Oligometastatic Renal Cell Carcinoma

Thomas D. Atwell, MD

Mayo Clinic

Disclosures

No relevant financial relationships to disclose.

Brand names are included in this presentation for participant clarification purposes only. No product promotion should be inferred.

Goals

- Treatment of oligometastatic RCC improves survival
- Thermal ablation is effective in treating mRCC

Metastatic RCC

- 20-40% of new RCC diagnoses are patients presenting with metastatic disease

Psutka SP, Master VA. Cancer 2018; 124:3641
Kavolius, et al. JCO 1998. 16:2261

Metastatic RCC

- 20-40% of new RCC diagnoses are patients presenting with metastatic disease
- Following definitive therapy of localized disease, 25% will develop metastases

Psutka SP, Master VA. Cancer 2018; 124:3641
Kavolius, et al. JCO 1998. 16:2261

Samuel Hellman
Ralph R. Weichselbaum
The University of Chicago
Chicago, IL
JCO 1995

EDITORIAL

Oligometastases

Tumor states intermediate between purely localized lesions and those widely metastatic

Oligometastases

ADENOCARCINOMA OF THE KIDNEY WITH METASTASIS TO THE LUNG

CURED BY NEPHRECTOMY AND LOBECTOMY[1]

J. DELLINGER BARNEY AND EDWARD J. CHURCHILL

From the Surgical Services of the Massachusetts General Hospital

1932
Left nephrectomy
Resx of lung metastasis
NED @ 5 years

J Urology 1938

Resection of Metastatic Renal Cell Carcinoma

By J.P. Kavolius, D.P. Mastorakos, C. Pavlovich, P. Russo, M.E. Burt, and M.S. Brady

278 Patients

Table 1. Univariate Analysis of Prognostic Variables for Survival

Prognostic Variable	5-Year DFI	5-Year OS	P*
DFS > 12 months (n = 200), %	51	55	< .0001
DFS ≤ 12 months (n = 78), %	9	9	
Solitary first recurrence (n = 155), %	49	54	< .001
Multiple first recurrence (n = 123), %	28	29	
Curative first metastectomy (n = 141), %	36	44	< .001
Noncurative metastectomy (n = 70), %	10	14	< .09
Nonoperative treatment of first recurrence (n = 67), %	10	11	
Age < 60 years (n = 165), %	45	49	< .05
Age ≥ 60 years (n = 113), %	32	35	
Women (n = 75)	17	22	.13
Men (n = 203)	25	32	

JCO 1998. 16:2261

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By J.P. Kavolius, D.P. Mastorakos, C. Pavlovich, P. Russo, M.E. Burt, and M.S. Brady

278 Patients

- Curative resection 5yr OS 44%
  - 2nd curative resection 5yr OS 46%
  - 3rd curative resection 5yr OS 44%
- Noncurative resection 5yr OS 14%
- Nonsurgical treatment 5yr OS 11%

Age < 60 years (n = 165), %	43	49	< .05
Age ≥ 60 years (n = 113), %	32	35	
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278 Patients

- Disease free interval > 12 months
- Solitary (vs. multiple) recurrence
- Age < 60 yrs
- Curative (vs. noncurative) metastasectomy

Nonoperative treatment of first recurrence (n = 67), %	10	11	
Age < 60 years (n = 165), %	45	49	< .05
Age ≥ 60 years (n = 113), %	32	35	
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JCO 1998. 16:2261

Local treatments for metastases of renal cell carcinoma: a systematic review

Saeed Dabestani, Lorenzo Marconi, Fabian Hofmann, Fiona Stewart, Thomas B L Lam, Steven E Canfield, Michael Staehler, Thomas Powles, Börje Ljungberg, Axel Bex

In six of the eight studies, a significantly longer median overall survival or cancer-specific survival was reported after complete metastasectomy compared with incomplete or no metastasectomy (median 40.8 vs. 14.8 months).

Lancet Oncology 2014.15:549

Local treatments for metastases of renal cell carcinoma: a systematic review

Saeed Dabestani, Lorenzo Marconi, Fabian Hofmann, Fiona Stewart, Thomas B L Lam, Steven E Canfield, Michael Staehler, Thomas Powles, Börje Ljungberg, Axel Bex

The results suggest that patients treated with complete metastasectomy have <u>better survival and symptom control</u> (including pain relief in bone metastases) than those treated with either incomplete or no metastasectomy.

Lancet Oncology 2014.15:549

Outcomes Following Complete Surgical Metastasectomy for Patients with Metastatic Renal Cell Carcinoma: A Systematic Review and Meta-Analysis

Harras B. Zaid, William P. Parker, Nida S. Safdar, Boris Gershman, Patricia J. Erwin, M. Hassan Murad, Stephen A. Boorjian, Brian A. Costello, R. Houston Thompson and Bradley C. Leibovich*

Complete surgical metastasectomy was associated with a reduced risk of all cause mortality compared with incomplete surgical metastasectomy (HR 2.37)

J Urol 2017. 197:44

Survival After Complete Surgical Resection of Multiple Metastases From Renal Cell Carcinoma

Angela L. Alt, MD[1]; Stephen A. Boorjian, MD[1]; Christine M. Lohse, MS[2]; Brian A. Costello, MD[3]; Bradley C. Leibovich, MD[1]; and Michael L. Blute, MD[4]

887 patients who developed **multiple** metastases

125 underwent complete resection of all metastases

→ ***median CSS 4.8 yrs vs. 1.3 yrs***

Cancer 2011. 117:2873

Survival After Complete Surgical Resection of Multiple Metastases From Renal Cell Carcinoma

Angela L. Alt, MD[1]; Stephen A. Boorjian, MD[1]; Christine M. Lohse, MS[2]; Brian A. Costello, MD[3]; Bradley C. Leibovich, MD[1]; and Michael L. Blute, MD[4]

Lung-only disease: 5yr CSS 74% vs. 19%

Non-lung disease: 5yr CSS 33% vs. 12%

→ ***median CSS 4.8 yrs vs. 1.3 yrs***

Cancer 2011. 117:2873

Curr Opin Urol 2015. 25(5):381

Role of metastasectomy in metastatic renal cell carcinoma

Arun Z. Thomas, Mehrad Adibi, Leonardo D. Borregales, Christopher G. Wood, and Jose A. Karam

Organ	Incidence	5yr OS	Favorable metastasectomy features
Lung	**45-75%**	**36-50%**	**Complete metastasectomy** **Pulmonary metastases (<7)** **Negative lymph node metastases** **RFS more than 23 months**
Bone	**15-34%**	**35%**	**Solitary metastasis** **Bone only metastasis if multiple**
Liver	**20%**	**18-43%**	**ECOG 0** **pN0 at nephrectomy** **Fuhrman gr 1-2 at nephrectomy** **Metachronous metastasis at diagnosis** **No extra-hepatic disease**
Retroperitoneum	**3%**	**18-52%**	**Solitary recurrence** **pN0 at nephrectomy** **Size of recurrence**

Curr Opin Urol 2015. 25(5):381

Role of metastasectomy in metastatic renal cell carcinoma

Arun Z. Thomas, Mehrad Adibi, Leonardo D. Borregales, Christopher G. Wood, and Jose A. Karam

- Extended recurrence free interval
- Solitary metastasis
- Complete metastasectomy
- No lymph node disease
- Low grade primary tumor

Organ	Incidence	5yr OS	Favorable metastasectomy features
Lung			ses
Bone			le
Liver			y iagnosis
			No extra-hepatic disease
Retroperitoneum	3%	18-52%	Solitary recurrence pN0 at nephrectomy Size of recurrence

The clinical effectiveness and cost-effectiveness of ablative therapies in the management liver metastases: systematic review and economic evaluation

Emma Loveman, Jeremy Jones, Andrew J Clegg, Joanna P
Jillian L Colquitt, Diana Mendes, David J Breen, Emily Mo
Steve George, Graeme Poston, David Cunningha
Theo Ruers and John Primrose

Multicenter Study of Metastatic Lung Targeted by Interventional Cryoablati Evaluation (SOLSTICE)

Matthew R. Callstrom, MD, PhD,[a,*] David A. Woodrum, M
Francis C. Nichols, MD,[b] Jean Palussiere, MD,[c] Xavier Buy, MD, Robert D. Sun, MD,
Fereidoun G. Abtin, MD,[d] Bradley B. Pua, MD,[e] David C. Madoff
Sandeep L. Bagla, MD,[f] Dimitrios C. Papadouris, MD,[f] Hiran C. F
Damian E. Dupuy, MD,[h] Terrance T. Healey, MD,[h] William H. Moc
Thomas V. Bilfinger, MD,[i] Stephen B. Solomon, MD,[j] Hooman Yar
Henry J. Krebs, MD,[k] Charles J. Fulp, MD,[k] Antoine Hakime, MD
Lambros Tselikas, MD,[l] Thierry de Baere, MD[l]

AJR FOCUS ON:

Imaging-Guided Adrenal Tumor Ablation

Raul N. Uppot[1]
Debra A. Gervais[1,2]

OBJECTIVE. The purpose of this review is to describe the in to imaging-guided ablation of the adrenal gland.

Percutaneous Minimally Invasive Thermal Ablation of Osseous Metastases: Evidence-Based Practice Guidelines

Anderanik Tomasian[1]
Jack W. Jennings[2]

OBJECTIVE. The objective of this article is to describe evidence-based guidel percutaneous minimally invasive imaging-guided thermal ablation of bone metastase

Renal fossa recurrence after nephrectomy for renal cell carcinoma: prognostic features and oncological outcomes

Sarah P. Psutka*,†, Mark Heidenreich‡, Stephen A. Boorjian*, George C. Bailey*, John C. Cheville§, Suzanne B. Stewart-Merrill¶, Christine M. Lohse**, Thomas D. Atwell††, Brian A. Costello‡‡, Bradley C. Leibovich* and R. Houston Thompson*

Radiofrequency Ablation of Metastases from Renal Cell Carcinoma: Technique, Complications, and Midterm Outcome

Christian Kloeters[a,*], Ann-Kathrin Mager[a], Manfred Johannsen[b], Martin Ringsdorf[b], Andreas Roemer[b], Maximilian Tuellmann[b], Bernd Hamm[a], Eike Hein[a], Patrik Rogalla[a]

38 Pts → 66 mets

Tumor debulking in 7 pts with 16 metastases

Definitive treatment in 31 pts with 50 metastases

Mean follow-up 10mo (3-47)

Eur Urol Supp 2007. 6:653

Radiofrequency Ablation of Metastases from Renal Cell Carcinoma: Technique, Complications, and Midterm Outcome

Christian Kloeters[a,*], *Ann-Kathrin Mager*[a], *Manfred Johannsen*[b], *Martin Ringsdorf*[b], *Andreas Roemer*[b], *Maximilian Tuellmann*[b], *Bernd Hamm*[a], *Eike Hein*[a], *Patrik Rogalla*[a]

38
Tu
De
Me
es

Feasible
2 pneumothoraces (11 lung rfa's)
Single recurrence reported

Eur Urol Supp 2007. 6:653

Percutaneous Cryoablation of Metastatic Renal Cell Carcinoma for Local Tumor Control: Feasibility, Outcomes, and Estimated Cost-effectiveness for Palliation

Hyun J. Bang, MD, Peter J. Littrup, MD, Dylan J. Goodrich, BS, Brandt P. Currier, BS, Hussein D. Aoun, MD, Lance K. Heilbrun, PhD, Ulka Vaishampayan, MD, Barbara Adam, NP, and Allen C. Goodman, PhD

27 Pts → 60 procedures → 72 mets

All patients intermediate or poor risk

Table 4. Total Procedural and Satellite Recurrences by Anatomic Location of Tumor

Location	No. of Tumors	Total Local Recurrences
Soft Tissue		
Nephrectomy bed	11	—
Adrenal gland	9	—
Paraaortic	7	—
Superficial	12	—
Intraperitoneal	5	—
Bone	13	1
Subtotal	57	1
Liver	1	1
Lung	14	—
Total	72	2 (3)

Note.—Values in parentheses are percentages.

Local control in 70/72 (97%) mets

5yr OS 27%

JVIR 2012. 23:770

Feasibility and Oncologic Control after Percutaneous Image Guided Ablation of Metastatic Renal Cell Carcinoma

Brian T. Welch,* Matthew R. Callstrom,† Jonathan M. Morris,* Anil N. Kurup,* Grant D. Schmit,* Adam J. Weisbrod,* Christine M. Lohse,* Manish Kohli,* Brian A. Costello,* Kenneth R. Olivier,* R. Houston Thompson,* Stephen A. Boorjian* and Thomas D. Atwell*,‡

J Urol 2014. 192;357-363

61 patients → 74 ablation procedures →→ 82 RCC metastases

Location of disease (82 tumors)

- Hepatic
- Adrenal
- Spine/paraspinal
- Bone
- Retroperitoneal/soft tissue
- Nephrectomy bed
- Body wall
- Lung
- Diaphragm
- Gluteal muscles

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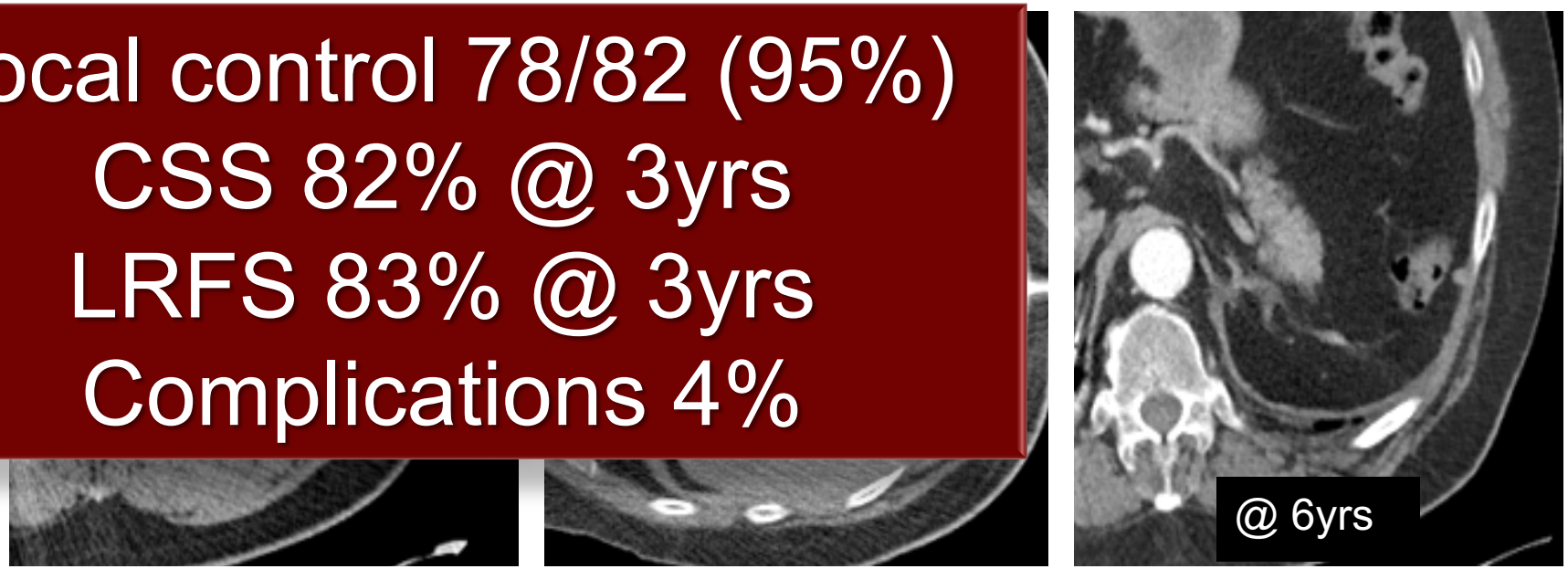
Local control 78/82 (95%)
CSS 82% @ 3yrs
LRFS 83% @ 3yrs
Complications 4%

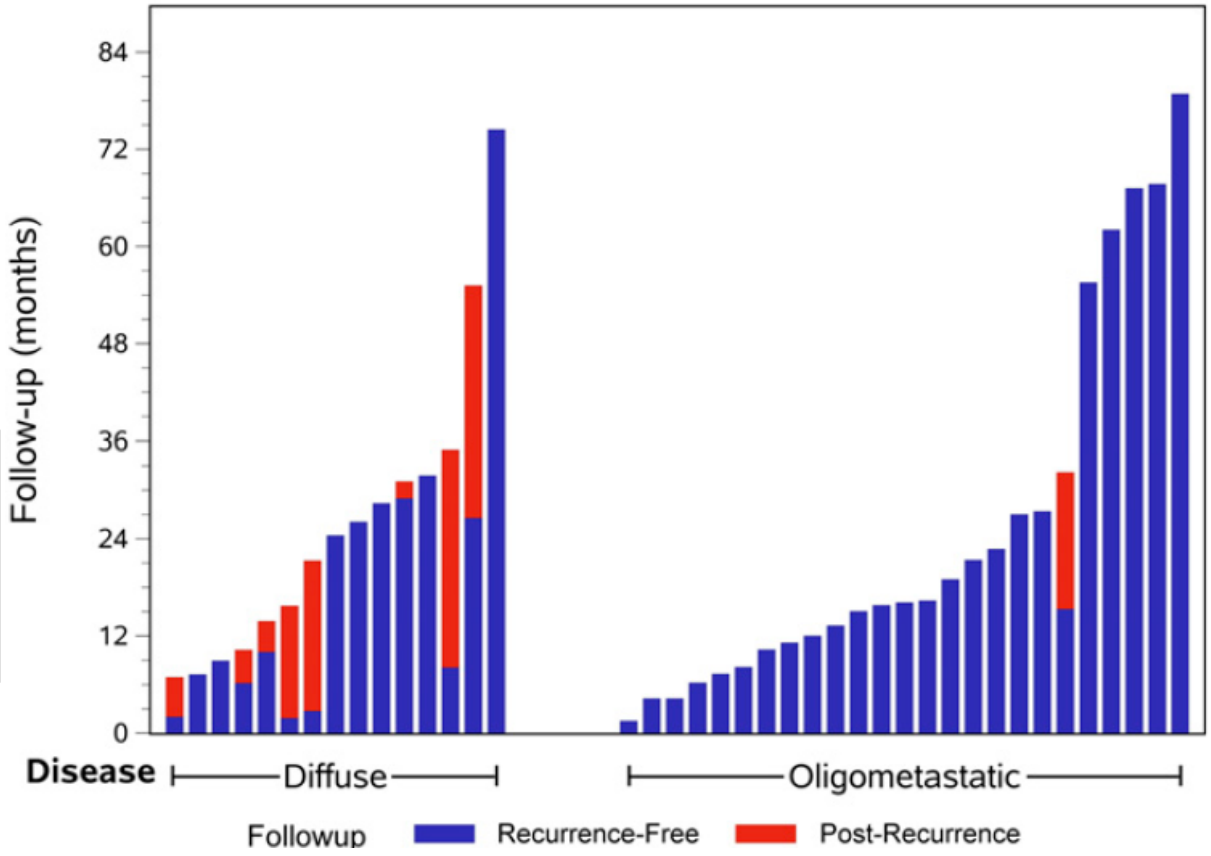


Cryoablation of Bone Metastases from Renal Cell Carcinoma for Local Tumor Control

Carly S. Gardner, MD, Joe E. Ensor, PhD, Kamran Ahrar, MD, Steven Y. Huang, MD, Sharjeel H. Sabir, MD, Nizar M. Tannir, MD, Valerae O. Lewis, MD, and Alda L. Tam, MD

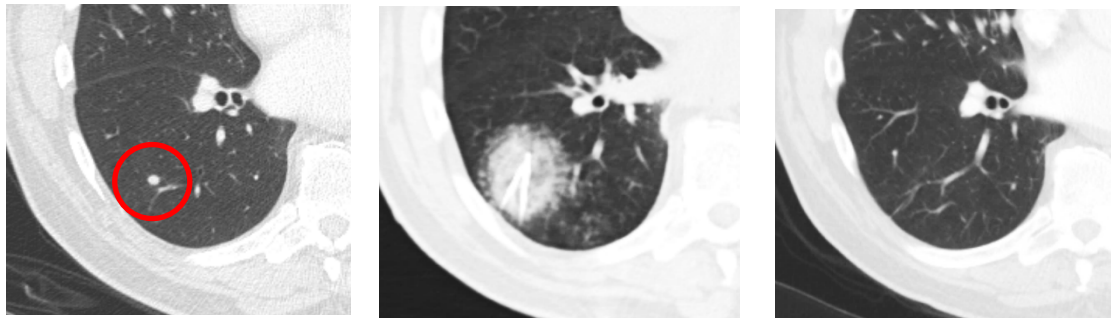
40 patients with 50 bone metastases
Median follow-up 35mo

Local control in 82%
Progression elsewhere 38/40



J Bone Joint Surg Am 2017. 99:1916

Renal cell carcinoma lung metastases treated by radiofrequency ablation integrated with systemic treatments: over 10 years of experience

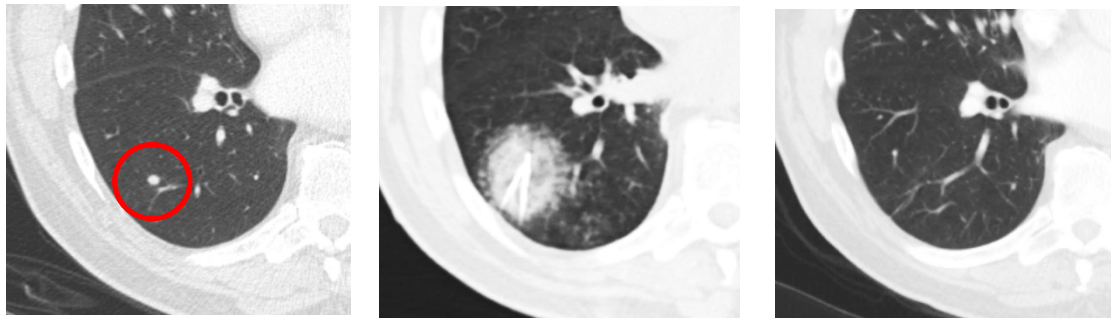


Alexis Gonnet[1,2], Laura Salabert[3,4], Guilhem Roubaud[4], Vittorio Catena[1], Véronique Brouste[5], Xavier Buy[1], Marine Gross Goupil[3], Alain Ravaud[3] and Jean Palussière[1*]

53 Pts → 65 RFA procedures → 100 RCC lung mets
Median follow-up 61mo

BMC Cancer 2019. 19:1182

Renal cell carcinoma lung metastases treated by radiofrequency ablation integrated with systemic treatments: over 10 years of experience



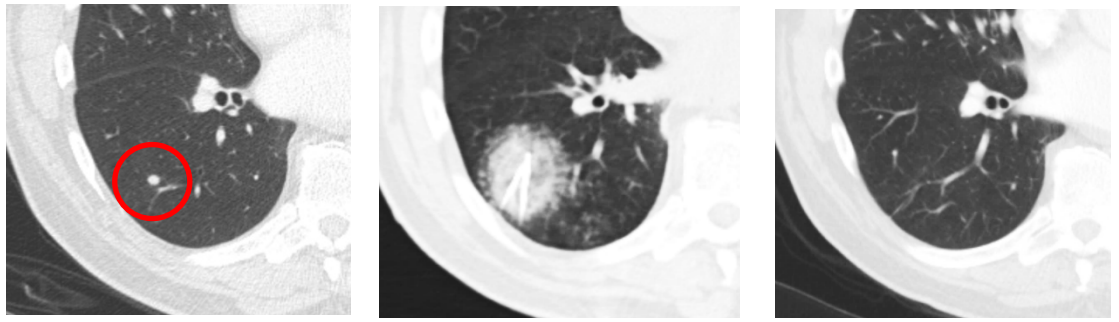
Alexis Gonnet[1,2], Laura Salabert[3,4], Guilhem Roubaud[4], Vittorio Catena[1], Véronique Brouste[5], Xavier Buy[1], Marine Gross Goupil[3], Alain Ravaud[3] and Jean Palussière[1*]

53 I ...nets

Local control in 91%
- 7/9 received repeat RFA
5yr OS 62%
3yr PFS (lung) 59%
Median time to systemic tx: 28mo

BMC Cancer 2019. 19:1182

Renal cell carcinoma lung metastases treated by radiofrequency ablation integrated with systemic treatments: over 10 years of experience



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53 I…nets

Local cont…
- 7/9 rec…
5yr OS (…
3yr PFS …
Median ti… tx: 28mo

Chemo

BMC Cancer 2019. 19:1182

Kidney Cancer

RELAPSE OR STAGE IV TREATMENT

Clinical trial

or

See First-Line Therapy (KID-C, 1 of 2)

or

Metastasectomy or SBRT or ablative techniques for oligometastatic disease

and

Best supportive care[h]

Cryotreatment against Metastatic Renal Cell Bone Tumour Reduced Multiple Lung Metastases

HIDEJI NISHIDA[1], TOSHIHARU SHIRAI[1], KATSUHIRO HAYASHI[1], AKIHIKO TAKEUCHI[2], YOSHIKAZU TANZAWA[1], ATSUSHI MIZOKAMI[3], MIKIO NAMIKI[3] and HIROYUKI TSUCHIYA[1]

Anticancer Res 2011. 31:2927

Efficacy of vertebral cryoablation and immunotherapy in a patient with metastatic renal cell carcinoma: a case report

Apiruk Sangsin, Hideki Murakami*, Takaki Shimizu, Satoshi Kato and Hiroyuki Tsuchiya

J Med Case Rep 2019. 13:96

Cardiovasc Intervent Radiol (2011) 34:424–430
DOI 10.1007/s00270-010-9896-9

CASE REPORT

Spontaneous Regression of Multiple Pulmonary Metastases After Radiofrequency Ablation of a Single Metastasis

Pramod Rao · Bernard Escudier · Thierry de Baere

Cryotreatment against Metastatic Renal Cell Bone Tumour Reduced Multiple Lung Metastases

HIDEJI NISHIDA[1], TOSHIHARU SHIRAI[1], KATSUHIRO HAYASHI[1], AKIHIKO TAKEUCHI[2], YOSHIKAZU TANZAWA[1], ATSUSHI MIZOKAMI[3], MIKIO NAMIKI[3] and HIROYUKI TSUCHIYA[1]

Anticancer Res 2011. 31:2927

Overview

The Dandelion Dilemma Revisited for Oligoprogression: Treat the Whole Lawn or Weed Selectively?

P.H. Patel *†, D. Palma ‡, F. McDonald *†1, A.C. Tree *†1

Clin Onc 2019. 31:824

J Med Case Rep 2019. 13:96

Spontaneous Regression of Multiple Pulmonary Metastases After Radiofrequency Ablation of a Single Metastasis

Pramod Rao · Bernard Escudier · Thierry de Baere

Conclusion

Treatment of oligometastatic RCC is associated with improved patient survival

Ablative techniques warrant consideration in management of metastatic RCC