UTILIDAD DE SBRT EN METASTASIS SUPRARENALES

Dr. José A. Capraro Fuentes

Radioncólogo CETAC Juncal

FUNDACION MARIA CURIE – INSTITUTO ZUNINO

Córdoba - Argentina

13 – 14 de NOVIEMBRE de 2025.

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL

CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Metástasis Suprarrenales

- Patología maligna más frecuente que afecta a estas glándulas.
- Segunda en frecuencia si se considera a todos los tumores luego de los adenomas benignos.

- Diagnostico y/o sospecha es de forma incidental. Gracias a los avances en TC/RM/PET para estadificación o seguimiento de pacientes oncológicos.

- Principal vía de diseminación es hematógena.

- Origen · Pulmón (39%) · Mama (35%) · Melanoma · Páncreas · Tracto gastrointestinal · Riñón,

https://www.ncbi.nlm.nih.gov/books/NBK441879/

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

Selección pacientes

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

- BUEN ESTADO GENERAL ECOG 1-2 PFS>70%
- OLIGOMETASTASICO / OLIGOPROGRESION
- POSIBILIDAD DE TRATAMIENTO SISTEMICO
- EXPECTATIVA DE VIDA MAYOR A 6 MESES.

Criterios a considerar

- RADIOTERAPIA PREVIA EN REGION ABDOMINAL O PROXIMA AL AREA A TRATAR.
- QUE SE OBSERVE INFILTRACION DE INTESTINO.
- DISTANCIA ENTRE SUPRARRENAL E INTESTINO MENOR A 5mm

Posicionamiento del paciente

- Ayuno de 4 a 6 horas.
- Evaluar o pre entrenar para técnica respiratoria.
- Posición supina.
- Brazos sobre la cabeza o cuello en una posición cómoda y reproducible.
- Se puede utilizar colchonetas de vacío.
- Apoya cabeza, rampa de piernas y tobillos idealmente indexadas a camilla.

TC de simulación

- Idealmente utilizar técnicas de breath hold / gating / TC 4D.
- Cortes tomográficos menores a 2 mm.
- Secuencia o barrido con y sin contraste EV.

FUSION DE IMAGENES

- IDEALMENTE INTENTAR LOGRAR QUE LAS IMÁGENES DE FUSION SEAN OBTENIDAS EN CAMILLAS PLANAS.

- SE SUGIERE FUSIONAR TC DE SIMULACION CON RMN Y/O PET.

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

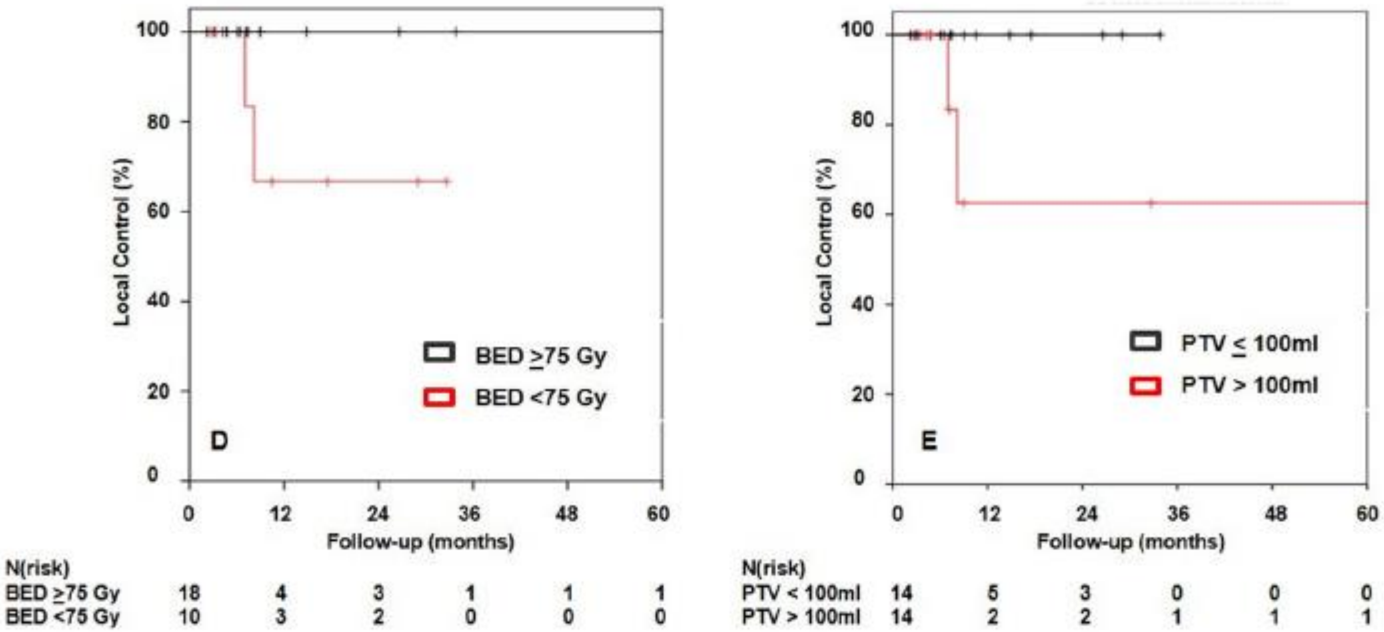
RESEARCH Open Access

Stereotactic body radiotherapy (SBRT) for adrenal metastases of oligometastatic or oligoprogressive tumor patients

Check for updates

Laila König[1,2,3*], Matthias F. Häfner[1,2,3], Sonja Katayama[1,2,3], Stefan A. Koerber[1,2,3], Eric Tonndorf-Martini[1,2,3,4], Denise Bernhardt[1,2,3], Bastian von Nettelbladt[1,2,3], Fabian Weykamp[1,2,3], Philipp Hoegen[1,2,3], Sebastian Klüter[1,2,3], Matthew S. Susko[7], Jürgen Debus[1,2,3,4,5,6] and Juliane Hörner-Rieber[1,2,3,4]

- 28 Pacientes.
- Casi 50% Ca de Pulmón.
- Entre 2012 y 2019
- Retrospectivo



König et al. Radiation Oncology (2020) 15:30

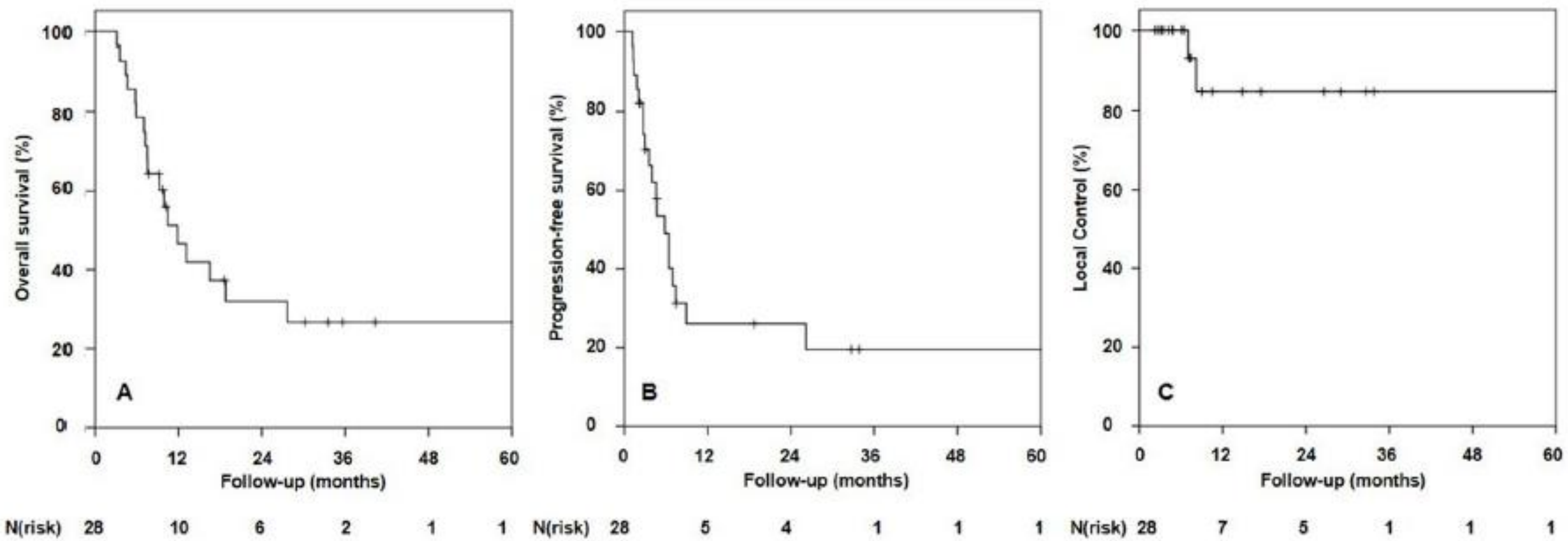
Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

RESEARCH Open Access

Stereotactic body radiotherapy (SBRT) for adrenal metastases of oligometastatic or oligoprogressive tumor patients

Laila König[1,2,3*], Matthias F. Häfner[1,2,3], Sonja Katayama[1,2,3], Stefan A. Koerber[1,2,3], Eric Tonndorf-Martini[1,2,3,4], Denise Bernhardt[1,2,3], Bastian von Nettelbladt[1,2,3], Fabian Weykamp[1,2,3], Philipp Hoegen[1,2,3], Sebastian Klüter[1,2,3], Matthew S. Susko[7], Jürgen Debus[1,2,3,4,5,6] and Juliane Hörner-Rieber[1,2,3,4]



Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

RESEARCH Open Access

Stereotactic body radiotherapy (SBRT) for adrenal metastases of oligometastatic or oligoprogressive tumor patients

Check for updates

Laila König[1,2,3*], Matthias F. Häfner[1,2,3], Sonja Katayama[1,2,3], Stefan A. Koerber[1,2,3], Eric Tonndorf-Martini[1,2,3,4], Denise Bernhardt[1,2,3], Bastian von Nettelbladt[1,2,3], Fabian Weykamp[1,2,3], Philipp Hoegen[1,2,3], Sebastian Klüter[1,2,3], Matthew S. Susko[7], Jürgen Debus[1,2,3,4,5,6] and Juliane Hörner-Rieber[1,2,3,4]

SBRT for adrenal metastases resulted in promising local control with only mild toxicity. Based on our study and our data, a dose-response relationship also seems to exist for adrenal SBRTs. However, we could also show that the application of sufficiently high doses is often limited by the close proximity of OARs and further dose escalations strategies and techniques (e.g. gating, tracking, adaptive radiotherapy) should be investigated in future.

König et al. Radiation Oncology (2020) 15:30

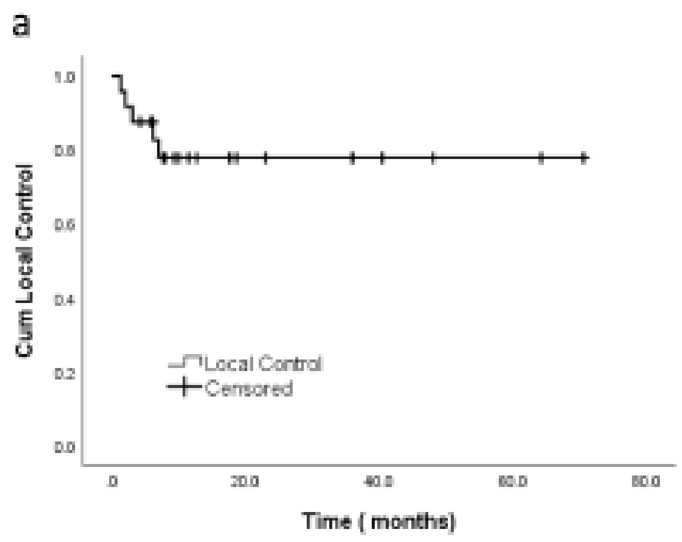
Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica:
Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

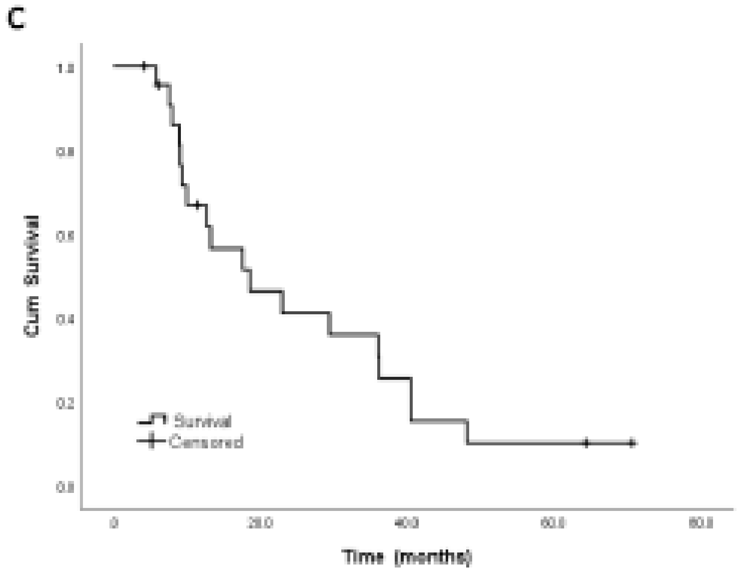
RESEARCH Open Access

Two-institution results of Stereotactic Body Radiation Therapy (SBRT) for treating adrenal gland metastases from liver cancer

Bichun Xu[1†], Xianzhi Zhao[1†], Di Chen[1], Wenjuan Zhao[1], Xiaoyan Wang[1], Changhua Ding[1], Zhiyong Yuan[2] and Huojun Zhang[1*]



Number at risk
24 8 5 2



Number at risk
23 9 5 2

Xu et al. BMC Cancer (2023) 23:73

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

RESEARCH Open Access

Two-institution results of Stereotactic Body Radiation Therapy (SBRT) for treating adrenal gland metastases from liver cancer

Bichun Xu[1†], Xianzhi Zhao[1†], Di Chen[1], Wenjuan Zhao[1], Xiaoyan Wang[1], Changhua Ding[1], Zhiyong Yuan[2] and Huojun Zhang[1*]

Table 6 Adverse effects reported/observed

AE	Grade 1-2	Grade3 or more	Total N (%)
Nausea	2 (8.7%)	0 (-)	2 (8.7%)
Vomiting	1 (4.3%)	0 (-)	1 (4.3%)
Poor appetite	3 (13.0%)	0 (-)	3 (13.0%)
Diarrhea	0 (-)	0 (-)	0 (-)
Abdominal pain	1 (4.3%)	0 (-)	1 (4.3%)
Hematochezia	1 (4.3%)	0 (-)	1 (4.3%)
Hepatic injury	0 (-)	1 (4.3%)	1 (4.3%)
Fatigue	5 (21.7%)	0 (-)	5 (21.7%)
Gastric distension	1 (4.3%)	0 (-)	1 (4.3%)

AE adverse effects

Conclusion

SBRT is a safe and effective treatment for patients with AGMs from liver cancer, it could provide a high local control rate and mild treatment-related side effects. And patients with small metastatic lesions (less than 34.5 ml) may benefit most at LC and OS. Distant metastases still occurred after SBRT, implying the importance of systemic treatment in high-risk patients.

Xu et al. BMC Cancer (2023) 23:73

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Contents lists available at ScienceDirect

Clinical and Translational Radiation Oncology

journal homepage: www.sciencedirect.com/journal/clinical-and-translational-radiation-oncology

Original Research Article

Total dose, fraction dose and respiratory motion management impact adrenal SBRT outcome

Ory Haisraely [a,*], Ilana Weiss [a], Marcia Jaffe [b], Sarit Appel [a], Orit Person-Kaidar [a], Zvi Symon [a], Maoz Ben-Ayun [a], Sergi Dubinski [a], Yaacov Lawrence [a]

- 83 Pacientes.
- 44% Ca de Pulmón.
- 93% Mtts unilateral.
- Entre 2015 y 2022
- Retrospectivo

Table 1
(a) Patients characteristics.

Total (N)	83
Age	67.1 y (42–92)
Gender (female)	38 (45.7 %)
Primary histology	
Non small cell lung	37 (44 %)
Melanoma	14 (16.8 %)
Colon	10 (12 %)
Breast	8 (9.6 %)
Others	14 (16.8 %)
Side	
Left	40 (48.1 %)
Right	37(44.5 %)
Bilateral	6 (7.2 %)
Oligometastasis (<5 mets)	58 (70 %)
Oligoprogression	25 (30 %)

O. Haisraely et al. Clinical and Translational Radiation Oncology 47 (2024) 100788

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Contents lists available at ScienceDirect

Clinical and Translational Radiation Oncology

journal homepage: www.sciencedirect.com/journal/clinical-and-translational-radiation-oncology

Original Research Article

Total dose, fraction dose and respiratory motion management impact adrenal SBRT outcome

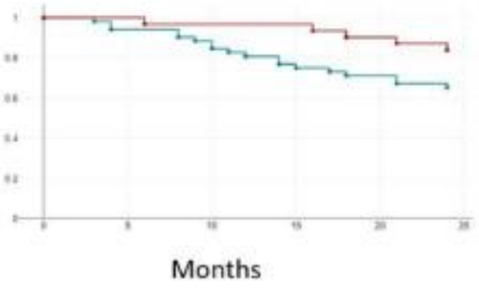
Ory Haisraely [a,*], Ilana Weiss [a], Marcia Jaffe [b], Sarit Appel [a], Orit Person-Kaidar [a], Zvi Symon [a], Maoz Ben-Ayun [a], Sergi Dubinski [a], Yaacov Lawrence [a]

Table 3
Multivariable comparison local control vs local failure.

Variable	Local control (n = 62) 74.6 %	Local failure (n = 21) 25.4 %	HR
Age (y) (mean, range)	66.2 (51–79)	69.68 (42–92)	1.003 (0.91–1.22) p = 0.87
Fraction Dose > 8 Gy **Fraction Dose ≤ 8 Gy**	83.8 % 65.3 %	16.2 % 34.7 %	**0.53(0.32–0.88) p = 0.038**
Dose > 75 Gy **Dose ≤ 75 Gy**	88.8 % 59.5 %	11.2 % 40.5 %	**0.41(0.2–0.81) p = 0.031**
Melanoma/Colon CA **others**	57.1 % 78.2 %	42.9 % 21.8 %	1.4 (0.89–2.4) p = 0.71
PTV(CC) mean	136.7 cc	143.03 cc	1.02 (0.93–1.3) p = 0.91
Breath hold/free breathing + CPAP **4d/CBCT only**	84.3 % 68.8 %	15.7 % 31.2 %	**0.65 (0.43–0.91) p = 0.047**
Oligo-metastases **Oligo-progression**	77.5 % 68 %	22.5 % 32 %	0.8(0.64–2.1) p = 0.34

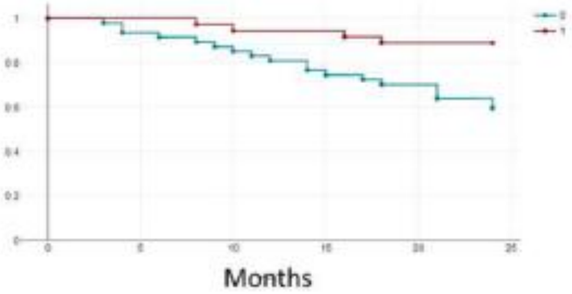
Highlight variables were statistically significant.

Effect of BED



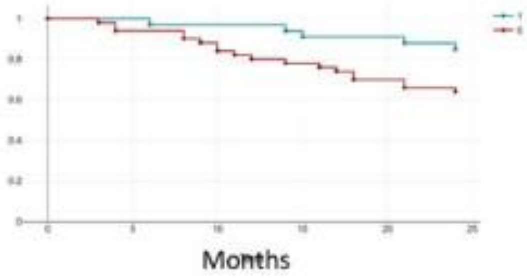
KM Curve
Cumulative progression proportion
Red dose >75Gy, Green≤75Gy
P=0.012

Effect of dose per fraction



KM Curve
Cumulative progression proportion fraction
Red dose D/F>8Gy, Green D/F≤8Gy
P=0.026

Type of respiratory motion control and local failure



KM Curve
Red dose -4D/ITV
Green-Breath hold/CPAP
P=0.019

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

Contents lists available at ScienceDirect

Clinical and Translational Radiation Oncology

journal homepage: www.sciencedirect.com/journal/clinical-and-translational-radiation-oncology

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Original Research Article

Total dose, fraction dose and respiratory motion management impact adrenal SBRT outcome

Ory Haisraely [a,*], Ilana Weiss [a], Marcia Jaffe [b], Sarit Appel [a], Orit Person-Kaidar [a], Zvi Symon [a], Maoz Ben-Ayun [a], Sergi Dubinski [a], Yaacov Lawrence [a]

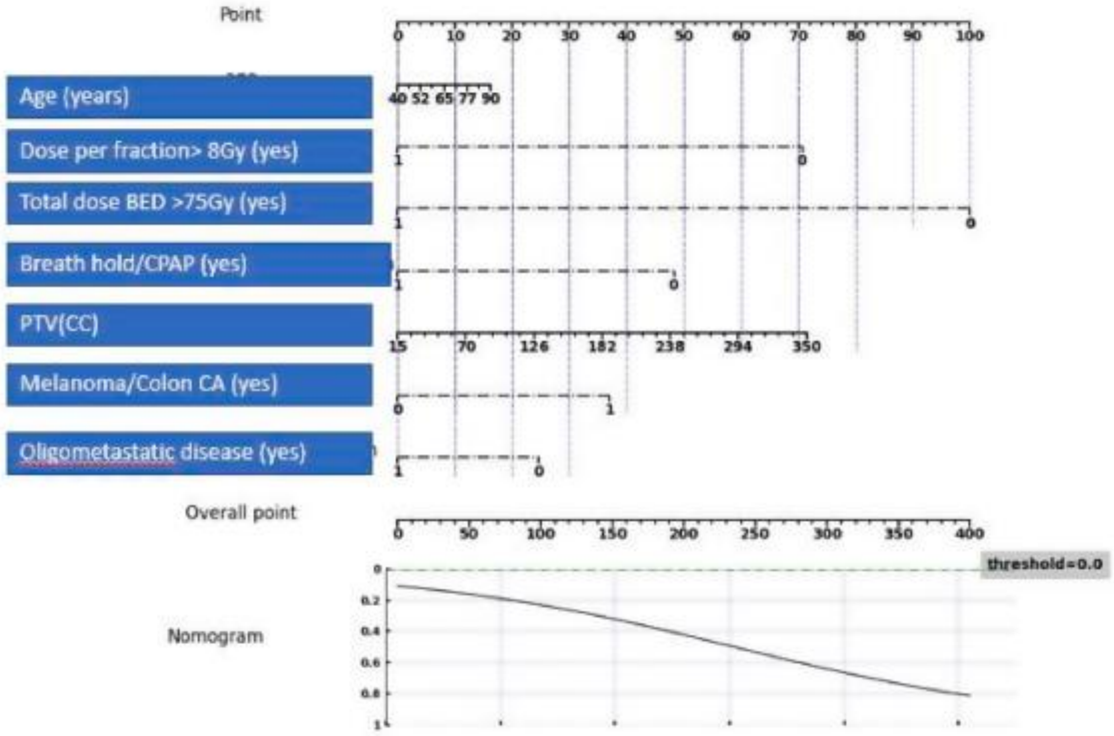


Fig. 2. Nomogram (n-132).

Conclusions

SBRT for adrenal metastases is a highly effective local therapy and alternative to surgery with mild toxicity. We demonstrated that a dose above 8 Gy a total BED above 75 Gy and breath hold/CPAP enhanced local control. For our knowledge this is the first study that showed the importance of Dose per fraction when treating adrenal SBRT and in addition the first time that breath hold Technique was showed to improve local control versus 4D/ITV method.

We propose a treatment regimen with a fraction size of at least 8 Gy and a BED of at least 75 Gy BED (for example 42GY in 5 fractions) with incorporation of breath hold or using MR-LINAC for evaluation in a prospective clinical trial. In addition, we created a nomogram which can help improve individual dos regiment, we suggest to evaluate our nomogram in larger cohorts.

O. Haisraely et al. Clinical and Translational Radiation Oncology 47 (2024) 100788

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

GUIAS AUSTRALIANAS

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Dose prescription

IMRT/VMAT/3DCRT									
Phase	Target area	Dose prescription	Prescription/volume	Beam type	Beam Energy	Dose/#	Fractions	Scheduling	
								#/day	#/week
1	PTV	26 Gy	ICRU 91 Prescribed to the covering isodose.	Photons	6-10 MV*	26 Gy	1	1	1
OR									
1	PTV	42 Gy	ICRU 91 Prescribed to the covering isodose.	Photons	6-10 MV*	14 Gy	3	1	2-3 Treat on non-consecutive days. Approximate interfraction interval: 48 hours.
OR									
1	PTV	40-50 Gy	ICRU 91 Prescribed to the covering isodose.	Photons	6 MV*	8-10 Gy	5	1	2-3 Treat on non-consecutive days. Approximate interfraction interval: 48 hours.

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS AUSTRALIANAS

Target volume objectives

Target volume	Objective
GTV/ITV	• D100% ≥95% of the prescribed dose (PD). Ideally ≥100% of PD.
PTV	• D95-99% ≥100% of PD • Lower coverage may be acceptable in certain scenarios to meet OAR constraints. • Dmax >125% and <143% (within iGTV).

Volume	Description
GTV	• GTV = Tumour visible on CT and/or MRI, usually whole adrenal gland, consider reviewing with diagnostic radiologist or at multidisciplinary meeting.

IGTV = ITV	• ITV = GTV in all phases of the respiratory cycle.
	• For free breathing (FB) or free breathing gating (FBG) technique:
	  ◦ ITV mandatory.
	• For breath hold (BH) technique:
	  ◦ ITV is optional.

PTV	• PTV = ITV + minimum 5 mm margin. • If there is no ITV: PTV = GTV + 5 mm margin. • PTV margins should be considered based on patient immobilisation, reproducibility of BH, breathing motion on 4D CT and method of image guidance. Note, margins can be different in all planes.

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS AUSTRALIANAS

Organ	Dose Prescription			Contouring notes
	26 Gy/1 fraction	42 Gy/3 fractions (14 Gy/fraction)	40-50 Gy/5 fractions (8-10 Gy/fraction)	
Spinal canal	• Ideal: D0.03 cc <12 Gy[11] • Acceptable: D0.035 cc <14 Gy[12]	• Ideal: D0.03 cc <18 Gy[11] • Acceptable: D0.035 cc <22.5 Gy[12]	• D0.035 cc <28 Gy[12]	• The constraints from Timmerman 2022 are to the spinal cord structure.[12]
Skin (5 mm subcutis)	• Ideal: D1.5 cc <18 Gy[11] • Acceptable: D0.035 cc <27.5 Gy[12]	• Ideal: D1.5 cc <30 Gy[11] • Acceptable: D0.035 cc <33 Gy[12]	• D0.035 cc <38.5 Gy[12]	

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS AUSTRALIANAS

Organ	Dose Prescription			Contouring notes
	26 Gy/1 fraction	42 Gy/3 fractions (14 Gy/fraction)	40-50 Gy/5 fractions (8-10 Gy/fraction)	
Small bowel	• D0.03 cc <26 Gy[11]	• D0.03 cc <30 Gy[11]	• D0.035 cc <34.5 Gy[12]	
	• Ideal: D5 cc <22.5 Gy[11] • Acceptable: D30 cc <17.6 Gy[12]	• Ideal: 30 cc ≤12.5 Gy[11] • Acceptable: D30 cc <20.7 Gy[12]	• D30 cc <24 Gy[12]	
	• Maximum dose covering full circumference of bowel wall: ◦ Ideal: ≤12.5 Gy [11] ◦ Acceptable: Avoid circumferential irradiation.[12] • Aim for <13 Gy to full circumference of small bowel loop.[11]	• Maximum dose covering full circumference of bowel wall: ◦ Ideal: ≤22.5 Gy [11] ◦ Acceptable: Avoid circumferential irradiation.[12]	• Maximum dose covering full circumference of bowel wall: Avoid circumferential irradiation.[12]	
Duodenum	• D0.035 cc <22 Gy[12]	• D0.035 cc <30 Gy[12]	• D0.035 cc <35 Gy[12]	• The FASTRACK II trial used the small bowel constraints for this structure. • Avoid circumferential irradiation.
	• D5 cc <17.4 Gy[12]	• D5 cc <22.5 Gy[12]	• D5 cc <26.5 Gy[12]	

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS AUSTRALIANAS

Organ	Dose Prescription			Contouring notes
	26 Gy/1 fraction	42 Gy/3 fractions (14 Gy/fraction)	40-50 Gy/5 fractions (8-10 Gy/fraction)	
Stomach	• Ideal: ALARA, aim for ideal D1.5 cc <15.4 Gy[11] • Acceptable: D5 cc <22.5 Gy[11]	• D0.03 cc <30 Gy[11] • D5 cc <22.5 Gy[11, 12]	• D0.035 cc <35 Gy[12] • D5 cc ≤26.5 Gy[12]	
Large bowel	• Ideal: ALARA, aim for D1.5 cc <26 Gy[11] • Acceptable: D0.035 cc <31 Gy and avoid circumferential irradiation.[12]	• Ideal: ALARA, aim for D1.5 cc <42 Gy[11] • Acceptable: D0.035 cc <45 Gy and avoid circumferential irradiation.[12]	• D0.035 cc <52.5 Gy and avoid circumferential irradiation.[12]	

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS AUSTRALIANAS

Organ	Dose Prescription			Contouring notes
	26 Gy/1 fraction	42 Gy/3 fractions (14 Gy/fraction)	40-50 Gy/5 fractions (8-10 Gy/fraction)	
Liver	• D700 cc <11.6 Gy[12] • NB: The FASTRACK II trial had no constraint for the liver for the 1 fraction prescription.	• Ideal: D700 cc <15 Gy[11] • Acceptable: D700 cc <17.7 Gy[12]	• D700 cc <21.5 Gy[12]	
Ipsilateral kidney minus ITV	• ALARA: minimise volume of high dose regions (>50% isodose)[11]	• ALARA: minimise volume of high dose regions (>50% isodose)[11]	• Contour entire renal cortex, not including hilum or gross tumour. • ALARA minimise volume of high dose regions (>50% isodose).	• Ipsilateral kidney minus ITV should adhere to the ALARA principle. In particular, focus on minimising high dose regions (>50% isodose) outside the ITV but within the ipsilateral kidney. • Five fraction constraint is based on committee consensus.
Contralateral kidney	• V10 Gy ≤33%[11]	• V10 Gy ≤33%[11]	• V10 Gy <10%[13]	

https://www.eviq.org.au/radiation-oncology/urogenital/kidney-and-adrenal/4440-adrenal-metastases-stereotactic-ebrt

GUIAS UK

Oligometastases: adrenal

Due to a rich sinusoidal blood supply, adrenal metastases are frequently observed in patients with melanoma, breast, lung, kidney and gastrointestinal tumours. Based on non-randomised observations of enhanced survival in patients undergoing adrenalectomy for oligometastatic disease, stereotactic radiotherapy has also been used. Meta-analysis of 39 studies (2009–2019) has shown pooled local control rates of 82% at 1 year and 63% at 2 years, across a wide range of dose fractionation schedules.[37]

Recommendations

- 30–36 Gy in 3 fractions on alternate days (Grade C)
- 40–45 Gy in 5 fractions on alternate days or daily (Grade C)

The types of evidence and the grading of recommendations used within this review are based on those proposed by the Oxford Centre for Evidence-Based Medicine.[24]

The Royal College of Radiologists Clinical Oncology   Radiotherapy dose fractionation: fourth edition

https://www.ncbi.nlm.nih.gov/books/NBK441879/

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

PRESENTE

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Special Article

Stereotactic Body Radiation Therapy for the Treatment of Adrenal Metastases — A Case-Based Radiosurgery Society Practice Guide and Review

Felix Ehret, MD,[a,b,c,*] Daniel K. Ebner, MD, MPH,[d] Tugce Kutuk, MD,[e]

SBRT dose regimens					
Fractions	Dose per fraction (Gy)	Total dose (Gy)	Prescription isodose line* (%)	Biologically effective dose (Gy, α/β ratio: 10)	References
1	24-26	24-26	60-100	81.6-93.6	22,23,27
3	13-15	39-45	60-100	89.7-112.5	22,23,28
5	9-10	45-50	60-100	85.5-100.0	23,29,35
8	6-7.5	48-60	60-100	76.8-105.0	23,30,31
10	5-7	50-70	60-100	75.0-119.0	26,30-32

F. EhretetalPracticalRadiationOncology:November/December2025

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

PRESENTE

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Special Article

Stereotactic Body Radiation Therapy for the Treatment of Adrenal Metastases — A Case-Based Radiosurgery Society Practice Guide and Review

Felix Ehret, MD,[a,b,c,*] Daniel K. Ebner, MD, MPH,[d] Tugce Kutuk, MD,[e]

Dose constraints				
Organs at risk	Fractions	Dose constraint references		
		AAPM TG 101[19,‡]	HyTEC[33]	Timmerman table[34]
Stomach	1	Dmax: 12.4 Gy D10cm^3: 11.2 Gy		Dmax: 22 Gy D5cm^3: 17.4 Gy
	3	Dmax: 22.2 Gy D10cm^3: 16.5 Gy		Dmax: 30 Gy D5cm^3: 22.5 Gy
	5	Dmax: 32 Gy D10cm^3: 18 Gy		Dmax: 35 Gy D5cm^3: 26.5 Gy
	8			Dmax: 42 Gy D5cm^3: 31.2 Gy
	10			Dmax: 45 Gy D50cm^3: 33.9 Gy

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

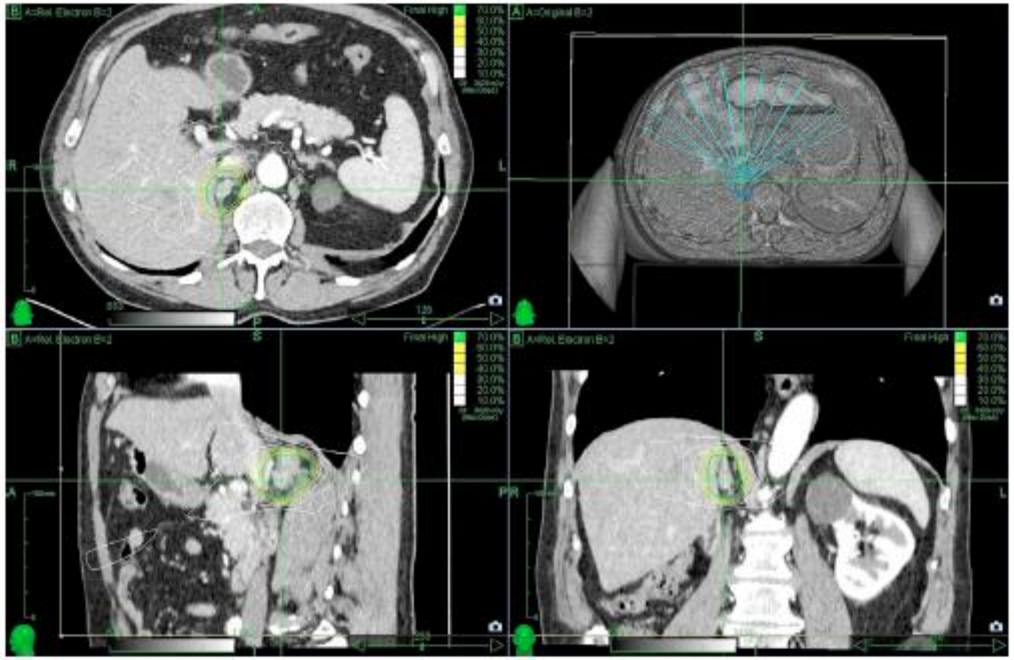
PRESENTE

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Special Article

Stereotactic Body Radiation Therapy for the Treatment of Adrenal Metastases — A Case-Based Radiosurgery Society Practice Guide and Review

Felix Ehret, MD,[a,b,c,*] Daniel K. Ebner, MD, MPH,[d] Tugce Kutuk, MD,[e]



F. EhretetalPracticalRadiationOncology:November/December2025

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

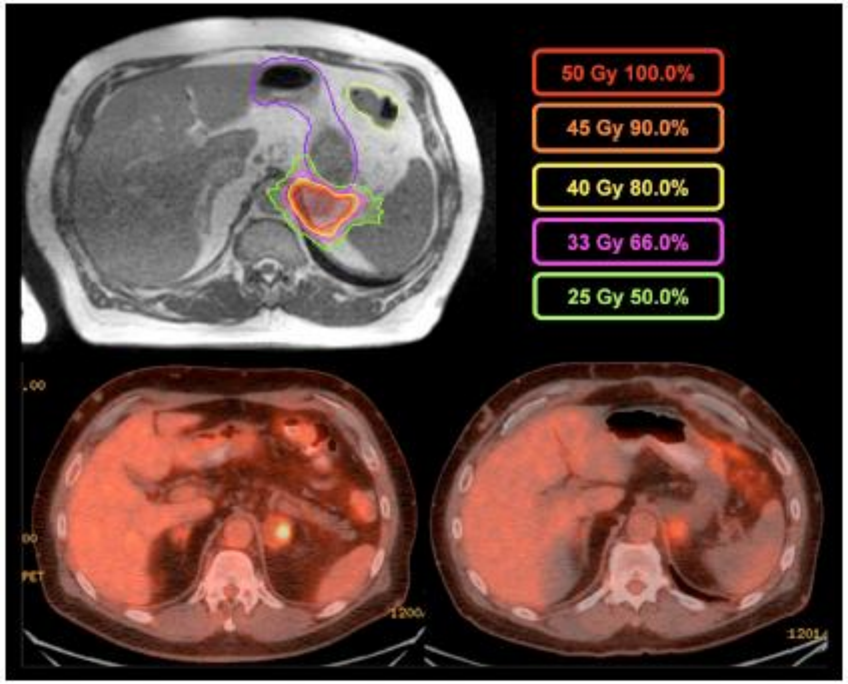
PRESENTE

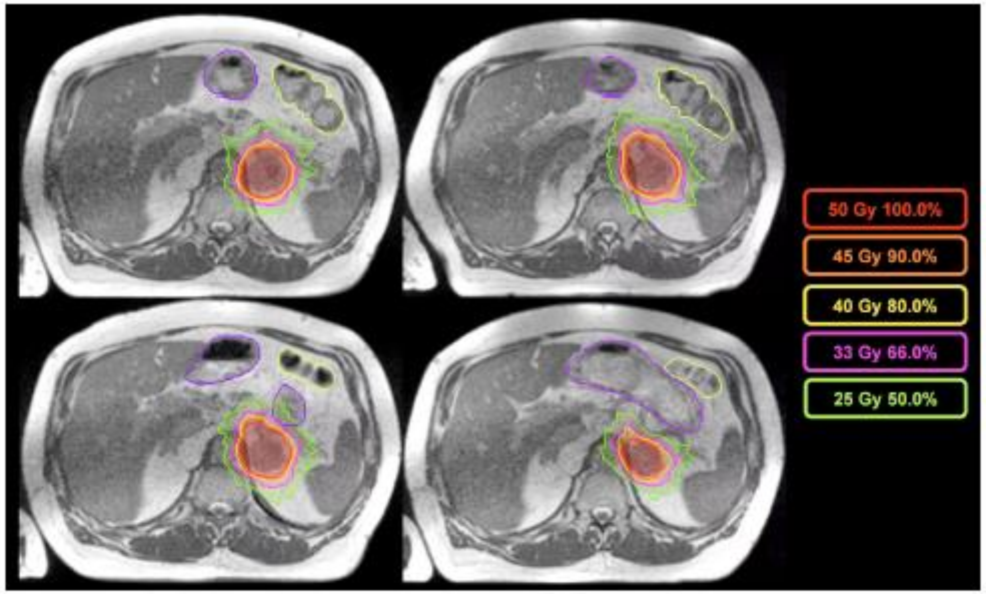
CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Special Article

Stereotactic Body Radiation Therapy for the Treatment of Adrenal Metastases — A Case-Based Radiosurgery Society Practice Guide and Review

Felix Ehret, MD,[a,b,c,*] Daniel K. Ebner, MD, MPH,[d] Tugce Kutuk, MD,[e]





F. EhretetalPracticalRadiationOncology:November/December2025

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

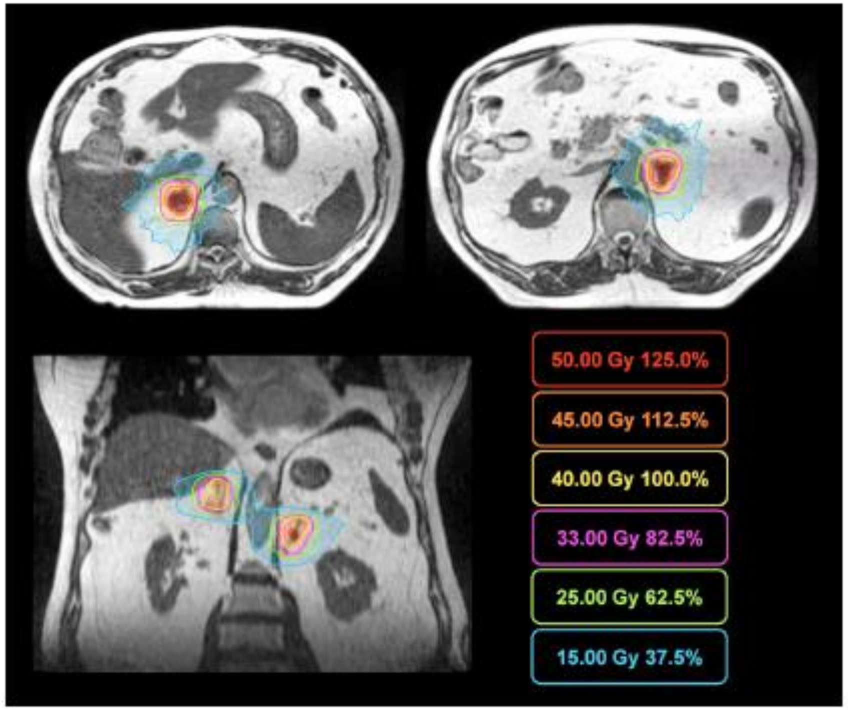
PRESENTE

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Special Article

Stereotactic Body Radiation Therapy for the Treatment of Adrenal Metastases — A Case-Based Radiosurgery Society Practice Guide and Review

Felix Ehret, MD,[a,b,c,*] Daniel K. Ebner, MD, MPH,[d] Tugce Kutuk,



Conclusion

The adrenal glands are one of the most common metastatic tumor sites. Although surgery has been the historical gold standard, SBRT has become an effective and safe treatment alternative. The available evidence demonstrates favorable local control rates with a BED $\geq$ 100 Gy, assuming an α/β ratio of 10, with low rates of high-grade toxicity. SBRT planning requires careful consideration of tumor location and size, motion management, dose and fractionation, and adjacent OARs dose constraints. This case-based review serves as a practical and concise guide for SBRT for the treatment of adrenal metastases. The first case involved a patient with a small, right-sided adrenal gland metastasis, highlighting the potential use of high-dose, single-fraction SBRT in selected cases with favorable anatomy. The second case described a large, left-sided adrenal metastasis, calling for fractionated SBRT and careful motion management. MRgSBRT enabled the safe delivery of an ablative dose to achieve local control while minimizing toxicity. The final case described bilateral adrenal metastases, which were successfully treated with fractionated SBRT. This case highlighted the potential risk of adrenal insufficiency in the setting of bilateral adrenal involvement and emphasized the importance of establishing care with endocrinology early on, whenever possible and deemed necessary. This allows for the early detection of adrenal dysfunction and the timely management of adrenal insufficiency or adrenal crisis. Finally, we briefly discuss the limited evidence for the use of SBRT in treating adrenal PCCs and PGLs, as well as related metastases.

F. EhretetalPracticalRadiationOncology:November/December2025

MIRANDO AL FUTURO

Contents lists available at ScienceDirect
Radiotherapy and Oncology
journal homepage: www.thegreenjournal.com
ELSEVIER

Original Article

Tumor volume changes during stereotactic ablative radiotherapy for adrenal gland metastases under MRI guidance

Nicolas Giraud [a,b,*], Famke L. Schneiders [a,b], John R. van Sornsen de Koste [a], Miguel A. Palacios [a], Suresh Senan [a,b]

In conclusion, our findings of inter-fraction GTV variations in 59% of all patients undergoing 5-fraction MR-SABR compared to simulation plans, supports the routine use of on-couch adaptive delivery.

N. Giraud, et al. Radiotherapy and Oncology 186 (2023) 109749

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

MIRANDO AL FUTURO

CETAC JUNCAL CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Contents lists available at ScienceDirect

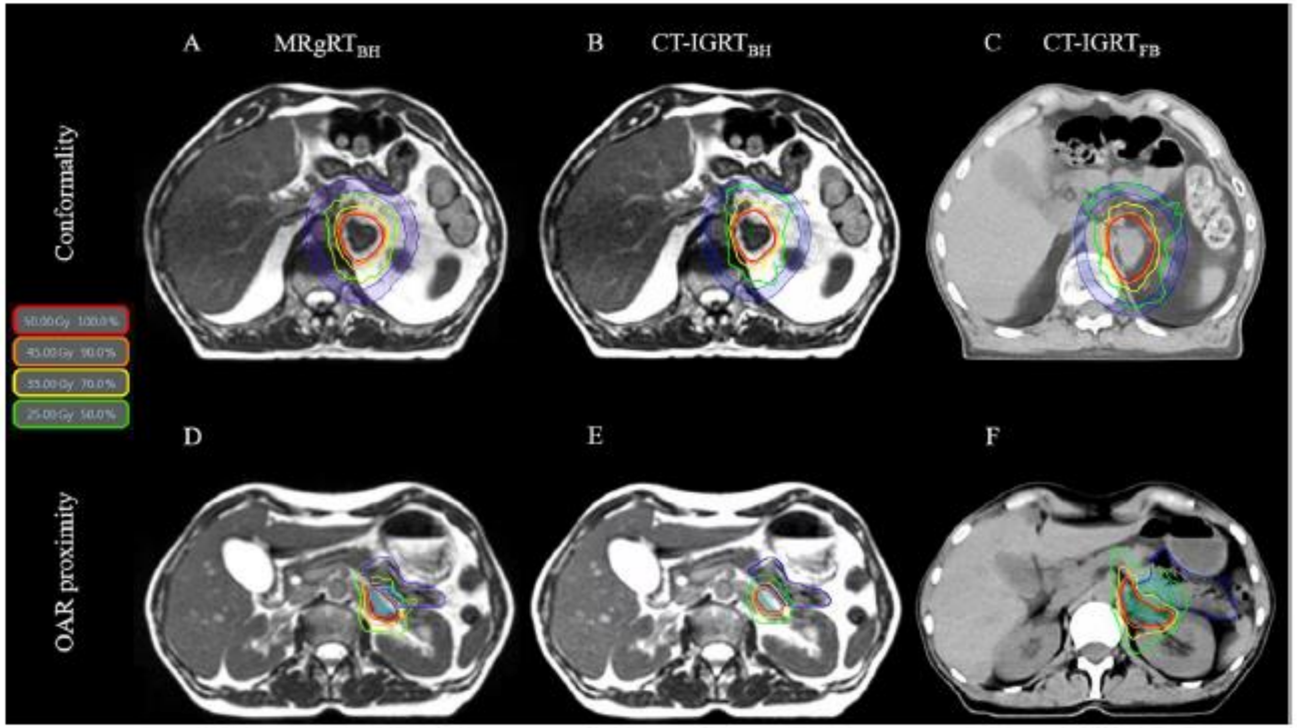
Radiotherapy and Oncology

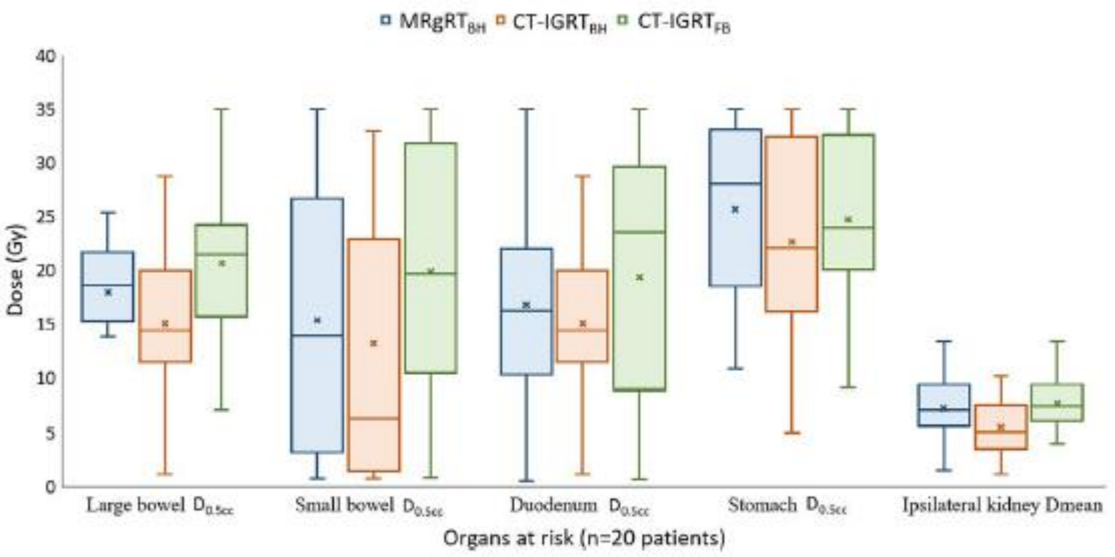
journal homepage: www.thegreenjournal.com

Original Article

CT-guided versus MR-guided radiotherapy: Impact on gastrointestinal sparing in adrenal stereotactic body radiotherapy

Lori L. Rodriguez [a], Rupesh Kotecha [a,b], Martin C. Tom [a,b], Michael D. Chuong [a,b], Jessika A. Contreras [a,b],





L.L. Rodriguez, R. Kotecha, M.C. Tom et al. Radiotherapy and Oncology 166 (2022) 101–109

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

MIRANDO AL FUTURO

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

ELSEVIER

Original Article

CT-guided versus MR-guided radiotherapy: Impact on gastrointestinal sparing in adrenal stereotactic body radiotherapy

Lori L. Rodriguez [a], Rupesh Kotecha [a,b], Martin C. Tom [a,b], Michael D. Chuong [a,b], Jessica A. Contreras [a,b],

In conclusion, initial plans for VMAT CT-IGRT$_{BH}$ were shown to be dosimetrically superior in target coverage, conformality, and OAR sparing to the large bowel, duodenum, and ipsilateral kidney versus IMRT MRgRT$_{BH}$. However, the majority of fractions had OAR constraint violations when the initial CT-IGRT$_{BH}$ plans were calculated on the anatomy of the day. MR-guided adaptive radiotherapy enabled no OAR violations to the luminal GI organs. The highly conformal CT-IGRT$_{BH}$ plans were less robust to interfractional target changes, compared to MRgRT$_{BH}$ coverage. The dosimetric advantages of VMAT were lost when applied to the standard free breathing ITV-approach of CT-based IGRT. Compared to CT-IGRT$_{FB}$, MRgRT$_{BH}$ enabled significant reductions in target volumes, marginally improved PTV coverage, and significant improvements in GTV coverage and small bowel sparing.

Congreso sobre Avances Integrados en Oncología, Radiocirugía y Física Médica: Innovación y Precisión en el tratamiento del cáncer

CETAC JUNCAL
CENTRO DE TRATAMIENTO DE ALTA COMPLEJIDAD

Instituto Zunino
Fundación Marie Curie
Tecnología e Investigación contra el cáncer

Jose.capraro@sjuncal.com.ar

GRACIAS


CETAC
JUNCAL
CENTRO DE TRATAMIENTO
DE ALTA COMPLEJIDAD
CETAC
JUNCAL