
CT multiple liver metastases
- Feb-Sep 2015 Pazopanib  
EMPRASS trial





## CONCLUSIONS

- CT main form of follow up imaging
- MRI added value liver, MSK and Neuro system
- PET/CT added value, elective use
- R0 Surgery of all oligometastatic disease achieve best results
- RFA/MWA ablation achieve good local control to low volume disease
- SBRT/IRE added value
- Combined Local treatments with SACT.
- Multi-disciplinary Approach to Specialise tertiary Sarcoma Centres







THANK YOU FOR YOUR ATTENTION  
Q & A /DISCUSSION

