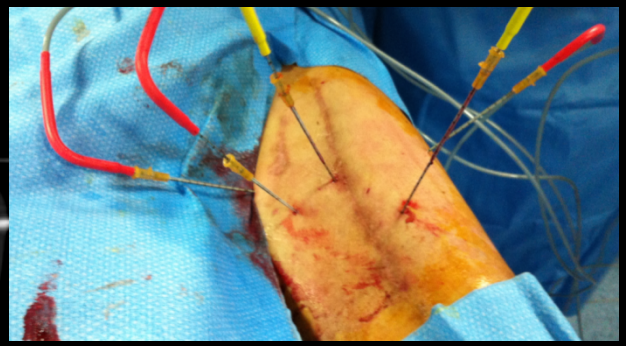
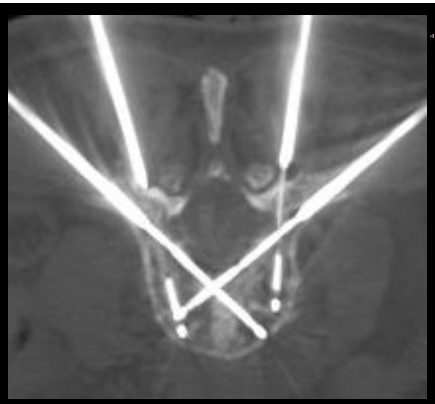
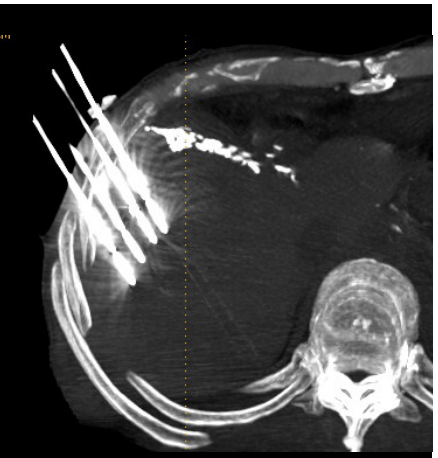
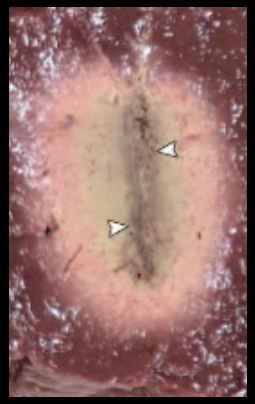
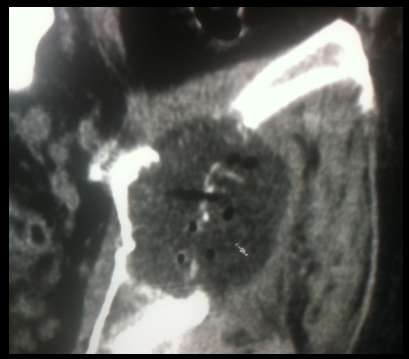
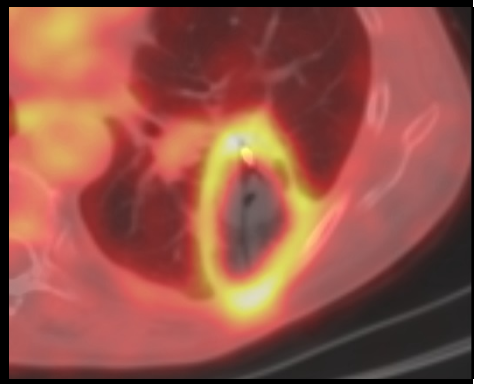




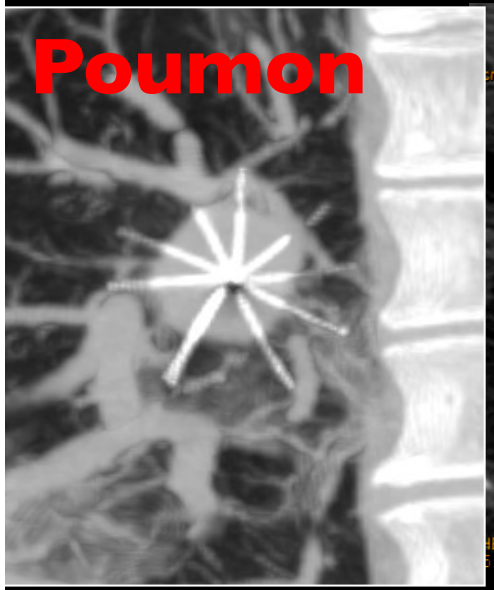
Principes des Ablations percutanées en cancérologie

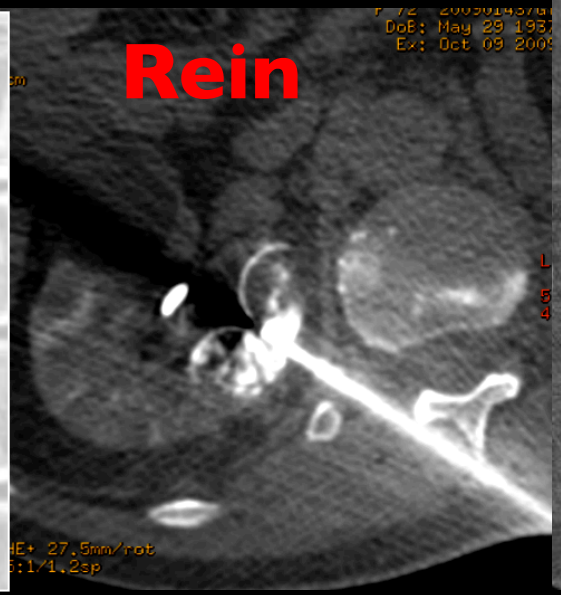




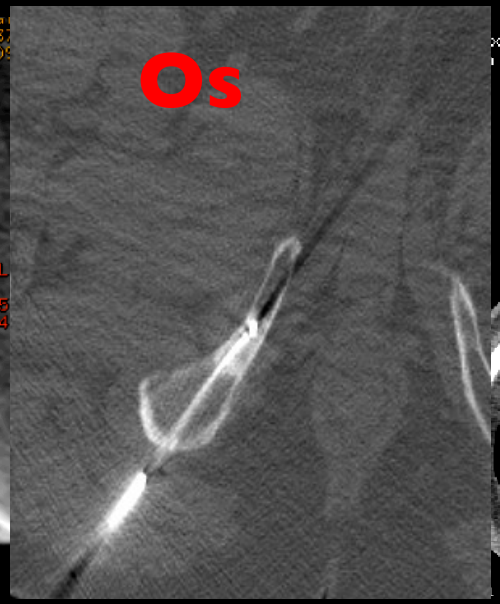
Charles Mastier- Radiologie Interventionnelle

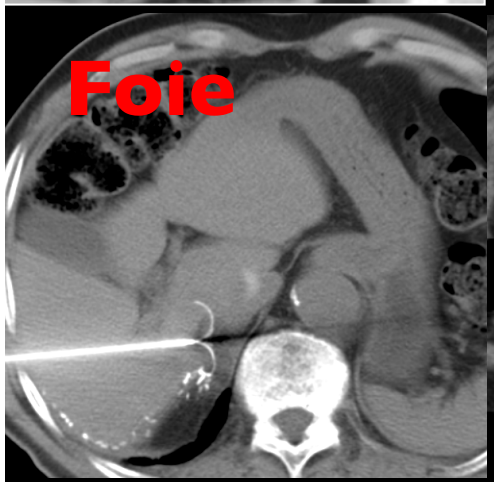
CENTRE DE LUTTE CONTRE LE CANCER LEON BERARD

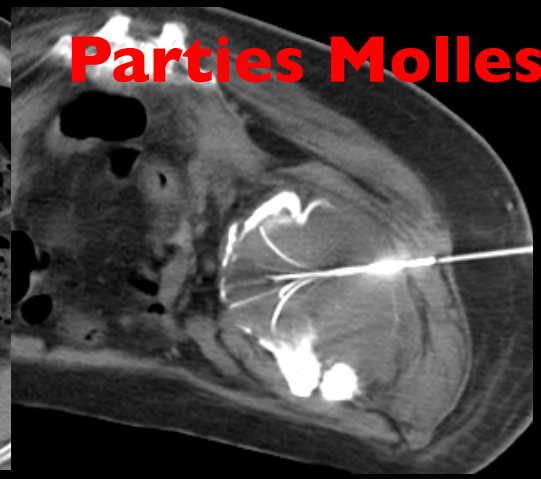
Cancer?







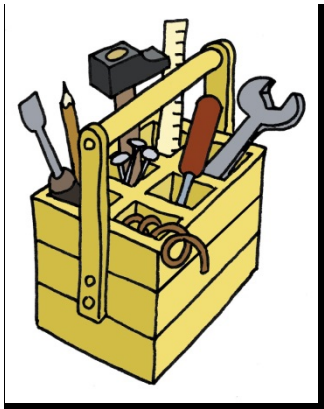




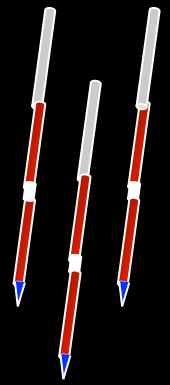
Ganglion Pancréas

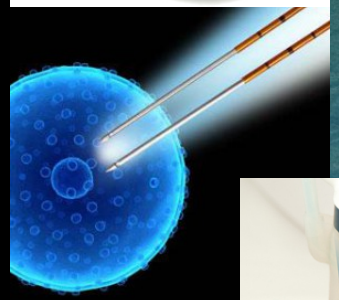
Prostate Sein

...



Ablation percutanée

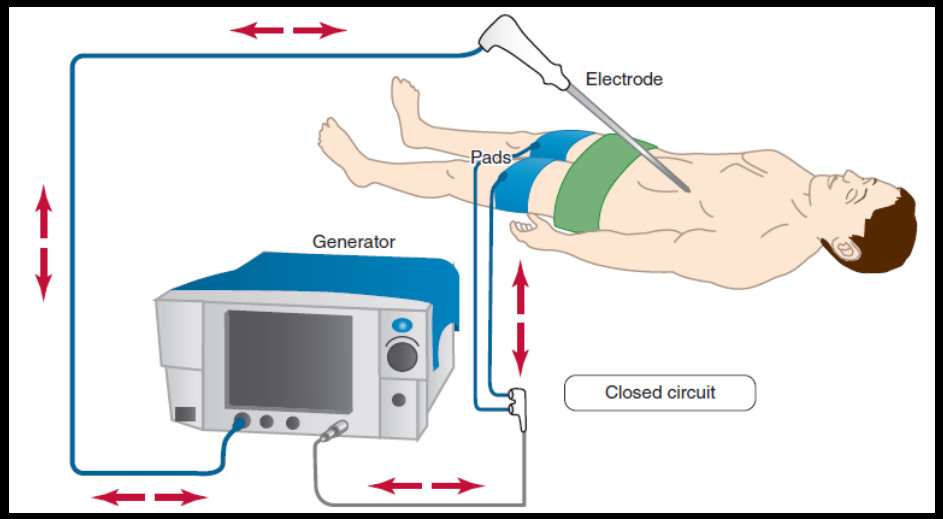


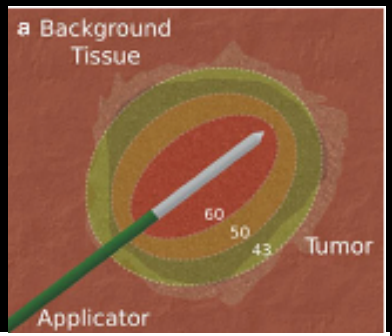


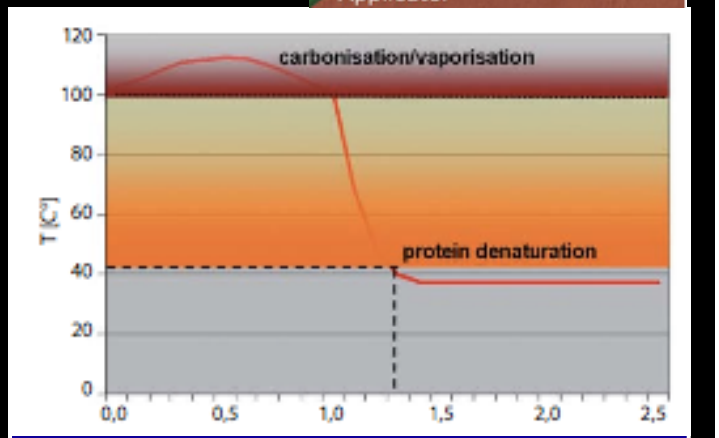
- Radiofréquence Mono / Multipolaire
- Micro-ondes
- Cryo-ablation
- Electroporation Irreversible
- HIFU (High Intensy Focused Ultrasound)
- Traitements combinés

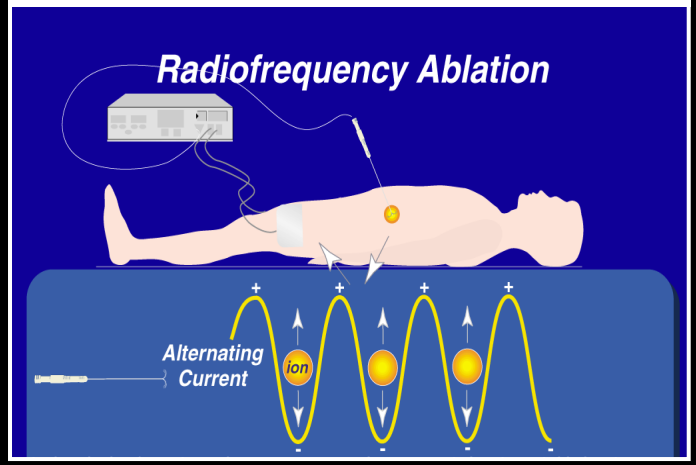
Radiofréquence

Aiguille = électrode
Courant sinusoïdal (500hz)
T> 60°C = mort cellulaire



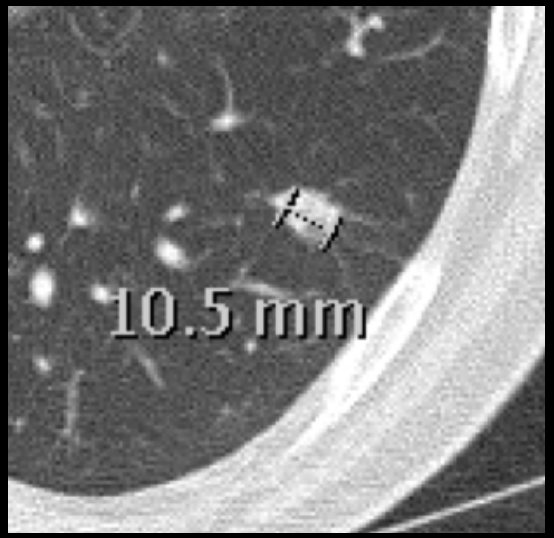


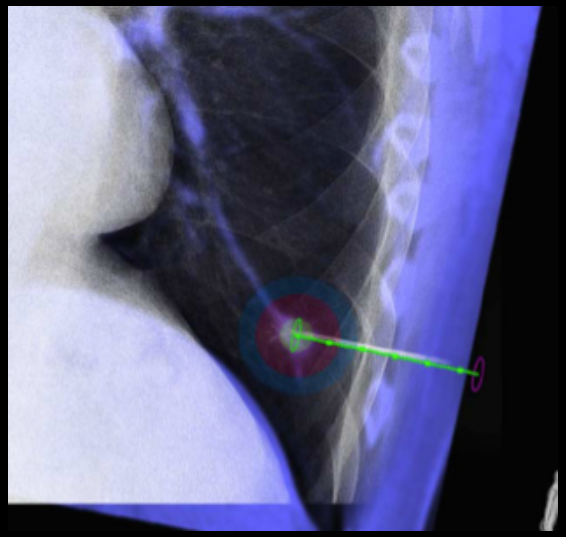


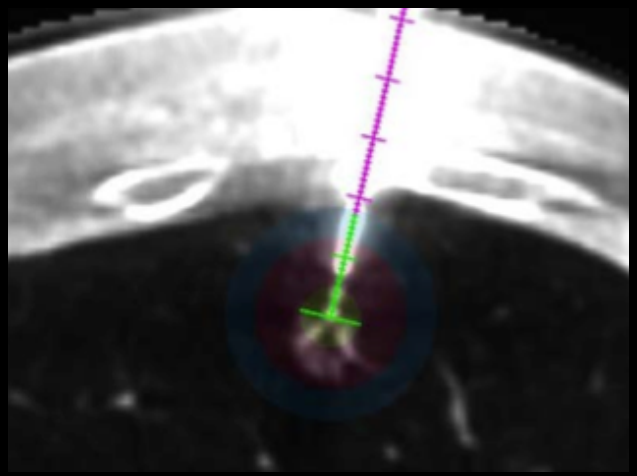


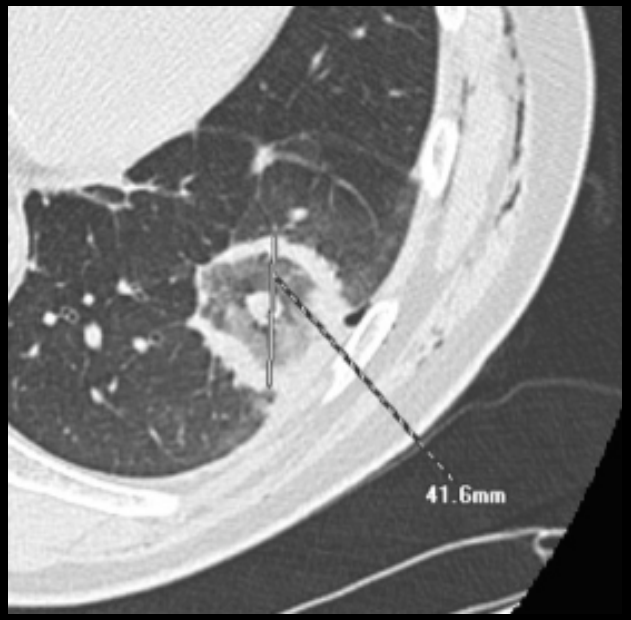
T = 1/r4
T≥60°sur 2,4 cm max

Radiofréquence

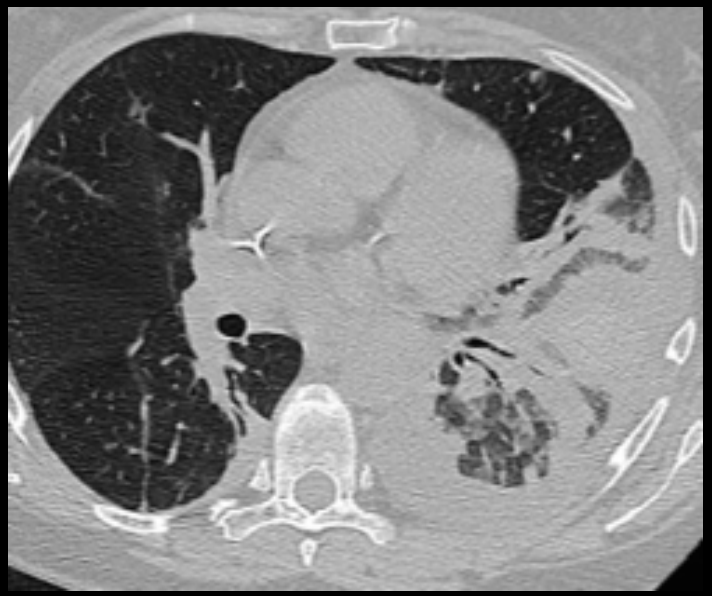




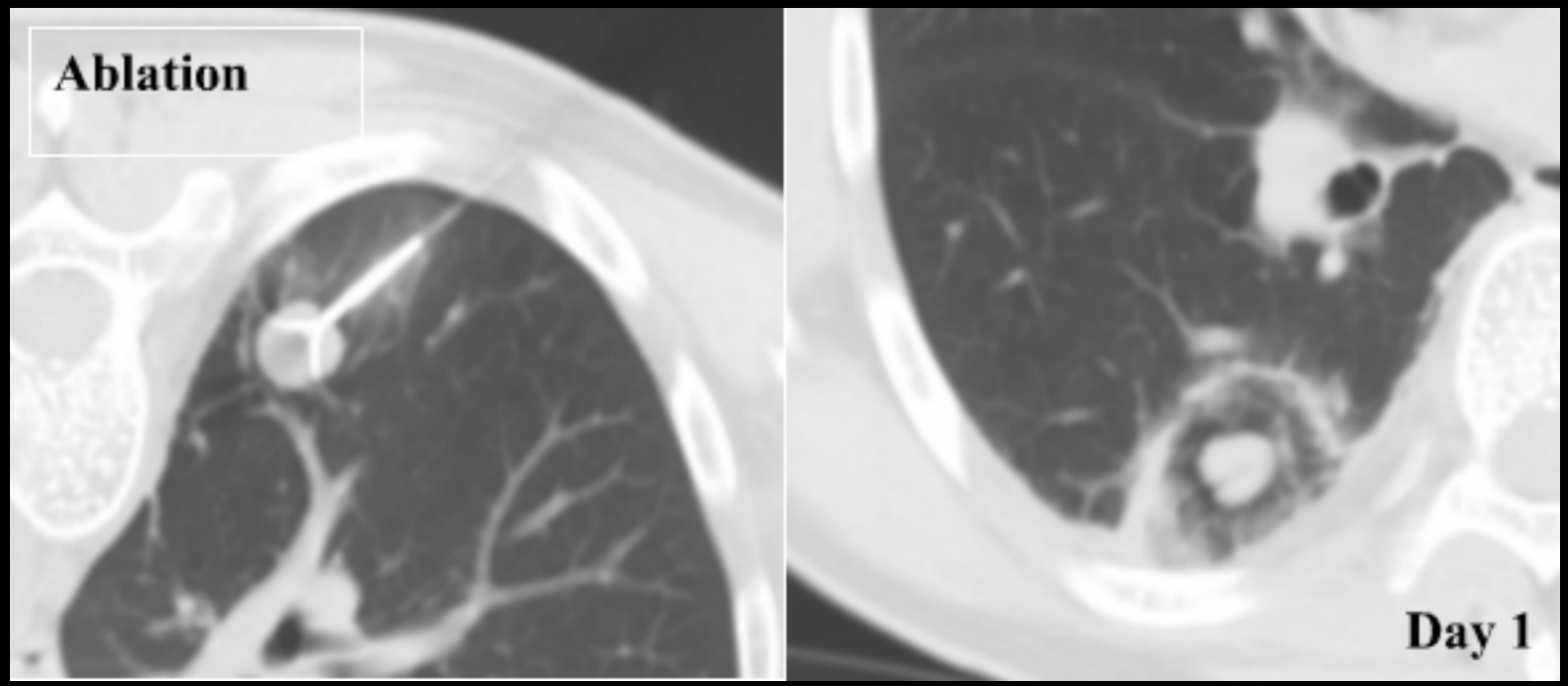




Radiofréquence



LES MARGES!!!



Volume ablation / Volume tumeur ++++

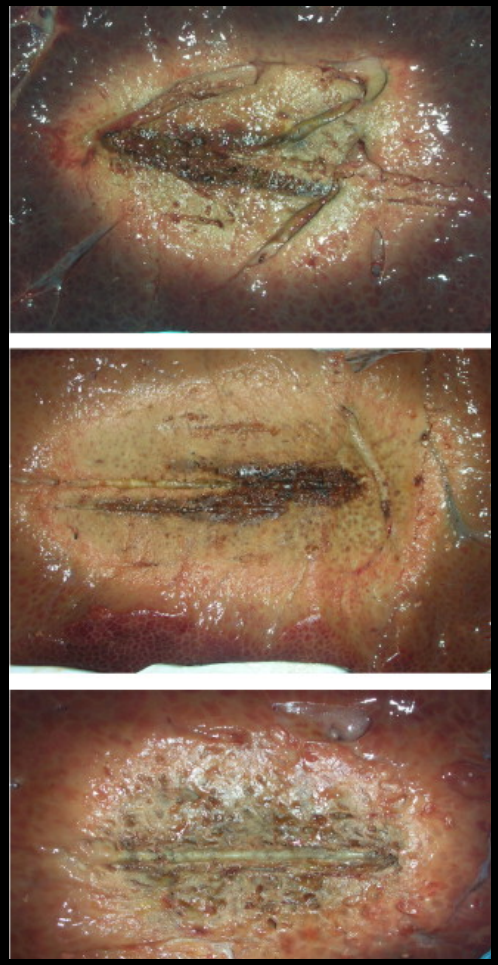
Si ≤ 4 = 19 % récidive

Si ≥ 4 = 4% !

De Baere Radiology 2006

BUT = AMELIORER SES MARGES ABLATIONS

- Taille de la (les?) lésion ?
- Taille + forme efficace d'ablation?
- Pas de voisin gênant
- Ciblage précis per op



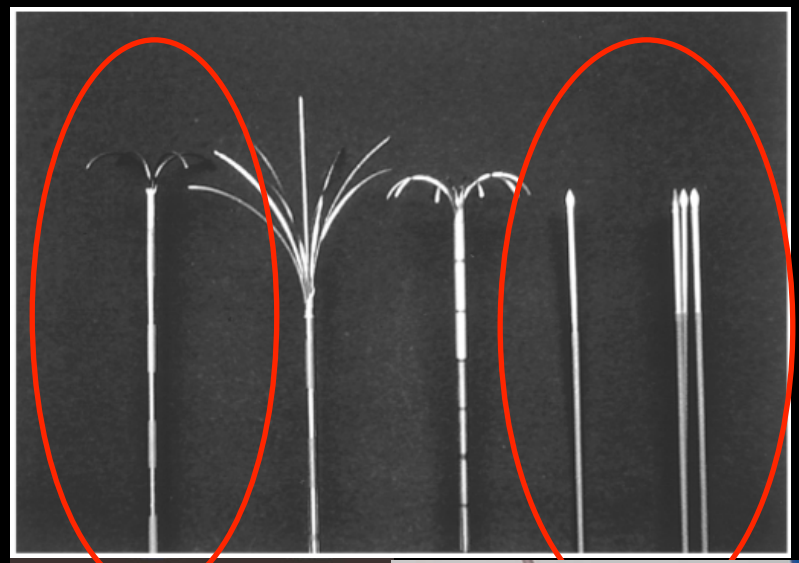
RESIDU = RECIDIVE

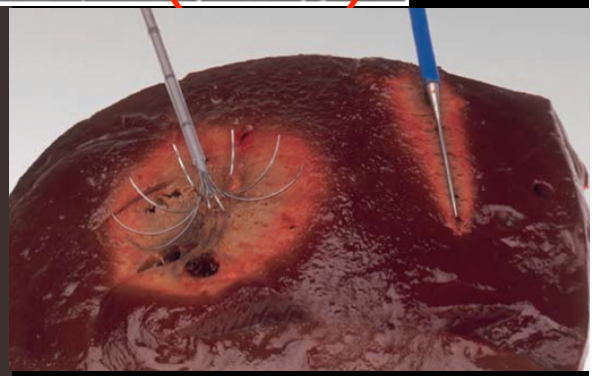
Taille d'ablation: améliorer la RF

= Améliorer conductivité

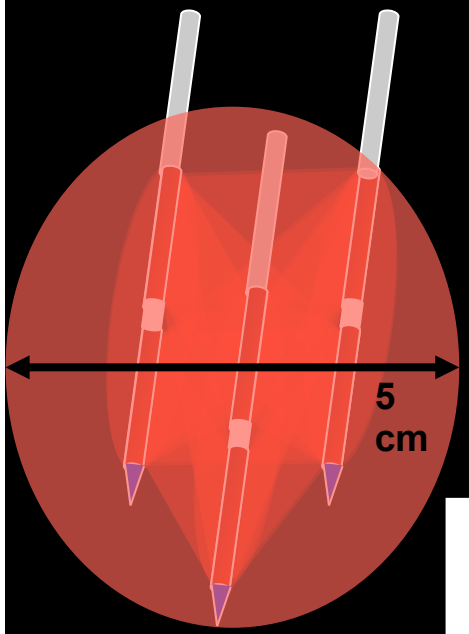
- Design electrode
- Refroidie
- Plusieurs aiguilles
- Pulsé, retour sur impédance..

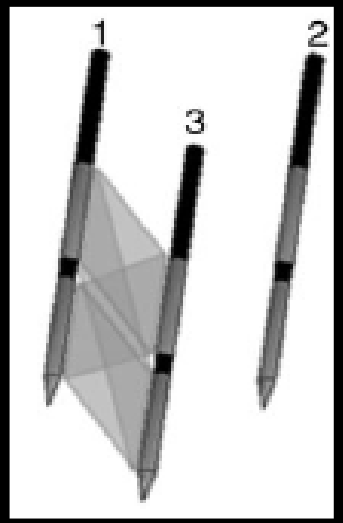
0,5 – 4 cm

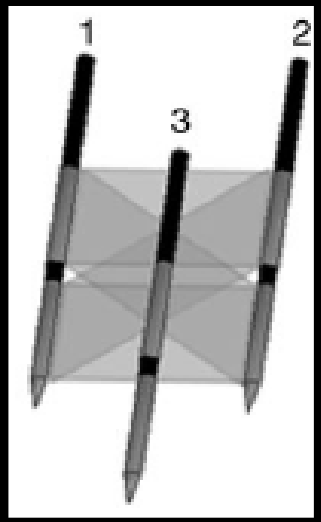


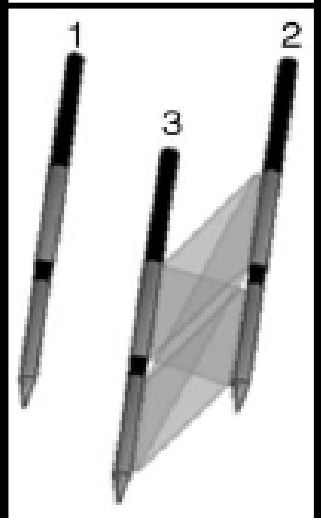


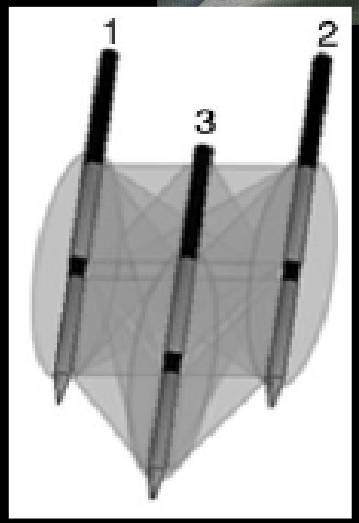
Taille d'ablation: RF multipolaire

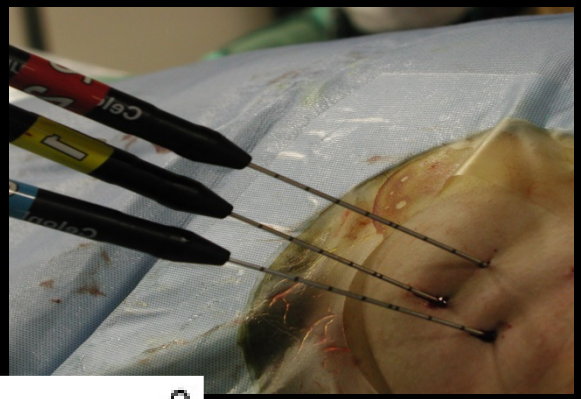






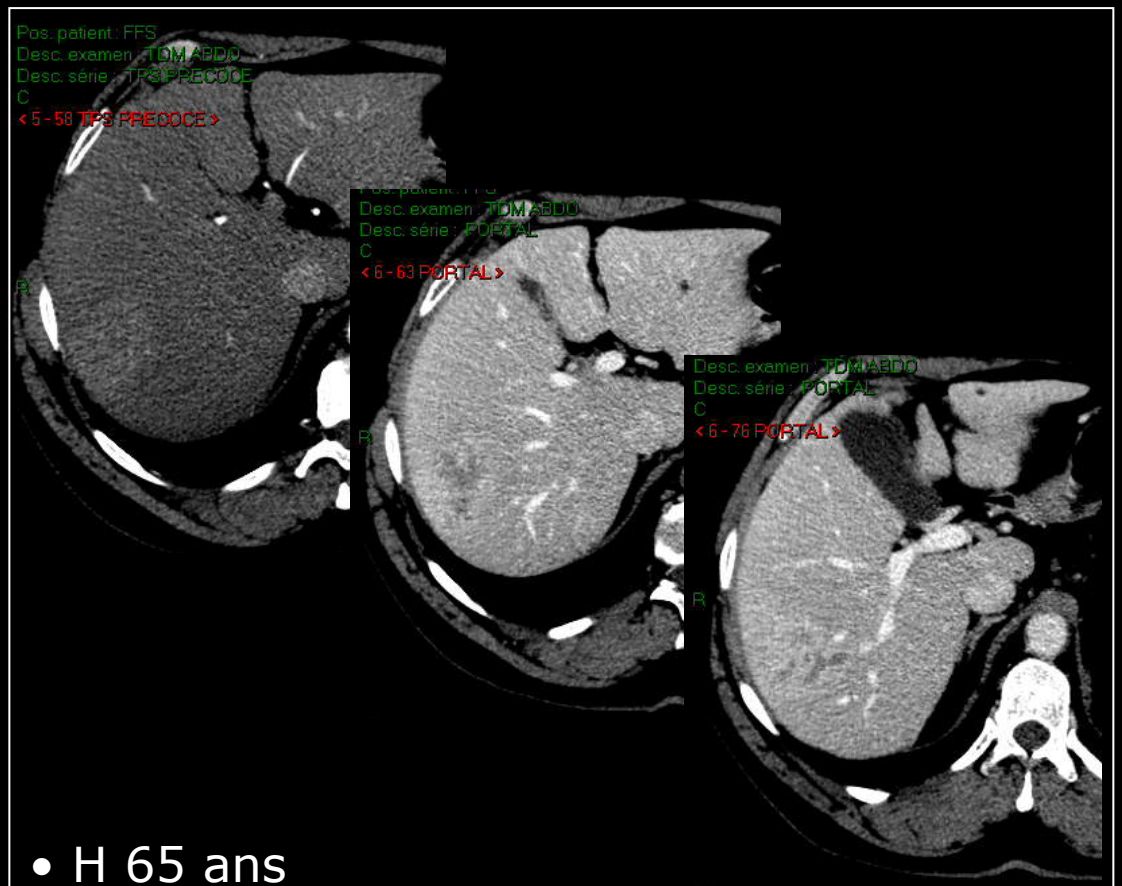




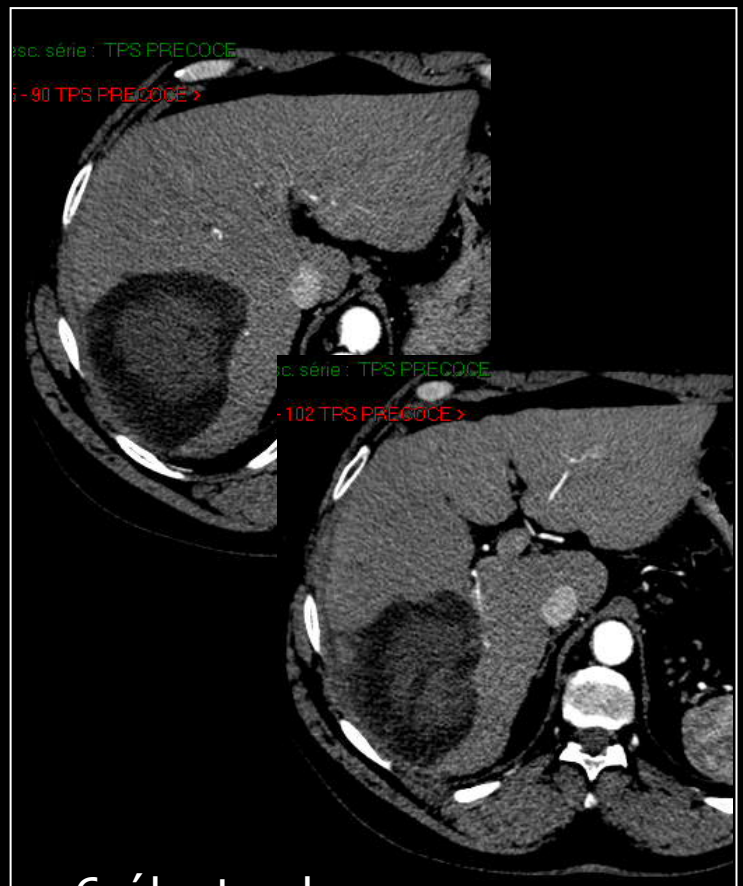


Et dans la vie réelle (O.Serror)…

- Masse infiltrante avec thrombose portale sous segmentaire

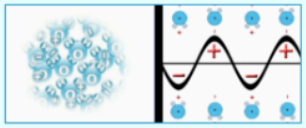


- H 65 ans
- Cirrhose VHC Child-Pugh A
- Infiltration V/VI de 7 cm + thr. porte VI



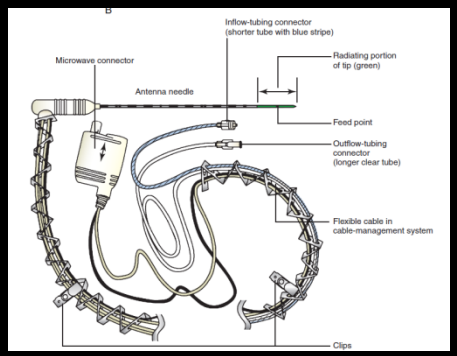
- 6 électrodes
- 220 kj
- 33’ d’application

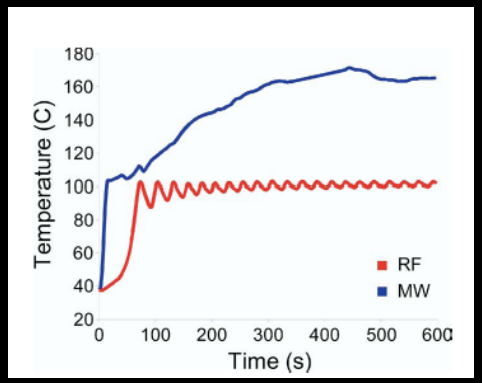
Taille d'ablation: Micro ondes

	MO	RF
Fréquence (MHz)	915-2450	0,2-3
Onde	électromagnétique	électrique
Physique	Chaleur par friction ionique Agitation molécules d'eau polaires 	Chaleur par friction ionique
Température (°c)	160-180	90-100
Convection	Peu sensible	Très sensible

	Volume d'ablation	Longueur zone d'ablation
RF	6 +/-3,2 cm3	3,8 +/- 0,9cm
Micro-onde	**13,9+/-8,2 cm3**	**6,8 +/- 1 cm**

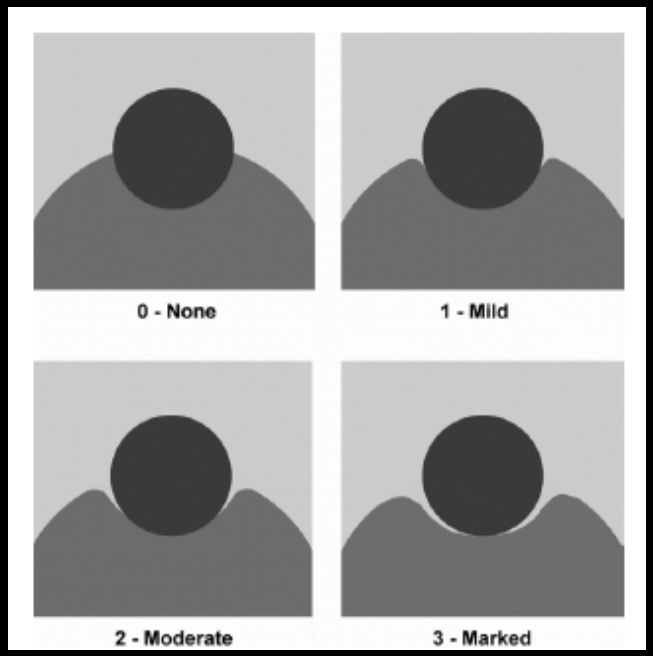
Augmentation volume d'ablation *Wright Radiology 2005*

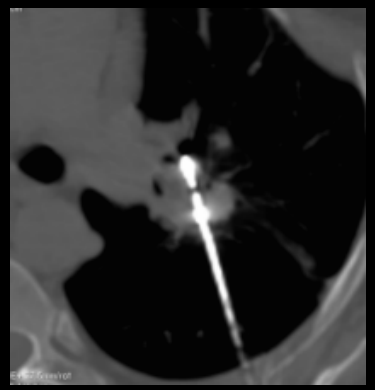


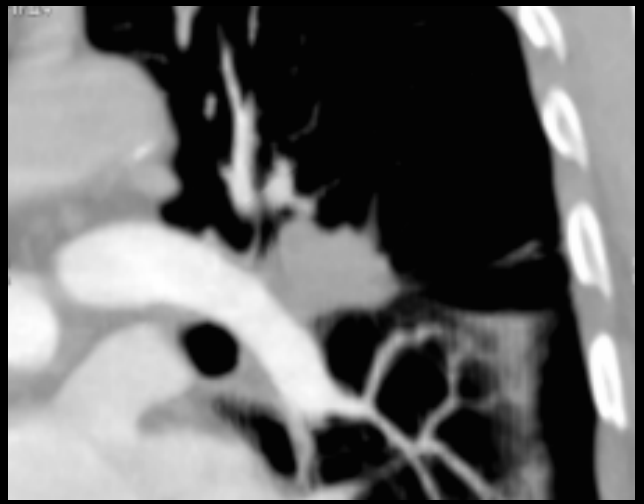


(Brace C, CurrProblDiagnRadiol 2009)

Micro ondes : effet frigo

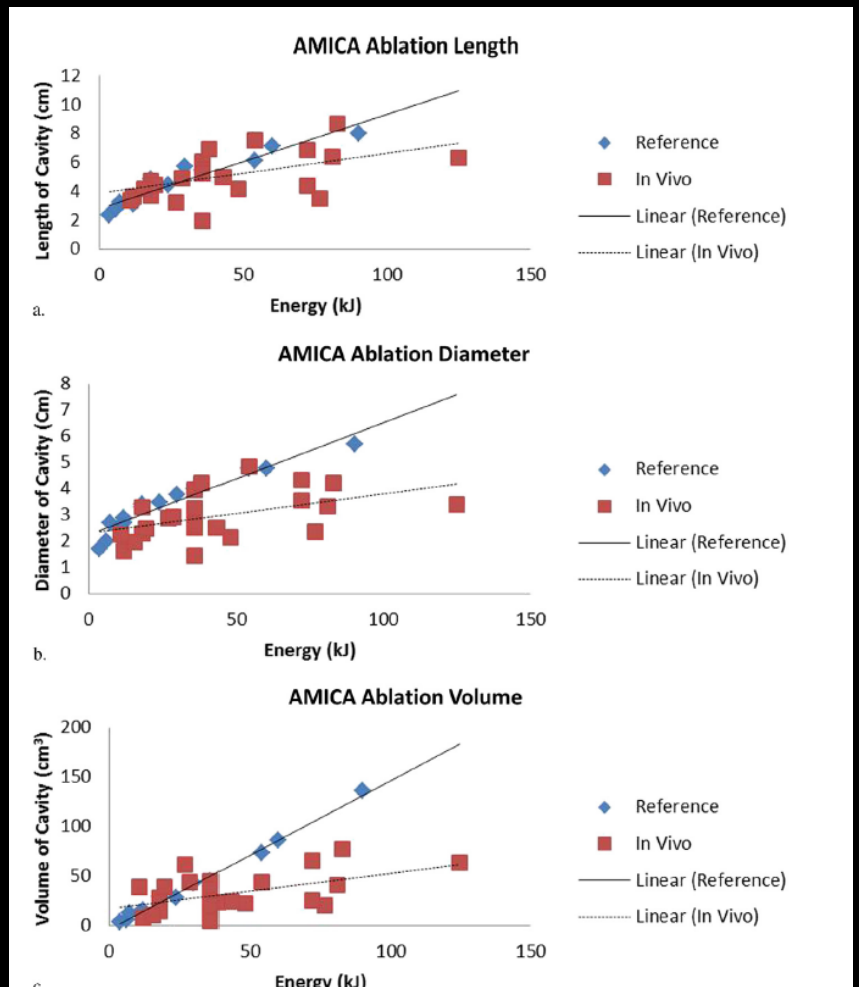






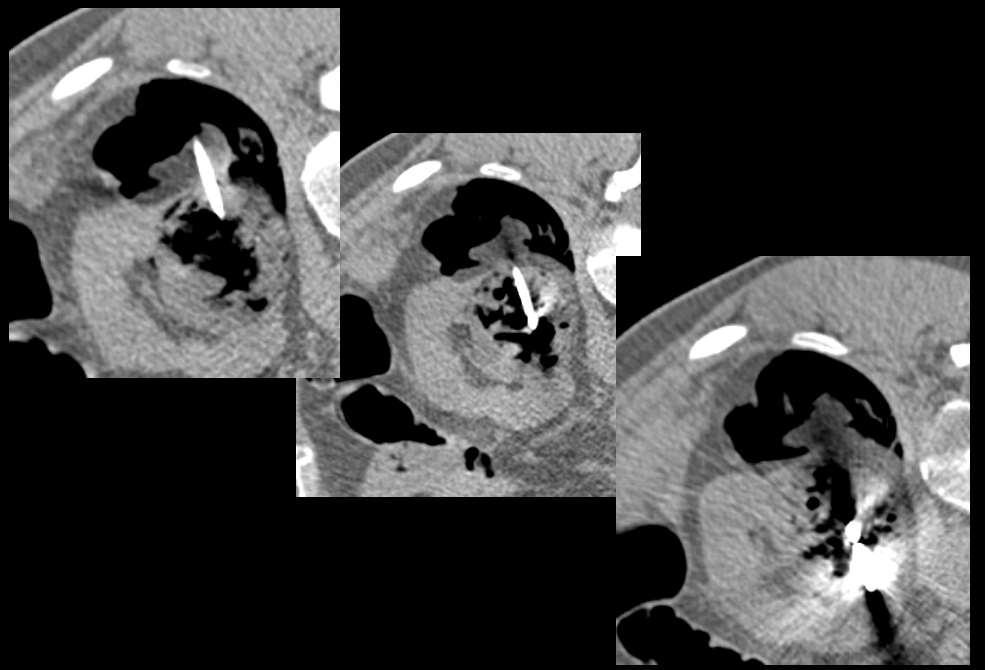
1X antenna: 40W/10 min
1X antenna: 60W/10 min
2X antennas: 60W/10 min

Taille d'ablation ?: Micro ondes

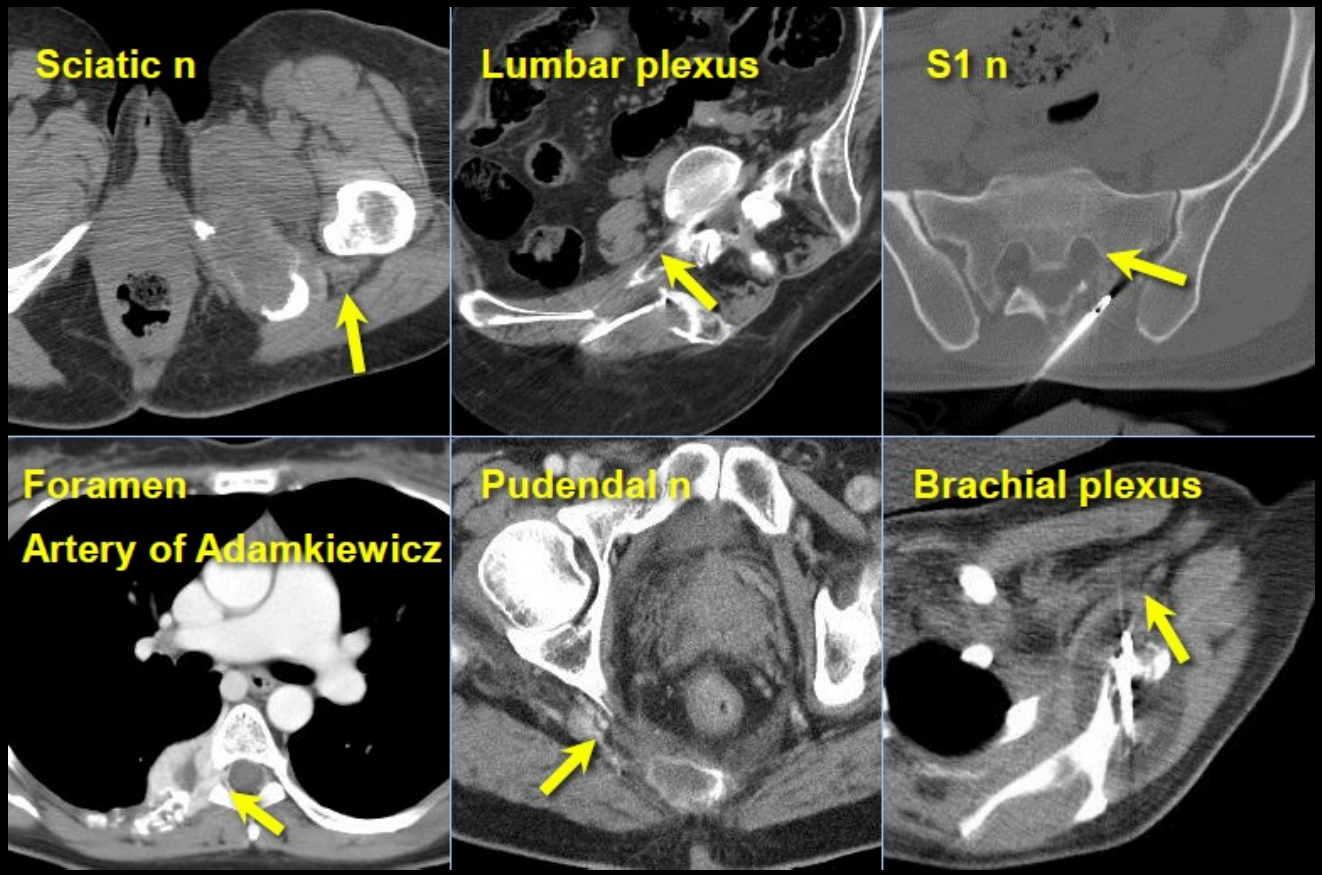


Manufacturer-Published Reference Values for Microwave Ablation

Winokur et al ■ JVIR



Nerf à protéger!



Anticiper +++ 5mm

H2O / CO2

PEM

Thermocouple

SEDATION

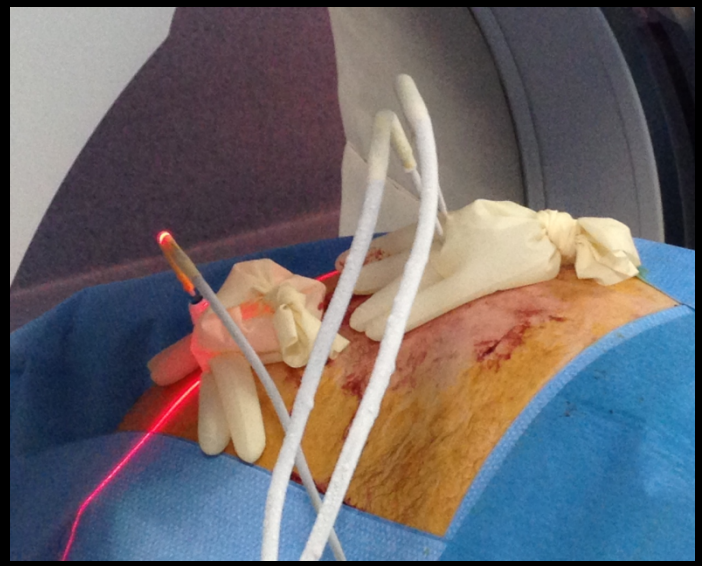
Radiographics. 2013 Jul-Aug;33(4):1195-215. doi: 10.1148/rg.334125141.

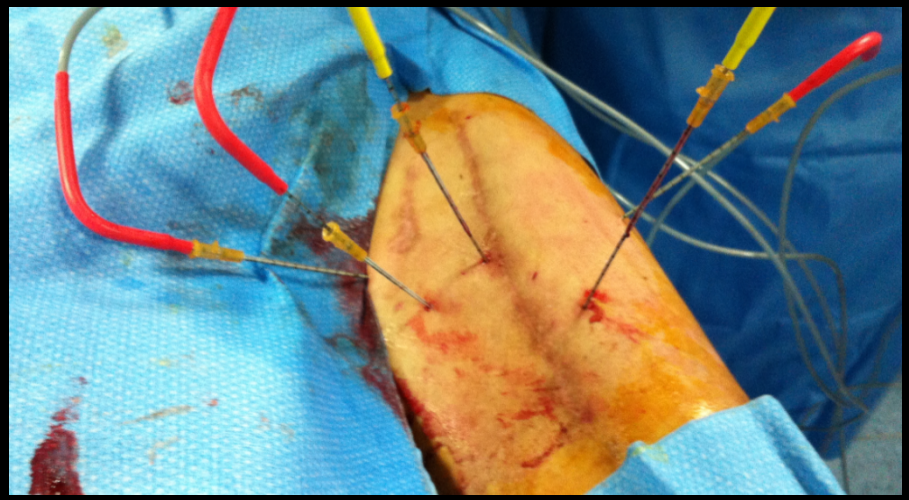
Neuroanatomic considerations in percutaneous tumor ablation.

Kurup AN[1], Morris JM, Schmit GD, Atwell TD, Weisbrod AJ, Murthy NS, Woodrum DA, Callstrom MR.

Cryo-ablation

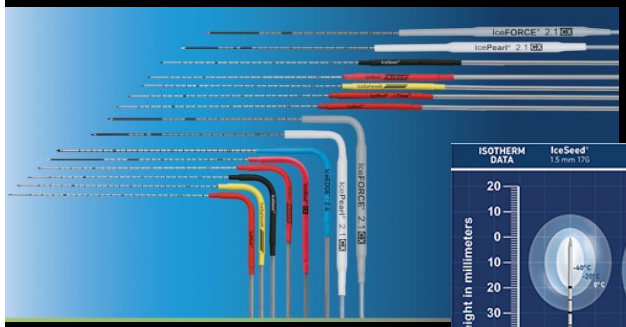
Refroidissement Argon
Réchauffement hélium ou éléctrique

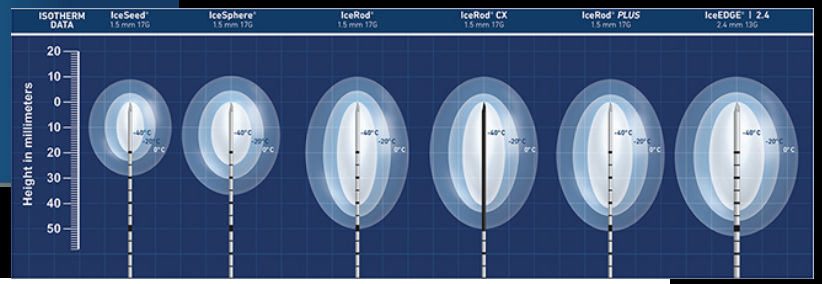


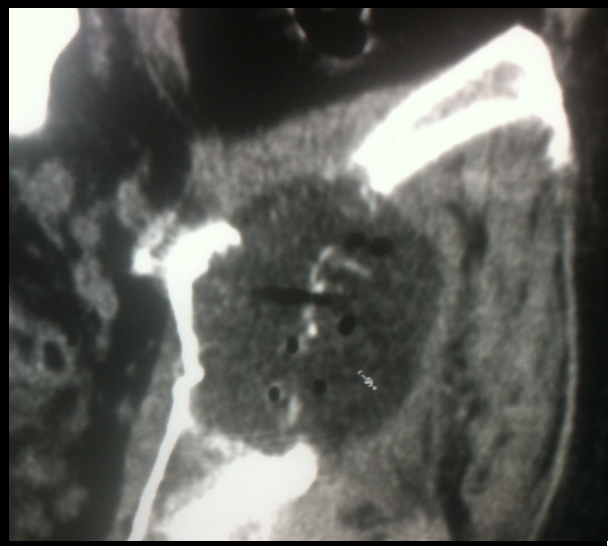


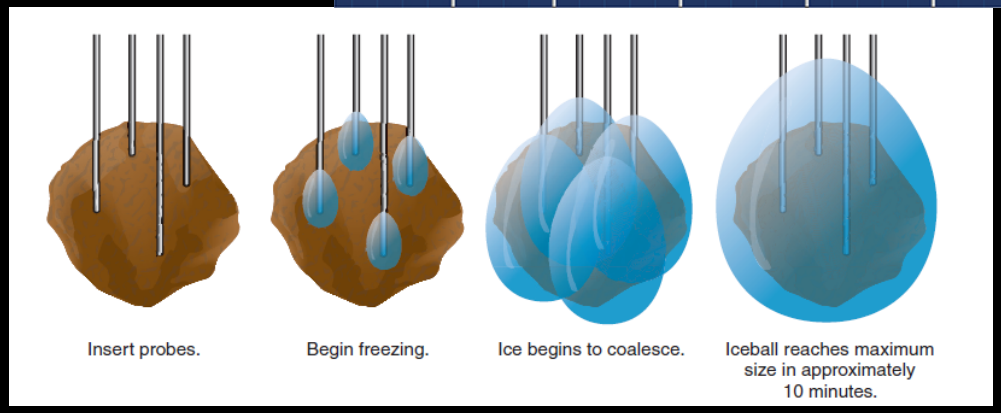
Avantages Cryothérapie

- Visualisation du glaçon en TDM / IRM
- Volume d'ablation ++ synergie (8cm)
- AL ++ + sédation consciente

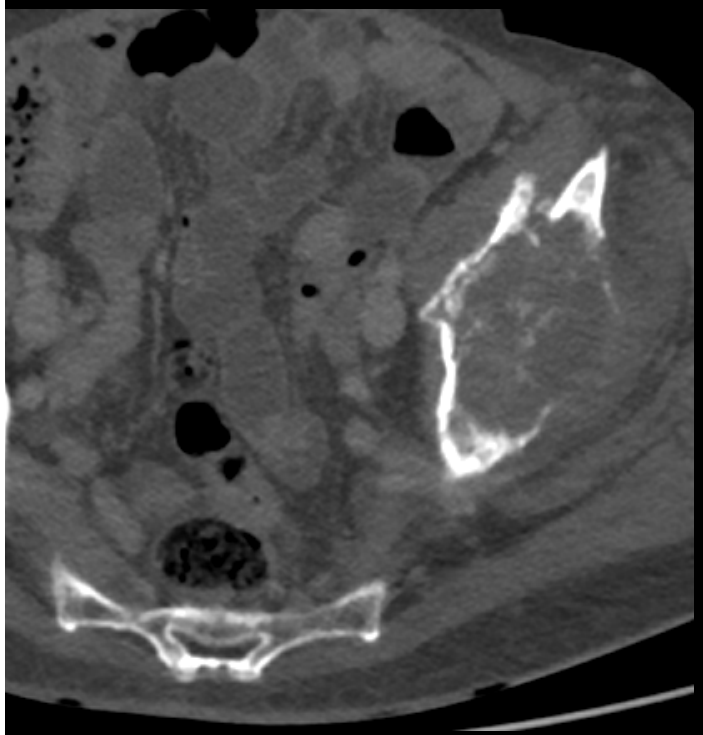


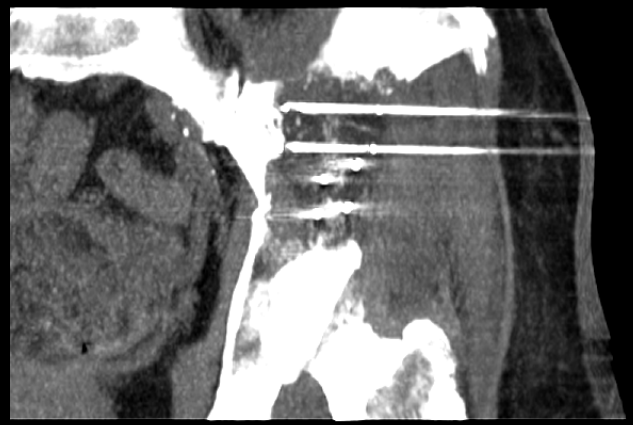


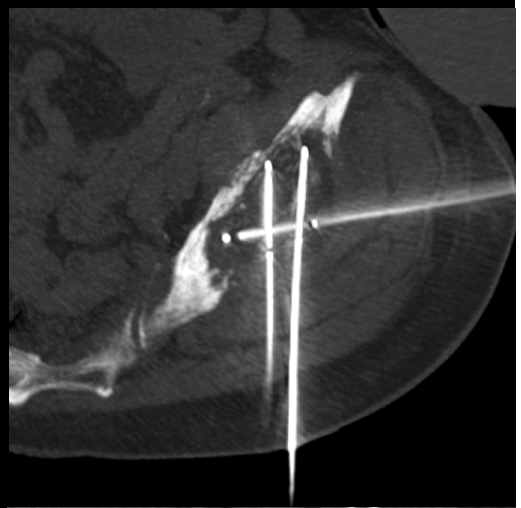


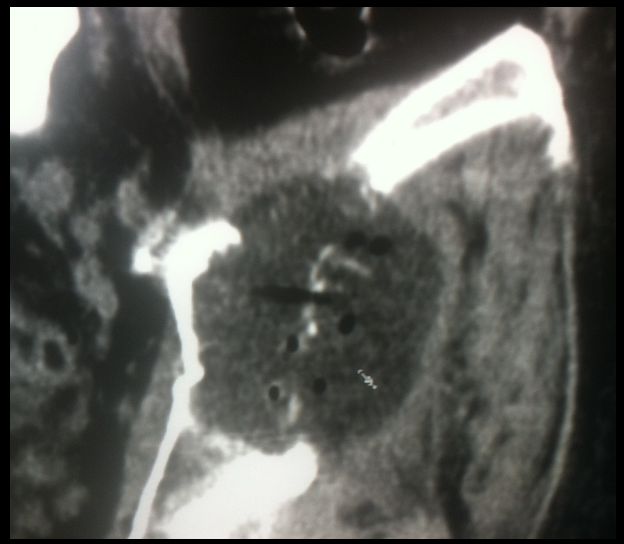


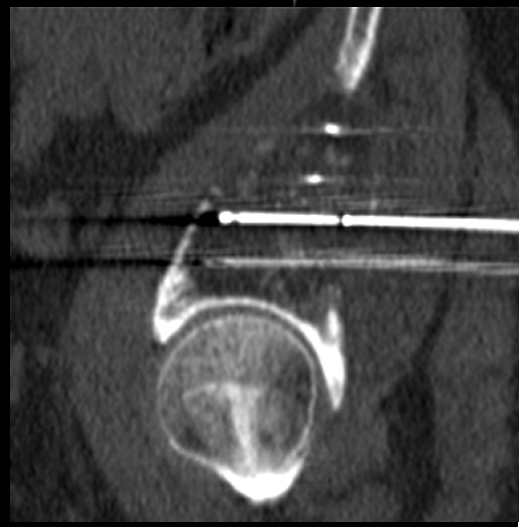
Avantages Cryothérapie











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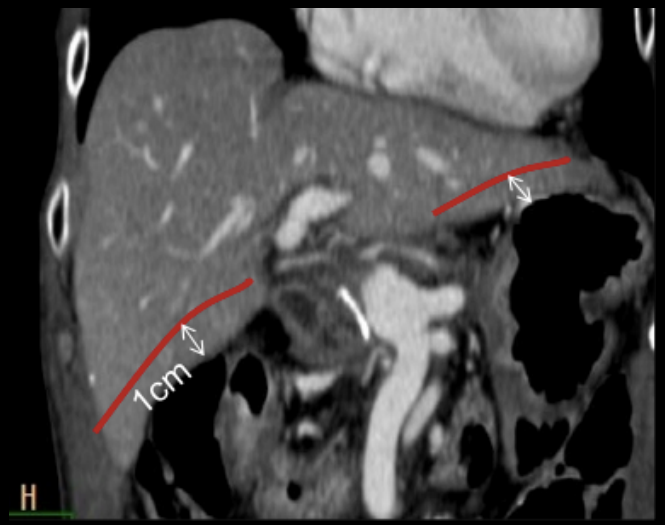

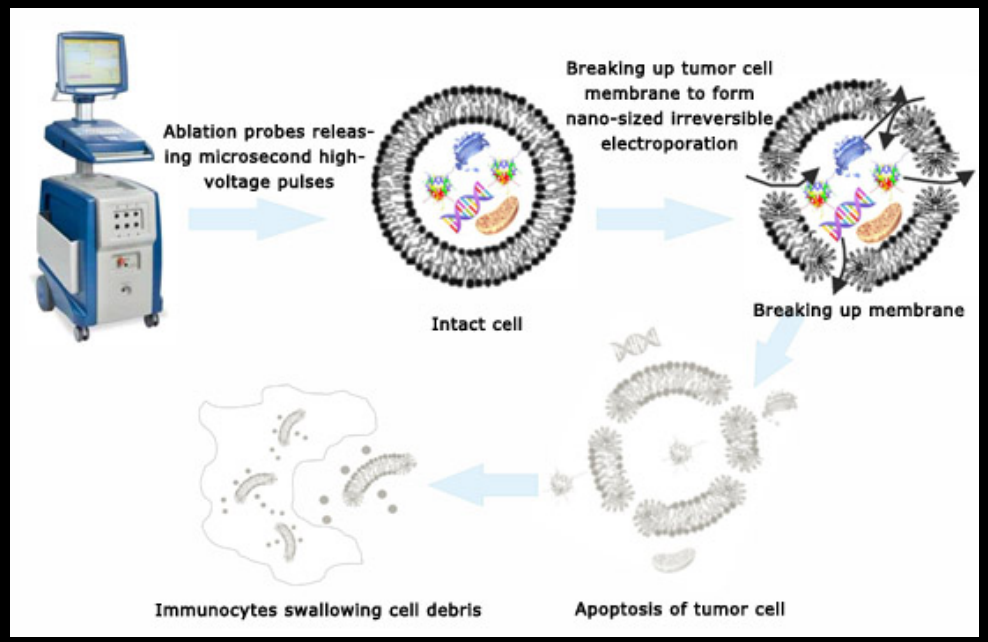

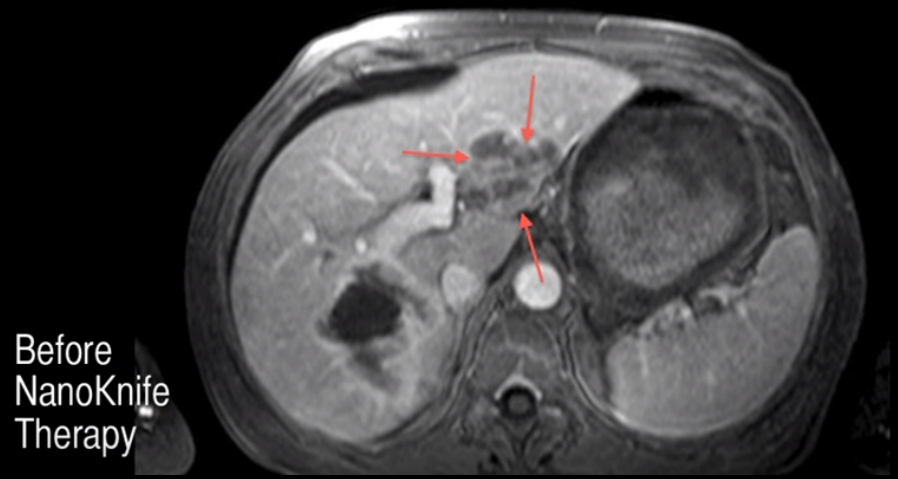

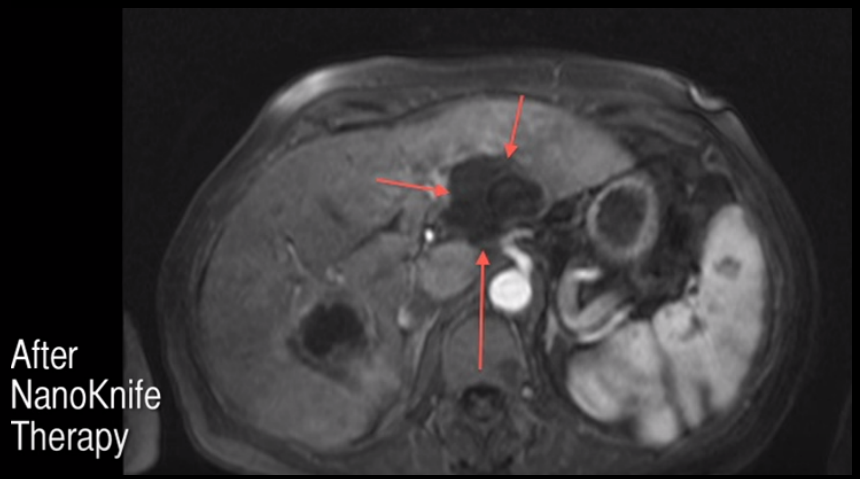

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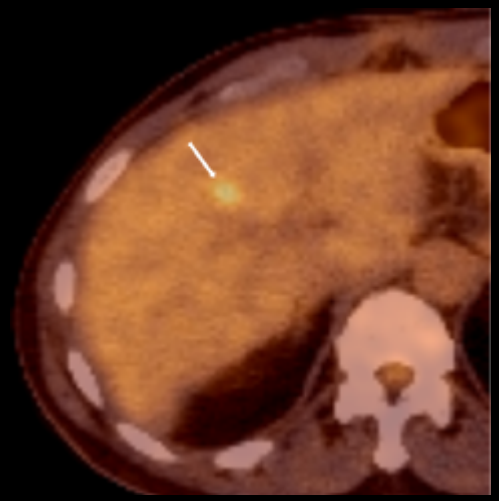

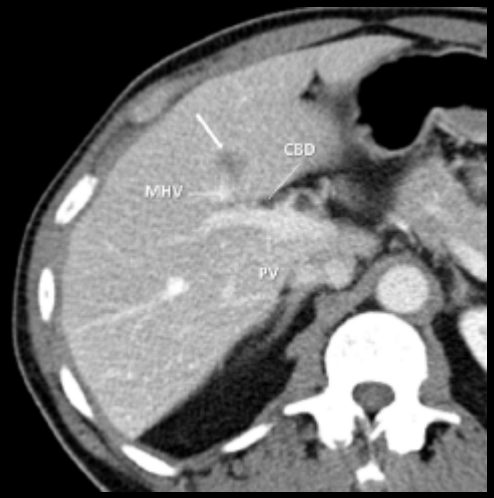

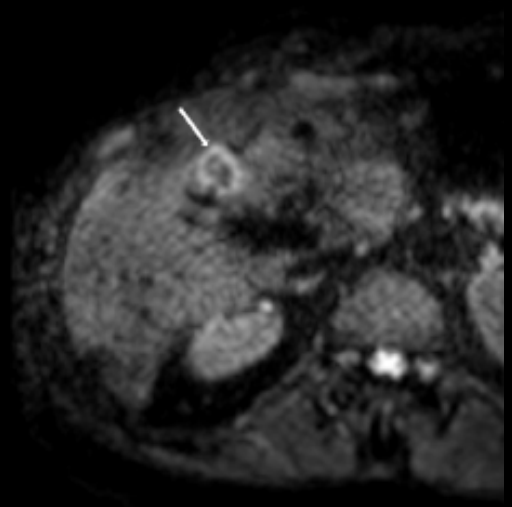

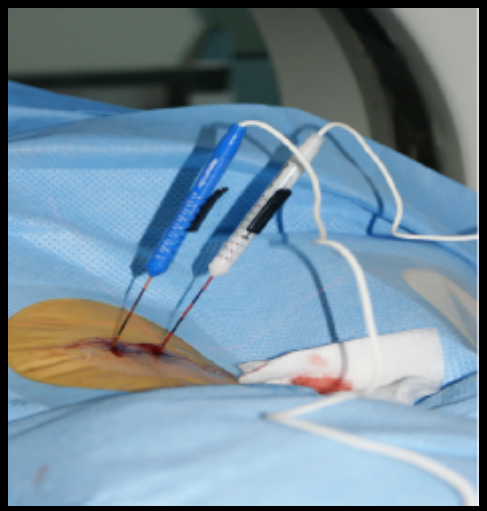

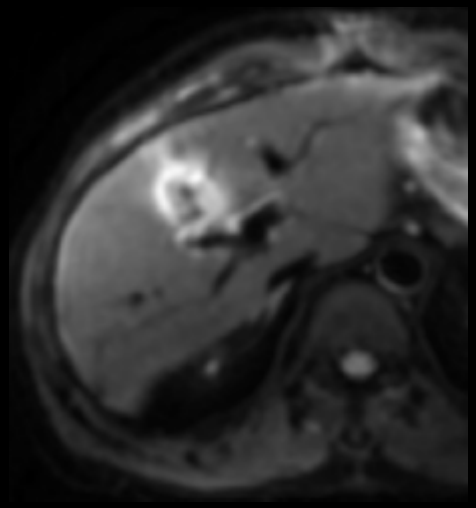
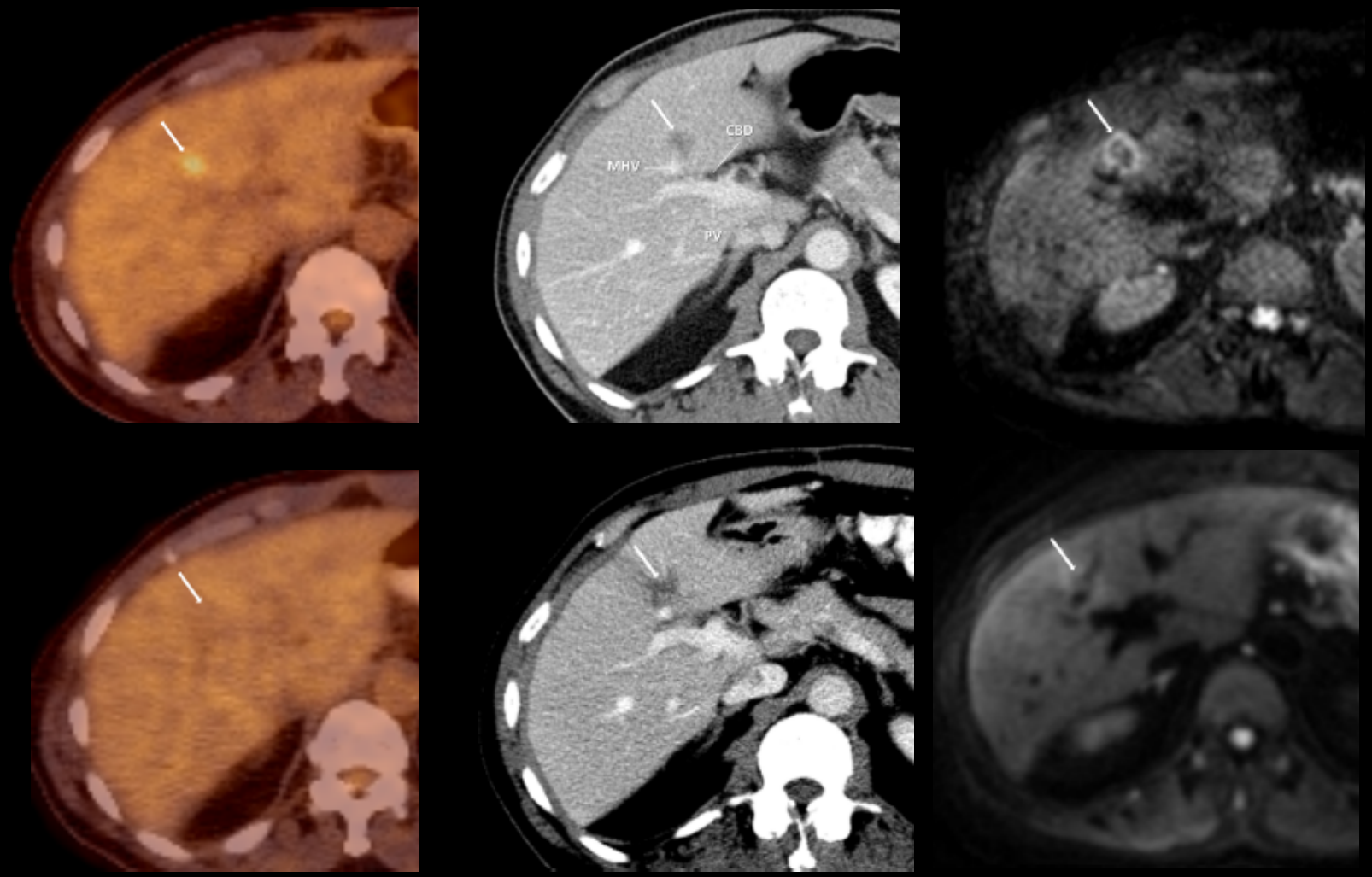
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