CHC et thrombose porte néoplasique : Actualités 2021 en Radiothérapie

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Journée Multidisciplinaire d'Hépatologie et transplantation hépatique, Lyon, 2 décembre 2021

Liens d'intérêt

Consulting: Roche, Boehringer Ingelheim, Lilly, Astra Zeneca.

Foie et Radiothérapie
Une association difficile mais réussie

Organe mobile,
Pts fragiles, parenchyme radiosensible,
Le « foie sain » n'est pas sain : *non tumoral*
Organes creux environnants, radiosensibles
Repérage difficile (isodensité)
Autres traitements peu compatibles + RT

Traitement du CHC :

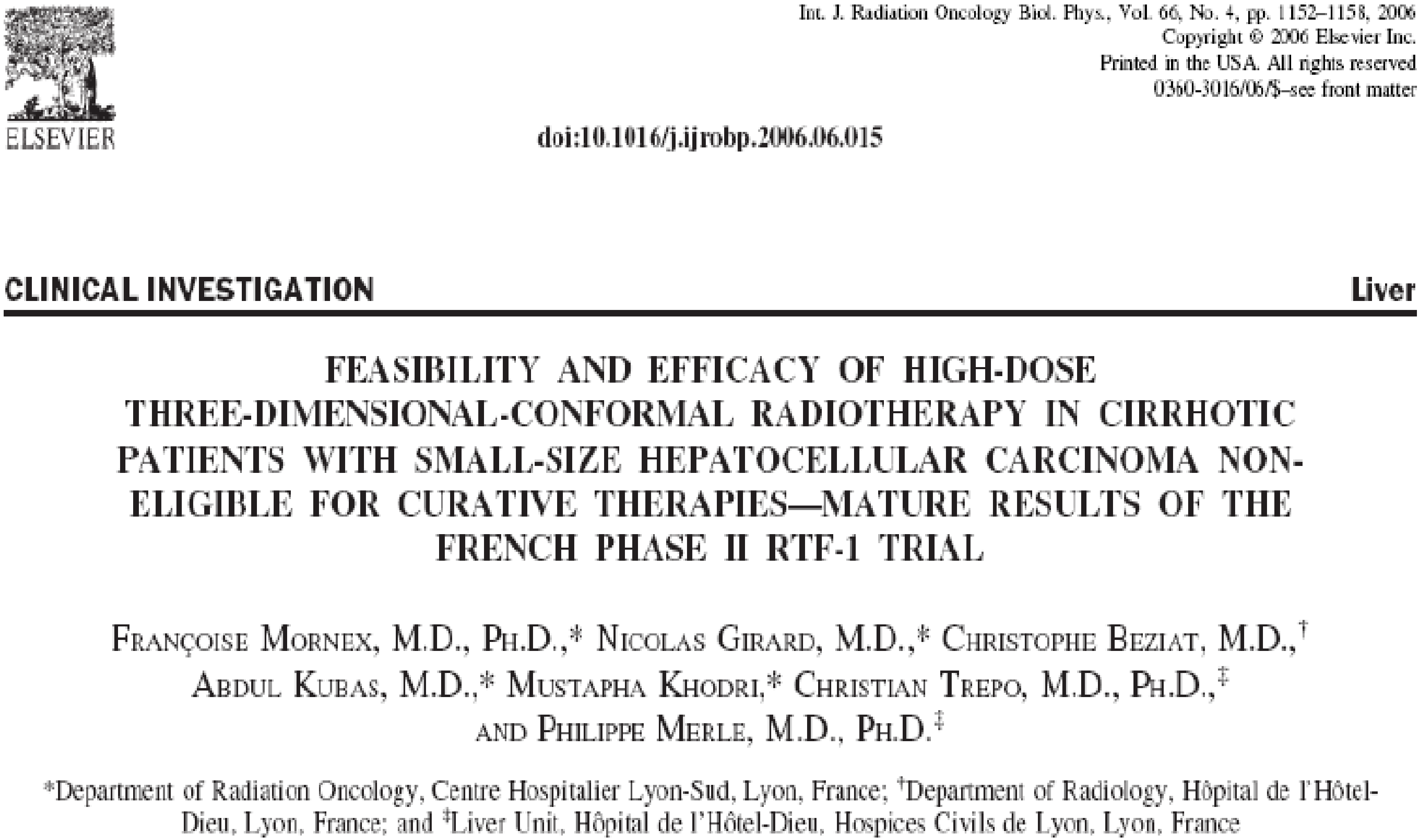
Place de la Radiothérapie.

~~Transplantation~~
~~Résection chirurgicale~~
~~Radiofréquence~~

T < 5 cm
T > 5 cm

CHC et Radiothérapie : Etude française RTF1

T<5 cm



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CLINICAL INVESTIGATION **Liver**

FEASIBILITY AND EFFICACY OF HIGH-DOSE THREE-DIMENSIONAL-CONFORMAL RADIOTHERAPY IN CIRRHOTIC PATIENTS WITH SMALL-SIZE HEPATOCELLULAR CARCINOMA NON-ELIGIBLE FOR CURATIVE THERAPIES—MATURE RESULTS OF THE FRENCH PHASE II RTF-1 TRIAL

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Abdul Kubas, M.D.,* Mustapha Khodri,* Christian Trepo, M.D., Ph.D.,‡
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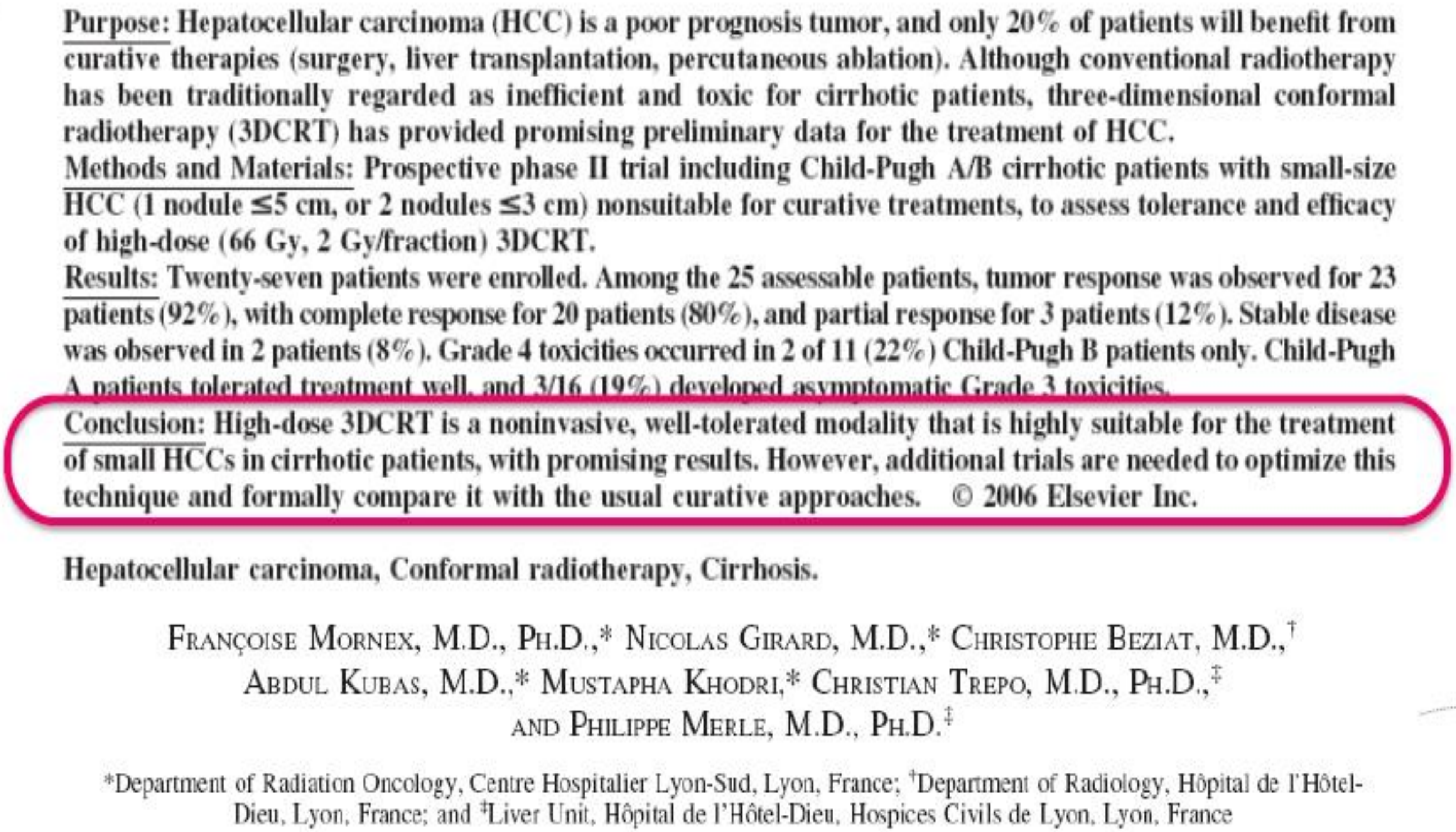
CHC et Radiothérapie : Etude française RTF1



Purpose: Hepatocellular carcinoma (HCC) is a poor prognosis tumor, and only 20% of patients will benefit from curative therapies (surgery, liver transplantation, percutaneous ablation). Although conventional radiotherapy has been traditionally regarded as inefficient and toxic for cirrhotic patients, three-dimensional conformal radiotherapy (3DCRT) has provided promising preliminary data for the treatment of HCC.

Methods and Materials: Prospective phase II trial including Child-Pugh A/B cirrhotic patients with small-size HCC (1 nodule ≤5 cm, or 2 nodules ≤3 cm) nonsuitable for curative treatments, to assess tolerance and efficacy of high-dose (66 Gy, 2 Gy/fraction) 3DCRT.

Results: Twenty-seven patients were enrolled. Among the 25 assessable patients, tumor response was observed for 23 patients (92%), with complete response for 20 patients (80%), and partial response for 3 patients (12%). Stable disease was observed in 2 patients (8%). Grade 4 toxicities occurred in 2 of 11 (22%) Child-Pugh B patients only. Child-Pugh A patients tolerated treatment well, and 3/16 (19%) developed asymptomatic Grade 3 toxicities.

Conclusion: High-dose 3DCRT is a noninvasive, well-tolerated modality that is highly suitable for the treatment of small HCCs in cirrhotic patients, with promising results. However, additional trials are needed to optimize this technique and formally compare it with the usual curative approaches. © 2006 Elsevier Inc.

Hepatocellular carcinoma, Conformal radiotherapy, Cirrhosis.

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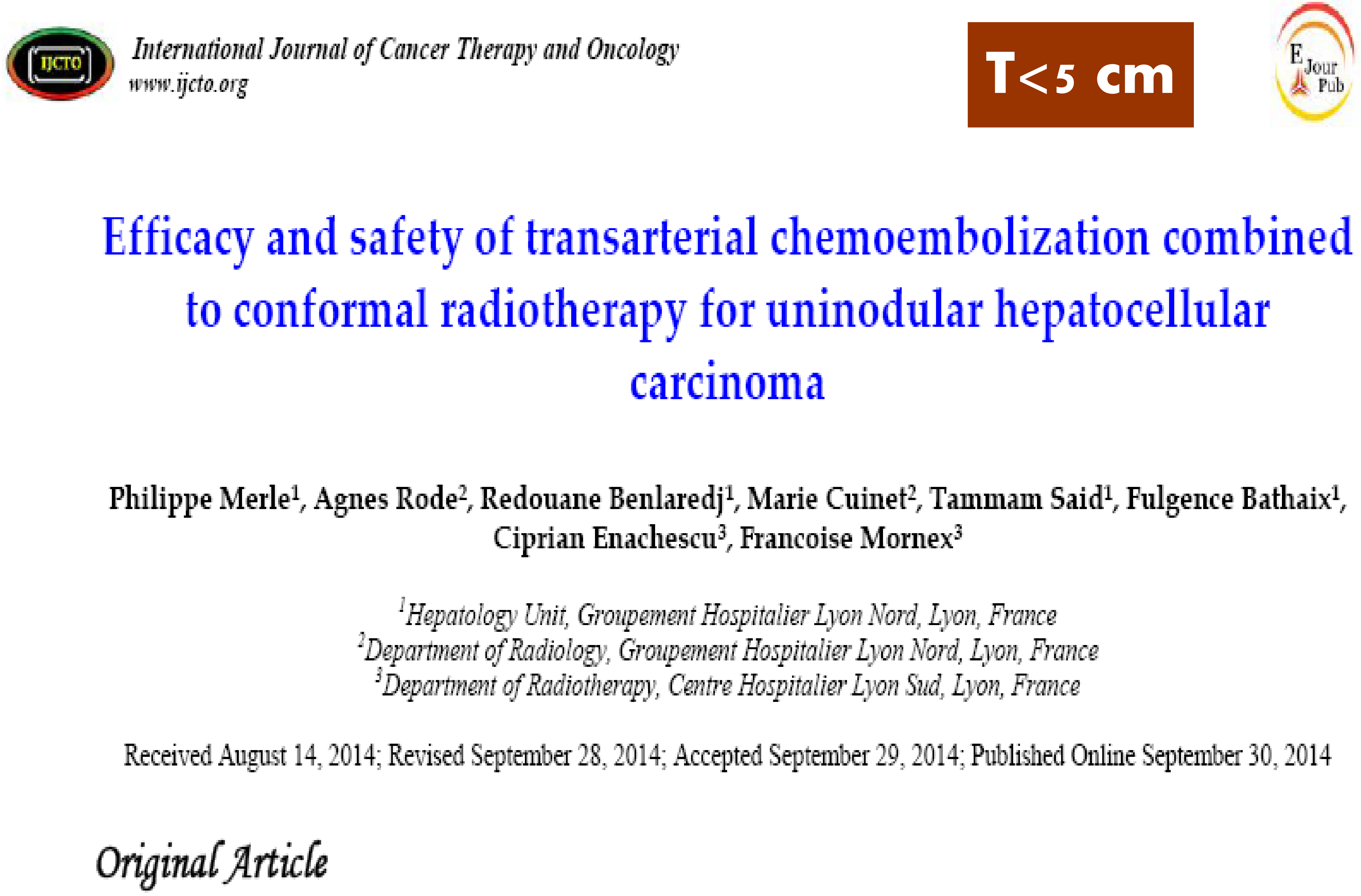
92% contrôle local

Conformal Radiation for HCC. Phase II trials

Author	n	CRT	OR	Acute toxicity grade ≥ 3	Infield failure rate	Multifocal failure rate	Disease-free survival	Survival
Robertson 1993	11	BF 48-72 Gy	100 %	16 %	-	-	72% (2-year)	-
Dawson 2000	27	BF 30-90 Gy	45 %	-	-	-	-	11 months (median)
Park 2000	158	MF 40-60 Gy	67 %	-	7 %	34 %	-	42% (1-year) 20% à 2-year
Liu 2004	44	MF 40-60 Gy	61 %	0 %	0 %	43 %	-	15 months (median) 61% (1-year) 40% (2-year)
Mornex 2005	27	MF 66 Gy	92 %	11 % Late 1%	26 %* > 2 yrs	43 %	34 months (median)	-

Le CHC est une tumeur très radiosensible

T<5 cm



International Journal of Cancer Therapy and Oncology
www.ijcto.org

Efficacy and safety of transarterial chemoembolization combined to conformal radiotherapy for uninodular hepatocellular carcinoma

Philippe Merle[1], Agnes Rode[2], Redouane Benlaredj[1], Marie Cuinet[2], Tammam Said[1], Fulgence Bathaix[1], Ciprian Enachescu[3], Francoise Mornex[3]

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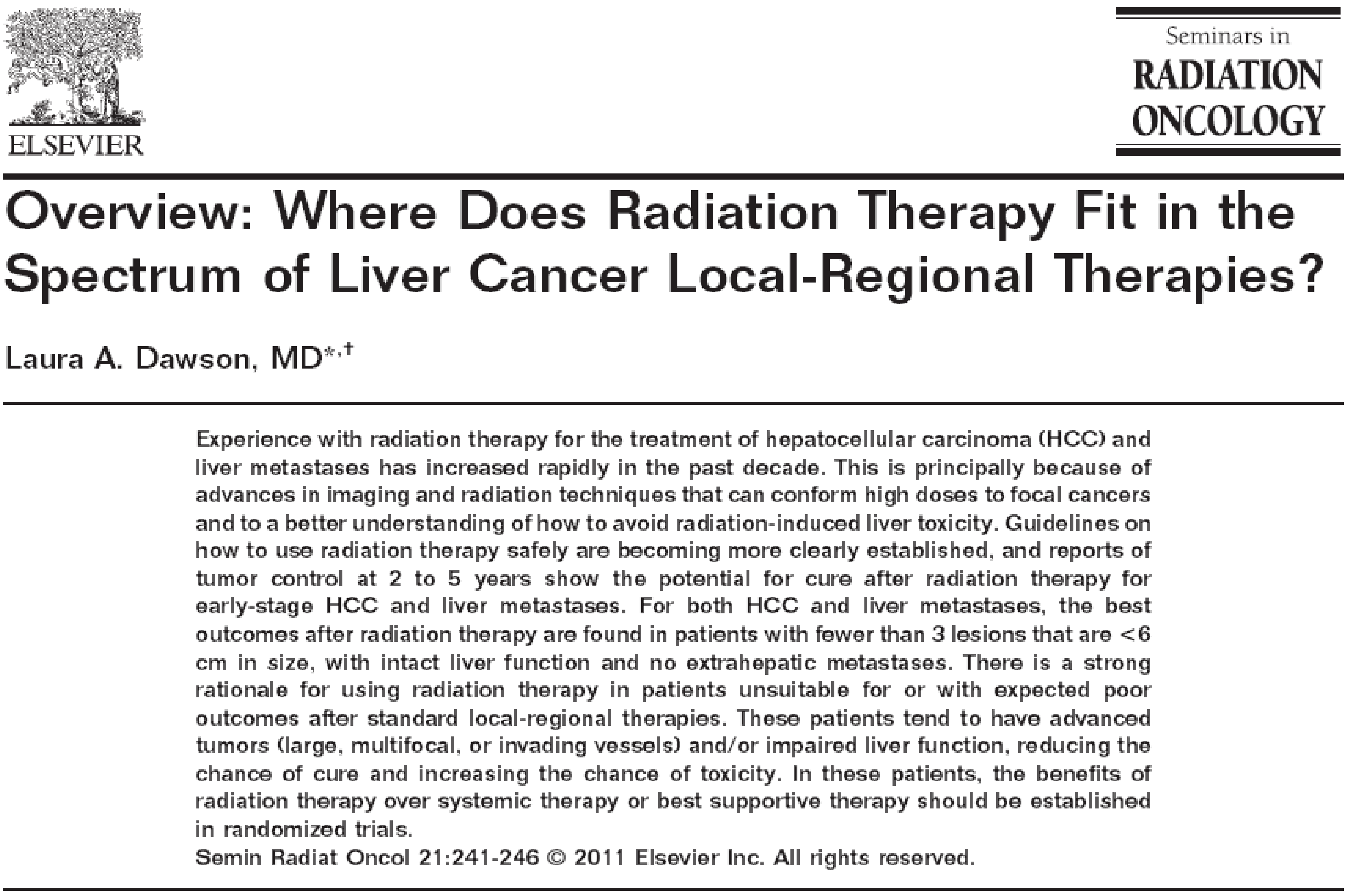
Original Article

Chimio-embolisation-RT: Conclusions

L'association chimio-embolisation-RT est efficace et bien tolérée.

Elle permet d'améliorer le contrôle local et la survie chez des patients présentant des facteurs de mauvais pronostic.



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Seminars in
RADIATION
ONCOLOGY

Overview: Where Does Radiation Therapy Fit in the Spectrum of Liver Cancer Local-Regional Therapies?

Laura A. Dawson, MD*,†

Experience with radiation therapy for the treatment of hepatocellular carcinoma (HCC) and liver metastases has increased rapidly in the past decade. This is principally because of advances in imaging and radiation techniques that can conform high doses to focal cancers and to a better understanding of how to avoid radiation-induced liver toxicity. Guidelines on how to use radiation therapy safely are becoming more clearly established, and reports of tumor control at 2 to 5 years show the potential for cure after radiation therapy for early-stage HCC and liver metastases. For both HCC and liver metastases, the best outcomes after radiation therapy are found in patients with fewer than 3 lesions that are <6 cm in size, with intact liver function and no extrahepatic metastases. There is a strong rationale for using radiation therapy in patients unsuitable for or with expected poor outcomes after standard local-regional therapies. These patients tend to have advanced tumors (large, multifocal, or invading vessels) and/or impaired liver function, reducing the chance of cure and increasing the chance of toxicity. In these patients, the benefits of radiation therapy over systemic therapy or best supportive therapy should be established in randomized trials.

Semin Radiat Oncol 21:241-246 © 2011 Elsevier Inc. All rights reserved.

SBRT hépatique

2 situations cliniques très différentes :

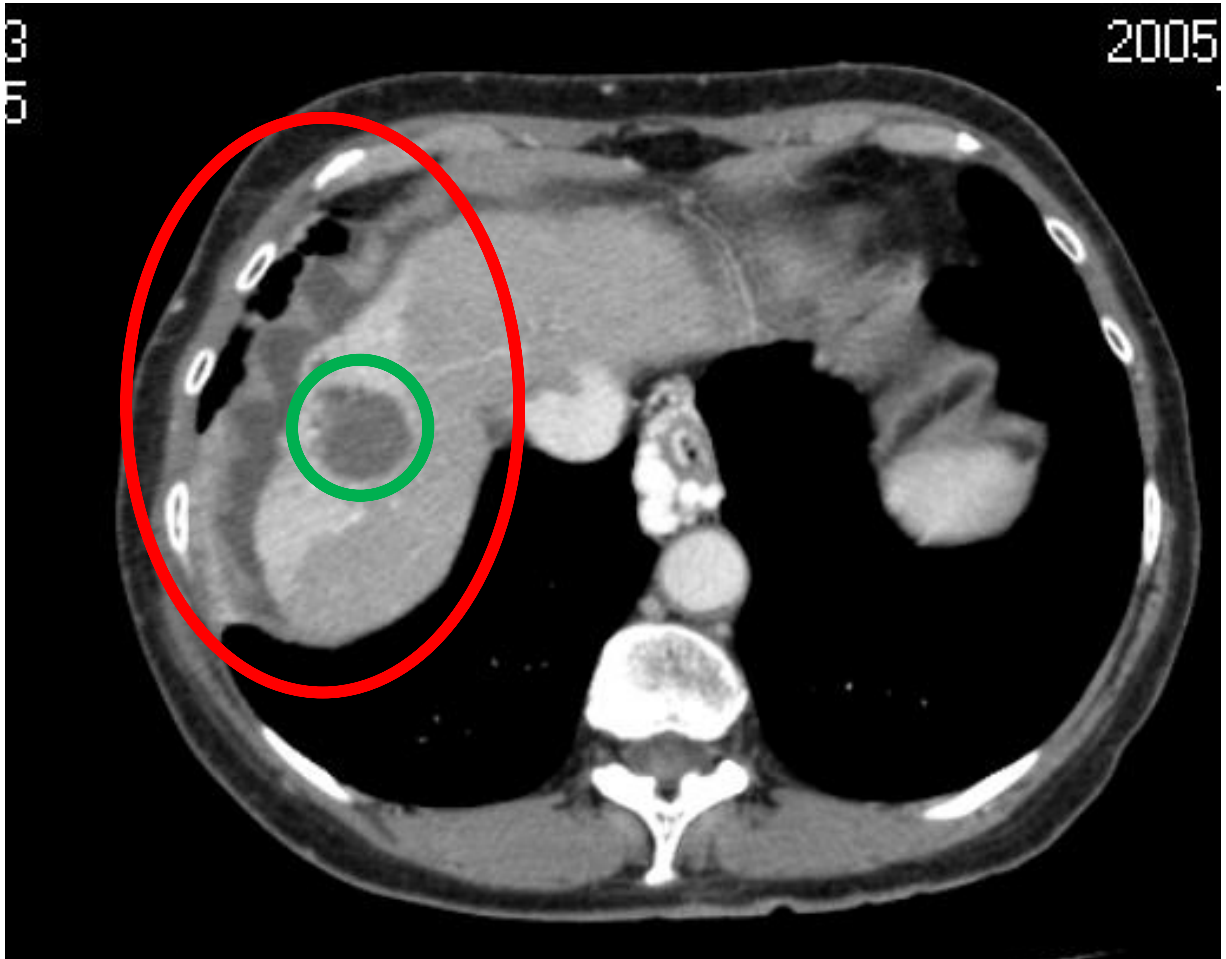
- **CHC : RT à visée curative, pts fragiles**

- **MTS : Statut oligoMTS, visée « curative »**

Dans les 2 situations, haute dose SBRT,
mais prendre en compte l'état hépatique,
l'espérance de vie longue et le cumul des traitements

Stéréotaxie: SBRT/SABR
Réduire le volume à irradier
Augmenter la dose de RT

2005 RT 3D Conformation



2012 SBRT Stéréotaxie

SBRT hépatique

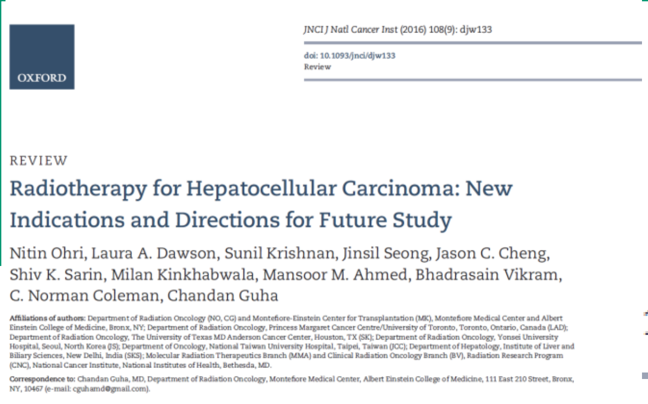
- Dose très “conformée”, moulée sur la forme de la T
- Dose totale très élevée, dose par fraction élevée
- Peu de fractions
- Prise en compte du mouvement
- Radiothérapie guidée par l’image
- Traitement non invasif et ambulatoire, rapide, “entre 2 chimios”, pas d’anesthésie
- Taux de contrôle local élevé, > 90%, bonne tolérance.

SBRT hépatique pour CHC
Seconde cause de mort par cancer dans le monde

- Lésion < 5 cm, 1-3 lésions, pas de MTS ?   OMS ≤ 2
- Attention à l'état du parenchyme :

  volume foie "sain" > 700 cc
- BH, CHILD P < B7 si cirrhose. Bilirub, Album, Prothromb, ascite, encéphalopathie
- Attention aux traitements précédents
- Penser aux traitements futurs
- Attention aux organes creux environnants,Rxsensibles
- Validation de la SBRT en RCP

CHC, SBRT-Résultats



JNCI J Natl Cancer Inst (2016) 108(9): djw133

doi: 10.1093/jnci/djw133
Review

REVIEW

Radiotherapy for Hepatocellular Carcinoma: New Indications and Directions for Future Study

Nitin Ohri, Laura A. Dawson, Sunil Krishnan, Jinsil Seong, Jason C. Cheng, Shiv K. Sarin, Milan Kinkhabwala, Mansoor M. Ahmed, Bhadrasain Vikram, C. Norman Coleman, Chandan Guha

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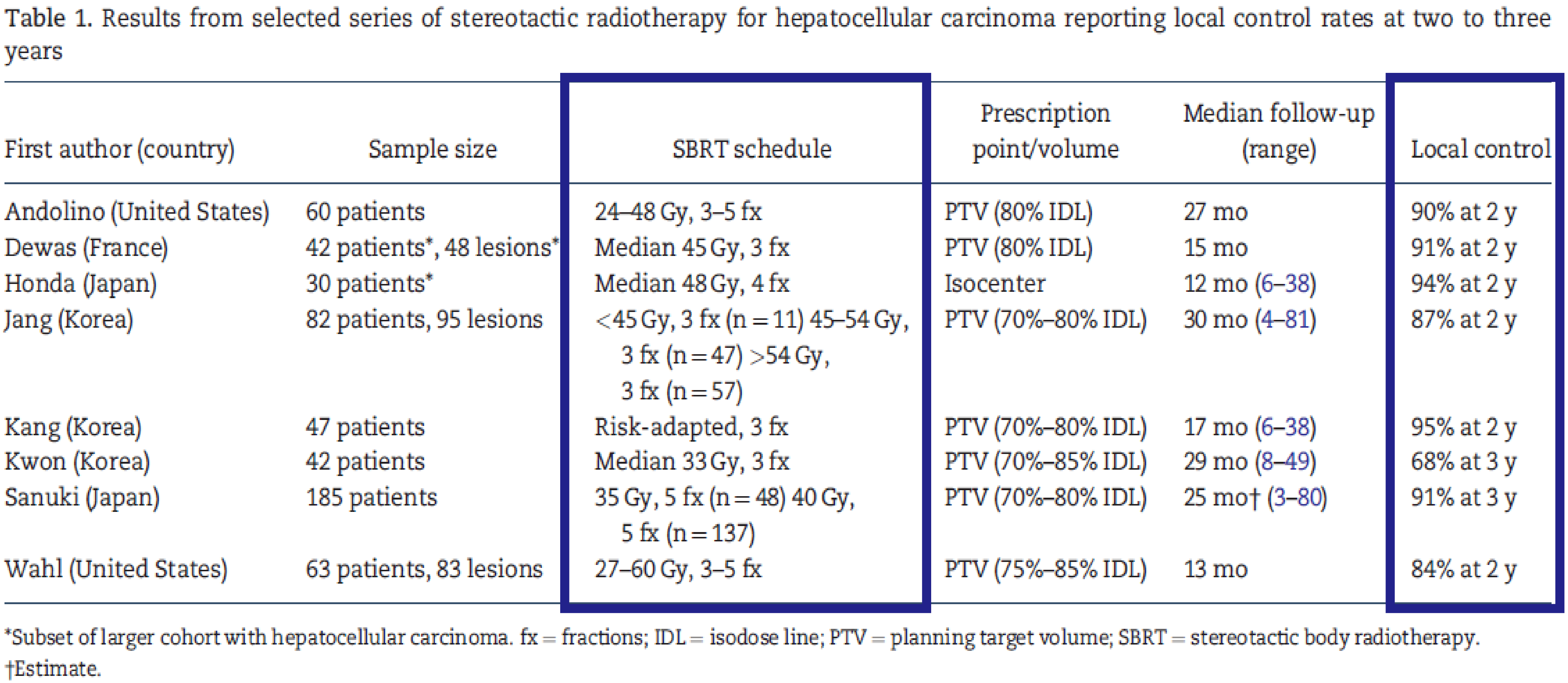
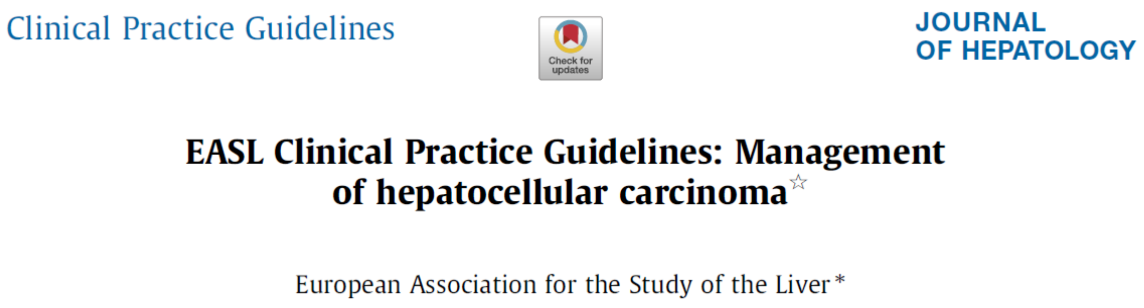


Table 1. Results from selected series of stereotactic radiotherapy for hepatocellular carcinoma reporting local control rates at two to three years

First author (country)	Sample size	SBRT schedule	Prescription point/volume	Median follow-up (range)	Local control
Andolino (United States)	60 patients	24–48 Gy, 3–5 fx	PTV (80% IDL)	27 mo	90% at 2 y
Dewas (France)	42 patients*, 48 lesions*	Median 45 Gy, 3 fx	PTV (80% IDL)	15 mo	91% at 2 y
Honda (Japan)	30 patients*	Median 48 Gy, 4 fx	Isocenter	12 mo (6–38)	94% at 2 y
Jang (Korea)	82 patients, 95 lesions	<45 Gy, 3 fx (n = 11) 45–54 Gy, 3 fx (n = 47) >54 Gy, 3 fx (n = 57)	PTV (70%–80% IDL)	30 mo (4–81)	87% at 2 y
Kang (Korea)	47 patients	Risk-adapted, 3 fx	PTV (70%–80% IDL)	17 mo (6–38)	95% at 2 y
Kwon (Korea)	42 patients	Median 33 Gy, 3 fx	PTV (70%–85% IDL)	29 mo (8–49)	68% at 3 y
Sanuki (Japan)	185 patients	35 Gy, 5 fx (n = 48) 40 Gy, 5 fx (n = 137)	PTV (70%–80% IDL)	25 mo† (3–80)	91% at 3 y
Wahl (United States)	63 patients, 83 lesions	27–60 Gy, 3–5 fx	PTV (75%–85% IDL)	13 mo	84% at 2 y

*Subset of larger cohort with hepatocellular carcinoma. fx = fractions; IDL = isodose line; PTV = planning target volume; SBRT = stereotactic body radiotherapy.
†Estimate.

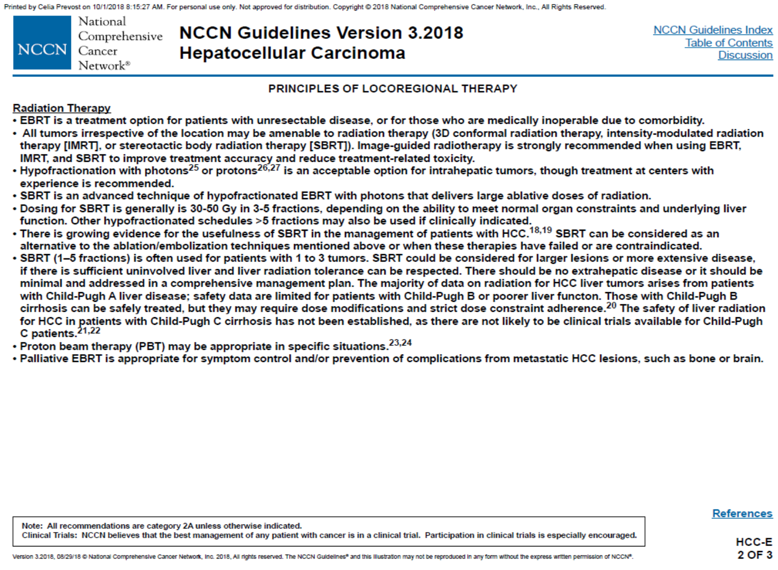


Clinical Practice Guidelines

JOURNAL
OF HEPATOLOGY

EASL Clinical Practice Guidelines: Management of hepatocellular carcinoma☆

European Association for the Study of the Liver*



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NCCN National Comprehensive Cancer Network®

NCCN Guidelines Version 3.2018
Hepatocellular Carcinoma

NCCN Guidelines Index
Table of Contents
Discussion

PRINCIPLES OF LOCOREGIONAL THERAPY

Radiation Therapy
- **EBRT is a treatment option for patients with unresectable disease, or for those who are medically inoperable due to comorbidity.**
- **All tumors irrespective of the location may be amenable to radiation therapy (3D conformal radiation therapy, intensity-modulated radiation therapy [IMRT], or stereotactic body radiation therapy [SBRT]). Image-guided radiotherapy is strongly recommended when using EBRT, IMRT, and SBRT to improve treatment accuracy and reduce treatment-related toxicity.**
- **Hypofractionation with photons[25] or protons[26,27] is an acceptable option for intrahepatic tumors, though treatment at centers with experience is recommended.**
- **SBRT is an advanced technique of hypofractionated EBRT with photons that delivers large ablative doses of radiation.**
- **Dosing for SBRT is generally is 30-50 Gy in 3-5 fractions, depending on the ability to meet normal organ constraints and underlying liver function. Other hypofractionated schedules >5 fractions may also be used if clinically indicated.**
- **There is growing evidence for the usefulness of SBRT in the management of patients with HCC.[18,19] SBRT can be considered as an alternative to the ablation/embolization techniques mentioned above or when these therapies have failed or are contraindicated.**
- **SBRT (1–5 fractions) is often used for patients with 1 to 3 tumors. SBRT could be considered for larger lesions or more extensive disease, if there is sufficient uninvolved liver and liver radiation tolerance can be respected. There should be no extrahepatic disease or it should be minimal and addressed in a comprehensive management plan. The majority of data on radiation for HCC liver tumors arises from patients with Child-Pugh A liver disease; safety data are limited for patients with Child-Pugh B or poorer liver functon. Those with Child-Pugh B cirrhosis can be safely treated, but they may require dose modifications and strict dose constraint adherence.[20] The safety of liver radiation for HCC in patients with Child-Pugh C cirrhosis has not been established, as there are not likely to be clinical trials available for Child-Pugh C patients.[21,22]**
- **Proton beam therapy (PBT) may be appropriate in specific situations.[23,24]**
- **Palliative EBRT is appropriate for symptom control and/or prevention of complications from metastatic HCC lesions, such as bone or brain.**

References

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

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HCC-E
2 OF 3

Journal of the Formosan Medical Association (2018) 117, 381–403

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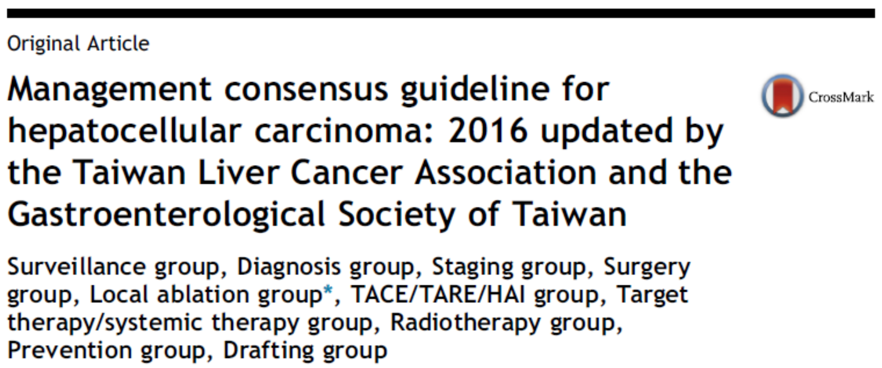
journal homepage: www.jf



Original Article

Management consensus guideline for hepatocellular carcinoma: 2016 updated by the Taiwan Liver Cancer Association and the Gastroenterological Society of Taiwan

Surveillance group, Diagnosis group, Staging group, Surgery group, Local ablation group*, TACE/TARE/HAI group, Target therapy/systemic therapy group, Radiotherapy group, Prevention group, Drafting group

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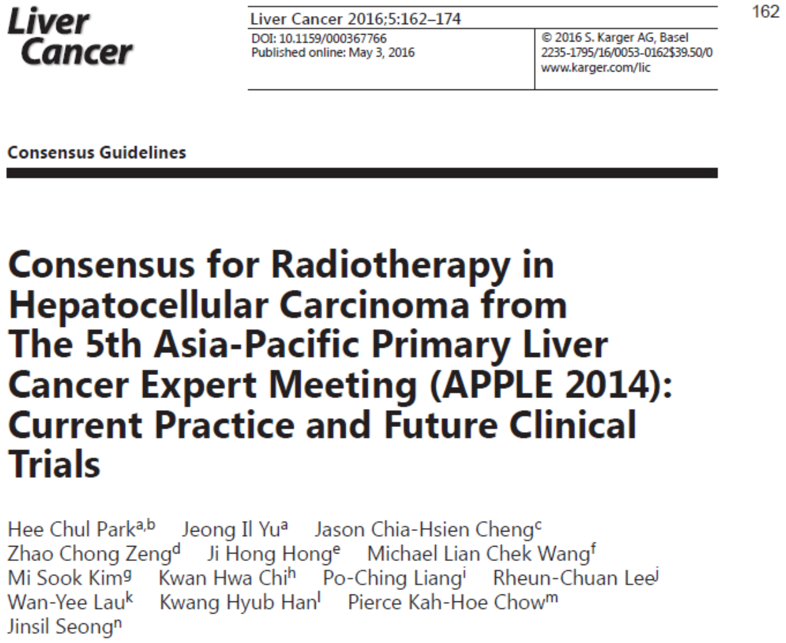

Liver Cancer

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Published online: May 3, 2016

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Consensus Guidelines

Consensus for Radiotherapy in Hepatocellular Carcinoma from The 5th Asia-Pacific Primary Liver Cancer Expert Meeting (APPLE 2014): Current Practice and Future Clinical Trials

Hee Chul Park[a,b] Jeong Il Yu[a] Jason Chia-Hsien Cheng[c]
Zhao Chong Zeng[d] Ji Hong Hong[e] Michael Lian Chek Wang[f]
Mi Sook Kim[g] Kwan Hwa Chi[h] Po-Ching Liang[i] Rheun-Chuan Lee[j]
Wan-Yee Lau[k] Kwang Hyub Han[l] Pierce Kah-Hoe Chow[m]
Jinsil Seong[n]

Original article

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Stereotactic body radiotherapy for liver tumors

Principles and practical guidelines of the DEGRO Working Group on Stereotactic Radiotherapy

Attention au tube digestif et aux ATCD

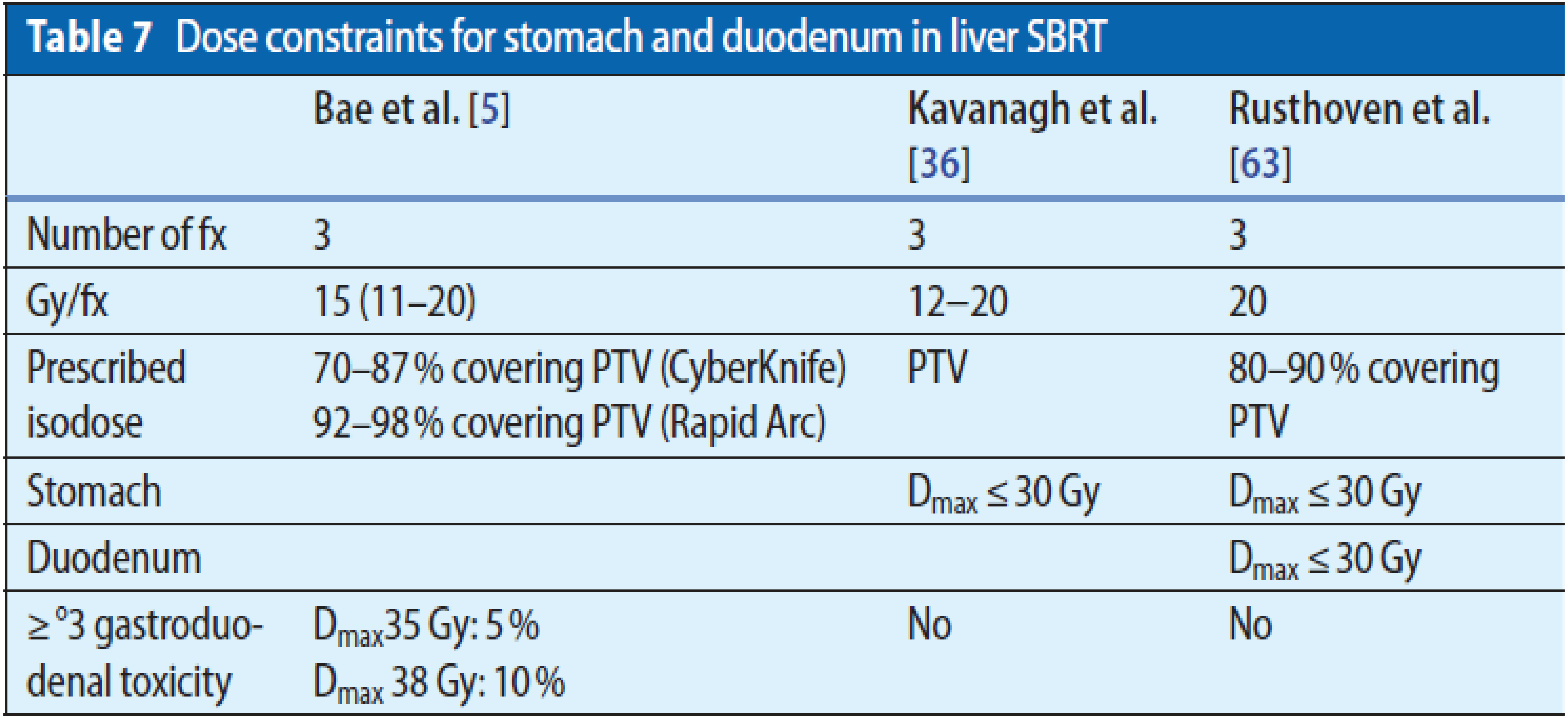

Table 7 Dose constraints for stomach and duodenum in liver SBRT

	Bae et al. [5]	Kavanagh et al. [36]	Rusthoven et al. [63]
Number of fx	3	3	3
Gy/fx	15 (11–20)	12–20	20
Prescribed isodose	70–87 % covering PTV (CyberKnife) 92–98 % covering PTV (Rapid Arc)	PTV	80–90 % covering PTV
Stomach		$D_{max} \leq 30$ Gy	$D_{max} \leq 30$ Gy
Duodenum			$D_{max} \leq 30$ Gy
≥°3 gastroduodenal toxicity	D_{max}35 Gy: 5 % D_{max} 38 Gy: 10 %	No	No

Sterzing F et al. Strahlenther Oncol 2014. 190; 872

Thrombose porte néoplasique (PVTT)

Thrombose porte néoplasique (PVTT)

Situation clinique rare en oncologie

Pronostic sombre (BCLC C), hétérogénéité pts
risque d'essaimage, pronostic vital engagé

Place pour un traitement local aggressif ?

RT : Forme tumorale spécifique : vaisseaux
Quel volume irradier ? Dose ?
Associations thérapeutiques ?

Journal Pre-proof

JOURNAL
OF HEPATOLOGY

BCLC staging.
Update 2022

BCLC strategy for prognosis prediction and treatment recommendation Barcelona Clinic Liver Cancer (BCLC) staging system. The 2022 update

M. Reig, A. Forner, J. Rimola, J. Ferrer-Fábrega, M. Burrel, A. Garcia-Criado, R.K. Kelley, P.R. Galle, V. Mazzaferro, R. Salem, B. Sangro, A.G. Singal, A. Vogel, J. Fuster, C. Ayuso, J. Bruix

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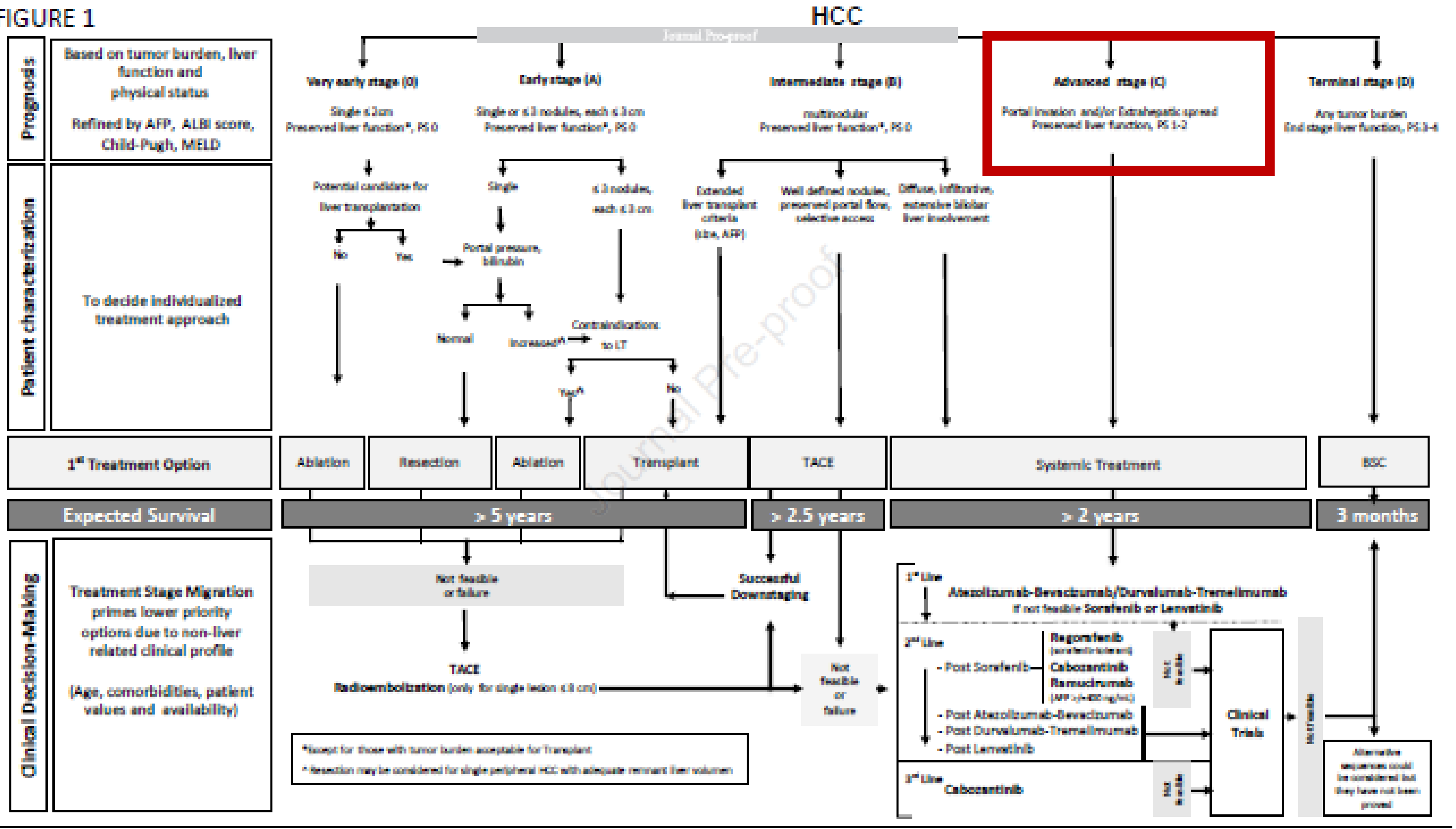
FIGURE 1



HCC
Journal Pre-proof
Prognosis
Based on tumor burden, liver function and physical status
Refined by AFP, ALBI score, Child-Pugh, MELD
Very early stage (0)
Single ≤ 2cm
Preserved liver function*, PS 0
Early stage (A)
Single or ≤ 3 nodules, each ≤ 3 cm
Preserved liver function*, PS 0
Intermediate stage (B)
multinodular
Preserved liver function*, PS 0
Advanced stage (C)
Portal invasion and/or Extrahepatic spread
Preserved liver function, PS 1-2
Terminal stage (D)
Any tumor burden
End stage liver function, PS 3-4
Patient characterization
To decide individualized treatment approach
Potential candidate for liver transplantation
No
Yes
Single
≤ 3 nodules, each ≤ 3 cm
Portal pressure, bilirubin
Normal
Increased^
Contraindications to LT
Yes^
No
Extended liver transplant criteria (size, AFP)
Well defined nodules, preserved portal flow, selective access
Diffuse, infiltrative, extensive bilobar liver involvement
1st Treatment Option
Ablation
Resection
Ablation
Transplant
TACE
Systemic Treatment
BSC
Expected Survival
> 5 years
> 2.5 years
> 2 years
3 months
Clinical Decision-Making
Treatment Stage Migration primes lower priority options due to non-liver related clinical profile
(Age, comorbidities, patient values and availability)
Not feasible or failure
TACE
Radioembolization (only for single lesion ≤8 cm)
Successful Downstaging
Not feasible or failure
1st Line
Atezolizumab-Bevacizumab/Durvalumab-Tremelimumab
If not feasible Sorafenib or Lenvatinib
2nd Line
- Post Sorafenib
Regorafenib (sorafenib-tolerant)
Cabozantinib
Ramucirumab (AFP ≥400 ng/mL)
- Post Atezolizumab-Bevacizumab
- Post Durvalumab-Tremelimumab
- Post Lenvatinib
3rd Line
Cabozantinib
Clinical Trials
Alternative sequences could be considered but they have not been proved
*Except for those with tumor burden acceptable for Transplant
^ Resection may be considered for single peripheral HCC with adequate remnant liver volumen

Quel traitement local ?
Associations ?

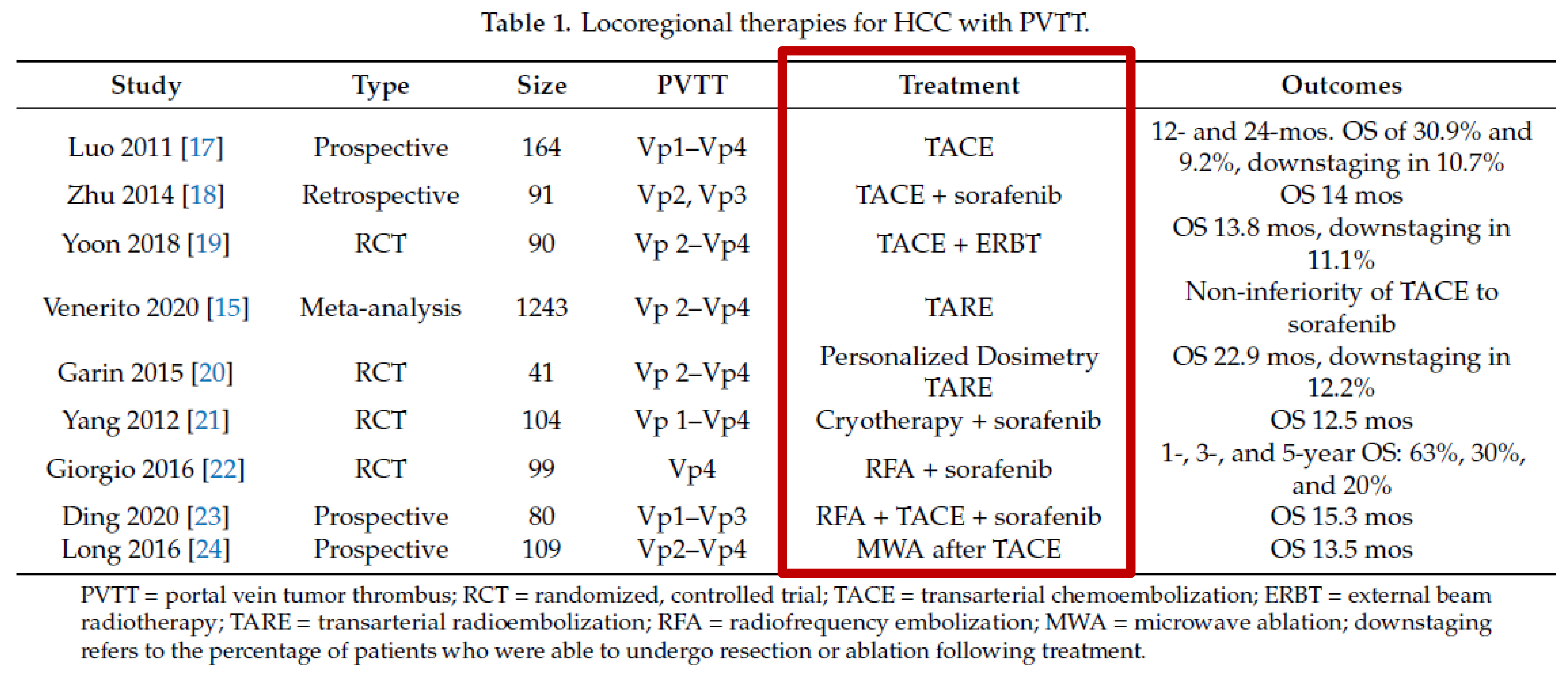


Table 1. Locoregional therapies for HCC with PVTT.

Study	Type	Size	PVTT	Treatment	Outcomes
Luo 2011 [17]	Prospective	164	Vp1–Vp4	TACE	12- and 24-mos. OS of 30.9% and 9.2%, downstaging in 10.7%
Zhu 2014 [18]	Retrospective	91	Vp2, Vp3	TACE + sorafenib	OS 14 mos
Yoon 2018 [19]	RCT	90	Vp 2–Vp4	TACE + ERBT	OS 13.8 mos, downstaging in 11.1%
Venerito 2020 [15]	Meta-analysis	1243	Vp 2–Vp4	TARE	Non-inferiority of TACE to sorafenib
Garin 2015 [20]	RCT	41	Vp 2–Vp4	Personalized Dosimetry TARE	OS 22.9 mos, downstaging in 12.2%
Yang 2012 [21]	RCT	104	Vp 1–Vp4	Cryotherapy + sorafenib	OS 12.5 mos
Giorgio 2016 [22]	RCT	99	Vp4	RFA + sorafenib	1-, 3-, and 5-year OS: 63%, 30%, and 20%
Ding 2020 [23]	Prospective	80	Vp1–Vp3	RFA + TACE + sorafenib	OS 15.3 mos
Long 2016 [24]	Prospective	109	Vp2–Vp4	MWA after TACE	OS 13.5 mos

PVTT = portal vein tumor thrombus; RCT = randomized, controlled trial; TACE = transarterial chemoembolization; ERBT = external beam radiotherapy; TARE = transarterial radioembolization; RFA = radiofrequency embolization; MWA = microwave ablation; downstaging refers to the percentage of patients who were able to undergo resection or ablation following treatment.

SBRT pour thrombose porte tumorale

Advanced radiotherapy technique in hepatocellular carcinoma with portal vein thrombosis: Feasibility and clinical outcomes

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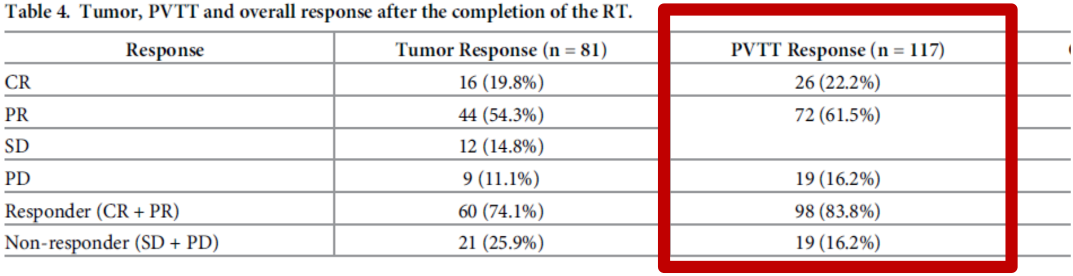


Table 4. Tumor, PVTT and overall response after the completion of the RT.

Response	Tumor Response (n = 81)	PVTT Response (n = 117)
CR	16 (19.8%)	26 (22.2%)
PR	44 (54.3%)	72 (61.5%)
SD	12 (14.8%)	
PD	9 (11.1%)	19 (16.2%)
Responder (CR + PR)	60 (74.1%)	98 (83.8%)
Non-responder (SD + PD)	21 (25.9%)	19 (16.2%)

RR 84%

Tox G>3 14%

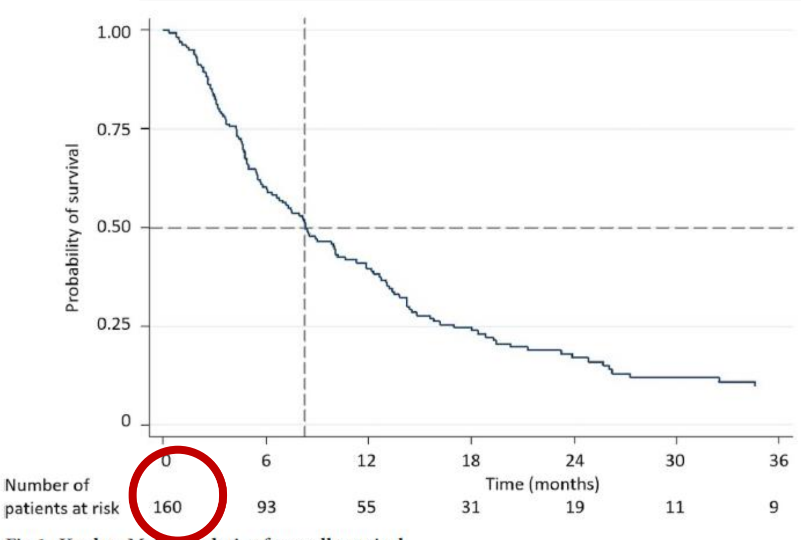


Fig 1. Kaplan-Meier analysis of overall survival.

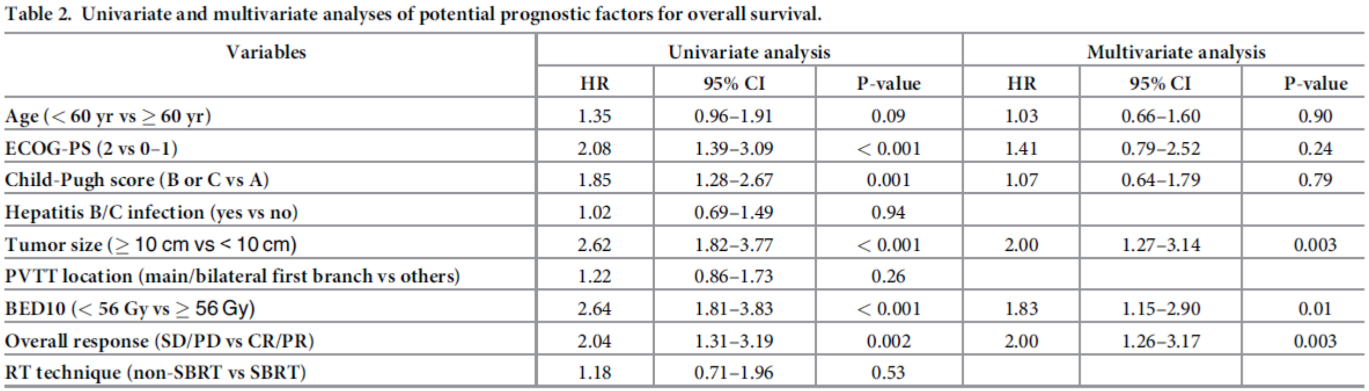
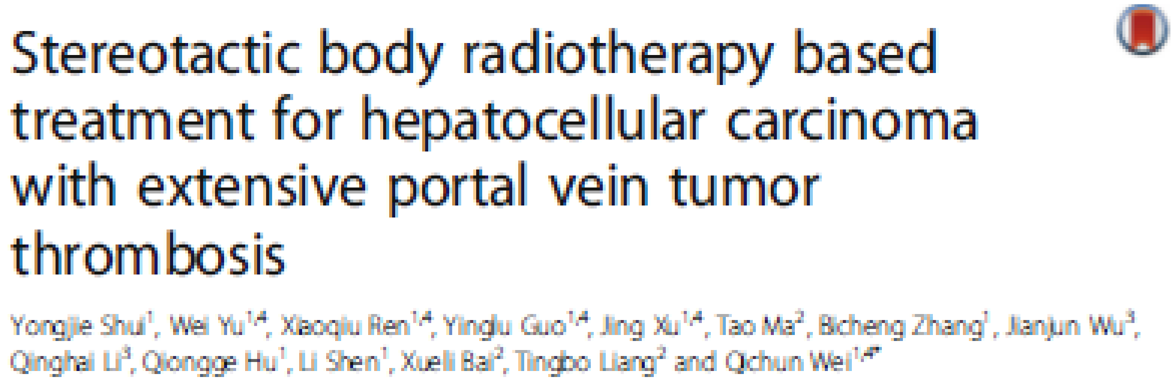


Table 2. Univariate and multivariate analyses of potential prognostic factors for overall survival.

Variables	Univariate analysis			Multivariate analysis		
	HR	95% CI	P-value	HR	95% CI	P-value
Age (< 60 yr vs ≥ 60 yr)	1.35	0.96–1.91	0.09	1.03	0.66–1.60	0.90
ECOG-PS (2 vs 0–1)	2.08	1.39–3.09	< 0.001	1.41	0.79–2.52	0.24
Child-Pugh score (B or C vs A)	1.85	1.28–2.67	0.001	1.07	0.64–1.79	0.79
Hepatitis B/C infection (yes vs no)	1.02	0.69–1.49	0.94			
Tumor size (≥ 10 cm vs < 10 cm)	2.62	1.82–3.77	< 0.001	2.00	1.27–3.14	0.003
PVTT location (main/bilateral first branch vs others)	1.22	0.86–1.73	0.26			
BED10 (< 56 Gy vs ≥ 56 Gy)	2.64	1.81–3.83	< 0.001	1.83	1.15–2.90	0.01
Overall response (SD/PD vs CR/PR)	2.04	1.31–3.19	0.002	2.00	1.26–3.17	0.003
RT technique (non-SBRT vs SBRT)	1.18	0.71–1.96	0.53			

Taille tumeur
Dose RT
Répondeur

La SBRT peut permettre une restauration du flux portal : Aspect dynamique de l’efficacité



Stereotactic body radiotherapy based treatment for hepatocellular carcinoma with extensive portal vein tumor thrombosis

Yongjie Shui[1], Wei Yu[1,4], Xiaoqiu Ren[1,4], Yinglu Guo[1,4], Jing Xu[1,4], Tao Ma[2], Bicheng Zhang[1], Jianjun Wu[3], Qinghai Li[3], Qiongge Hu[1], Li Shen[1], Xueli Bai[2], Tingbo Liang[2] and Qichun Wei[1,4*]

Un traitement local devient possible après SBRT

Taux de réponse	**Taux de réponse complète**	
79% à 3 mois	**10% 3 mois**	
84% à 6 mois	**32% 6 mois**	**50% 9 mois**

SBRT puis TACE

Hoon Sik Choi,
Asia PacificJournal of Clinical Oncology,
Aug 2020

Radio-embolisation / SIRT / TARE
+ SBRT

ROJ Radiation Oncology Journal

Original Article

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Combination of yttrium-90 radioembolization with stereotactic body radiation therapy in the treatment of portal vein tumor thrombosis

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**Y90: 104 Gy, 846 ml
pour le parenchyme**

**SBRT:30 Gy en 5 Fx, 91 ml
pour thrombus, PVTT
1 mois d'intervalle
12 pts**

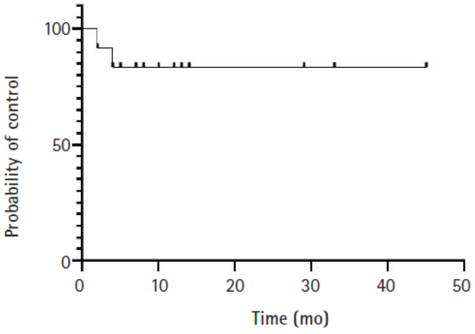


Fig. 2. Local control for all patients.

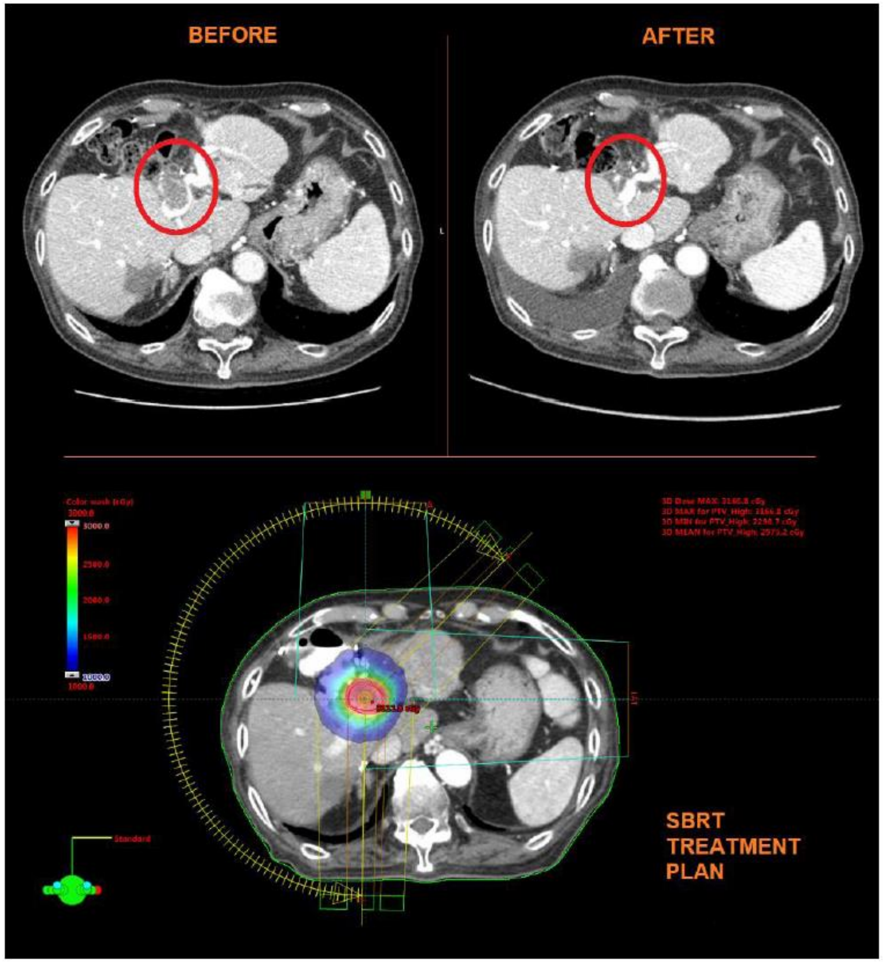
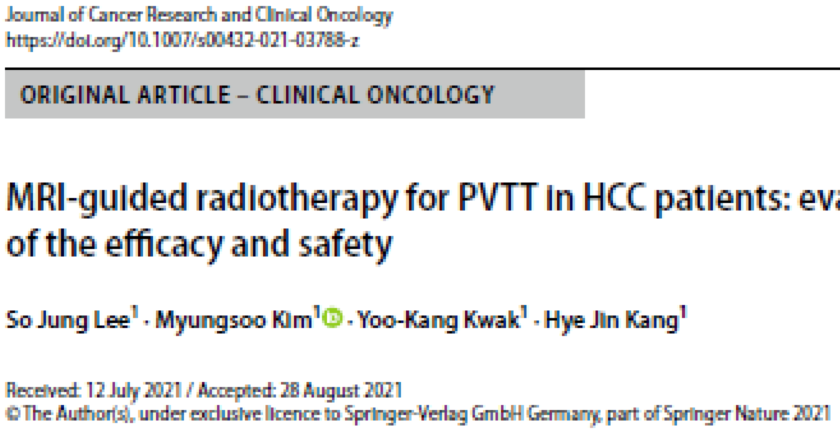


Fig. 4. Example of a SBRT plan to the PVTT and near CR after treatment. Patient #12 was an 83-year-old Asian male with hepatocellular carcinoma who received surgery, transarterial chemoembolization, and sorafenib, but progressed with worsening PVTT. Patient was treated with ^{90}Y radioembolization 107.3 Gy followed by SBRT 27.5 Gy in 5 fractions. Patient had near CR 3 months after SBRT. SBRT, stereotactic body radiation therapy; PVTT, portal vein tumor thrombosis; CR, complete response.

MRI-Guided Radiotherapy

- Meilleure visualisation de la tumeur (important pour CHC)
- Contourage plus précis
- Intégration des mouvements tumoraux,
- Suivi de la cible en temps réel,
- Faibles marges (épargne parenchyme)

IRM unity Elekta 1,5T Lyon Sud



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ORIGINAL ARTICLE – CLINICAL ONCOLOGY

MRI-guided radiotherapy for PVTT in HCC patients: evaluation of the efficacy and safety

So Jung Lee[1] · Myungsoo Kim[1] · Yoo-Kang Kwak[1] · Hye Jin Kang[1]

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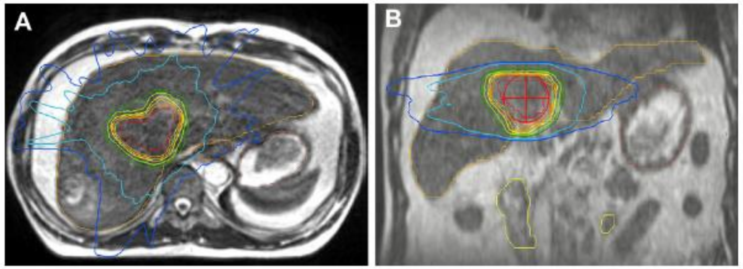
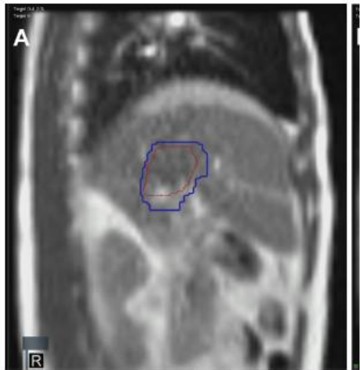
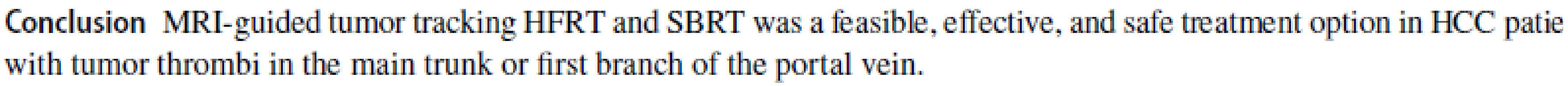


Fig. 1 Example of plan of stereotactic body radiation therapy for portal vein tumor thrombi. The patient received stereotactic body radiation therapy of 50 Gy in 5 fractions for portal vein tumor thrombus. Prescription dose was planned to cover more than 95% of the PTV volume (D95% = 100%). The volume of normal liver that irradiated less than 15 Gy was more than 700 cm^3. *Orange line—95% isodose line, yellow line—90% isodose line, green line—80% isodose line, cyan line—42% isodose line (21 Gy), blue line—30% isodose line (15 Gy)



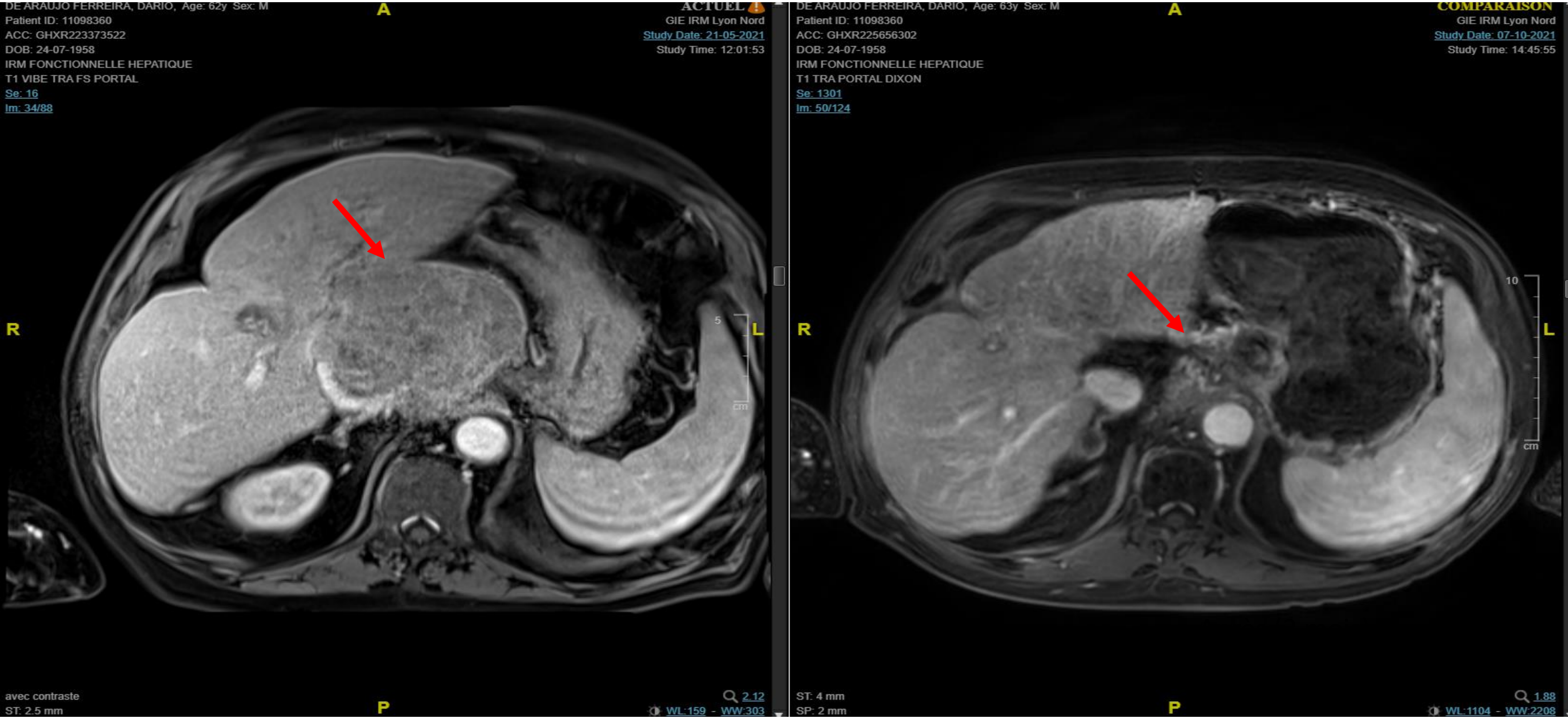
12 Pts, 83% contrôle local
8 TACE post RT



Conclusion MRI-guided tumor tracking HFRT and SBRT was a feasible, effective, and safe treatment option in HCC patie
with tumor thrombi in the main trunk or first branch of the portal vein.

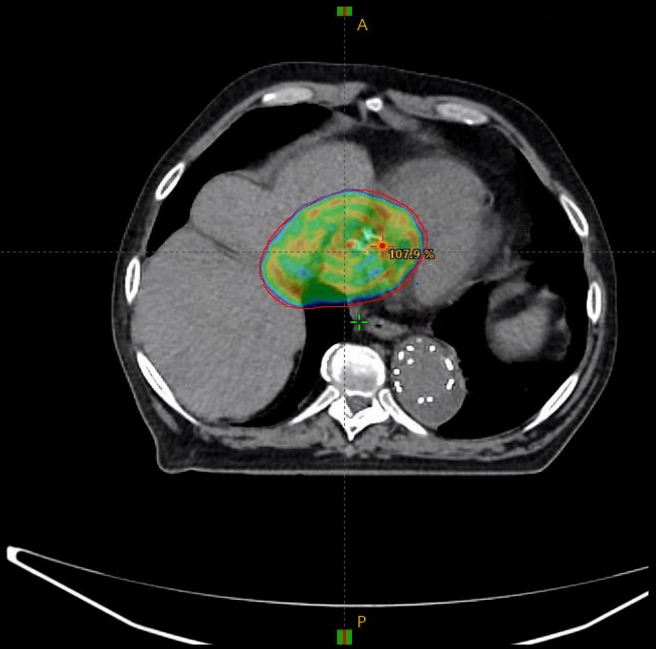
Mr FE DE A

CHC chez un patient de 63 ans envahissant la veine cave inférieure et la branche portale droite

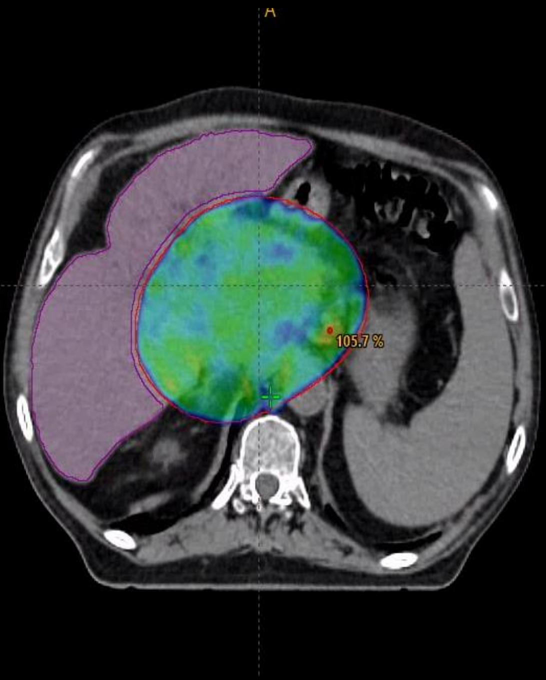

DE ARAUJO FERREIRA, DARIO, Age: 62y Sex: M
Patient ID: 11098360
ACC: GHXR223373522
DOB: 24-07-1958
IRM FONCTIONNELLE HEPATIQUE
T1 VIBE TRA FS PORTAL
Se: 16
Im: 34/88
A
ACTUEL
GIE IRM Lyon Nord
Study Date: 21-05-2021
Study Time: 12:01:53
R
L
5
cm
P
avec contraste
ST: 2.5 mm
2.12
WL:159 - WW:303
DE ARAUJO FERREIRA, DARIO, Age: 63y Sex: M
Patient ID: 11098360
ACC: GHXR225656302
DOB: 24-07-1958
IRM FONCTIONNELLE HEPATIQUE
T1 TRA PORTAL DIXON
Se: 1301
Im: 50/124
A
COMPARAISON
GIE IRM Lyon Nord
Study Date: 07-10-2021
Study Time: 14:45:55
R
L
10
cm
P
ST: 4 mm
SP: 2 mm
1.88
WL:1104 - WW:2208

Radiothérapie 60Gy/20fr puis ATEZOLIZUMAB et BEVACIZUMAB
Excellente tolérance du traitement

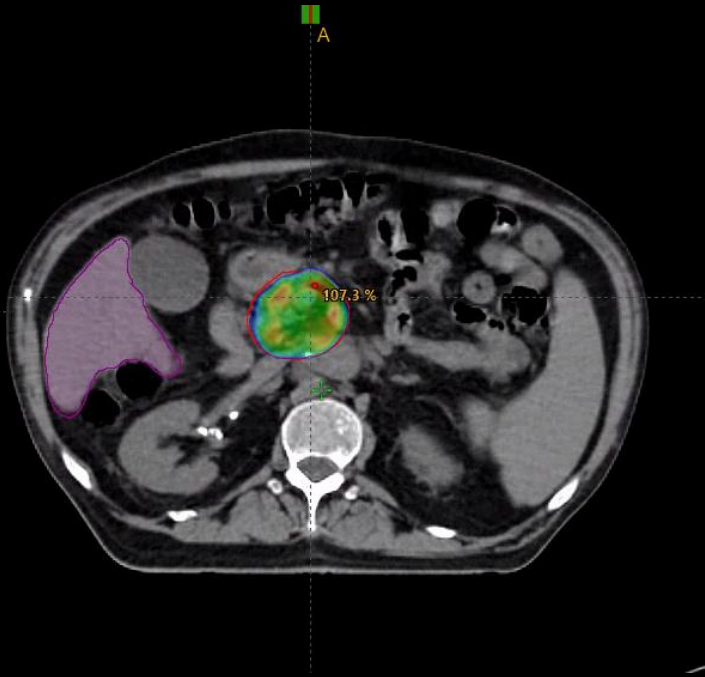
Couverture dosimétrique



Coupe supérieure



Coupe moyenne

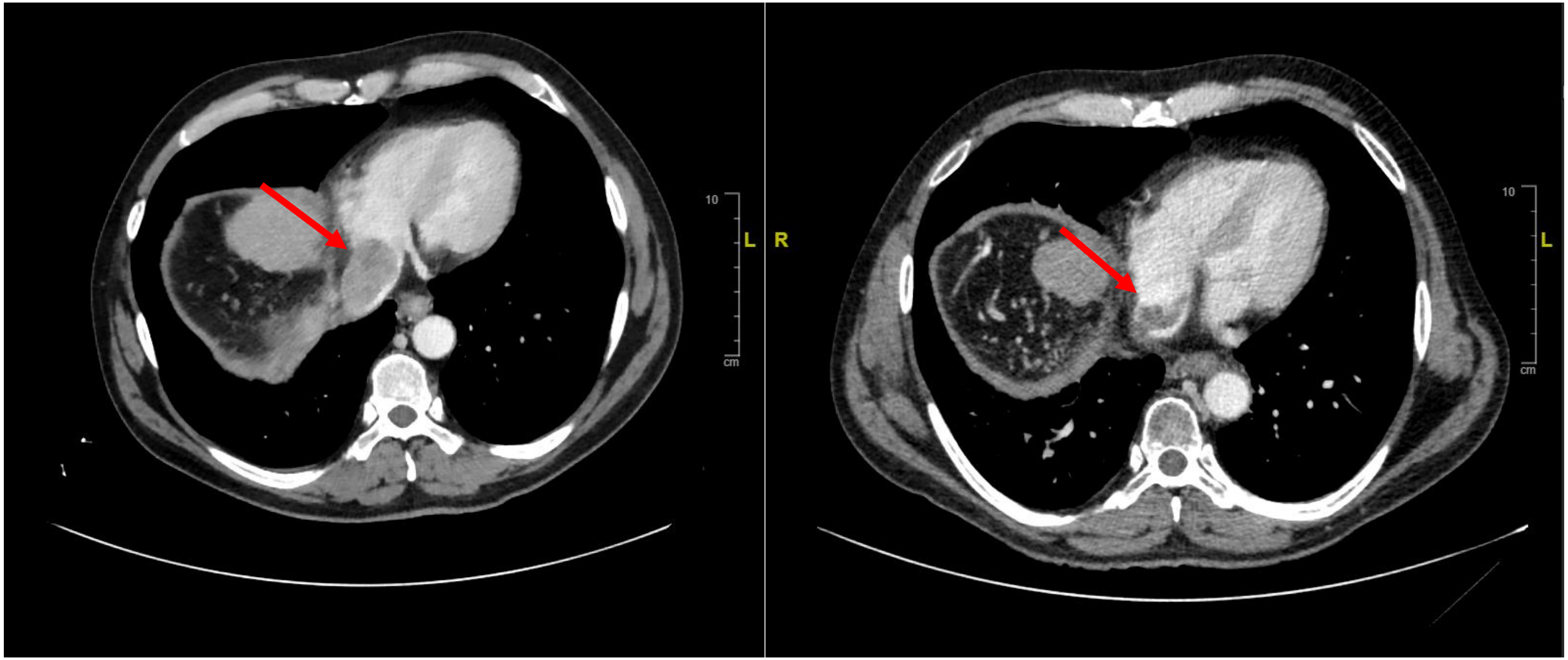


Coupe inferieure

Isodose 95%

Mr C.P

Récidive de CHC chez un patient de 54 ans au niveau du dôme hépatique avec thrombose cave inférieure tumorale remontant jusqu'à l'oreillette droite.

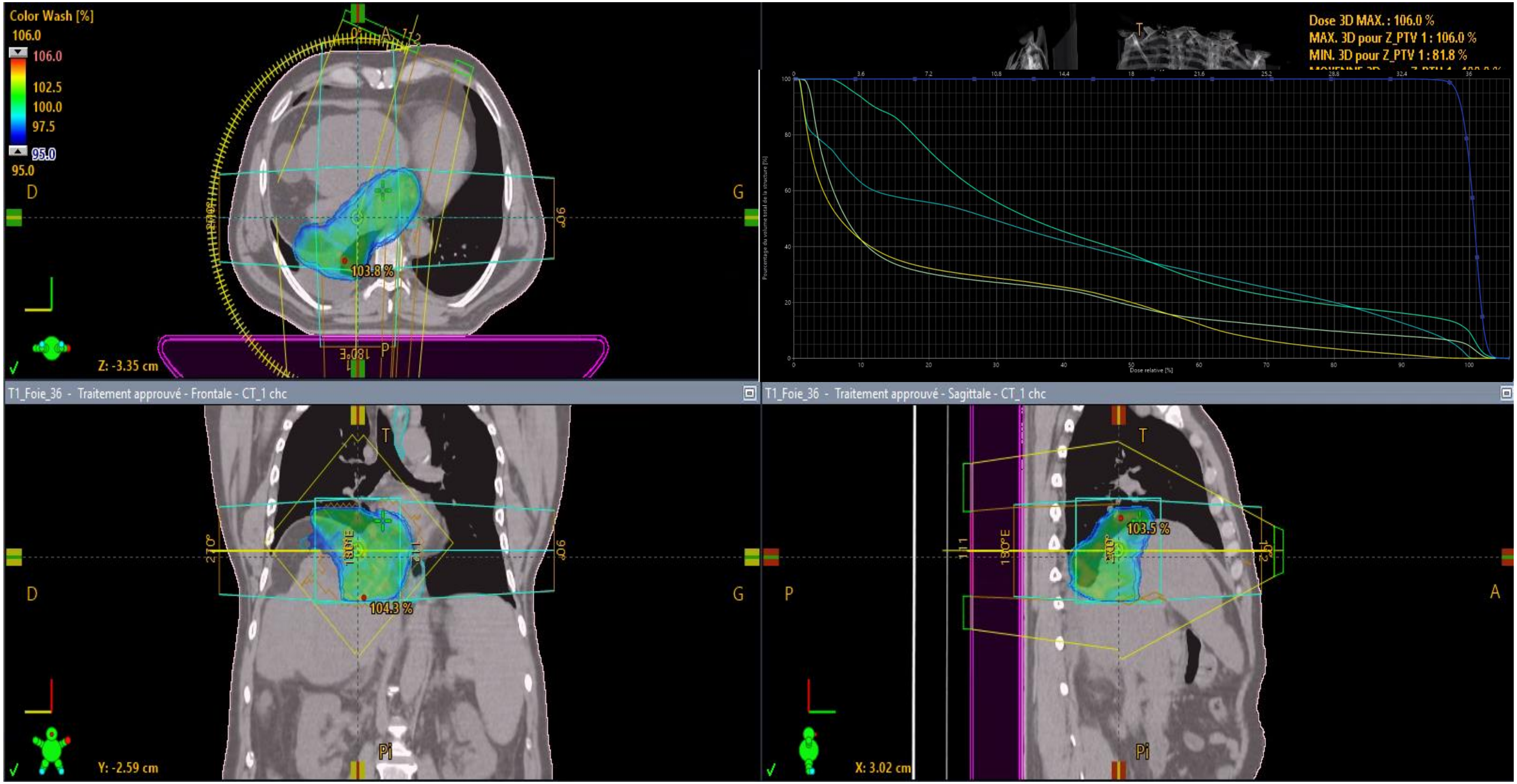


Avant

Après (délai 3 mois)

Résultat après RT (68 Gy/17 fr) puis ATEZOLIZUMAB BEVACIZUMAB
Toxicité: Œsophagite grade 2

DOSIMÉTRIE



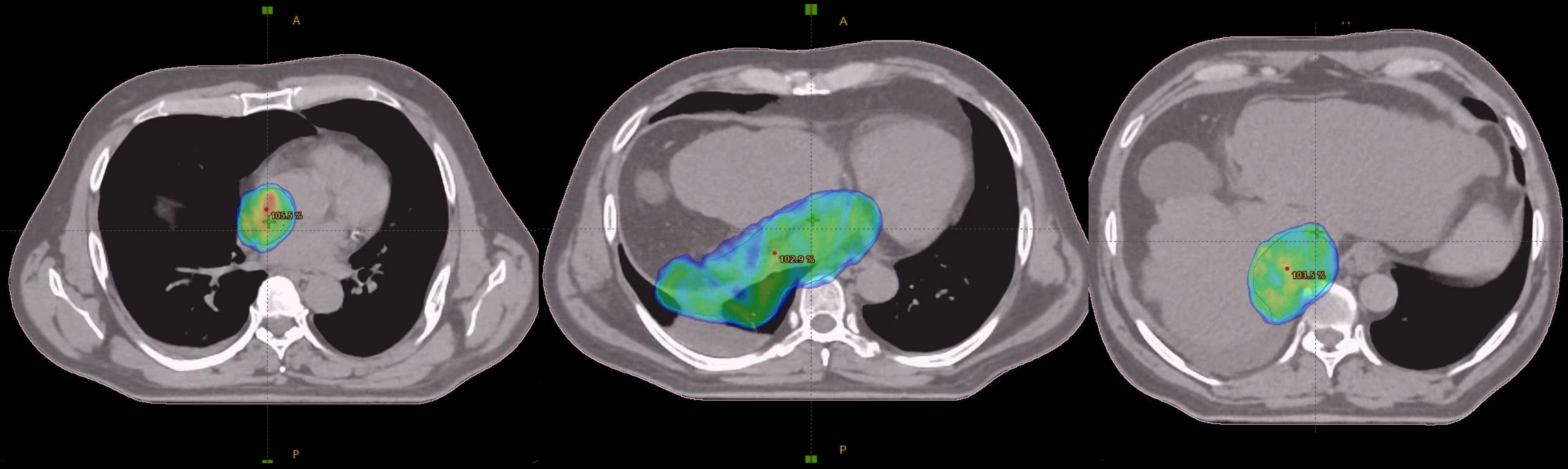
Dose 3D MAX. : 106.0 %
MAX. 3D pour Z_PTV 1 : 106.0 %
MIN. 3D pour Z_PTV 1 : 81.8 %

T1_Foie_36 - Traitement approuvé - Frontale - CT_1 chc

T1_Foie_36 - Traitement approuvé - Sagittale - CT_1 chc

Color Wash [%]
106.0
106.0
102.5
100.0
97.5
95.0
95.0
D
G
0°
A
P
90°
270°
180°E
103.8 %
Z: -3.35 cm
Pourcentage du volume total de la structure [%]
Dose relative [%]
0
3.6
7.2
10.8
14.4
18
21.6
25.2
28.8
32.4
36
100
80
60
40
20
0
10
20
30
40
50
60
70
80
90
100
T
104.3 %
Pi
Y: -2.59 cm
P
A
103.5 %
X: 3.02 cm

Couverture dosimétrique


A
105.5 %
P
A
102.9 %
P
103.5 %

Coupe supérieure

Coupe moyenne

Coupe inférieure

Isodose 95%

Au total

PVTT fréquente (50%), pronostic sombre (C)
Chirurgie, TACE difficiles

Sélection des patients nécessaire, RCP

Approche multidisciplinaire

SBRT: efficacité, tolérance
Rôle majeur à jouer, en association ATZ Bev…

Permet traitements locaux (Xie, TACE, TARE)