

LIPIODOL CHEMOEMBOLIZATION TECHNICAL CONSIDERATIONS

CIO 2021

William S Rilling MD, FSIR

Professor of Radiology and Surgery

Vascular and Interventional Radiology

Medical College of Wisconsin



DISCLOSURES

- Consultant : Boston Scientific, Sirtex, Varian, BD/Bard, Terumo
- MAB : Boston Scientific, Sirtex
- Will be discussing off label use of devices

TACE TIMELINE

- First reports of TACE for HCC in 1980s
 - Relative roles of drug, oil, embolization investigated
- cTACE became worldwide SOC with no level one data
- 2002 – two prospective randomized trials published showing survival benefit in HCC
- 2009 – PRECISION V DEB TACE study
- 2010 – present : drug and lipiodol shortages change practice patterns
- 2021 – cTACE STILL worldwide SOC for BCLC B HCC

WHY LIPIODOL ?

- Direct imaging guidance
- Proven drug delivery to tumor
- Biliary and liver safety profile well known
- Biomarker of response


Review

CardioVascular and Interventional Radiology

pp 1-10

First online: 21 September 2015

Treatment of Liver Tumors with Lipiodol TACE: Technical Recommendations from Experts Opinion

Thierry de Baere  , Yasuaki Arai, Riccardo Lencioni, Jean-Francois Geschwind, William Rilling,
Riad Salem, Osamu Matsui, Michael C. Soulen

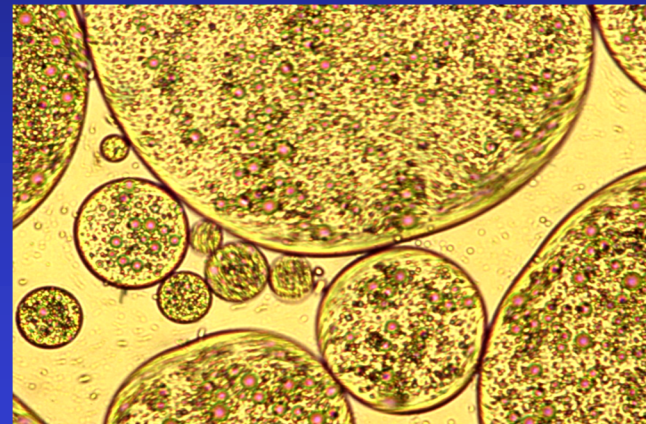
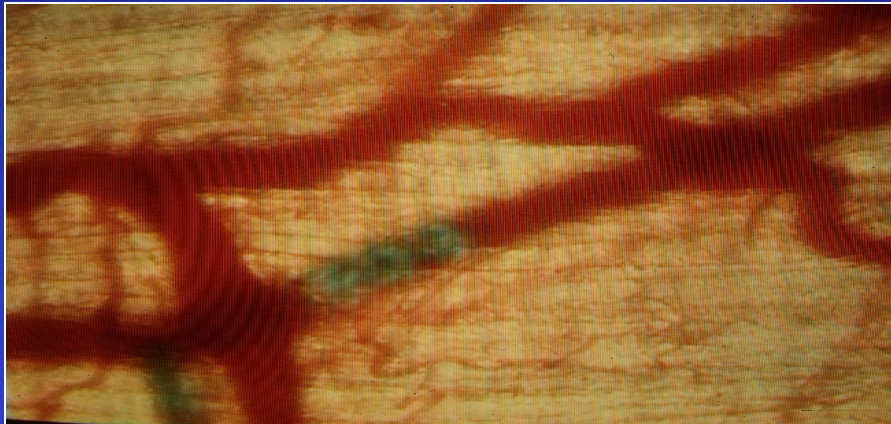
cTACE Technique

- Previous papers detailing DEB TACE, DEBIRI technique
- Emphasize importance of catheter position, ratio of lipiodol/chemo, mixing procedure, rate of infusion, timing and administration of particles

cTACE : ROLE OF ETHIODOL

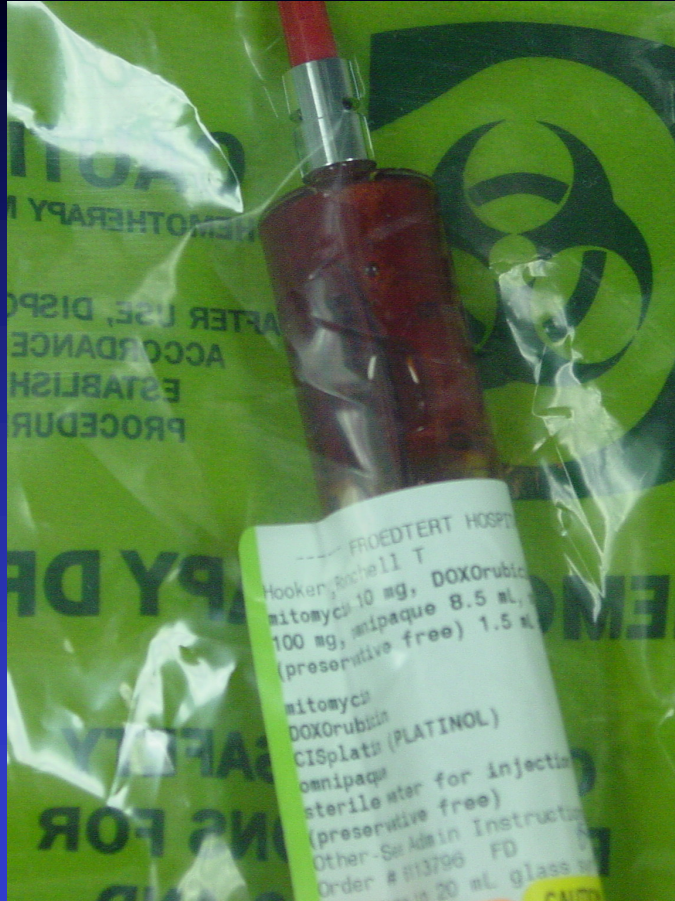
Iodized oil (Ethiodol, Lipiodol):

- OIL = Drug carrier + Targeting + Embolic agent
 - Occlusion of hepatic arterioles at 30 μm level
 - Enters portal venules through arterioportal shunts



cTACE : The Recipe Matters

- Ratio of drug (water) to lipiodol (oil)
 - Want water in oil, not oil in water
- Drugs : reconstituted in minimal volume with contrast
- Embolics : used to “close the front door” and help prevent washout after target dose delivered





Tumor Necrosis: Oil +/- Particle

- Rate of complete tumor necrosis on explant:

	Main Tumor	Daughter Nodules
Dox/Lipiodol/Gelfoam	83%	53%
Dox/Lipiodol	13%	6%
Lipiodol only	0%	0%

Takayasu K, RAD 1987;163:345-51

Courtesy M Soulen

Survival: Particle +/- Oil

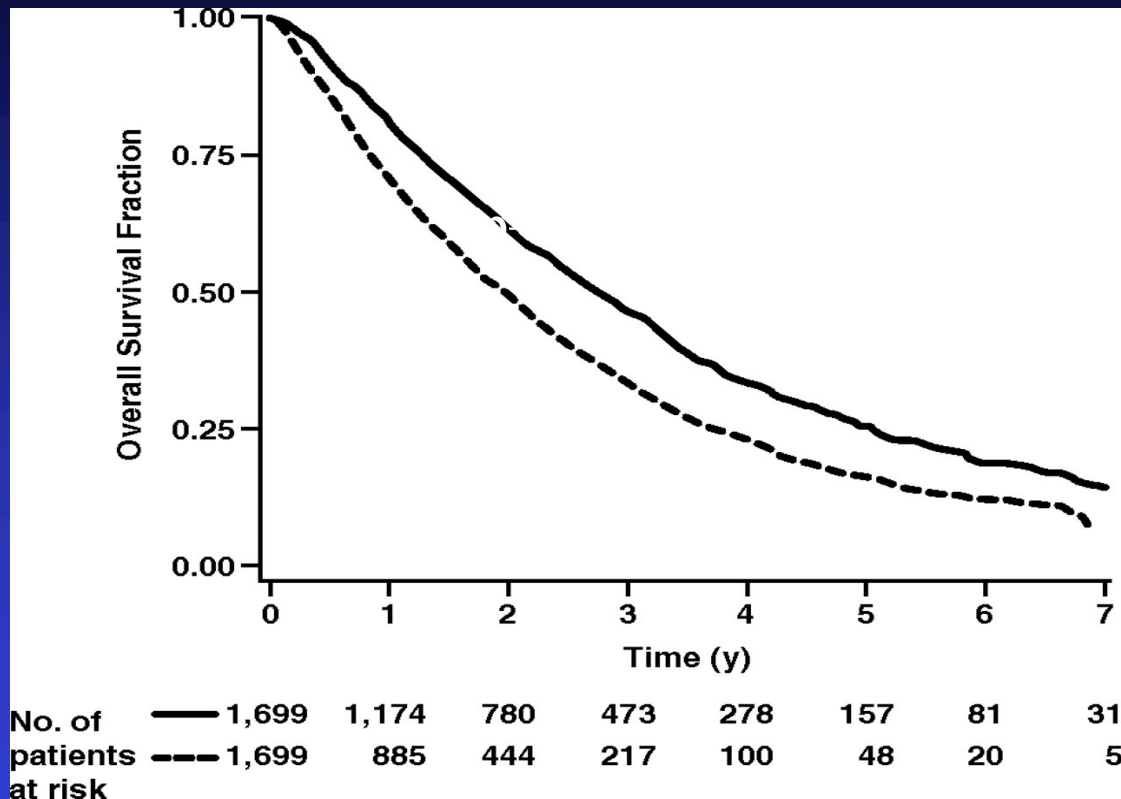
Survival	Dox/Gelfoam/Lipiodol	Dox/Gelfoam
	N = 100	N = 104
1 year	54%	45%
2 year	33%	16%
3 year	18%	4%

Nakamura H, RAD 1989;170:783-86

Courtesy M Soulen

Survival: Oil +/- Particles

Lipiodol chemoembolization (solid line) vs. Lipiodol without embolization (dotted line) matched by propensity score

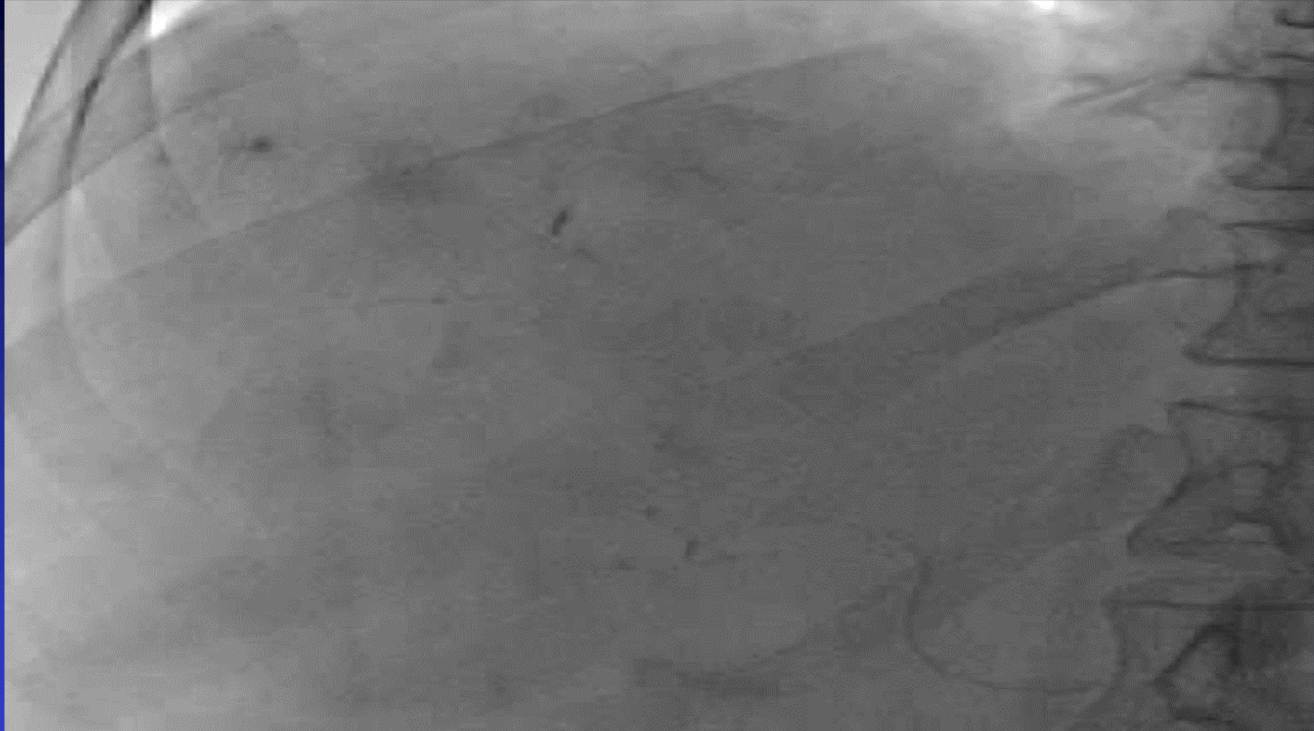


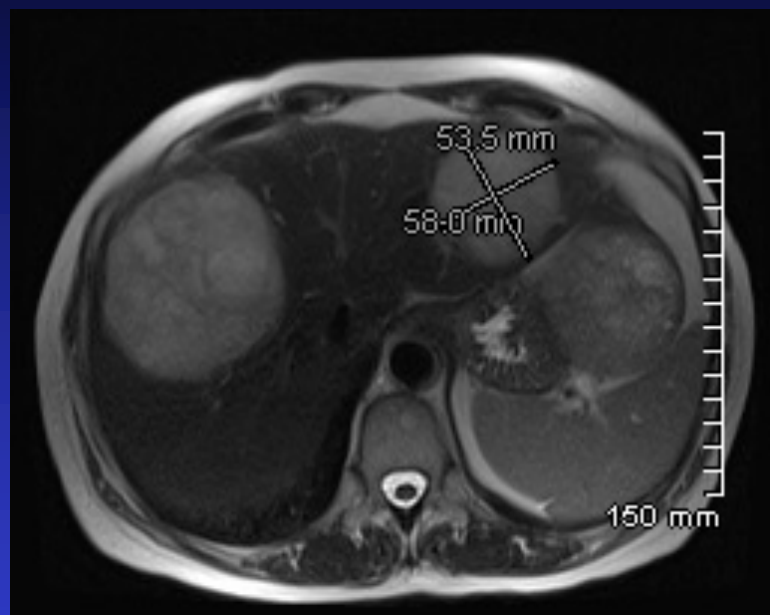
cTACE : The Technique Matters

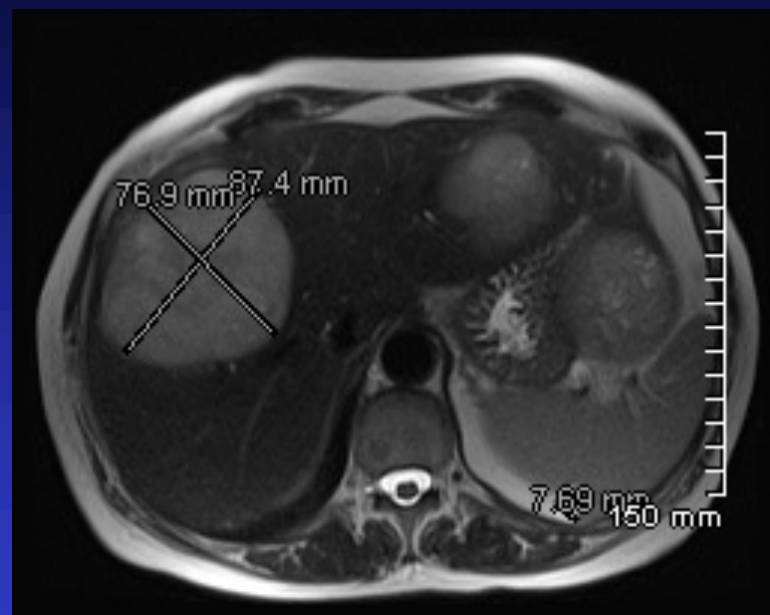
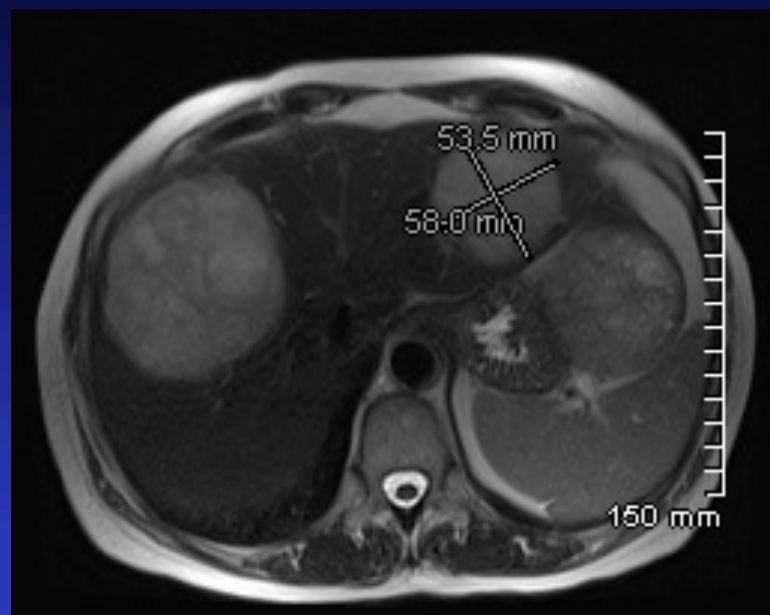
- Selectivity
- Dose delivered
- Endpoint

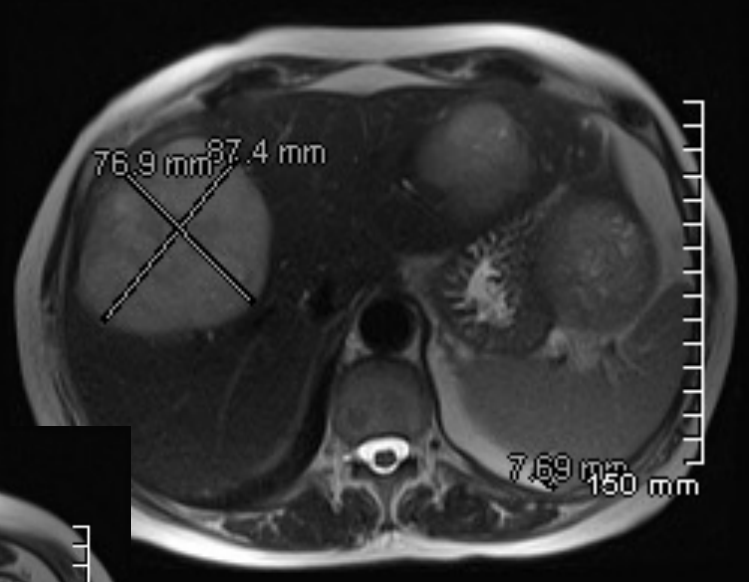
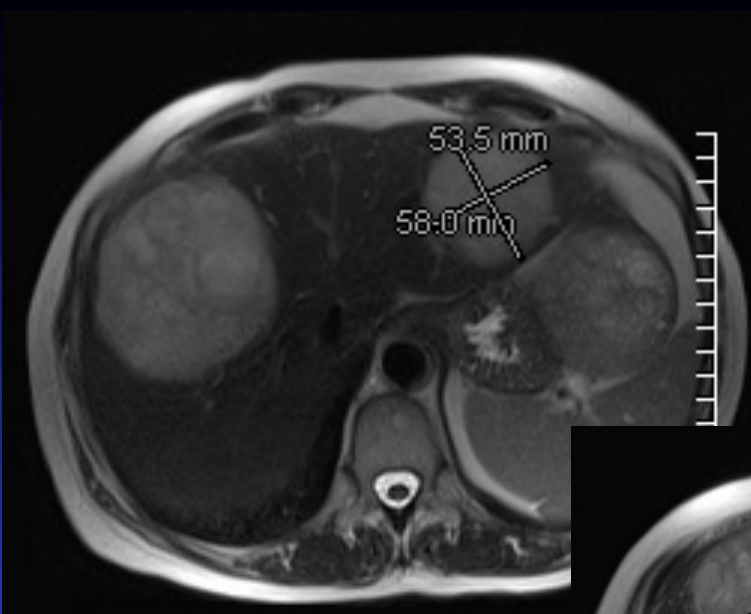




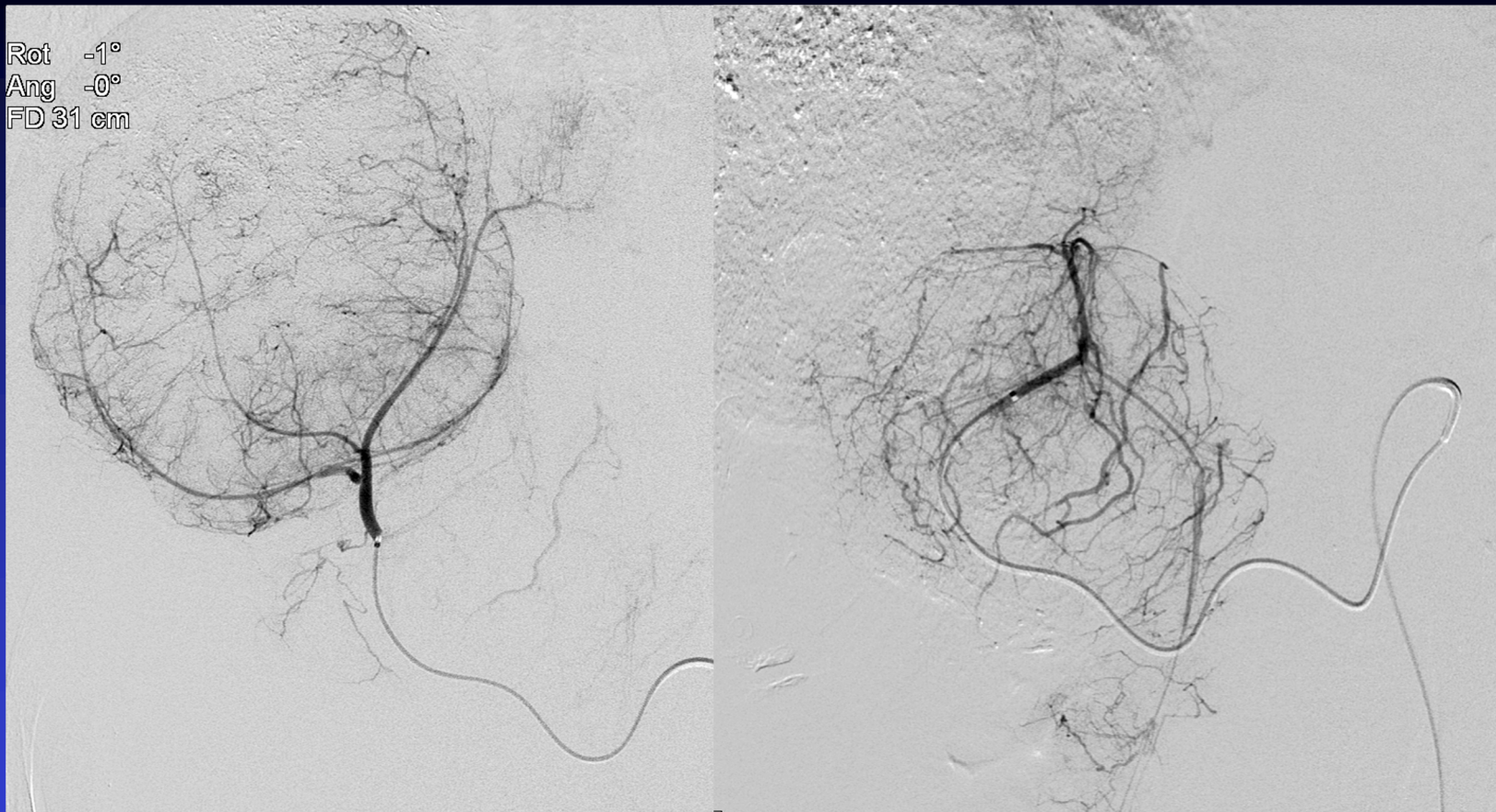


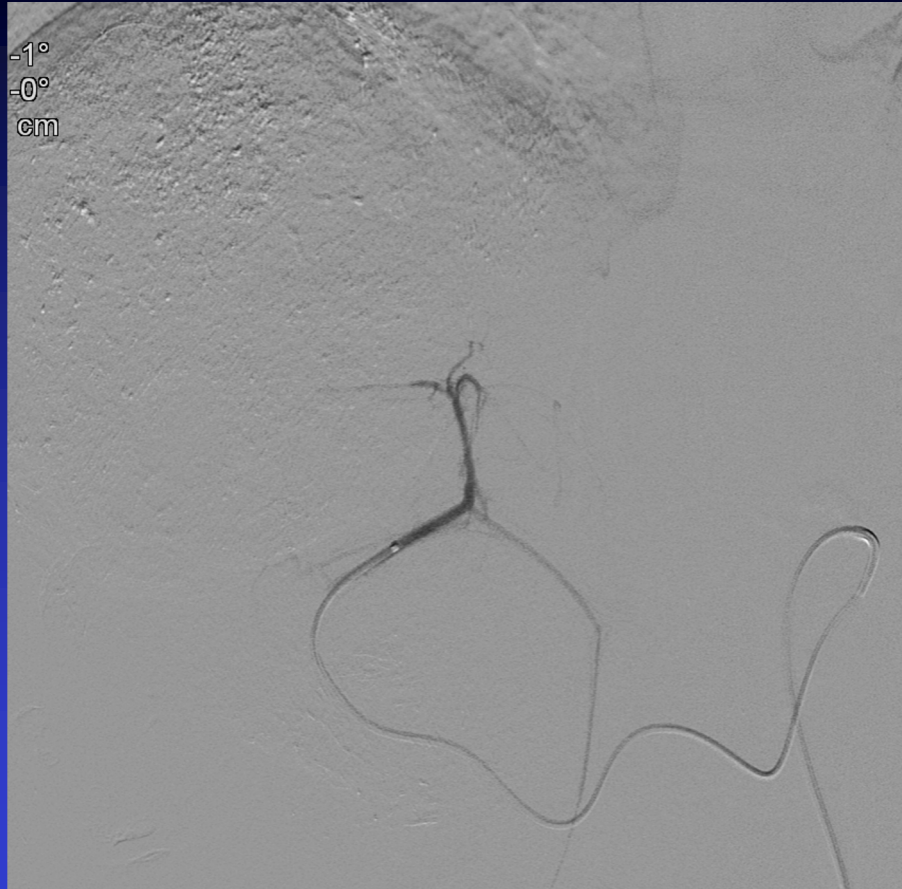


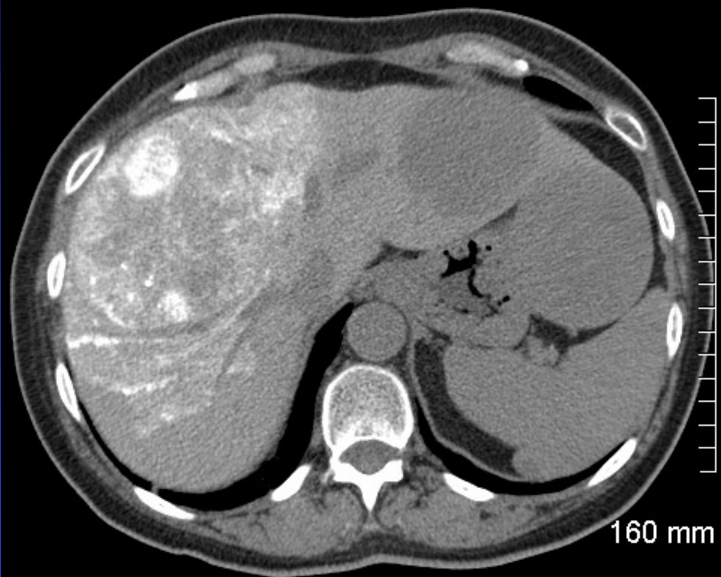


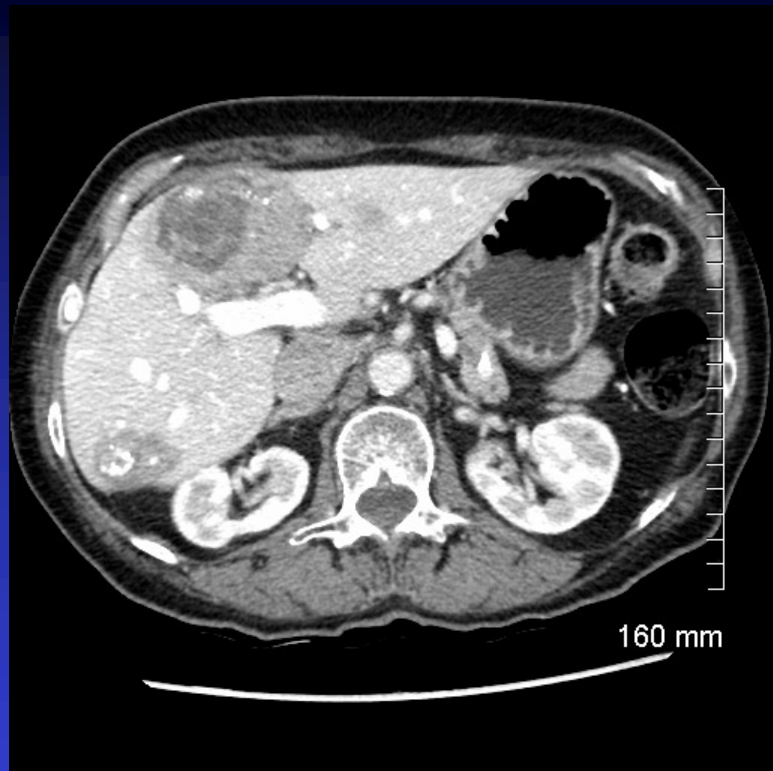
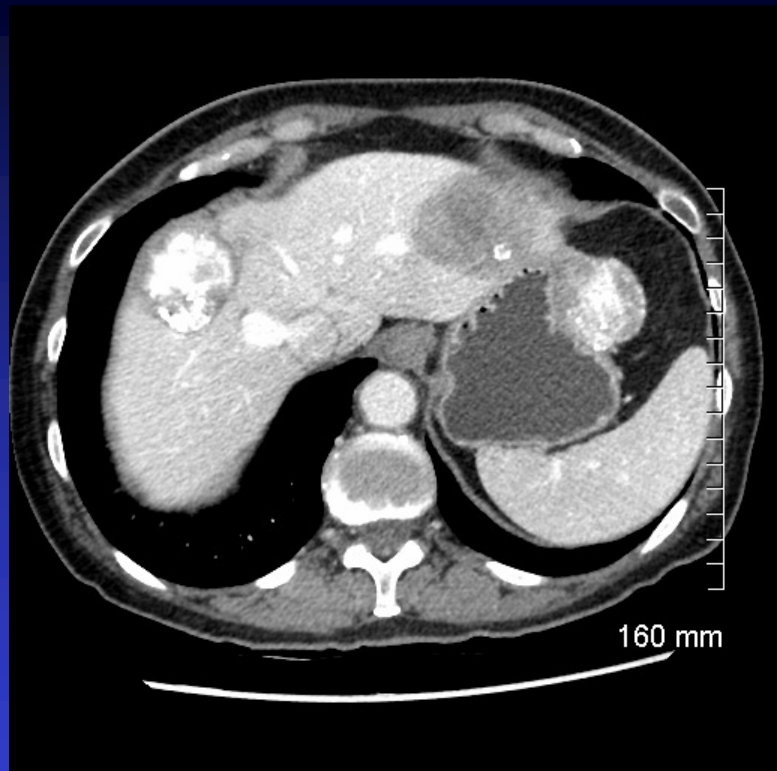


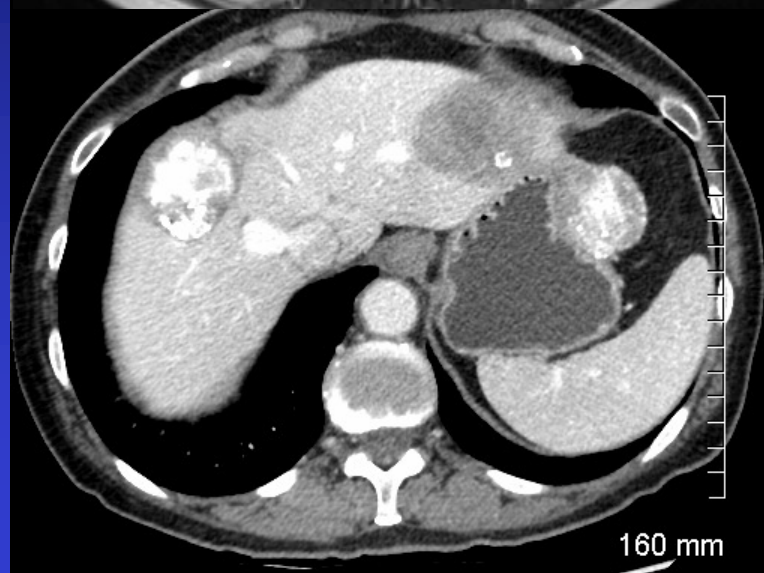
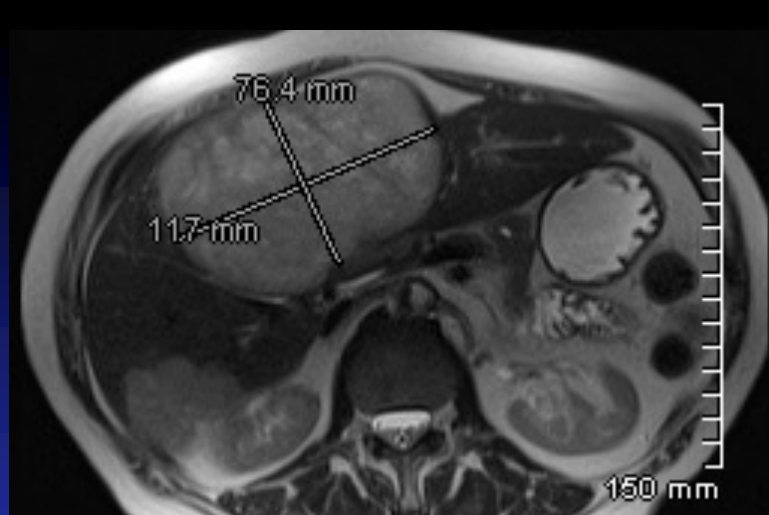
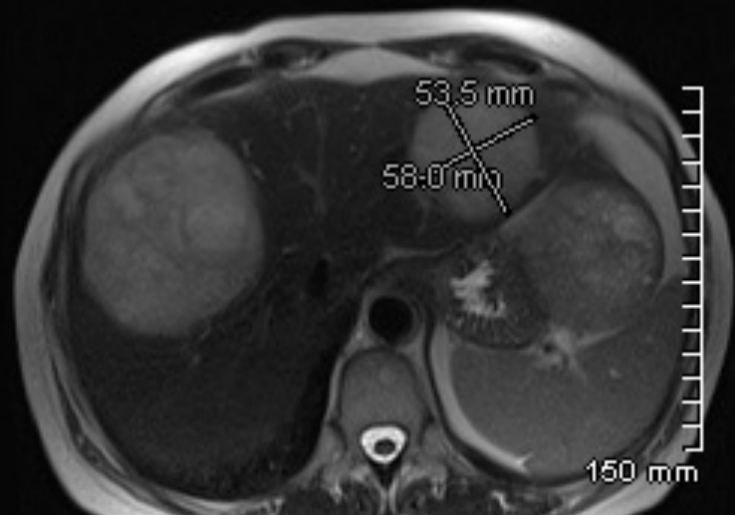
Rot -1°
Ang -0°
FD 31 cm



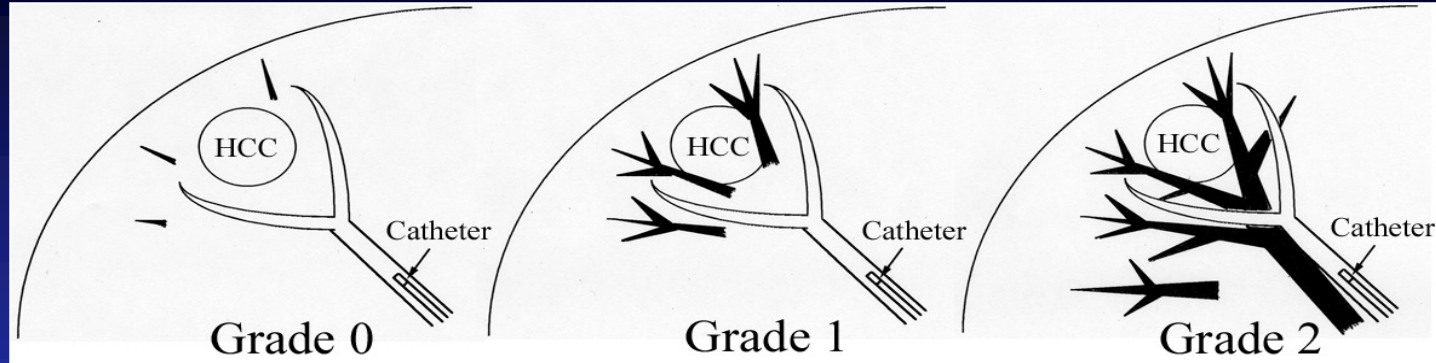








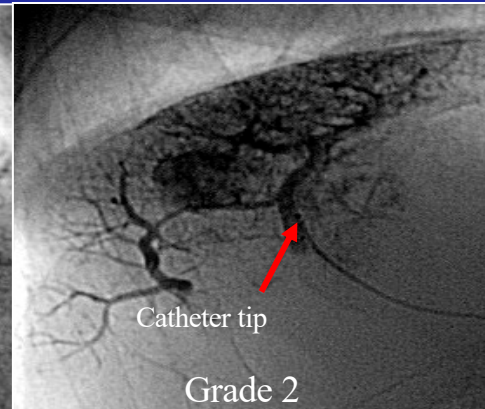
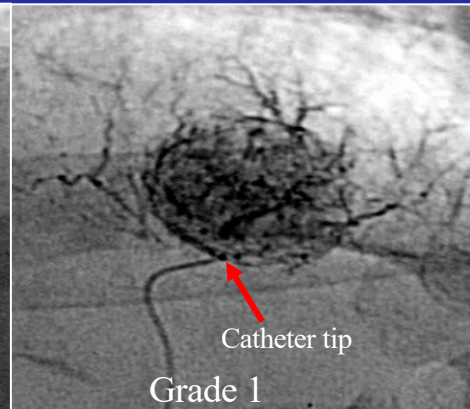
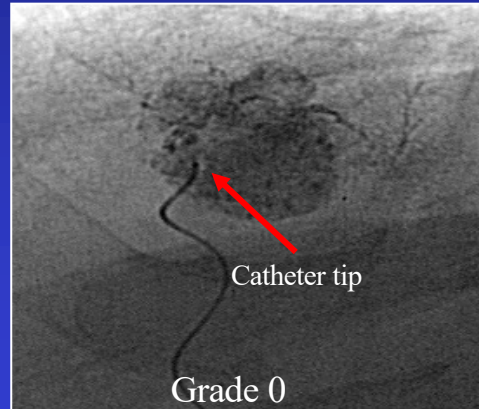
Arterio-portal shunt (peribiliary plexus) Long lasting Lipiodol uptake



No visualization

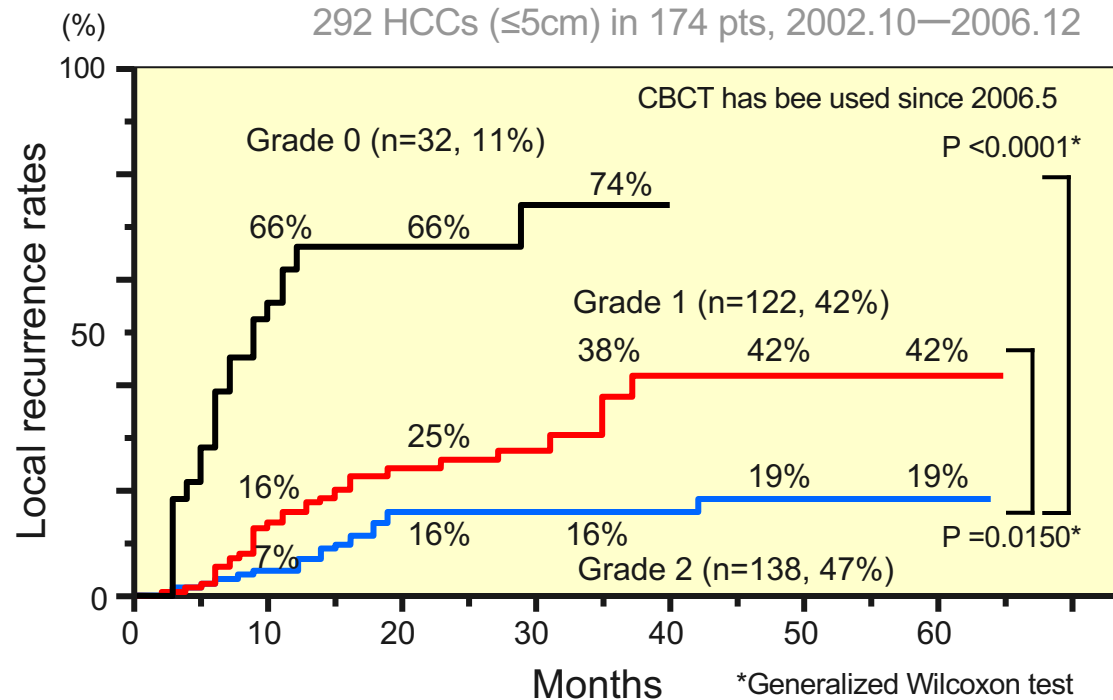
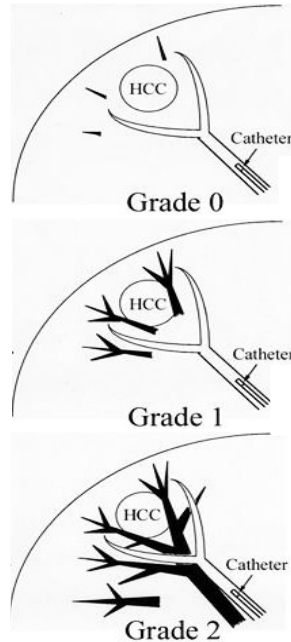
Visualization adjacent to the tumor

Visualization in the whole or extending embolized area



Arterio-portal shunt (peribiliary plexus) Long lasting Lipiodol uptake

Local Recurrence / Portal Vein Visualization (by a Single TACE Session)



Courtesy T Debaere

Miyayama S, et al.
JVIR 2007; 18:365-376.

TOP 5 PEARLS

- All components of cTACE contribute to efficacy : drugs, oil, particle
- Mixing of drugs and lipiodol: water in oil
- Selectivity, embolization endpoint also important for optimal results
- Take your time
- Recognize and treat vasospasm