



METASTASI EPATICHE DA NET: TERAPIA ABLATIVA ECOGUIDATA

A. Cutini, P.Tombesi

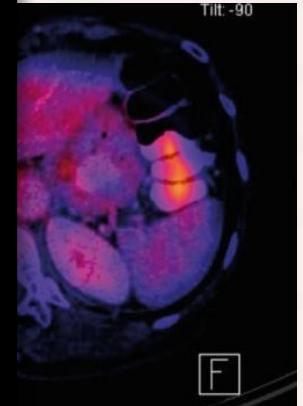
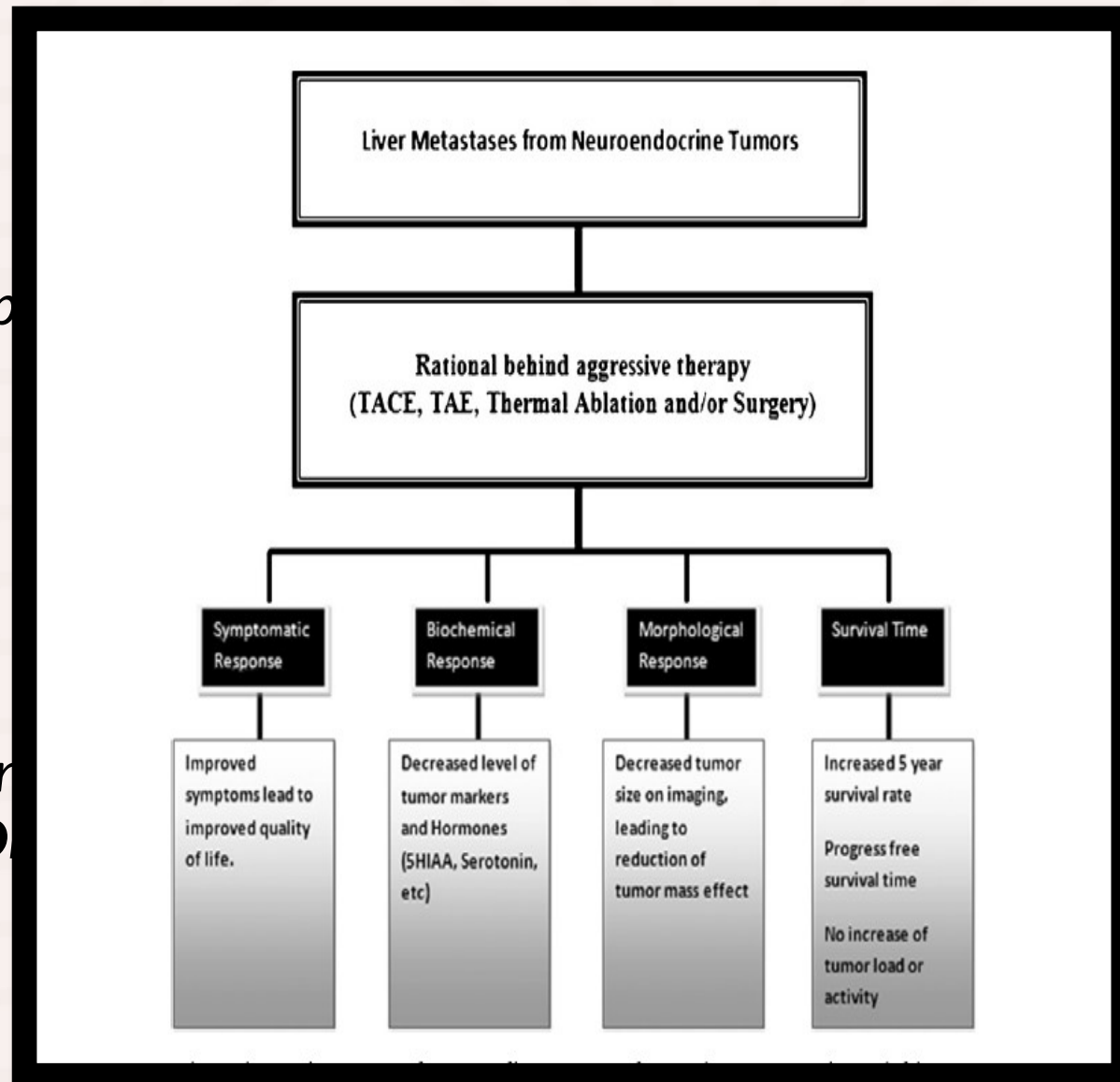
Ecografia Interventistica

Az. Ospedaliera Universitaria S. Anna

Gestione metastasi epatiche da NET

✓ 1° ob

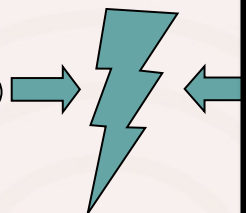
✓ Quan
CITO



Gestione metastasi epatiche da NET

Chirurgia prima

80-90% pz non eligibili



clinical practice guidelines

Annals of Oncology 23 (Supplement 7): vii124-vii130, 2012
doi:10.1093/annonc/mds295

**Neuroendocrine gastro-entero-pancreatic tumors:
ESMO Clinical Practice Guidelines for diagnosis,
treatment and follow-up[†]**

K. Öberg¹, U. Knigge², D. Kwekkeboom³ & A. Perren⁴ on behalf of the ESMO Guidelines Working Group*

[†]Department of Endocrine Oncology, University Hospital, Uppsala University, Uppsala, Sweden; ²Department of Surgery, Rigshospitalet, Copenhagen, Denmark; ³Department of Nuclear Medicine, Erasmus Medical Center, Rotterdam, The Netherlands; ⁴Institute of Pathology, University of Bern, Bern, Switzerland

**CITORIDUZIONE
AGGRESSIVA**

TAE

TACE

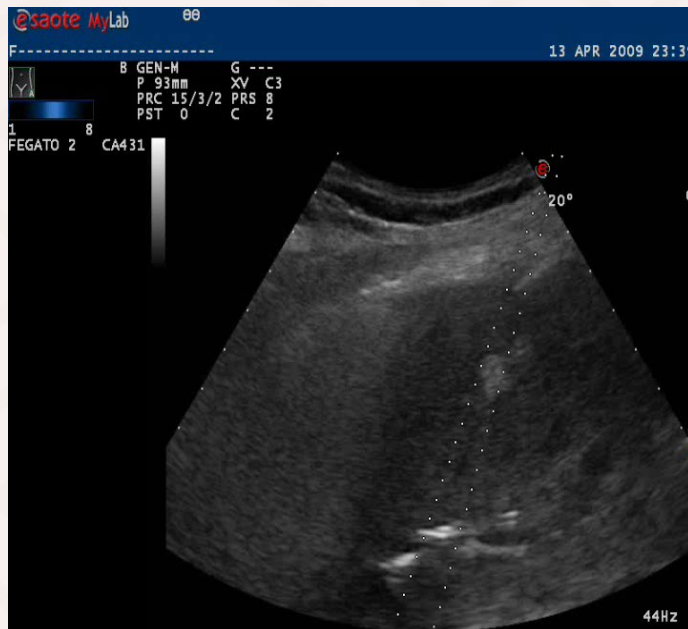
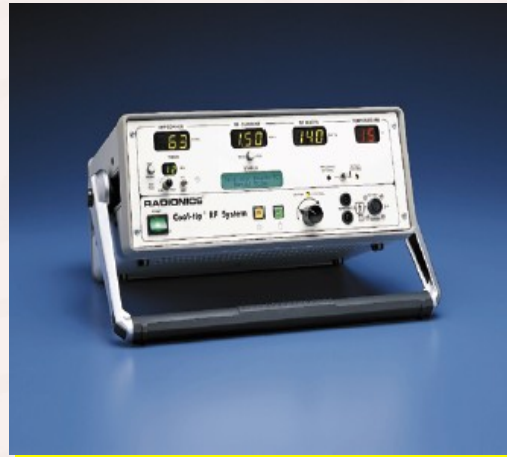
and might help to improve systemic treatment. There are no randomized clinical trials comparing the efficacy of locoregional therapies and palliative liver surgery [15]. The choice of the ablative or locoregional procedure such as radiofrequency ablation (RFA), laser-induced thermotherapy or selective hepatic transcatheter arterial embolization (TAE), chemoembolization (TACE) and selective internal radiotherapy (SIRT) depends on the local expertise, number and size of lesions and location of liver involvement. These types of

Terapia ablative percutanee (PATs) – Vantaggi

- ✓ *Scarsamente invasive;*
- ✓ *Bassa morbidità/mortalità;*
- ✓ *Risparmiano il parenchima sano;*
- ✓ *Teoricamente ripetibili all'infinito;*
- ✓ *Associabili efficacemente ad altri trattamenti citoriduttivi (resezione, TACE, TAE...);*

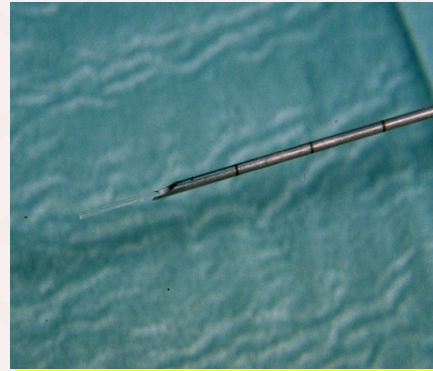
PAT'S QUALE METODICA?

Radiofrequenze (RF)



PAT'S QUALE METODICA?

Laser



Cardiovasc Intervent Radiol
<https://doi.org/10.1007/s00270-019-02308-4>



CLINICAL INVESTIGATION

INTERVENTIONAL ONCOLOGY

Percutaneous Laser Ablation of Liver Metastases from Neuroendocrine Neoplasm. A Retrospective Study for Safety and Effectiveness

Sergio Sartori¹ · Paola Tombesi¹ · Francesca Di Vece¹ · Lara Bianchi¹ · Rosaria Ambrosio²

[41, 42]. LA has been used sporadically in patients with NEN LM [29, 30], but thanks to some characteristics it could represent a valid alternative to RFA. The possibility of placing from one to four laser fibers into the tumor makes LA a very flexible technique. Each fiber provides an almost spherical thermal lesion of 12–15 mm in diameter, and the lesion size can be increased up to 4–5 cm by using multiple fibers and the pull-back technique [18, 19].

Percutaneous Laser Thermal Ablation in a Patient with 22 Liver Metastases from Pancreatic Neuroendocrine Tumours: A Case Report

Authors:	*Sergio Sartori, Francesca Di Vece, Lara Bianchi, Paola Tombesi Section of Interventional Ultrasound, St. Anna Hospital, Ferrara, Italy *Correspondence to srs@unife.it
Disclosure:	The authors have declared no conflicts of interest.
Received:	24.11.17
Accepted:	09.03.18
Keywords:	Laser thermal ablation (LTA), liver metastases (LM), neuroendocrine tumours (NET).
Citation:	EMJ Hepatol. 2018;6[1]:95-99.

Abstract

The relatively indolent nature of well-differentiated neuroendocrine tumours (NET) and their proclivity to be hormonally active warrants aggressive multimodal treatment, even for advanced stage disease. Good results have been reported in well-selected patients with a median of 23 liver metastases (LM) from NET treated with surgical resection combined with intraoperative radiofrequency ablation. We report the case of a patient who underwent percutaneous laser thermal ablation (LTA) of 22 small LM from NET, treated over three consecutive sessions. After 2 years, five new LM were detected and treated with LTA. At present, 82 months after the first LTA session, the patient is still alive and disease-free. Due to enabling the use of one to four optical fibres at once to tailor the thermal lesion size to the nodule size, LTA could represent the ablation technique of choice in the presence of multiple, small, and variably sized LM.

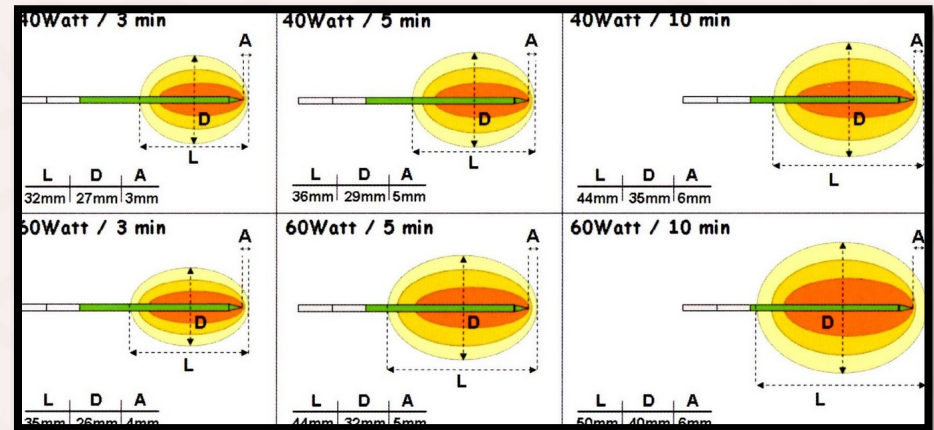
INTRODUCTION

Liver metastases (LM) from neuroendocrine tumours (NET) occur with variable frequency depending on the primary disease, ranging from 5–10% for carcinoid tumours to 75% for glucagonoma.¹ The relatively indolent nature of well-differentiated NET and their proclivity to be hormonally active warrants aggressive multimodal treatment even for advanced stage disease. Indeed, aggressive cytoreduction using combined treatments, such as surgery, transarterial chemoembolisation, and thermal ablation, can improve both survival and quality of life, and, to date, many guidelines for the management of NET recommend the removal of at least 90% of LM whenever possible.^{2–4}

With this aim, surgical resection is considered the gold standard treatment, but only 10–20% of patients with NET are suitable candidates for resection. Ablative therapies can be used in place of, or as an adjunct to, resection. In brief, they can preferentially be used for deep small lesions (diameter <4 cm) and recurrent lesions and can be considered as an adjunct to resection in patients with extensive bilobar disease. Thermal ablative techniques can deliver thermal energy, either cooling (cryoablation) or heating the tissue. Radiofrequency ablation (RFA), microwave ablation, and laser thermal ablation (LTA) raise the temperature of the tissue to between 60°C and 100°C, producing coagulative necrosis. LTA, according to the technique proposed by Pacella et al.⁵

PATs: quale metodica?

Microonde (MW)



Cardiovasc Intervent Radiol
DOI 10.1007/s00270-013-0733-9

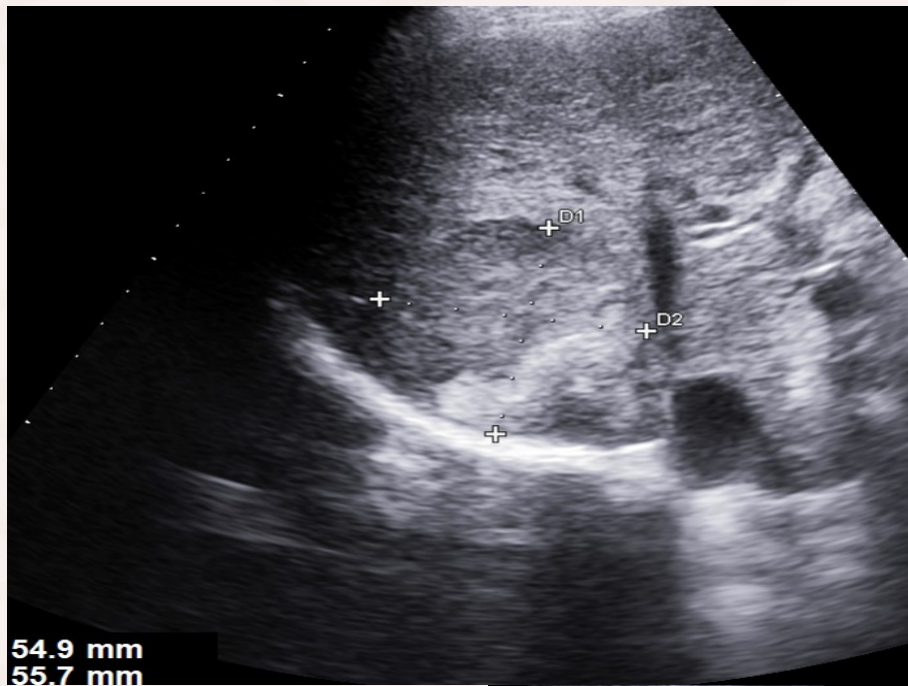
CIRSE

CLINICAL INVESTIGATION

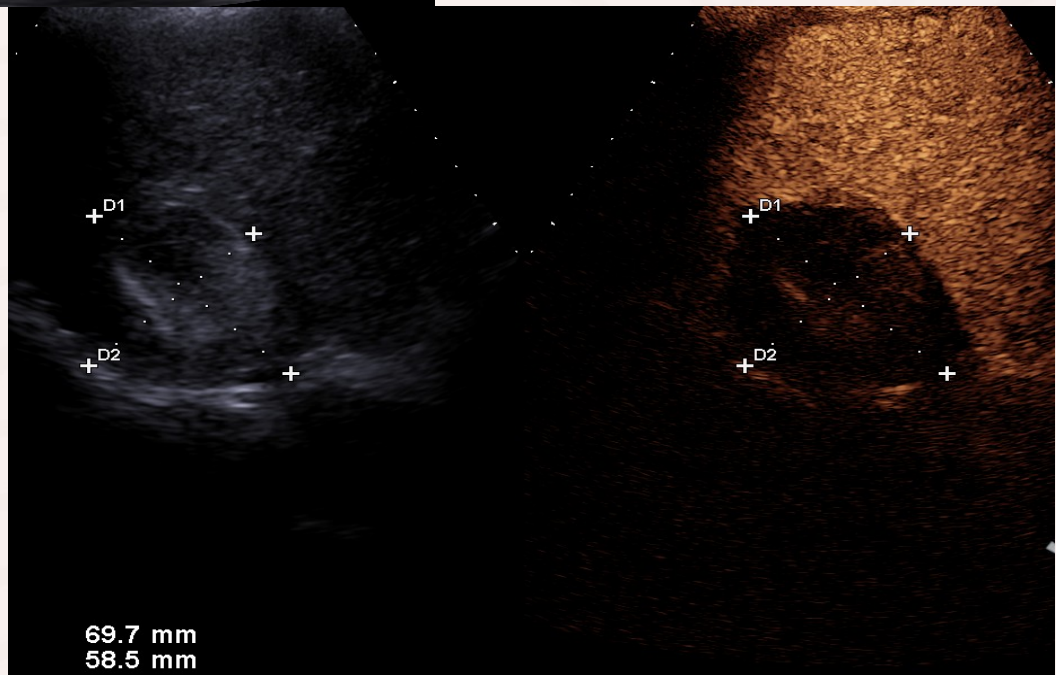
Coagulation Areas Produced by Cool-Tip Radiofrequency Ablation and Microwave Ablation Using a Device to Decrease Back-Heating Effects: A Prospective Pilot Study

Francesca Di Vece • Paola Tombesi •
Francesca Ermili • Cinzia Maraldi •
Sergio Sartori

In conclusion, this prospective pilot study suggests that the mini-choked MWA system can achieve significantly larger ablation areas than internally cooled RFA. These



54.9 mm
55.7 mm

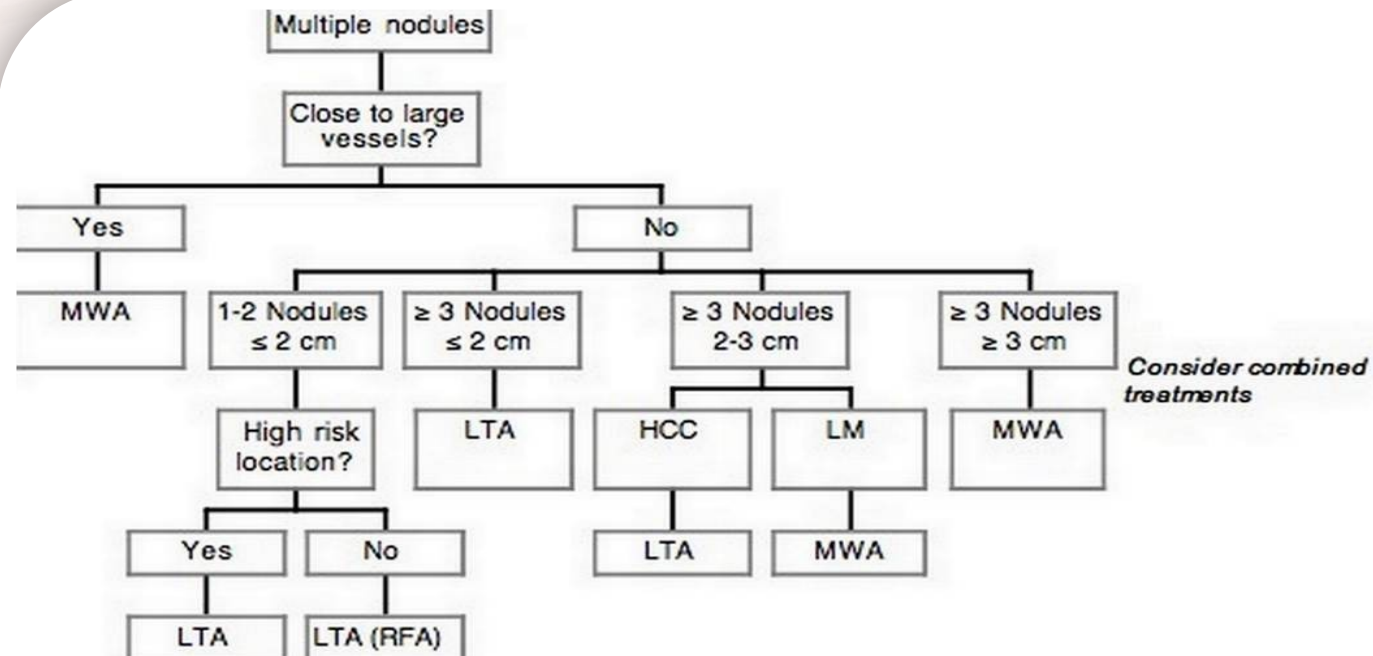


69.7 mm
58.5 mm

Radiofrequency, microwave, and laser ablation of liver tumors: time to move toward a tailored ablation technique?

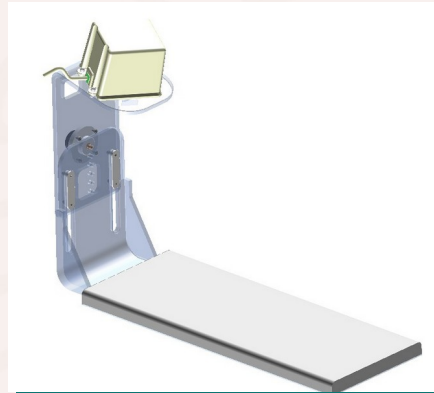
Paola Tombesi, Francesca Di Vece, Sergio Sartori

Department of Medical, Section of Interventional Ultrasound, St. Anna Hospital, 44100 Ferrara, Italy



Virtual Navigator/Fusion Imaging

- ✓ “Fusione” tra immagini US e volumi TC/RMN, che permette visualizzazione in tempo reale dell'immagine US e dell'immagine TC/RMN corrispondente.
- ✓ La correlazione tra la scansione US ed il corrispettivo taglio MR/CT si ottiene grazie ad un Sistema di “Tracking” Magnetico, che rileva la posizione nello spazio della sonda ecografica.



Virtual Navigator/Fusion Imaging

ESECUZIONE ESAME

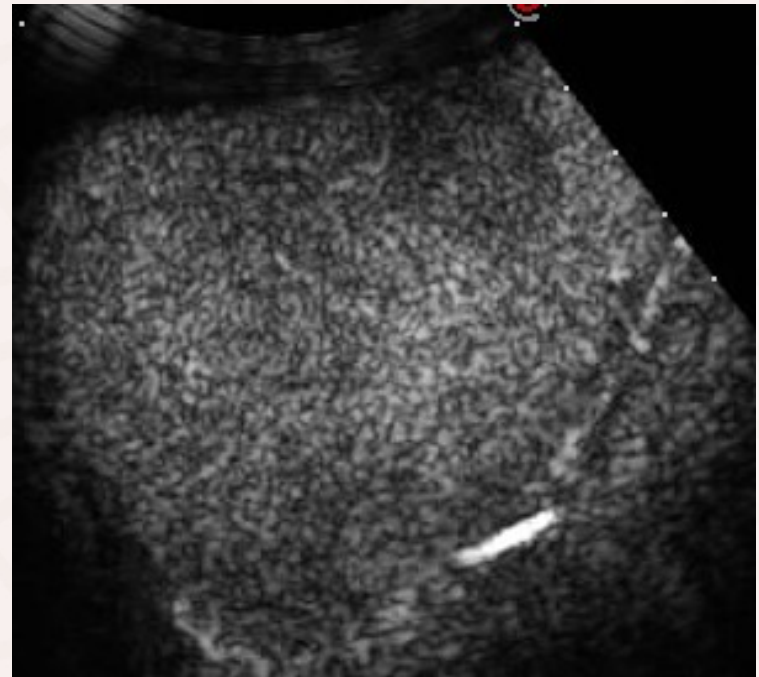
- ✓ Necessità di esame TC o RMN preesistente, che viene trasferito sul disco rigido dell'ecografo.
- ✓ Collimazione dell'immagine US e TC/RMN, correlando markers anatomici (vasi, angiomi, cisti etc).
- ✓ Una volta registrato il sistema, ogni movimento della sonda US corrisponde al corrispettivo piano del volume TC/RMN.
- ✓ Sovrapposizione e visualizzazione contemporanea delle immagini US in real time e delle immagini TC/RMN corrispondenti.

Virtual Navigator/Fusion Imaging

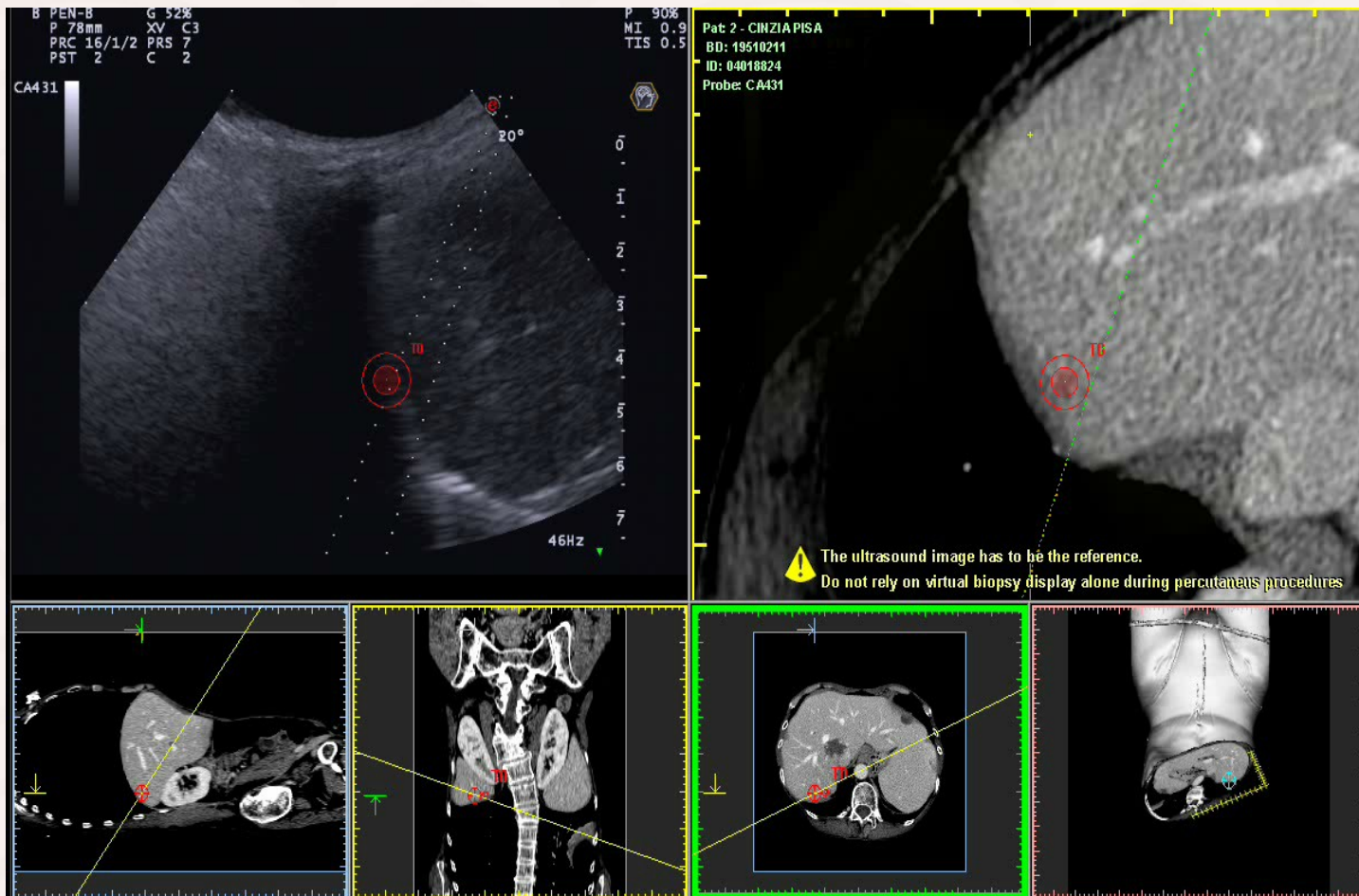
PRINCIPALI APPLICAZIONI

- ✓ **Guida** per interventistica diagnostica e terapeutica di lesioni complesse e/o male o non visualizzabili a US tradizionale e/o CEUS
- ✓ **Controllo** post-trattamento e follow up con ecografia con m.d.c. sempre con riferimento al volume TC precedentemente acquisito

GUIDA PER L'INTERVENTISTICA



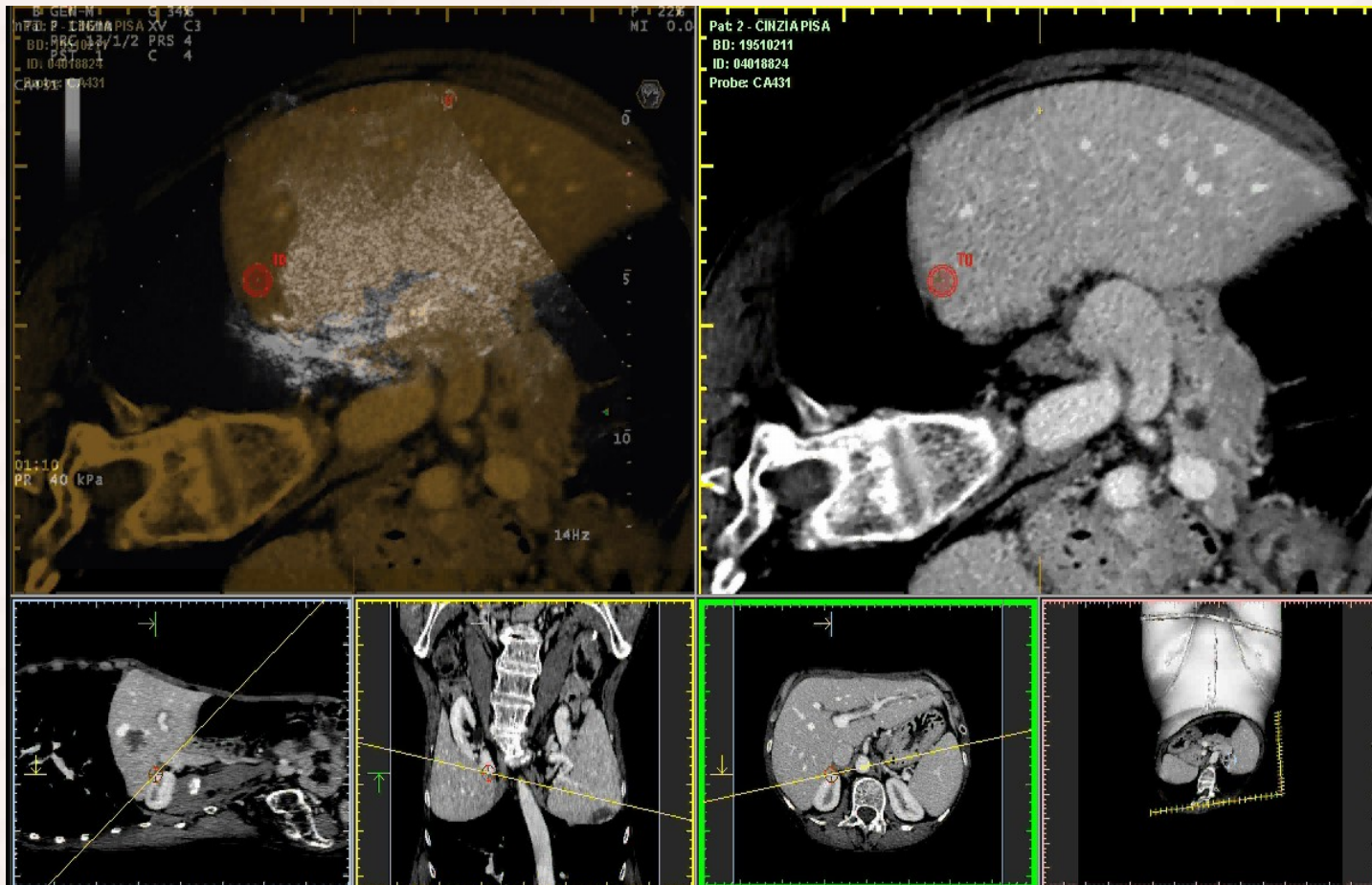
GUIDA PER L'INTERVENTISTICA



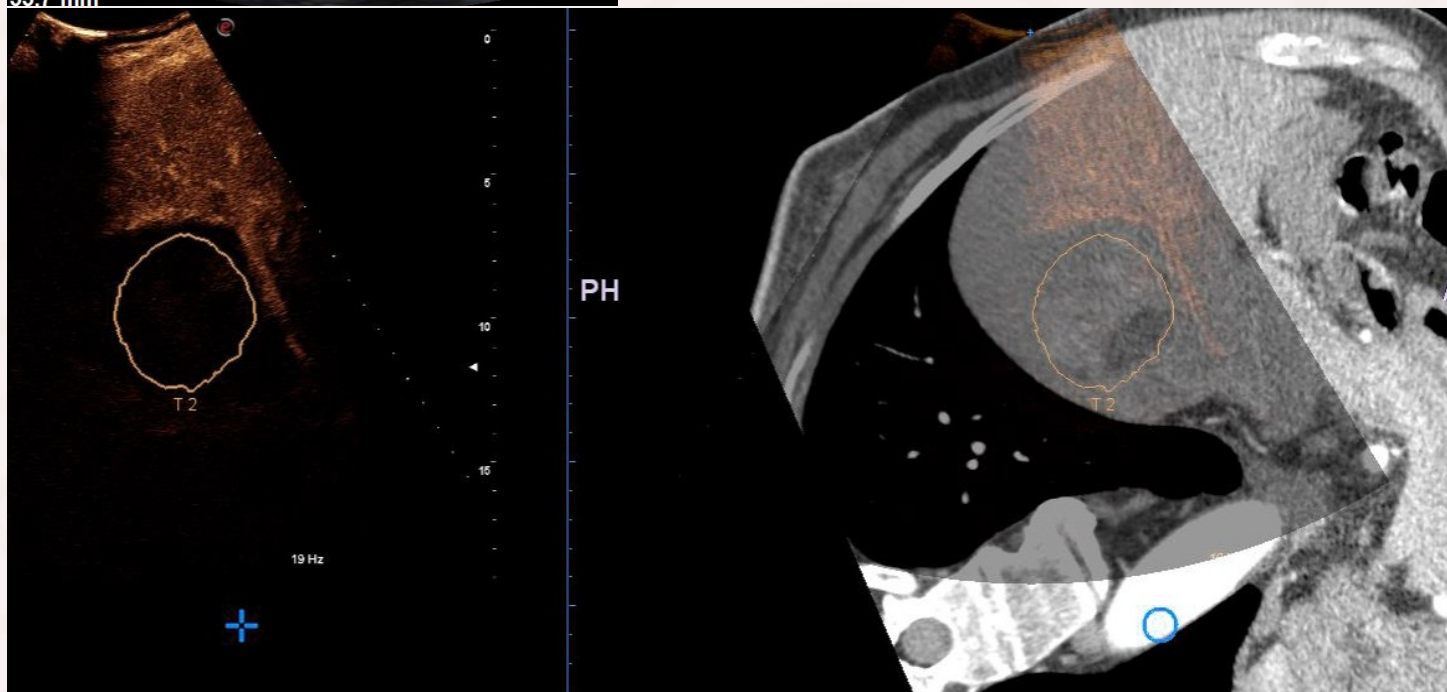
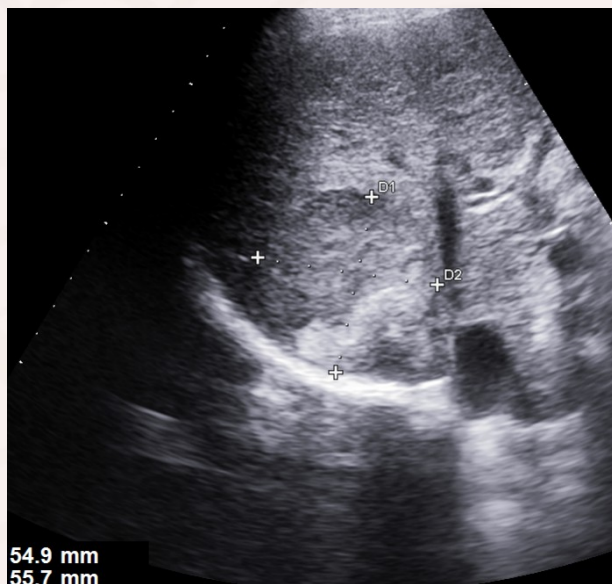
GUIDA PER L'INTERVENTISTICA



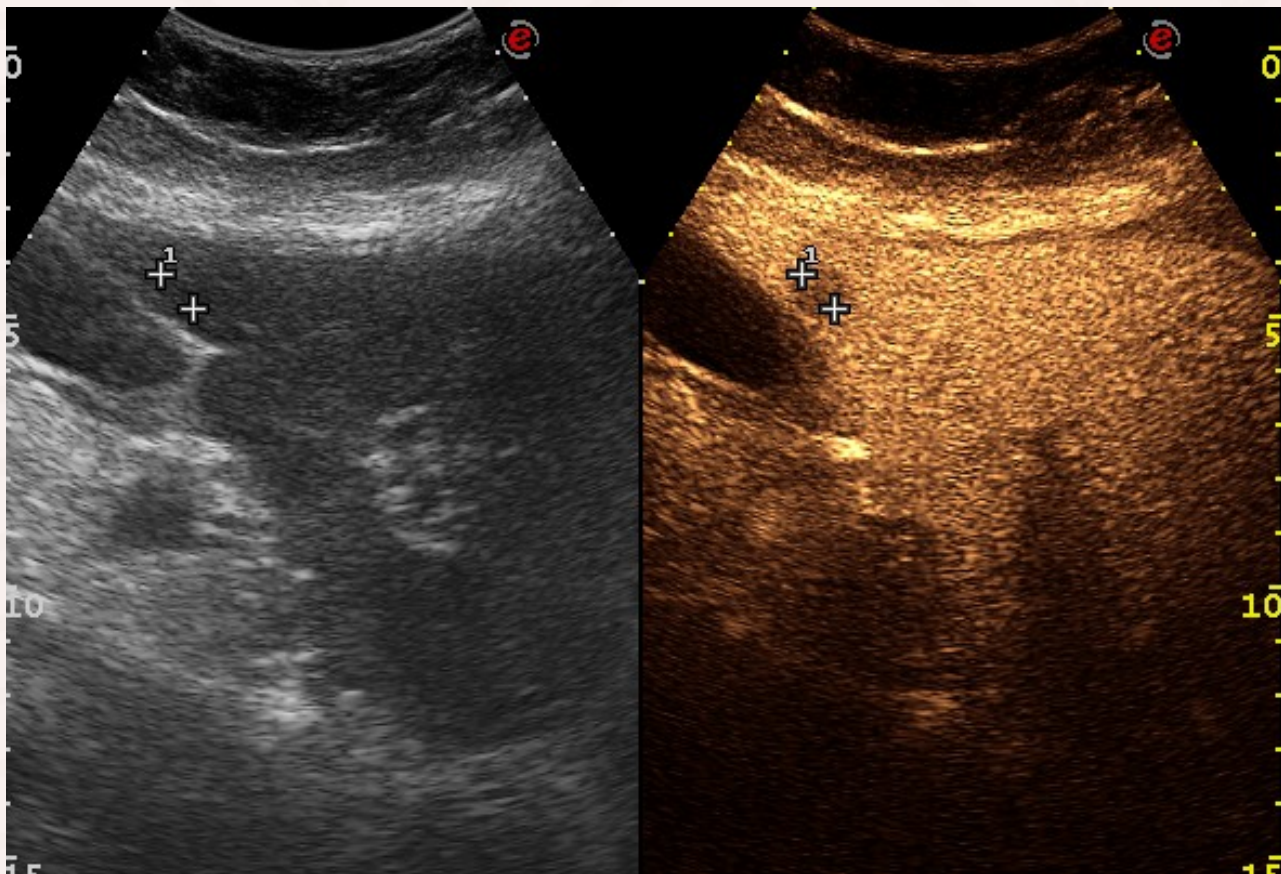
CONTROLLO POST-TRATTAMENTO



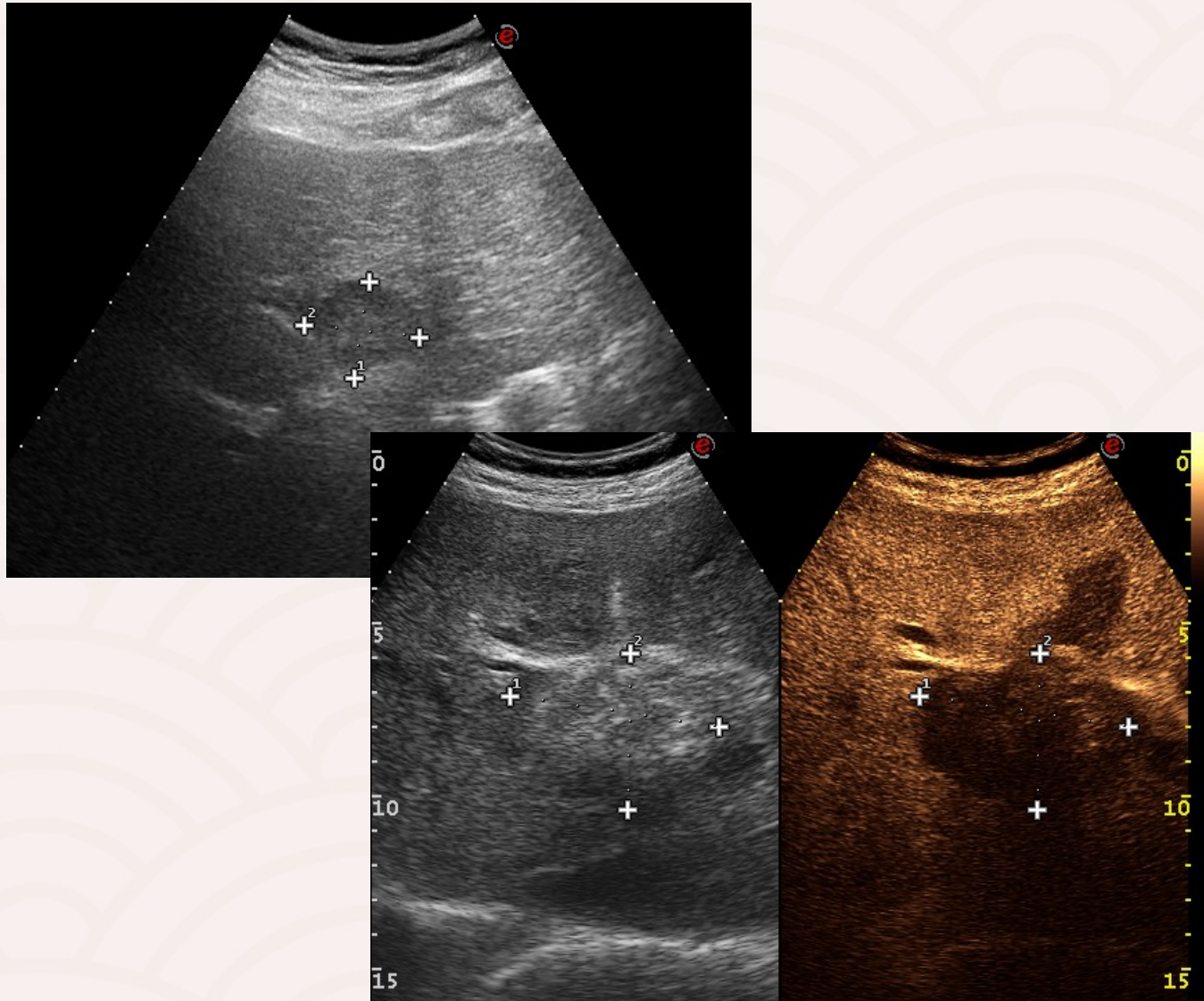
CONTROLLO POST-TRATTAMENTO



Termoablazione: quando NON si può

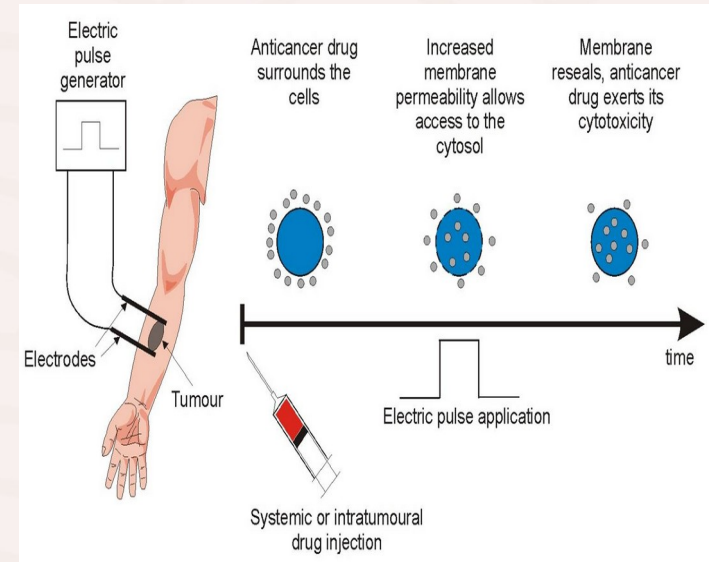


Termoablazione: quando NON si può



ELETTROCHEMIOTERAPIA

- ✓ - Impulsi elettrici che **alterano temporaneamente la permeabilità cellulare** all'interno del campo elettrico creato dagli elettrodi.
- ✓ - Iniezione a un tempo prefissato di **chemioterapico e.v.** (usualmente bleomicina)
- ✓ - **Il farmaco penetra elettivamente nelle cellule con permeabilità alterata.**



- ✓ Consente di **trattare lesioni in prossimità di strutture termosensibili** come vasi, nervi e visceri cavi
- ✓ Nessun evento avverso o tossicità grave.

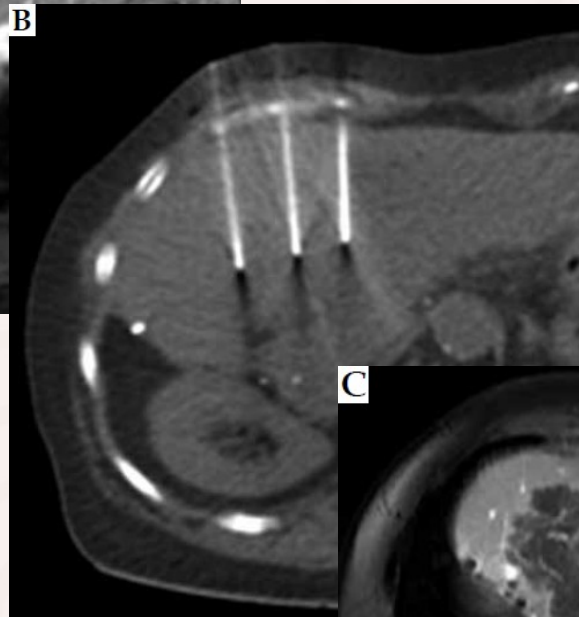
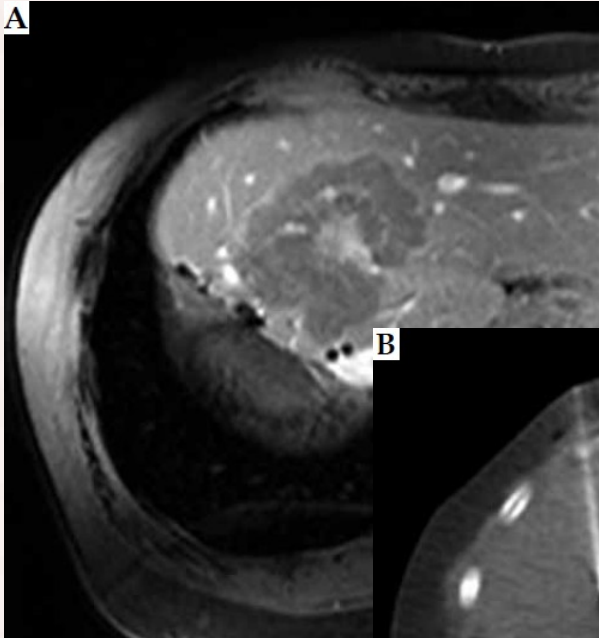
ELETTROCHEMIOTERAPIA



Complete response 60 days after Electrochemotherapy.



ELETTROCHEMIOTERAPIA



Conclusioni

- ✓ **Variabilità interessamento ed estensione di malattia epatica** in pazienti affetti da NET (n°lesioni, dimensioni e sedi)
- ✓ **Intento di trattamento** (radicalità del trattamento o citoriduzione)
- ✓ **Disponibilità di molti trattamenti tra loro associabili** (chirurgia, PAT, TACE, PRRT etc..)



- ✓ Importanza e necessità di **approccio multidisciplinare**
- ✓ Programmare **strategia di trattamento** che sia «ritagliata» sul singolo paziente

Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

Gordon C S Smith, Jill P Pell



Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

Sometimes, the evidence cannot be evidently proved, and needs to be supported by the common sense.