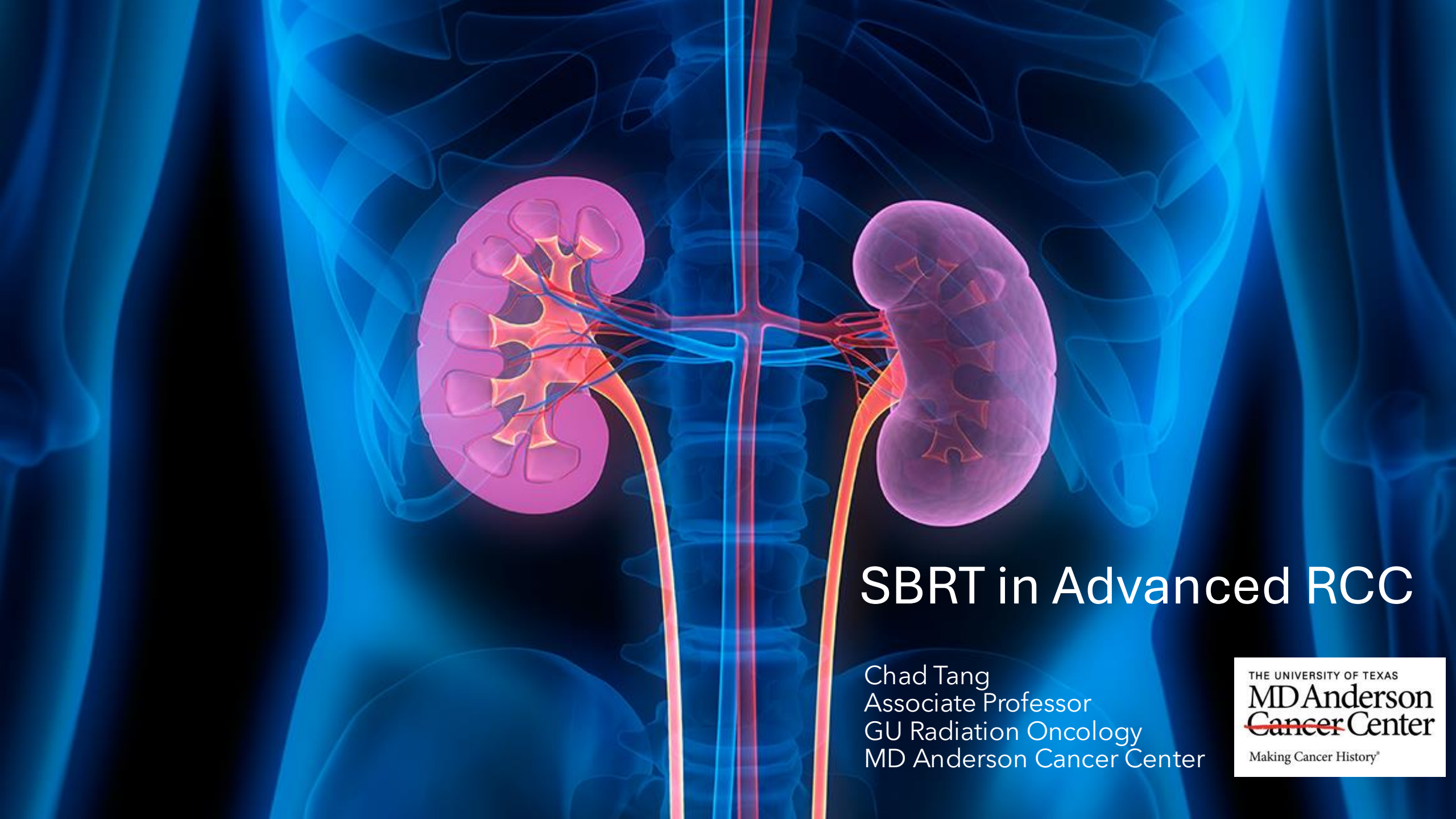


SBRT in Advanced RCC

Chad Tang
Associate Professor
GU Radiation Oncology
MD Anderson Cancer Center

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

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

Adenocarcinoma of the kidney (hypernephroma) is a neoplasm that on occasion may be treated by removal of the primary growth and an apparently single metastasis. The following case history relates the course of a patient in whom x-ray evidence of a metastatic nodule in the lung was the first sign of disease. A nephrectomy was performed 5 months later, and 15 months following the nephrectomy the pulmonary metastasis was excised by sub-total lobectomy. The patient is surviving 5 years later in good health, without evidence of disease.

[1] Read at the annual meeting of the American Association of Genito-Urinary Surgeons, Absecon, New Jersey, May 2, 1938.

Evolution of Radiation Therapy

1980s and earlier: 2D radiation

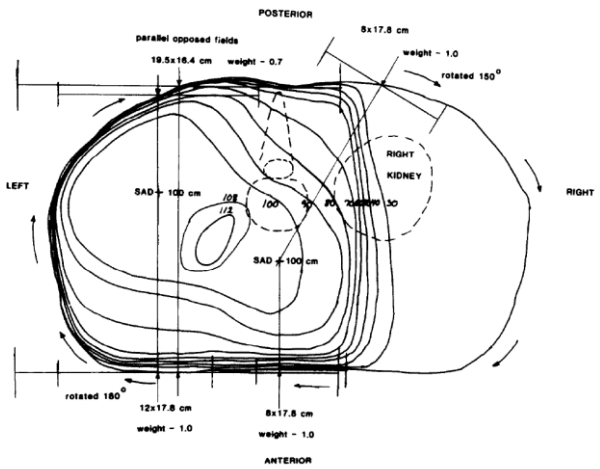
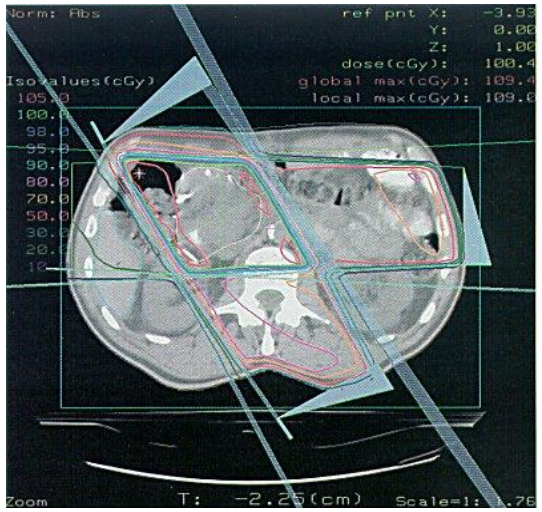


Fig. 2. Target area. Opposing fields + rotation technique used at Herlev Hospital.

1980-90s: 3D radiation

-Utilization of linear accelerators to generate a variety of energies

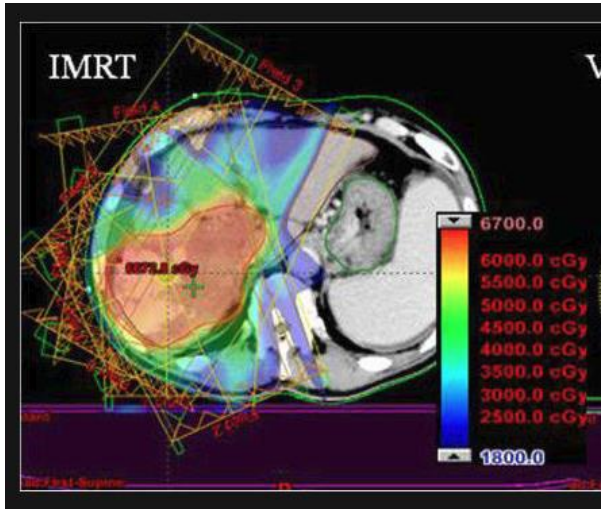
-Utilization of 3D imaging for planning



1990-2000s: IMRT/VMAT

-Automated MLCs

-Inverse planning algorithms

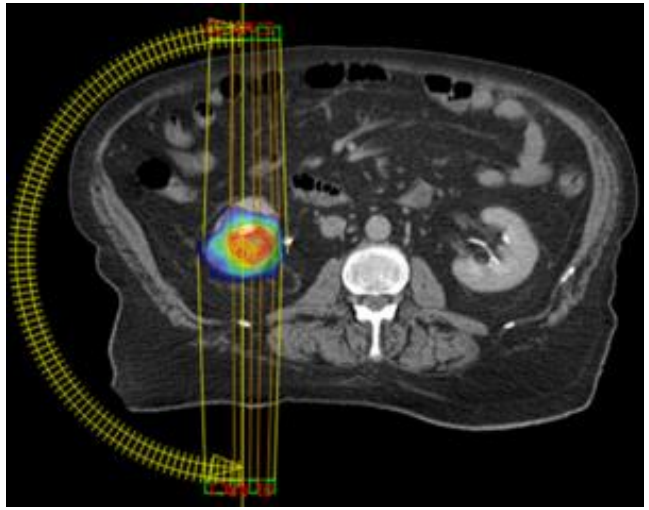


2000-2020: SBRT

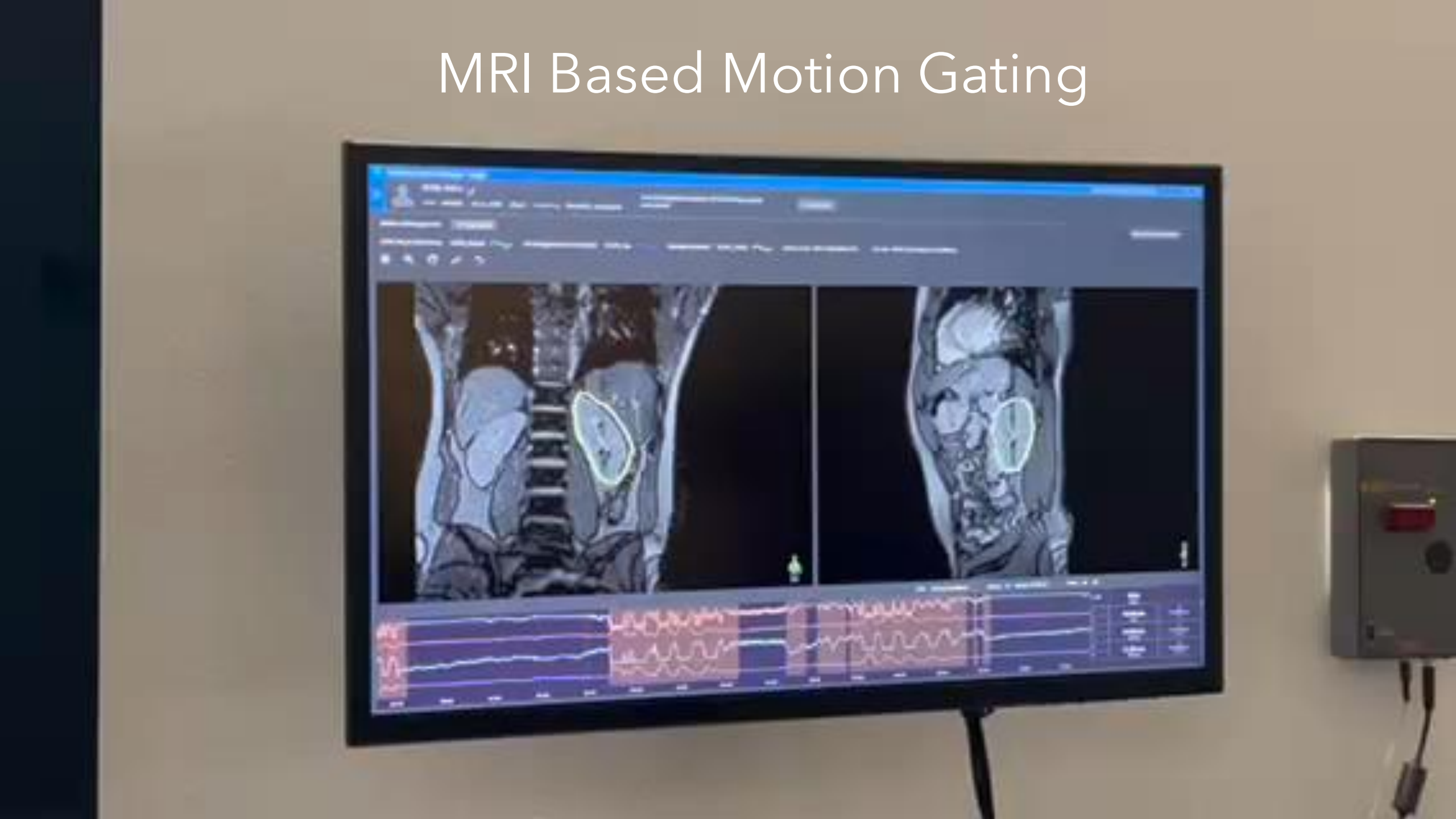
-Accurate on-board imaging

-Enhanced embolization, 4D planning

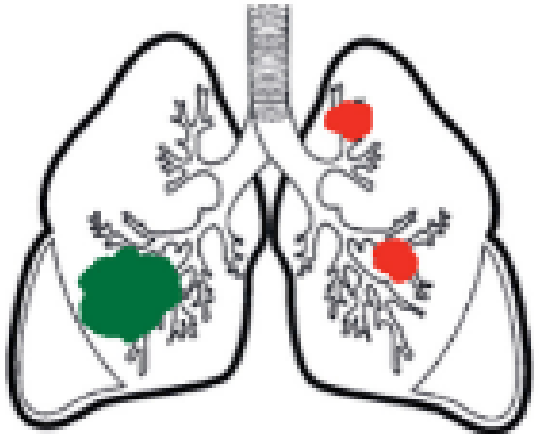
-Adaptive planning



MRI Based Motion Gating

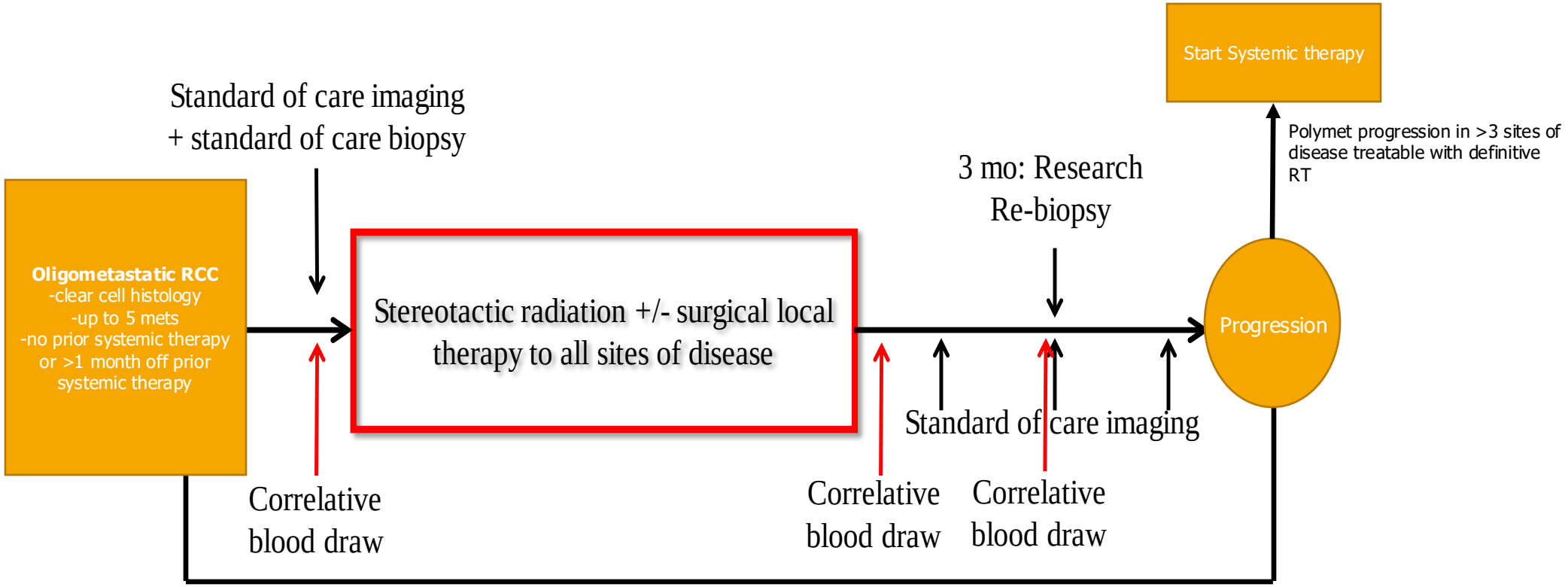


MDT to Defer Systemic Therapy

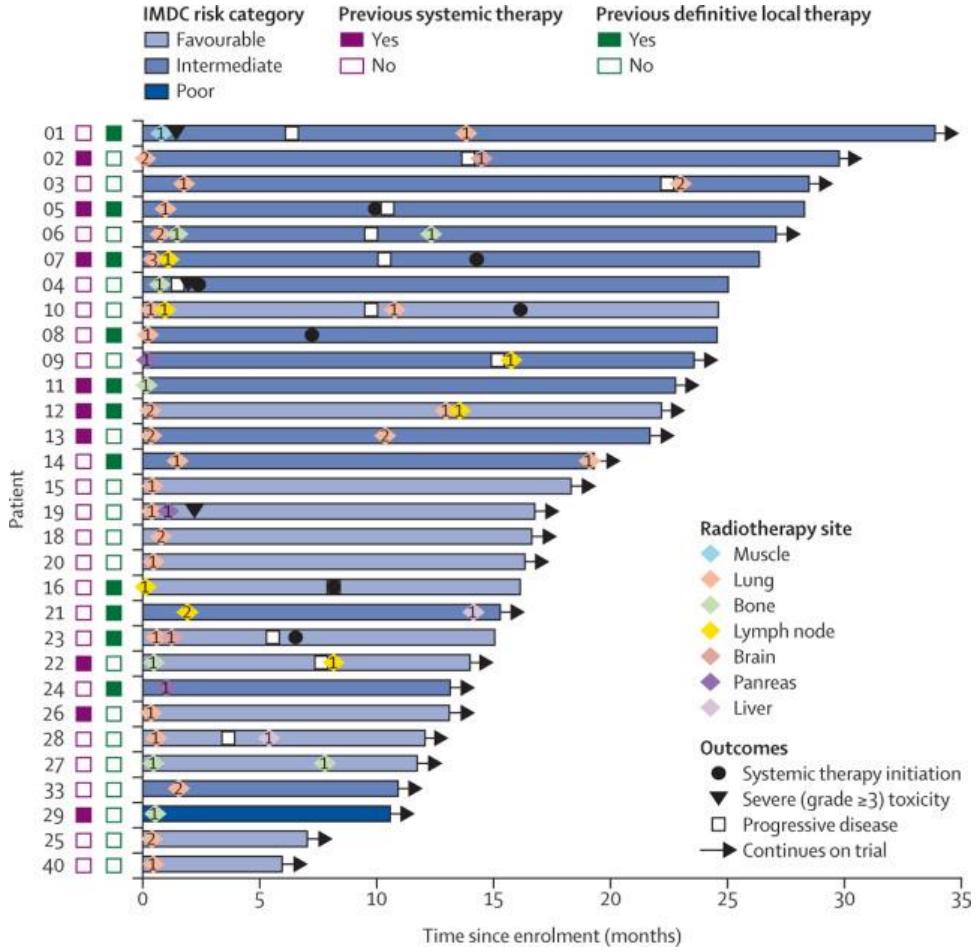


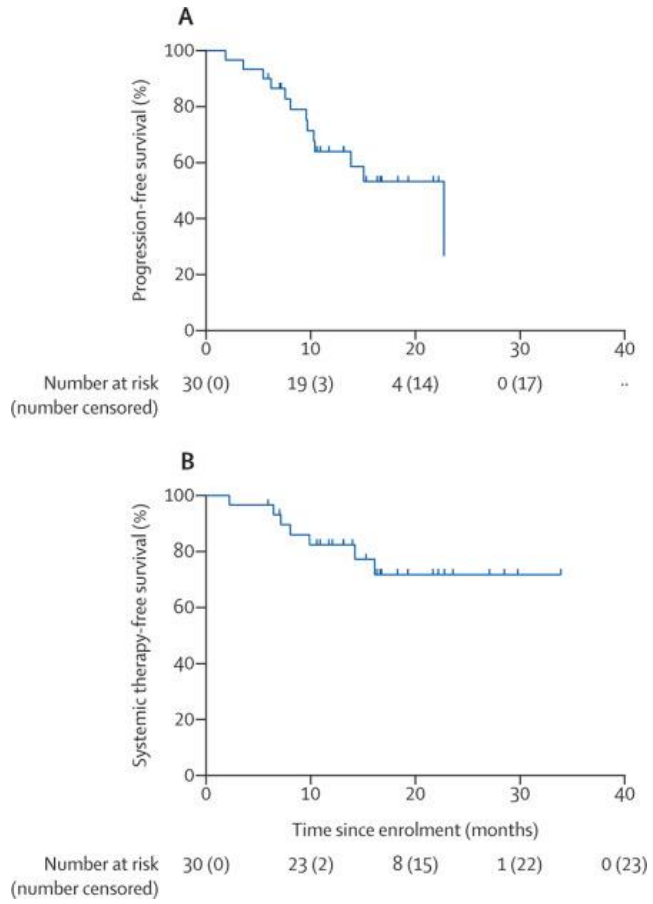
A patient with only a limited number of metastatic sites of disease (≤3-5)

Oligometastatic RCC



Oligometastatic RCC





Tang Lancet Onc 2021

available at www.sciencedirect.com
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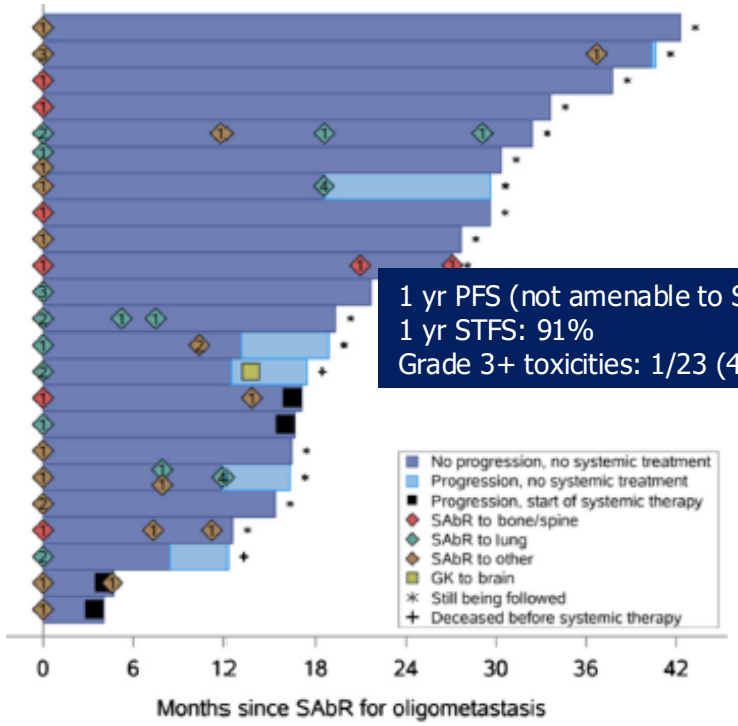
European Association of Urology

Stereotactic Ablative Radiation for Systemic Therapy–naïve Oligometastatic Kidney Cancer

Raquibul Hannan [a,b,], Michael Christensen [a], Alana Christie [b], Aurelie Garant [a,b], Ivan Pedrosa [b,d], Liliana Robles [a], Samantha Mannala [a], Chiachien Wang [a], Hans Hammers [b,c], Waddah Arafat [b,c], Kevin Courtney [b,c], Isaac A. Bowman [b,c], David Sher [a], Chul Ahn [b], Suzanne Cole [b,c], Hak Choy [a], Robert Timmerman [a,b,*], James Brugarolas [b,c,*]*

[a] Department of Radiation Oncology, University of Texas Southwestern Medical Center, Dallas, TX, USA; [b] Kidney Cancer Program, Simmons Comprehensive Cancer Center, University of Texas Southwestern Medical Center, Dallas, TX, USA; [c] Department of Internal Medicine, Hematology-Oncology Division, University of Texas Southwestern Medical Center, Dallas, TX, USA; [d] Department of Radiology, University of Texas Southwestern, Dallas, TX, USA



1 yr PFS (not amenable to SBRT): 83%
1 yr STFS: 91%
Grade 3+ toxicities: 1/23 (4%)

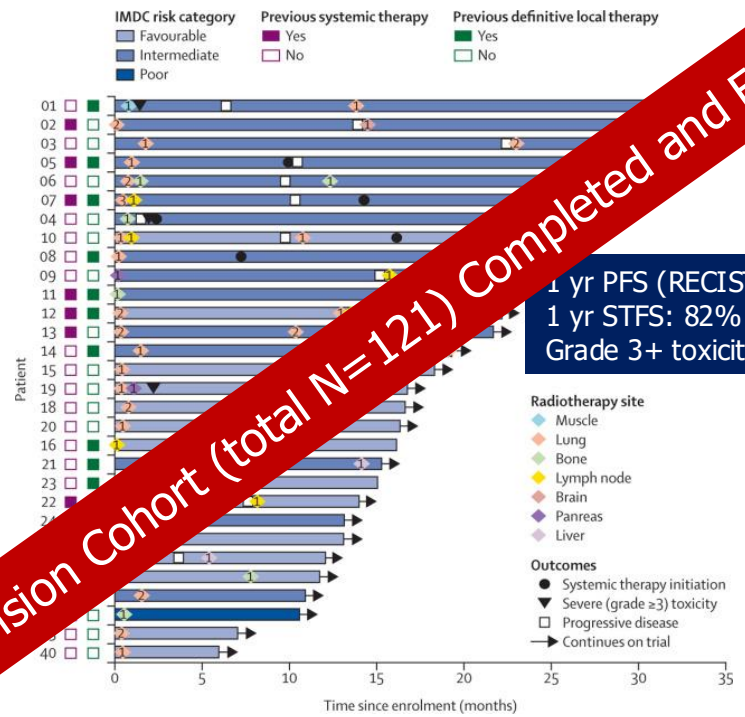
Definitive radiotherapy in lieu of systemic therapy for oligometastatic renal cell carcinoma: a single-arm, single-centre, feasibility, phase 2 trial

Chad Tang, Pavlos Msaouel*, Kieko Hara, Haesun Choi, Venus Le, Amishi Y Shah, Jennifer Wang, Eric Jonasch, Seungtaek Choi, Quynh-nhu Nguyen, Prajnan Das, Surendra Prajapati, Zhiqian Yu, Khaja Khan, Steven Powell, Ravi Murthy, Kanishka Sircar, Nizar M Tannir*

Lancet Oncol 2021; 22: 1732–39
Published Online October 27, 2021

Summary

Background The role of radiotherapy in metastatic renal cell carcinoma is controversial. We prospectively tested th
feasibility and efficacy of radiotherapy to defer systemic therapy for patients with oligometastatic renal cell carci



1 yr PFS (RECIST): 64%
1 yr STFS: 82%
Grade 3+ toxicities: 3/30 (10%)

Expansion Cohort (total N=121) Completed and FU Done

EA8211/SOAR
Randomized Phase III Non-inferiority Trial of SAbR vs Systemic Therapy for Oligometastatic RCC

Eligibility:
- Metastatic RCC
- Primary site addressed by surgery
- No Brain metastasis
- IMDC (mod) favorable and intermediate
- Total 2-5 metastatic lesions
- All metastasis amenable to SAbR

RANDOMIZATION

Stratification Factors:
- IMDC Risk Factor: 0 vs 1-2
- Time from Treatment of Primary: Synchronous (<1 year) vs Metachronous (>1 year)
- Number of Metastases (2-3 vs 4-5)
- Histology (Clear cell vs Non-Clear cell)
- Prior Adjuvant therapy (Yes vs. No)

Arm A:
Sequential SAbR followed by systemic therapy[1] at progression on SAbR (SAbR+ST)

Arm B:
Systemic therapy (ST)[1] only

Accrual Goal = 472

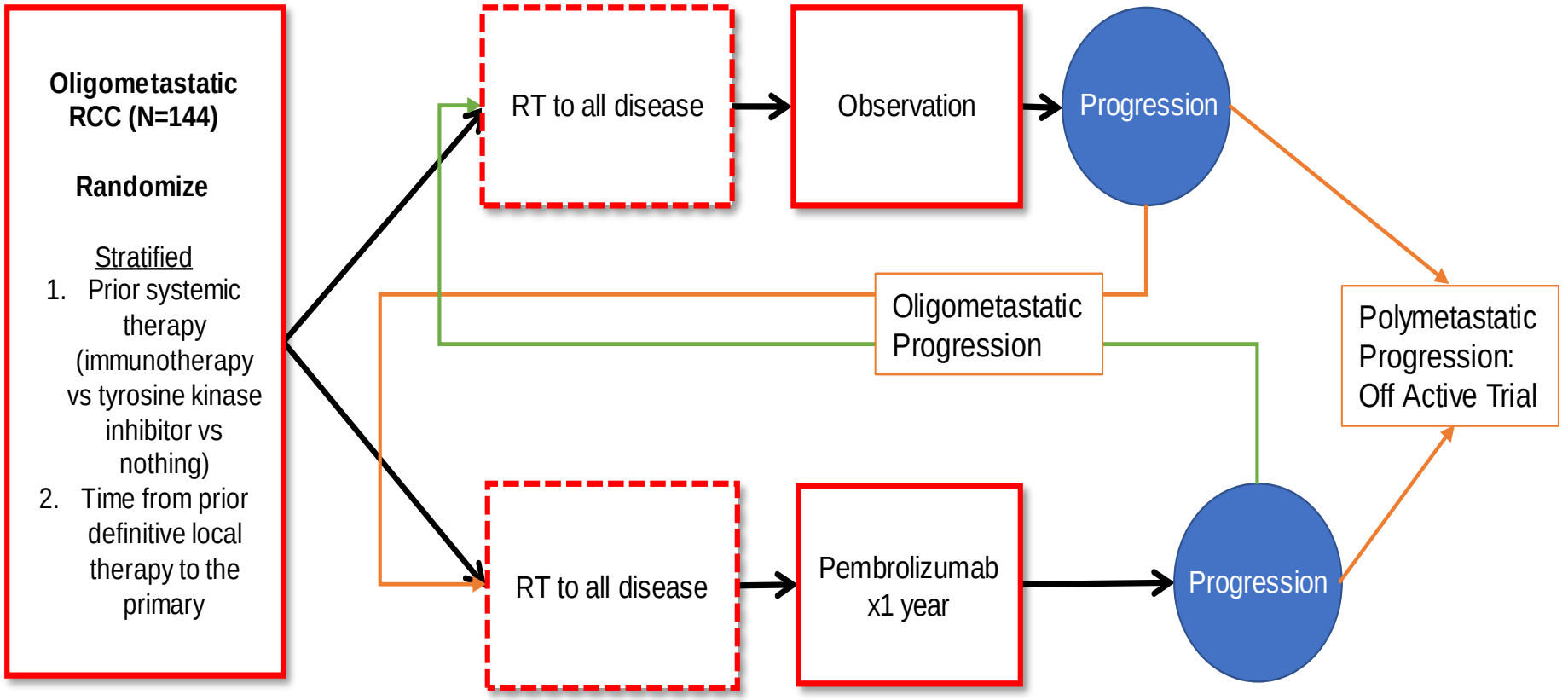
Cycle Length = assessments will be done every 3 months

1. Systemic therapy will consist of standard FDA approved first line systemic therapy for renal cell carcinoma, as per NCCN guidelines and with the options outlined in Section 5.1.2. The selection of the systemic therapy regimen used is at the discretion of the treating physician and in agreement with the patient. Once the regimen has been declared and started, patients may not switch to another regimen option.

Raquib Hannan, MD PhD
Principal Investigator
UT Southwestern

Suzanne Cole, MD
CO-Principal Investigator
UT Southwestern

ASTROs Trial



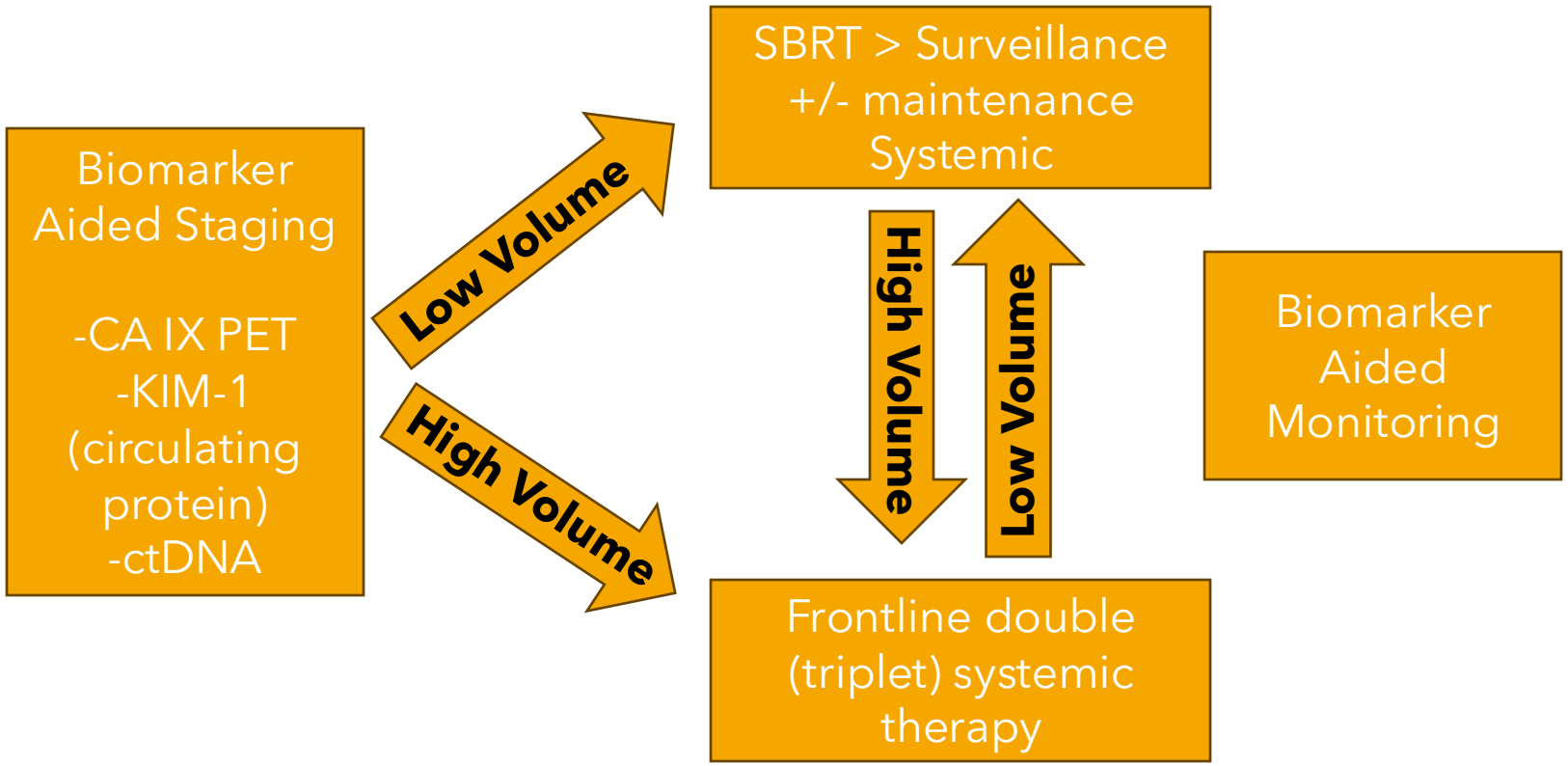
Activated November 2023
Primary Endpoint: PFS

Chad Tang, MD
Principal Investigator

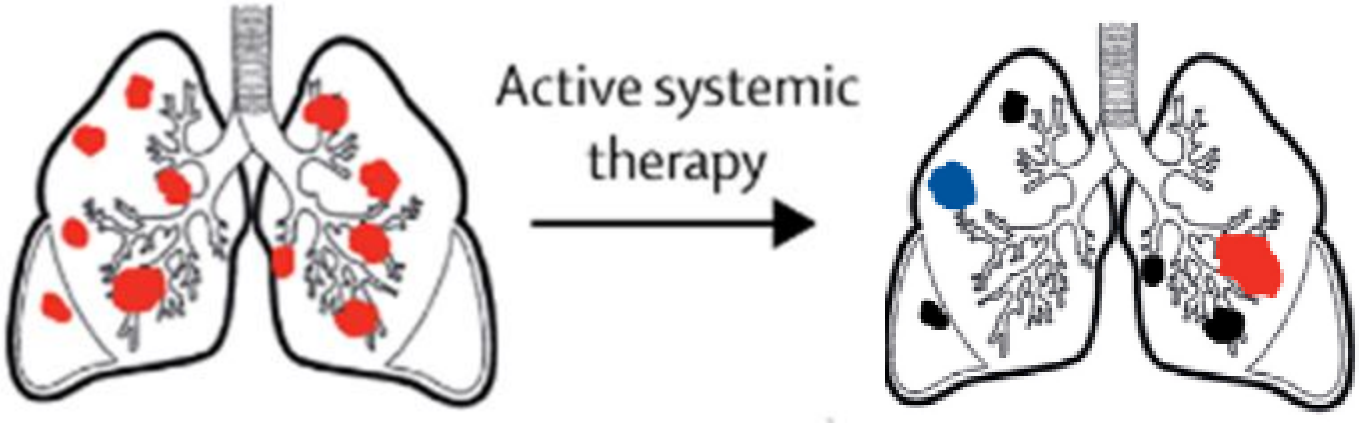
Pavlos Msaouel, MD PhD
Co-PI

Nizar Tannir, MD
Co-PI

Metastatic Kidney Cancer – Dynamic Escalation/De-Escalation



MDT to EXTEND Systemic Therapy



Patient with unlimited number of metastatic lesions initially, but through active systemic therapy all are controlled except for a limited number of growing ones (oligoprogressive lesions).

Prospective Studies

	Cheung et al. European Urology 2021	Hannan et al. European Urology Oncology 2022
Number of oligoprogressive sites	1-5	1-3
Histology	Required clear cell component	Mixed (90% clear cell)
Systemic Therapy	TKI monotherapy only	Mixed
Patient Number	38 (anticipated 62)	20

Prospective Studies Results

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journal homepage: www.europeanurology.com

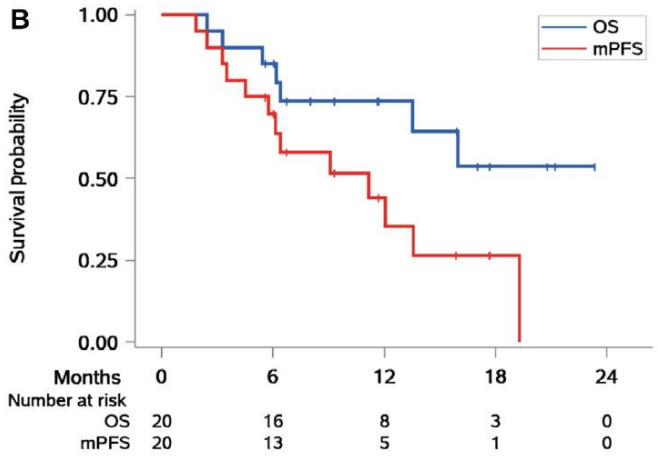
European Association of Urology

Platinum Priority – Kidney Cancer

Editorial by Shankar Siva, Piet Ost, Nicholas Zaorsky and Michael Staehler on pp. 701–702 of this issue

Stereotactic Radiotherapy for Oligoprogression in Metastatic Renal Cell Cancer Patients Receiving Tyrosine Kinase Inhibitor Therapy: A Phase 2 Prospective Multicenter Study

Patrick Cheung[a], Samir Patel[b], Scott A. North[c], Arjun Sahgal[a], William Chu[a], Hany Soliman[a], Belal Ahmad[d], Eric Winquist[e], Tamim Niazi[f], Francois Patenaude[g], Gerald Lim[h], Daniel Yick Chin Heng[i], Arbind Dubey[j], Piotr Czaykowski[k], Rebecca K.S. Wong[l], Anand Swaminath[m], Scott C. Morgan[n], Rupi Mangat[o], Sareh Keshavarzi[p], Georg A. Bjarnason[q,]*



Median PFS: 9.3 mo
New systemic therapy: 12.6 mo
Grade 3+ toxicities: 0%

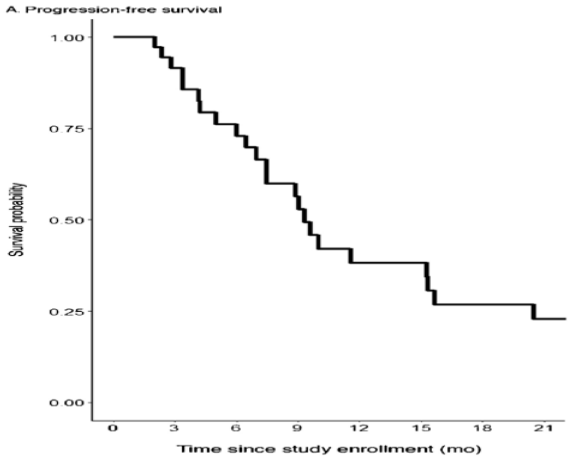
available at www.sciencedirect.com
journal homepage: euoncology.europeanurology.com

European Association of Urology

EUO Priority Article – Kidney Cancer

Phase II Trial of Stereotactic Ablative Radiation for Oligoprogressive Metastatic Kidney Cancer

Raquibul Hannan[a,b,], Michael Christensen[a], Hans Hammers[b,c], Alana Christie[b], Brendan Paulman[a], Dandan Lin[a], Aurelie Garant[a,b], Waddah Arafat[b,c], Kevin Courtney[b,c], Isaac Bowman[b,c], Suzanne Cole[b,c], David Sher[a], Chul Ahn[c], Hak Choy[a], Robert Timmerman[a,b,*], James Brugarolas[b,c,*]*



New systemic therapy/Death: 11.1 mo
Grade 3+ Toxicities: 1/20 (5%)

EXTEND OP

Individual Histology Baskets

1. Prostate
2. Renal
3. Bladder
4. Colorectal
5. Breast
6. Esophageal /gastric
7. Pancreatic

RANDOMIZE

Next-line systemic therapy → **PD = PFS**

Local consolidative therapy to all oligoprogressive sites and continued **same-line** systemic therapy → **Next-line** systemic therapy → **PD = PFS**

Primary Endpoint: PFS on Next-line systemic therapy

Ethan Ludmir, MD
Principal Investigator
UT MD Anderson

Chad Tang, MD
Co-Principal Investigator
UT MD Anderson

Thank You