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Actualités en radiologie: thermoablation tumorale percutanée

Pr Romaric LOFFROY

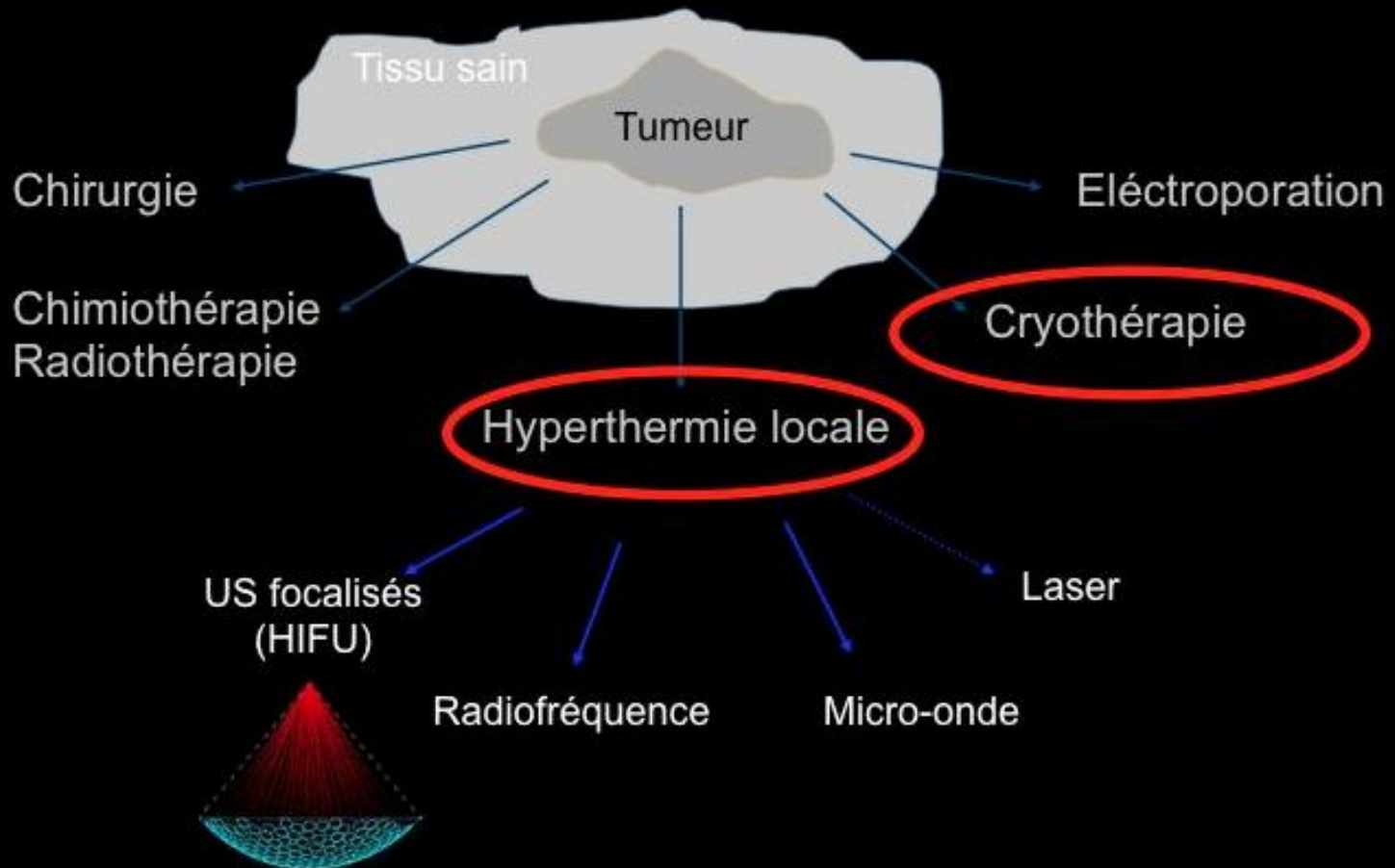
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Arsenal thérapeutique



Indications HAS

- Concertation pluridisciplinaire
- Traitement à visée **CURATIVE** des lésions non résécables en raison de leur localisation, de leur nombre, du terrain:
 - **Tumeurs malignes du foie:**
 - + Primitives: CHC ($1 \leq 5$ cm, ou ≤ 3 , ≤ 3 cm)
 - + Secondaires: Kc colorectal (≤ 3 , ≤ 3 cm)
 - **Kc du rein ≤ 3 cm:**
 - + Age > 70 ans
 - + Insuffisance rénale
 - + Rein unique ou greffon
 - + Tumeurs bilatérales / multiples
 - + Cancer héréditaire (VHL)

Sustained Complete Response and Complications Rates After Radiofrequency Ablation of Very Early Hepatocellular Carcinoma in Cirrhosis: Is Resection Still the Treatment of Choice?

Tito Livraghi,¹ Franca Meloni,¹ Michele Di Stasi,² Emanuela Rolle,³ Luigi Solbiati,⁴ Carmine Tinelli,⁵ and Sandro Rossi⁶

If liver transplantation is not feasible, partial resection is considered the treatment of choice for hepatocellular carcinoma (HCC) in patients with cirrhosis. However, in some centers the first-line treatment for small, single, operable HCC is now radiofrequency ablation (RFA). In the current study, 218 patients with single HCC ≤ 2.0 cm (very early or T1 stage) underwent RFA. We assessed 2 primary end points that could be easily compared with those reported for resective surgery: (1) the rate of sustained, local, complete response and (2) the rate of treatment-related complications. The secondary end point was 5-year survival in the 100 patients whose tumors had been considered potentially operable. After a median follow-up of 31 months, sustained complete response was observed in 216 patients (97.2%). In the remaining 6, percutaneous ethanol injection, selective intraarterial chemoembolization, or resection were used as salvage therapy. Perioperative mortality, major complication, and 5-year survival rates were 0%, 1.8%, and 68.5%, respectively. *Conclusion:* Compared with resection, RFA is less invasive and associated with lower complication rate and lower costs. RFA is also just as effective for ensuring local control of stage T1 HCC, and it is associated with similar survival rates (as recently demonstrated by 2 randomized trials). These data indicate that RFA can be considered the treatment of choice for patients with single HCC ≤ 2.0 cm, even when surgical resection is possible. Other approaches can be used as salvage therapy for the few cases in which RFA is unsuccessful or unfeasible. (HEPATOLOGY 2008;47:82-89.)

Comparison of Percutaneous and Surgical Approaches to Renal Tumor Ablation: Metaanalysis of Effectiveness and Complication Rates

Gladwin C. Hui, MD, MPH, Kemal Tuncali, MD, Servet Tatli, MD, Paul R. Morrison, MS, and Stuart G. Silverman, MD

J Vasc Interv Radiol 2008; 19:1311-1320

Table 5
Effectiveness Rates Following Renal Tumor Ablation: Comparison of Percutaneous and Surgical Approaches

Effectiveness	Percutaneous Ablation	Surgical Ablation	P Value
Primary	0.87 (0.82-0.91)	0.94 (0.92-0.96)	<.05
Secondary	0.92 (0.90-0.95)	0.95 (0.93-0.97)	>.05

Note.—Values in parentheses are 95% CIs.

Complications majeures : 3% vs 7% p<.05

Thermo-ablation tumorale en routine

Radiofréquence



Cryothérapie



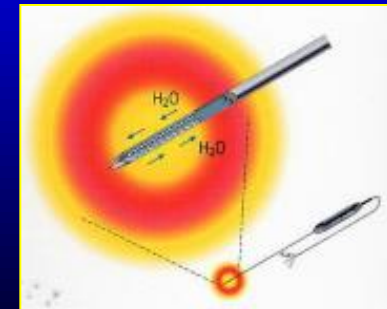
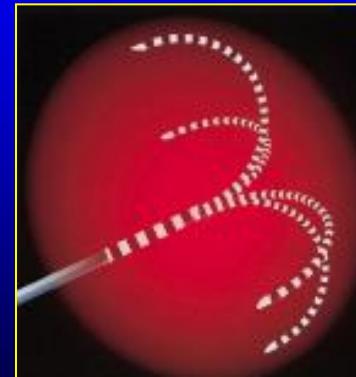
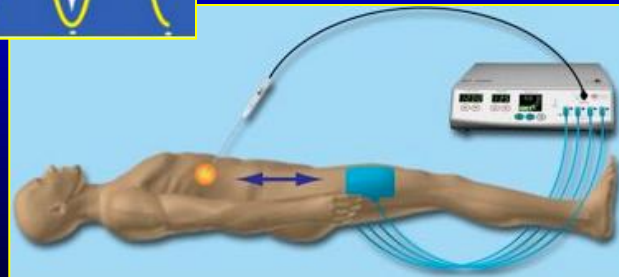
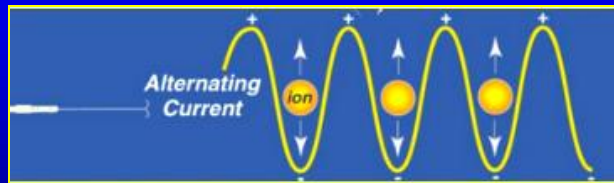
Micro-ondes



Radio-fréquence

- Principes:

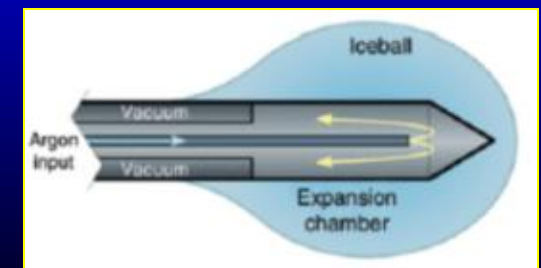
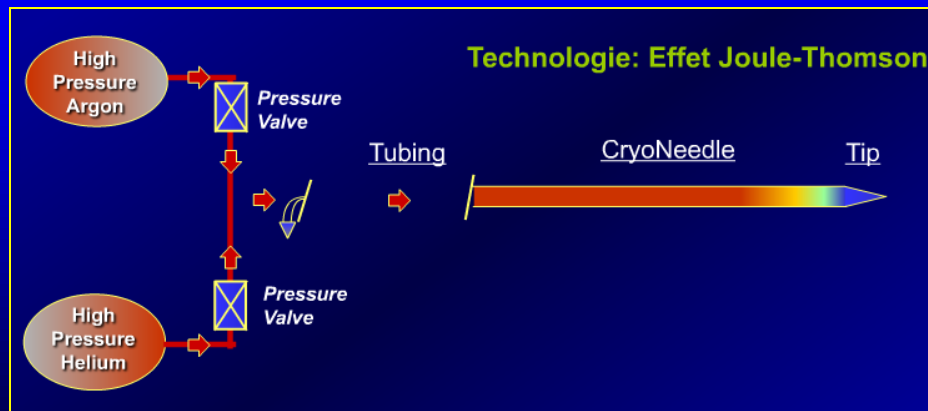
- Onde de RF: 300-500 kHz
- Circuit électrique: plaque de retour
- Courant alternatif > mouvement ionique oscillatoire > échauffement tissulaire par friction > nécrose de coagulation
- Volume chauffé dépend de la conductivité du tissu
- Objectif: 50-100° C lentement sans carbonisation



Cryothérapie

- Principes:

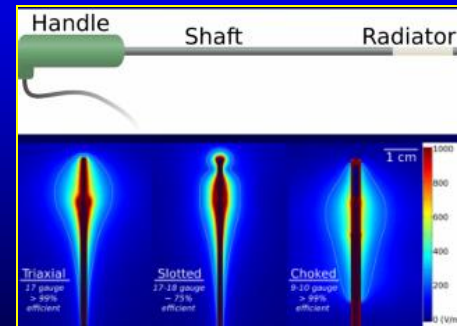
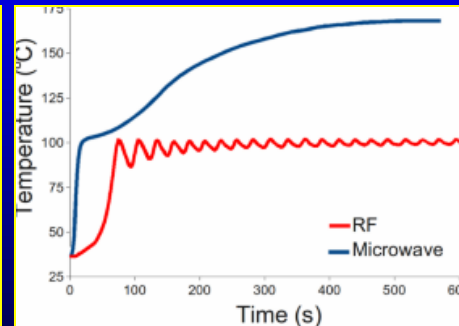
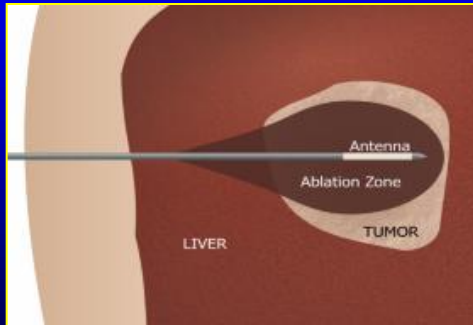
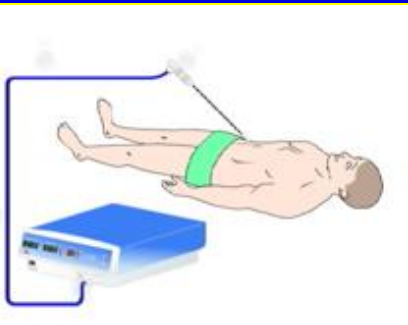
- Congélation $< -30^{\circ}$ C par décompression brutale d'argon à haute pression
- Cristaux de glace extracellulaires: déshydratation
- Cristaux de glace intracellulaires: rupture membranaire
- Obstruction vasculaire: ischémie cellulaire



Micro-ondes

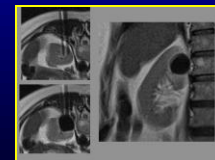
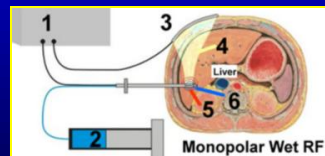
- Principes:

- Générateur > onde électromagnétique > mouvements molécules d'eau > friction > chaleur > nécrose de coagulation
- Bande de fréquence: 915-2450 MHz
- Longueur d'onde + courte / RF: pas de nécessité de plaque de dispersion
- Courant ne circule pas à travers le patient



Comparatif

	RF	Cryothérapie	Micro-ondes
Nécrose	ronde	elliptique	elliptique
Coût	moyen	très élevé	élevé
Durée	moyenne	moyenne	courte
Applicateur	unique/multiples	multiples	unique
Douleur	/	/	/
Monitoring	-	continu	-
Refroidissement vx	oui	non	non
Intérêt ++	Biopsie	Central / Large	Rapide



Technique

- Percutanée: +++

- Sous US +
- Sous TDM ++
- Sous IRM



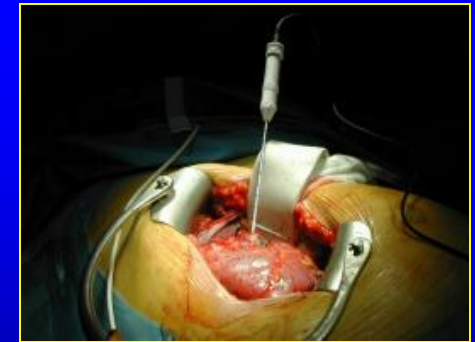
- Anesthésie:

- Anesthésie générale:

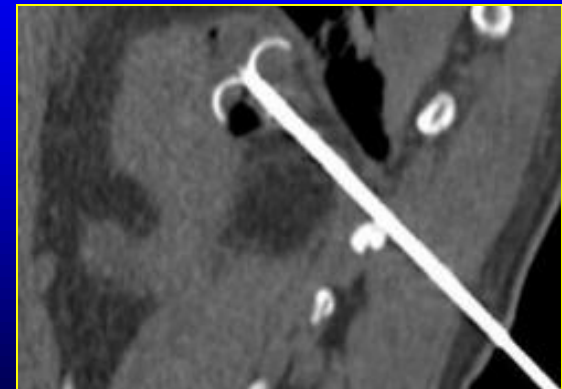
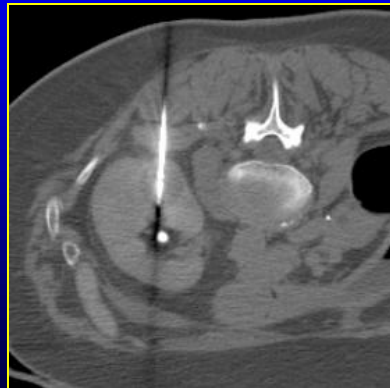
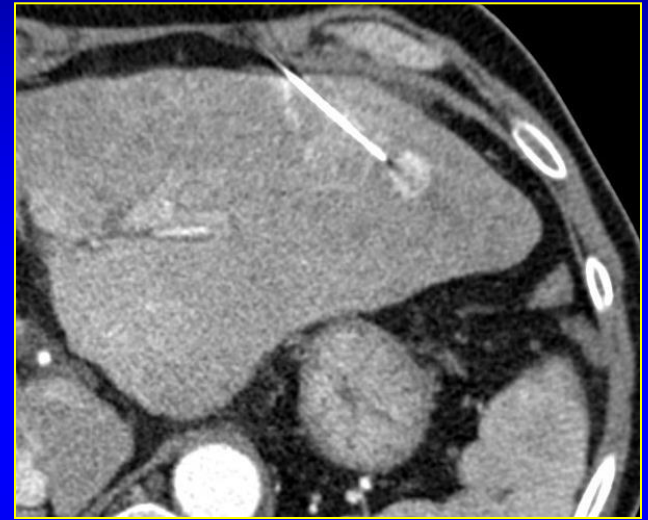
- + Confort: patient et opérateur
- + Positionnement reproductible en apnée

- Neuroleptanalgie:

- + L'échographie peut aider le positionnement (temps réel)



Abords: tout est possible !



Protection des structures nobles

- Dissection pour les structures extra-organe:

- Aérodisssection:

- + Carbodisssection: injection de gaz (CO₂)

- + La seule option en cryothérapie ++

- Hydrodissection:

- + Eau stérile

- + Glucosé: G5% ou G30% ++

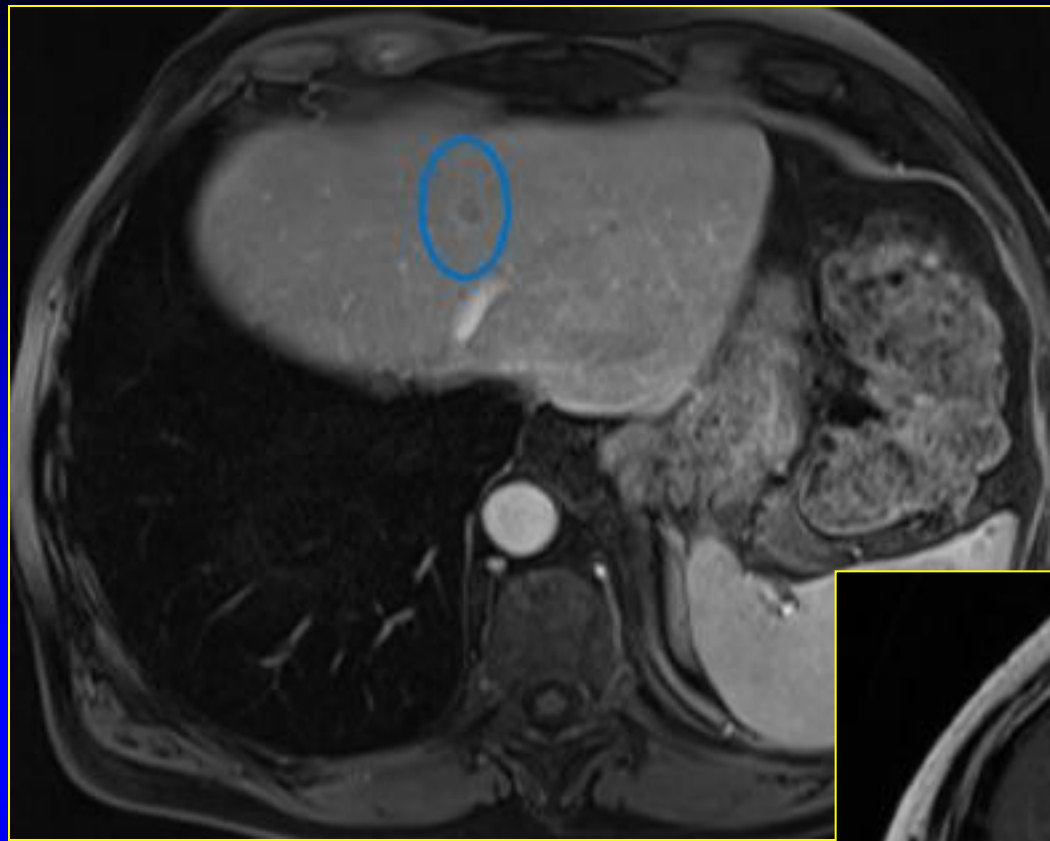
- + Pas de sérum salé (conducteur++)



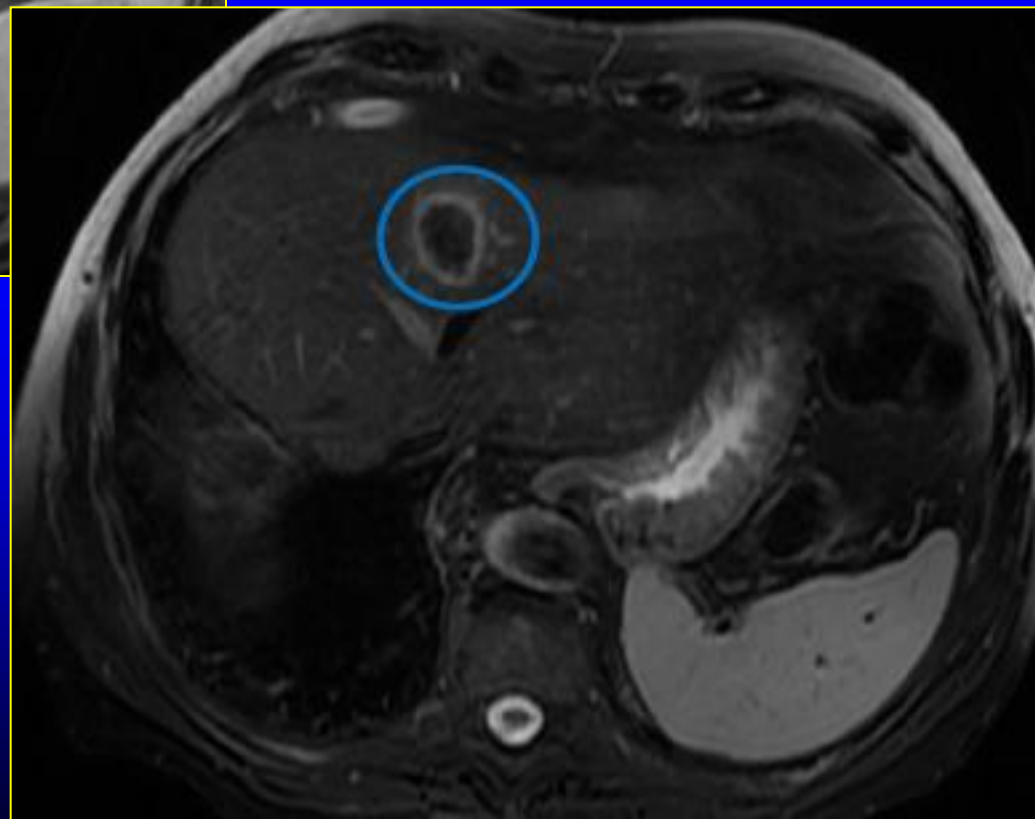
- Sonde vésiculaire ou urétérale

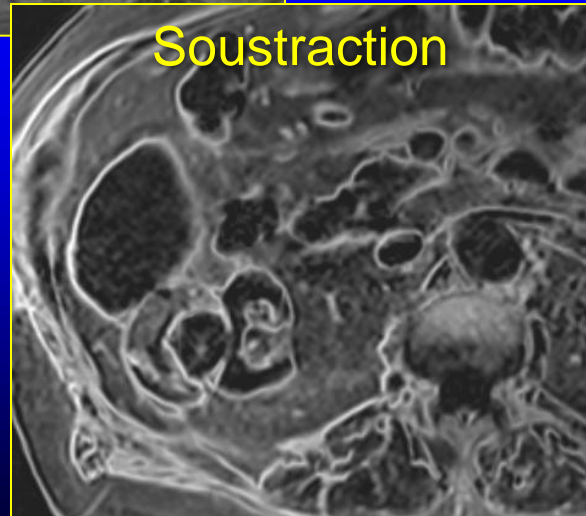
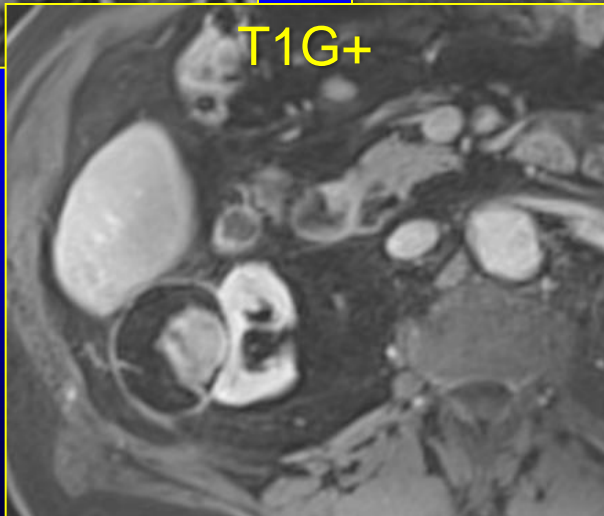
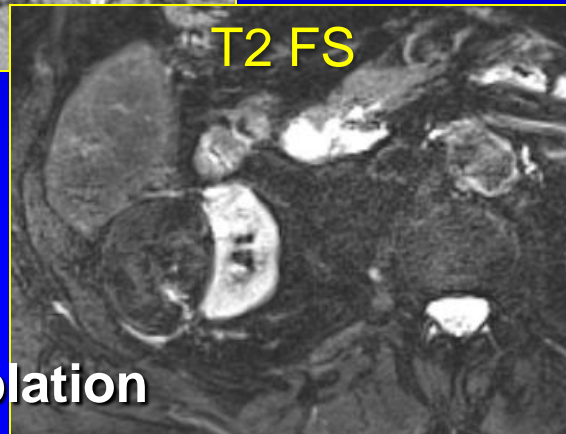
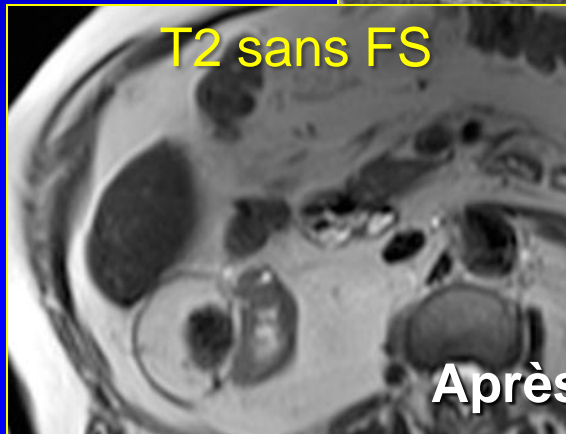
Suivi évolutif

- Rythme de surveillance:
 - Contrôles: 2, 6, 12 mois puis annuel pendant 5 ans
- Technique:
 - TDM ou IRM +++ (soustractions)
- Aspects:
 - Absence totale de prise de contraste
 - Prise de contraste nodulaire
 - + Résiduelle à 2 mois = reliquat ou échec technique
 - + Réapparaissant à distance = récurrence locale



Marges d'ablation





Après ablation

Conclusion

- Thermo-ablation = gold standard de demain...?
- Avantages:
 - Mini-invasivité
 - Préservation parenchymateuse
 - Possibilité de traitements répétés
 - Faible taux de complications
 - Hospitalisation courte de 36-48h
 - Coût moins élevé