

Presented by the Division of Thoracic Surgery,
Department of Surgery, University of Toronto

Surgery
UNIVERSITY OF TORONTO

50th Annual

Toronto Thoracic Surgery Refresher Conference

June 12 - 13, 2026 | Windsor Arms Hotel, 18 St. Thomas Street

Declaration of Conflict of Interest

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FACULTY/PRESENTER DISCLOSURE

- Faculty: Aman S Coonar
- Relationships with financial sponsors:
  - All sponsors or commercial providers to the previously mentioned organisations
  - Travel expenses from the course organisers

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TTSR Course aims

- 1. Assess and apply current evidence based surgical and multimodality treatment strategies for thoracic malignancies across early, locally advanced, and metastatic disease.
- 2. Evaluate the indications, benefits, and limitations of advanced thoracic surgical techniques and technologies to inform appropriate incorporation into clinical practice.
- 3. Formulate management approaches for complex and high-risk thoracic conditions using patient specific risk assessment and multidisciplinary principles.
- 4. Integrate multidisciplinary and international perspectives into clinical decision making to optimize outcomes in thoracic surgery and thoracic oncology.
- 5. Apply case based insights to enhance perioperative management, complication prevention, and quality of care in thoracic surgical practice.

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Surgery for Oligometastatic Lung Cancer

Aman S Coonar

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Royal Papworth Hospital

University of Cambridge

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John Constable Cloud Study c1822 Frick Collection

Oligometastatic Disease (OMD)

- Definitions vary

- IASLC: Up to 5 metastases in up to 3 organs
- ESMO: Up to 3 extrathoracic metastases
- NCCN: 3-5 metastases
- EORTC: up to 5 metastases in up to 3 organs
- STS: A limited metastatic state in which all sites of disease are potentially amenable to definitive local therapy.
  STS 2025 Guidelines used 3 mets*

IASLC

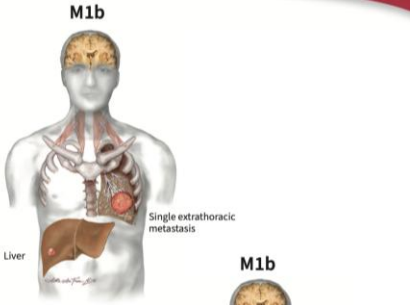
INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER

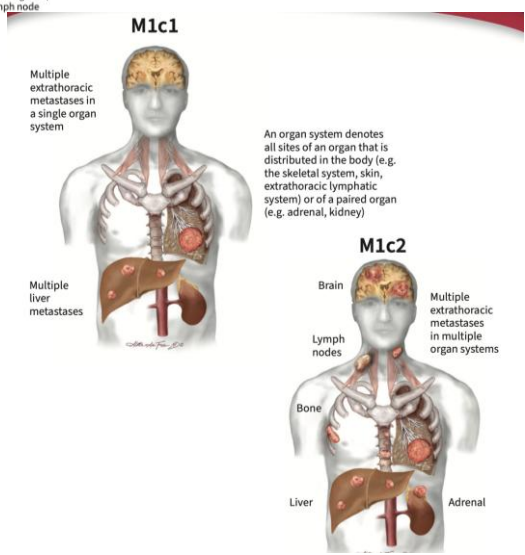
Lung Cancer TNM Stages–9th Edition

Stage Groups of the 9th Edition of the Tumor, Node, Metastasis (TNM) Classification of Lung Cancer

9th Edition TNM Descriptors and Stages

T/M	Categories and Descriptors	N0	N1	N2		N3
				N2a	N2b	
T1	T1a ≤1 cm	IA1	IIA	IIB	IIIA	IIIB
	T1b >1 to ≤2 cm	IA2	IIA	IIB	IIIA	IIIB
	T1c >2 to ≤3 cm	IA3	IIA	IIB	IIIA	IIIB
T2	T2a Visceral pleura / central invasion	IB	IIB	IIIA	IIIB	IIIB
	T2a >3 to ≤4 cm	IB	IIB	IIIA	IIIB	IIIB
	T2b >4 to ≤5 cm	IIA	IIB	IIIA	IIIB	IIIB
T3	T3 >5 to ≤7 cm	IIB	IIIA	IIIA	IIIB	IIIC
	T3 Invasion	IIB	IIIA	IIIA	IIIB	IIIC
	T3 Same lobe separate tumor nodules	IIB	IIIA	IIIA	IIIB	IIIC
T4	T4 >7 cm	IIIA	IIIA	IIIB	IIIB	IIIC
	T4 Invasion	IIIA	IIIA	IIIB	IIIB	IIIC
	T4 Ipsilateral separate tumor nodules	IIIA	IIIA	IIIB	IIIB	IIIC
	M1a Contralateral tumor nodules	IVA	IVA	IVA	IVA	IVA
	M1a Pleural / pericardial effusion, nodules	IVA	IVA	IVA	IVA	IVA
M1	M1b Single extrathoracic metastasis	IVA	IVA	IVA	IVA	IVA
	M1c1 Multiple metastases in 1 organ system	IVB	IVB	IVB	IVB	IVB
	M1c2 Multiple metastases in >1 organ systems	IVB	IVB	IVB	IVB	IVB





Surgery for Oligometastatic Lung Cancer

Is there a debate?

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Positions

Surgery has NO place in the management of

oligometastatic lung cancer

Surgery MUST be considered

in the management of ALL patients with oligometastatic lung cancer

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Outline

- **Case study**
- Biology
- Classification of Oligometastatic disease (OMD)
- Selected evidence
- Guidelines
- Next steps in Practice & Development

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R


S
I

Question for the residents?

- What do we do next?

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Question for the residents?

- What next?

- FEV1, TLCO 45%
- 6 min walk 300m SaO2 97 to 92%
- RV, TLC >160%
- (Q scan)

- CTPET

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I 100
Addenbro
DoB
E
g/ml
I 963


5
Addenbrook
M
DoB:
Ex:
g/ml
I

Outline

- Case study
- **Biology**
- Classification of Oligometastatic disease (OMD)
- Selected evidence
- Guidelines
- Next steps in Practice & Development

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Biology

- Oligometastatic disease - intermediate state between localised and systemically metastasised disease.
  Hellman S, Weichselbaum RR. Oligometastases. J Clin Oncol 1995;13: 8–10.
- Seed & Soil - particular metastatic cell & site permit metastases to develop.
- The descendent metastatic cancer cells may vary from their progenitor cell and each other
- Early treatment may be ‘better’ by ‘delaying or preventing’ emergence of resistance
- Immense research activity
- No consistent biomarkers

Outline

- Case study
- Biology
- **Classification of Oligometastatic disease (OMD)**
- Selected evidence
- Guidelines
- Next steps in Practice & Development

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Classification

Characterisation and classification of oligometastatic disease: a European Society for Radiotherapy and Oncology and European Organisation for Research and Treatment of Cancer consensus recommendation

Matthias Guckenberger, Yolande Lievens, Angelique B Bouma, Laurence Collette, Andre Dekker, Nandita M deSouza, Anne-Marie C Dingemans, Beatrice Fournier, Coen Hurkmans, Frédéric E Lecouvet, Icro Meattini, Alejandra Méndez Romero, Umberto Ricardi, Nicola S Russell, Daniel H Schanne, Marta Scorsetti, Bertrand Tombal, Dirk Verellen, Christine Verfaillie, Piet Ost

Lancet Oncol 2020; 21: e18–28

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Lancet Oncol 2020; 21: e18–28

Characteristics of oligometastatic disease

Panel: **Characteristics of oligometastatic disease**

Descriptive tumour characteristics

- Primary tumour characteristics: primary tumour site, histology, stage according to TNM Classification of Malignant Tumours, mutational status, tumour marker
- History of cancer progression: time interval since first diagnosis, disease-free interval, treatment-free interval
- History of treatment of primary tumour: method of local treatment, radical or palliative intent, controlled primary tumour
- History of systemic therapy before diagnosis of oligometastatic disease: types of systemic therapy, number of lines of systemic therapy
- Oligometastatic disease staging: imaging method, anatomical areas covered, invasive staging
- Involved organs of oligometastatic disease

Quantitative characteristics

- Number of metastatic lesions
- Number of involved organs
- Number of lesions per organ
- Maximum size or volume of individual metastasis

Developmental characteristics

- Does the patient have a history of polymetastatic disease before oligometastatic disease diagnosis?
- Does the patient have a history of oligometastatic disease before current diagnosis?
- Is oligometastatic disease diagnosed within 6 months after diagnosis of the primary tumour?
- Is the patient under active systemic therapy at the time of oligometastatic disease diagnosis?
- Are any oligometastatic lesions progressive on current imaging?

Metastases-specific characteristics

- Is the oligometastatic lesion a newly developed metastatic lesion?
- Is treatment of the oligometastatic lesion possible with radical intent?

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Lancet Oncol 2020; 21: e18–28

Descriptive tumour characteristics

1. Primary tumour characteristics: primary tumour site, histology, stage according to TNM Classification of Malignant Tumours, mutational status, tumour marker
2. History of cancer progression: time interval since first diagnosis, disease-free interval, treatment-free interval
3. History of treatment of primary tumour: method of local treatment, radical or palliative intent, controlled primary tumour
4. History of systemic therapy before diagnosis of oligometastatic disease: types of systemic therapy, number of lines of systemic therapy
5. Oligometastatic disease staging: imaging method, anatomical areas covered, invasive staging,
   Involved organs of oligometastatic disease

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Lancet Oncol 2020; 21: e18–28

Quantitative characteristics

1. Number of metastatic lesions
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4. Maximum size or volume of individual metastasis

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Lancet Oncol 2020; 21: e18–28

Developmental characteristics

1. Does the patient have a history of polymetastatic disease before oligometastatic disease diagnosis?
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4. Is the patient under active systemic therapy at the time of oligometastatic disease diagnosis?
5. Are any oligometastatic lesions progressive on current imaging?

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Metastases-specific characteristics

1. Is the oligometastatic lesion a newly developed metastatic lesion?

2. Is treatment of the oligometastatic lesion possible with ‘radical’ intent?

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9 sub-types of OMD

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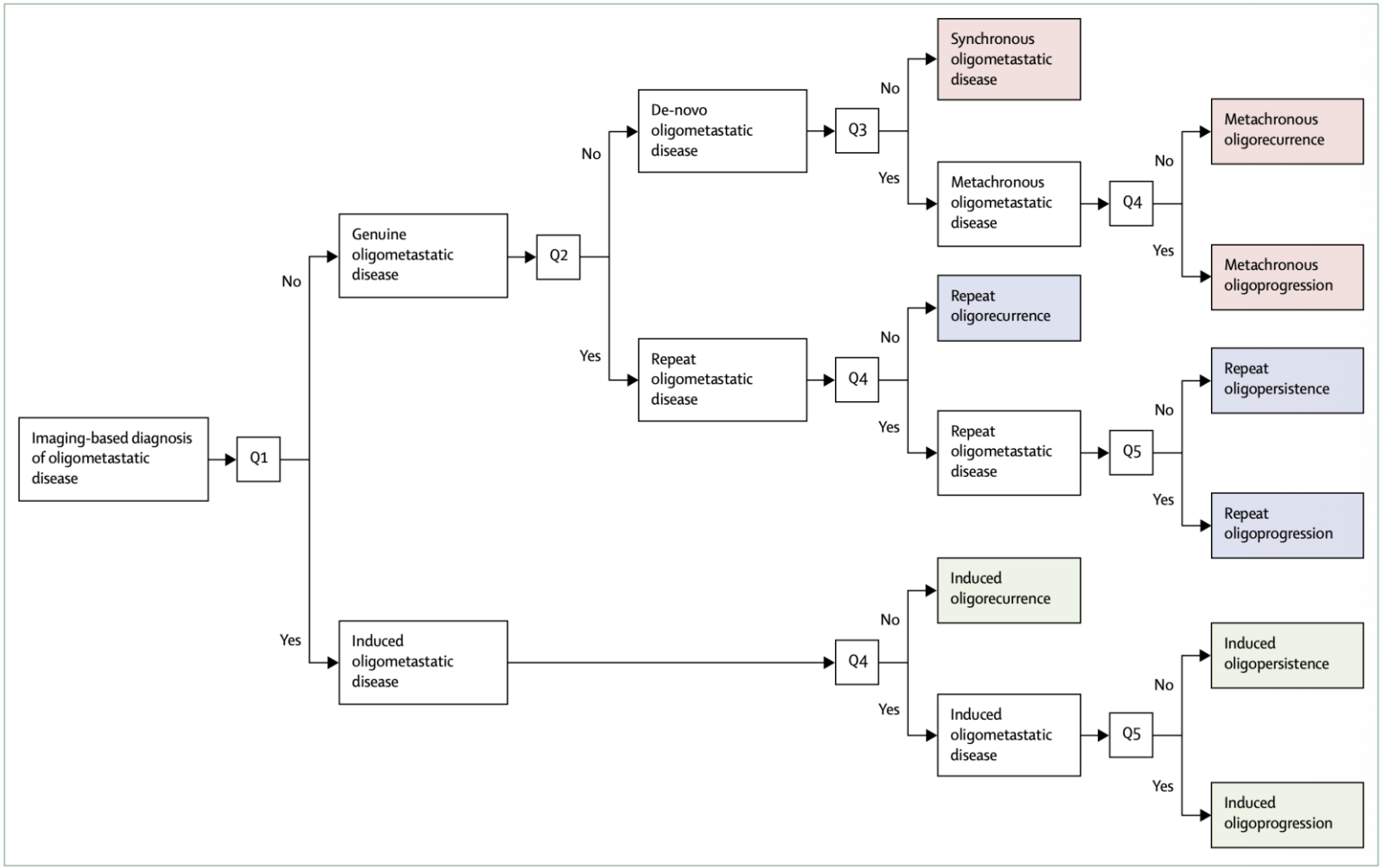

Figure 3: **Decision tree for classification of oligometastatic disease**

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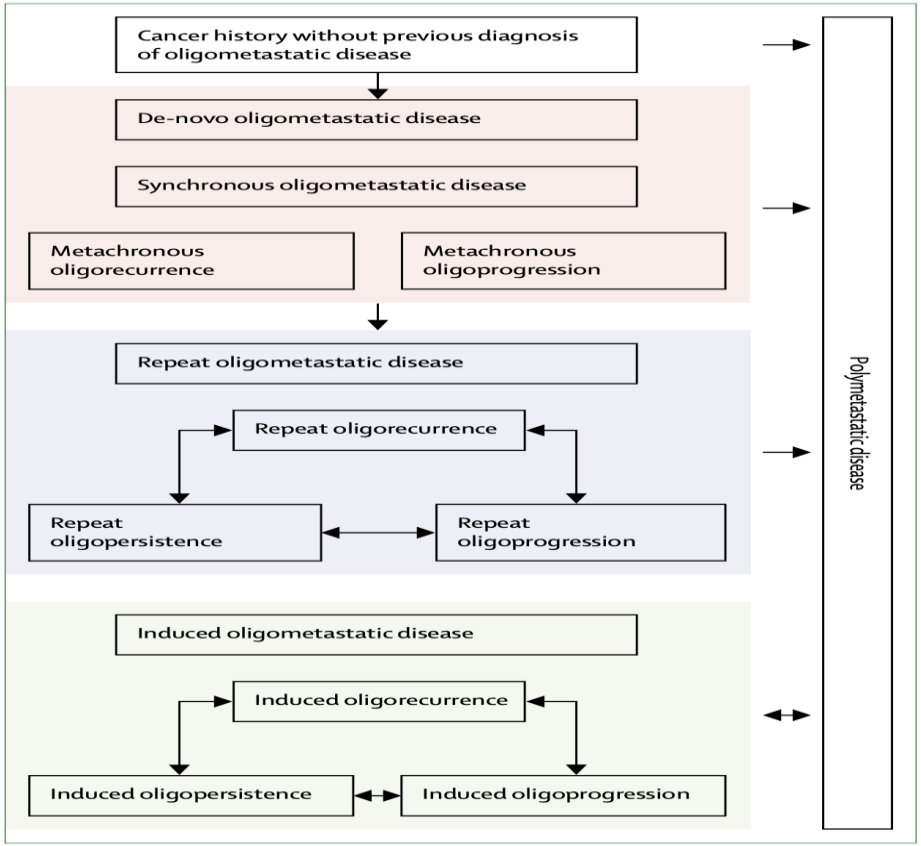

***Figure 5*: Dynamic oligometastatic state model**

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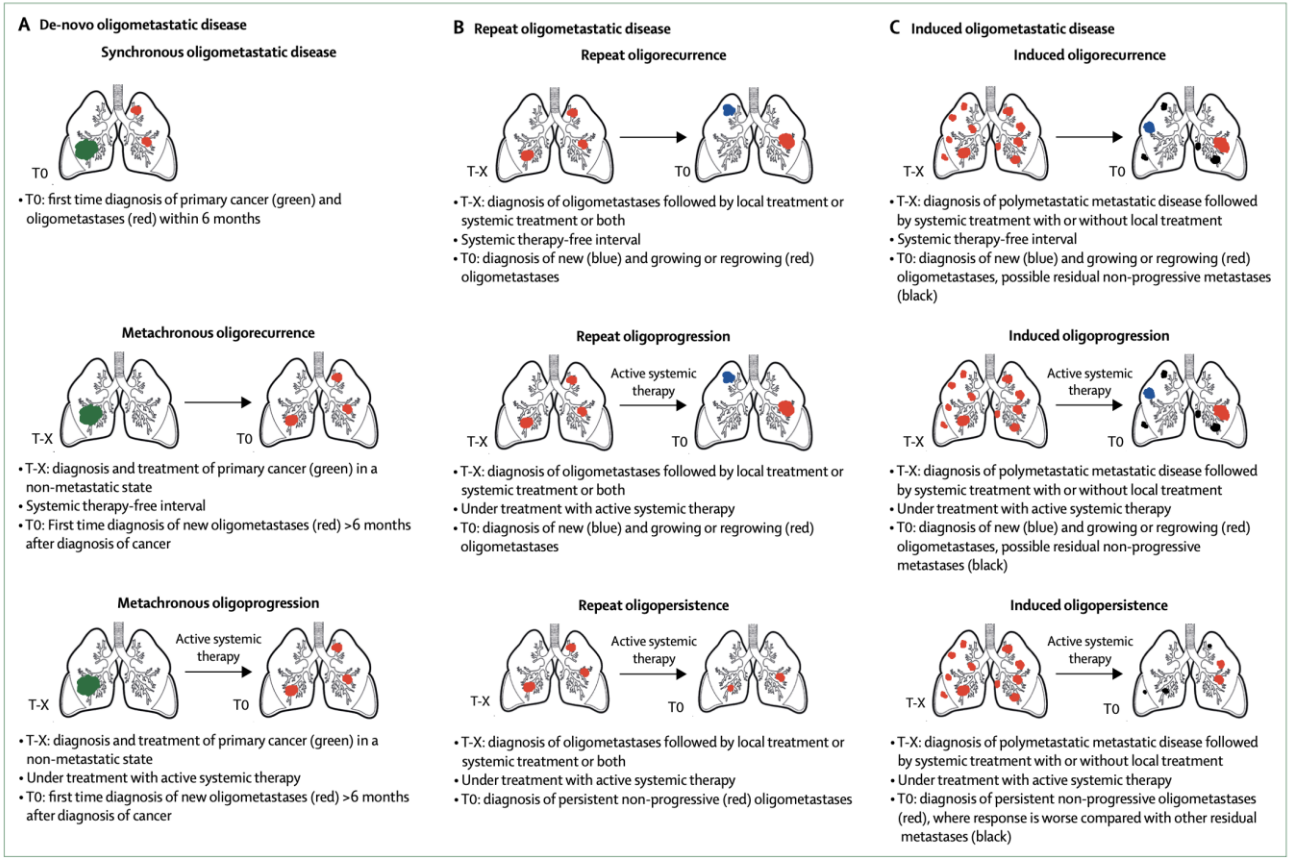

Figure 4: **Illustration of the oligometastatic disease classification system**
(A) De-novo oligometastatic disease. (B) Induced oligometastatic disease. (C) Repeat oligometastatic disease. In repeat and induced oligometastatic disease the primary tumour is assumed to be controlled by ongoing or previous treatment. Oligometastases are confirmed by imaging or biopsy to exclude simultaneous or secondary primary tumours. T0=at this current point of time. T-x=any previous point in time.

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De Novo OMD

Synchronous Oligometastatic Disease First presentation of cancer with ≤5 metastases detected at diagnosis or within 6 months.

Metachronous Oligorecurrence New oligometastatic disease >6 months after primary diagnosis *during a treatment-free interval.*

Metachronous Oligoprogression New oligometastatic disease >6 months after primary diagnosis *while receiving systemic therapy*.

Repeat OMD

Repeat Oligorecurrence New oligometastatic relapse after previous oligometastatic disease, occurring during a treatment-free interval.

Repeat Oligoprogression Previously treated oligometastatic disease with a few lesions progressing on systemic therapy.

Repeat Oligopersistence Persistent stable residual oligometastatic disease after previous treatment while on systemic therapy.

Induced OMD

Induced Oligorecurrence Prior polymetastatic disease reduced to oligometastatic disease by treatment, with recurrence during a treatment-free interval.

Induced Oligoprogression Prior polymetastatic disease largely controlled by therapy, with only a few lesions progressing.

Induced Oligopersistence Prior polymetastatic disease responding to therapy but with a few persistent residual metastases.

Factors allowing metastecomy

Is all disease controllable/controlled

Operability
Resectability of metastasis

Team acceptance
Institutional acceptance
Patient acceptance

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I 100
Addenbro
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5
Addenbrook
M
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Ex:
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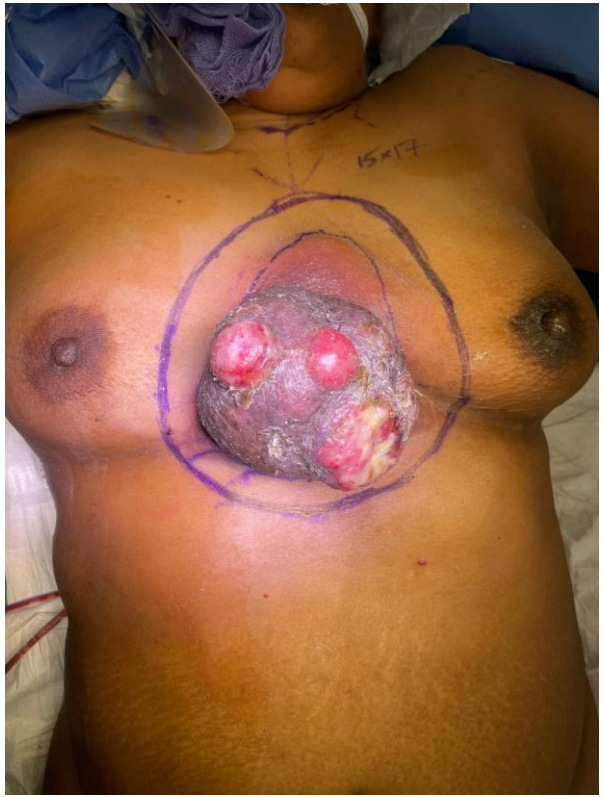
I

A Story of 2 Patients

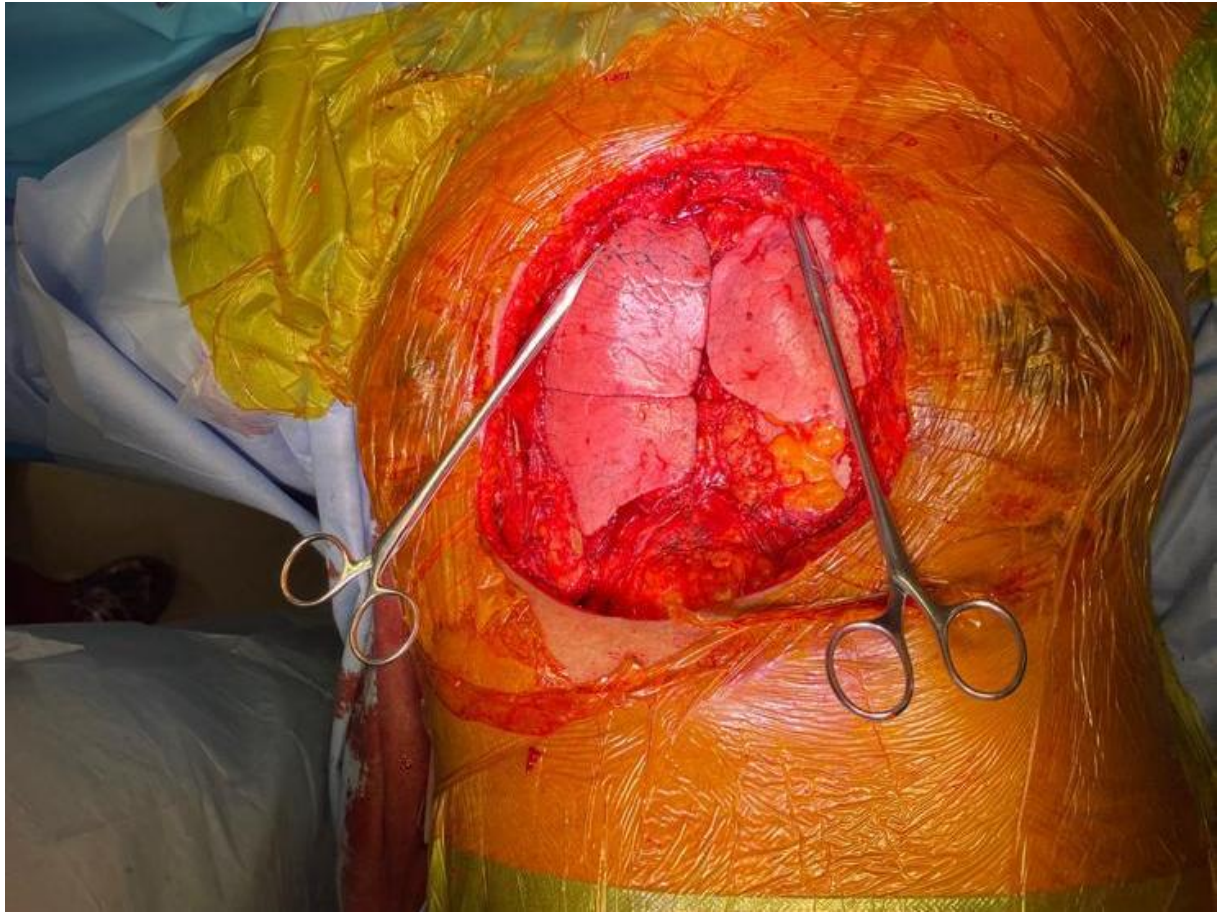




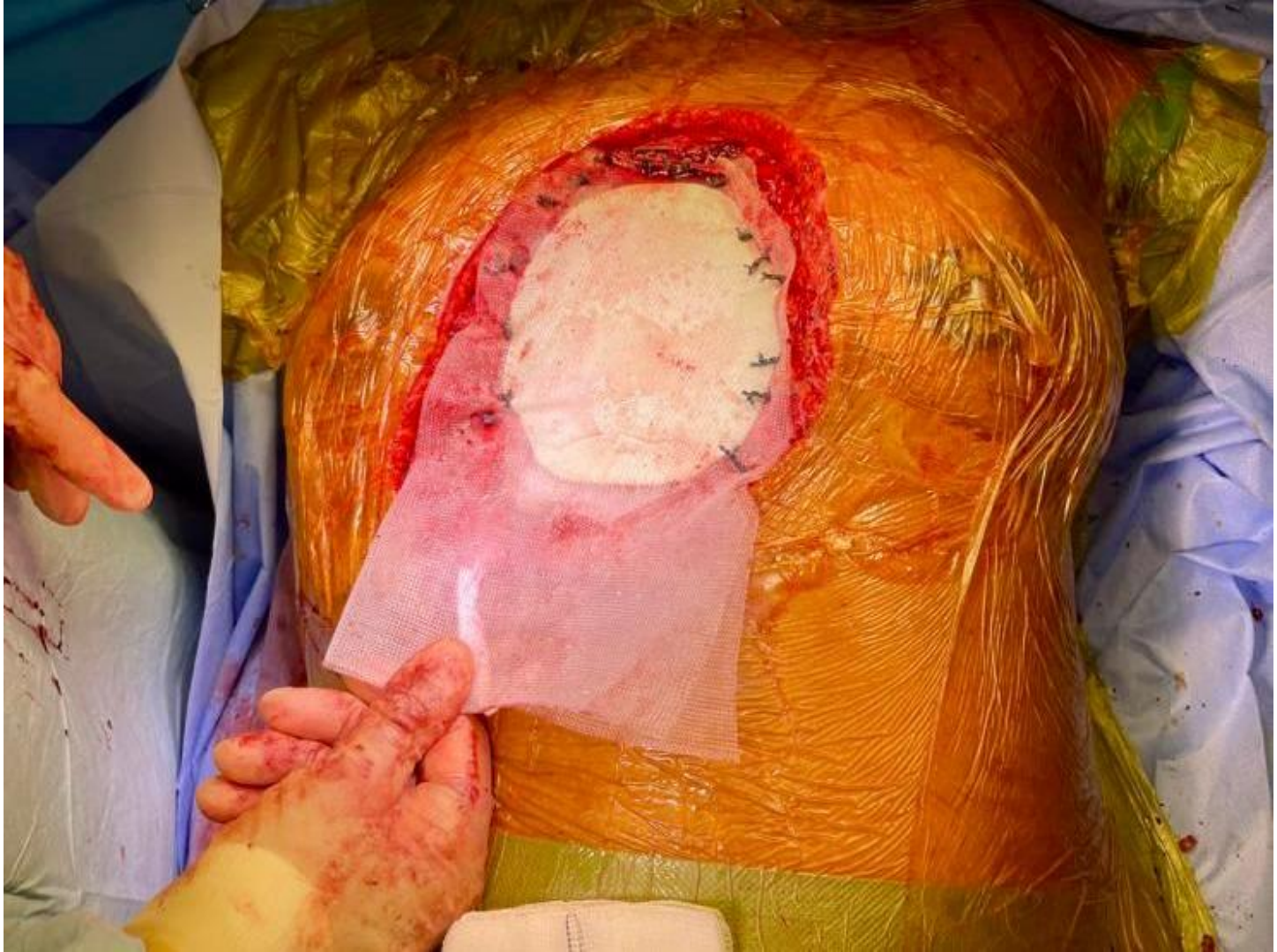








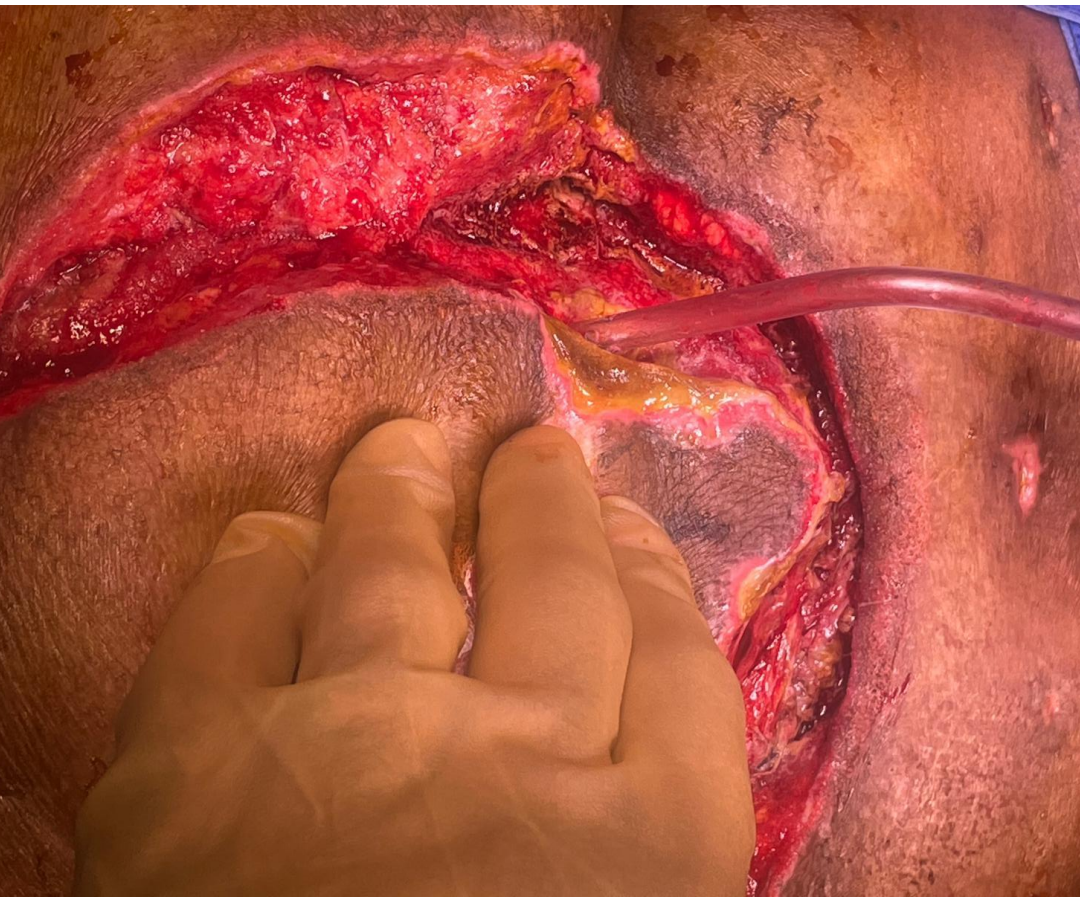


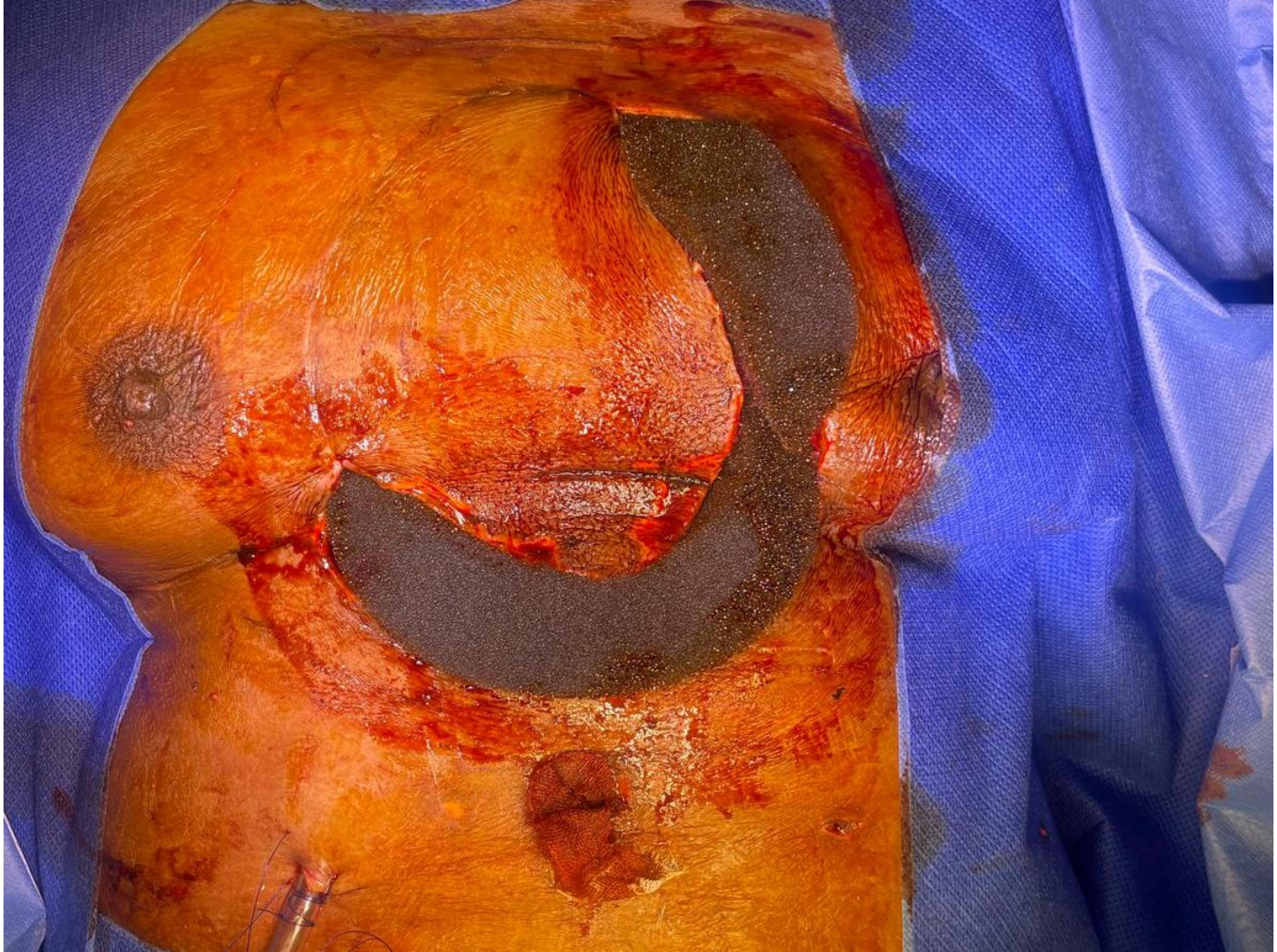










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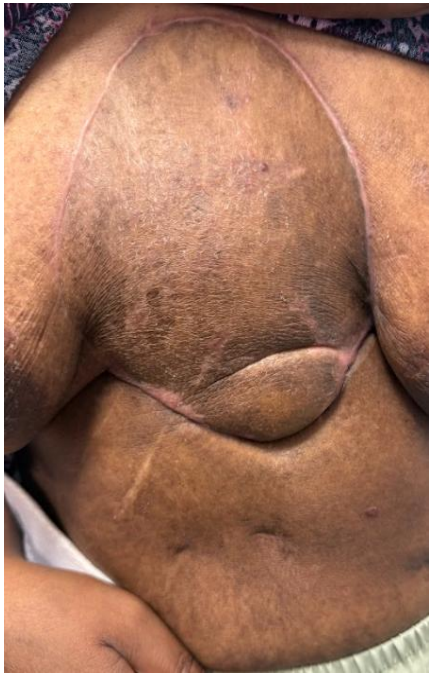
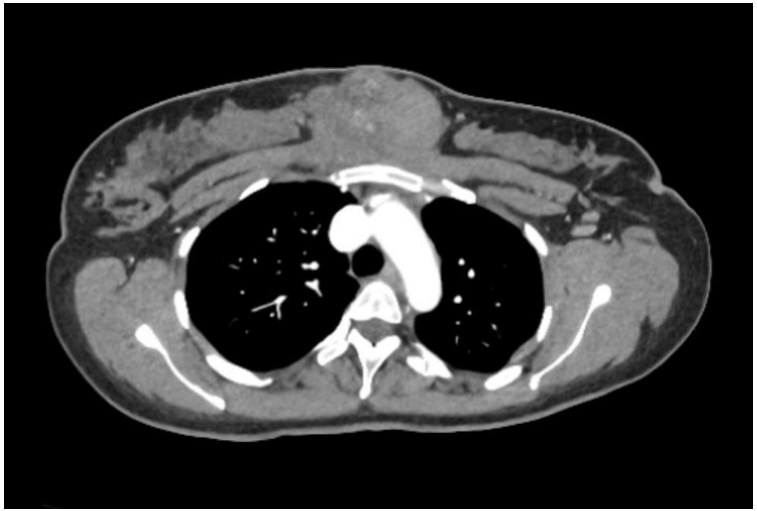
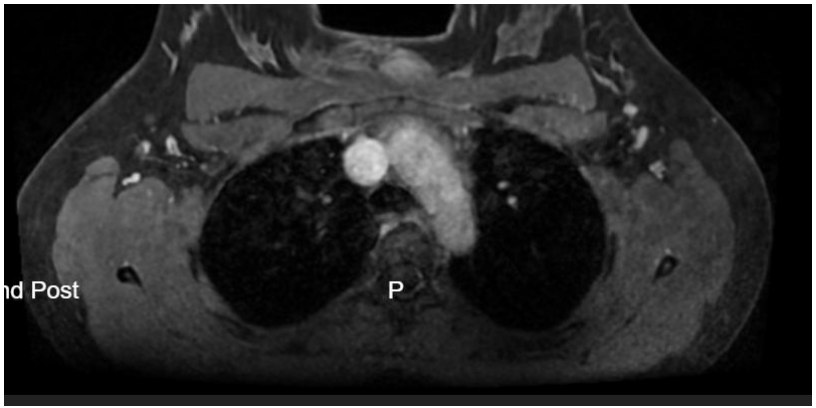


Patient 2





Presentation

Post chemo-immunotherapy

Patient 2



2 Patients

80 miles &
2 years apart

1.
Very late referral
Complex surgery
ITU
Multiple debridement
3 months in hospital

2.
Chemo-immunotherapy
Simple surgery
1 night in hospital
D/C + virtual hospital





Outline

- Case study
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Evidence - registry

JAMA Network Open

Original Investigation | Oncology

Comparison of Survival Rates After a Combination of Local Treatment and Systemic Therapy vs Systemic Therapy Alone for Treatment of Stage IV Non–Small Cell Lung Cancer

Johannes Uhlig, MD, MPH; Meaghan Dendy Case, MD; Justin D. Blasberg, MD; Daniel J. Boffa, MD; Anne Chiang, MD, PhD; Scott N. Gettinger, MD; Hyun S. Kim, MD

National Cancer Database
n=34887

835	Surgery + systemic therapy
9539	EBRT+ systemic therapy
24513	systemic therapy alone

*Uhlig et al, JAMA Network Open. **2019**;2(8):e199702.doi:10.1001*

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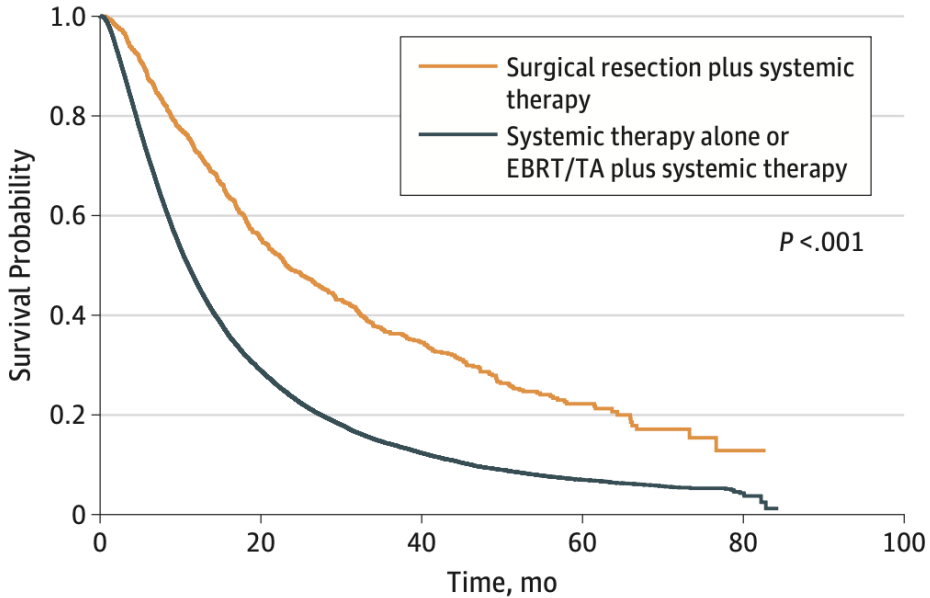
Figure 1. Overall Survival in Patients With Stage IV Non–Small Cell Lung Cancer



No. at risk

Surgical resection plus systemic therapy	835	432	169	51	2
Systemic therapy alone or EBRT/TA plus systemic therapy	34052	8526	2031	454	15

Comparison of Survival Rates After a Combination of Local Treatment and Systemic Therapy vs Systemic Therapy Alone for Treatment of Stage IV Non–Small Cell Lung Cancer. Uhlig et al, JAMA Network Open. ***2019****;2(8):e199702.doi:10.1001*

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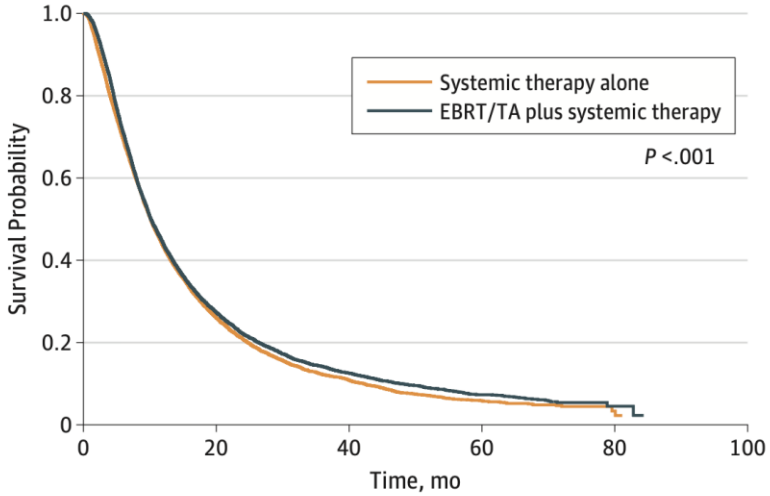
Figure 2. Overall Survival in Patients With Stage IV Non-Small Cell Lung Cancer After Accounting for Confounders via Propensity Score Matching



No. at risk					
Systemic therapy alone	8458	1861	423	99	3
EBRT/TA plus systemic therapy	8458	2031	529	119	4

Superior overall survival was identified for external beam radiotherapy/thermal ablation (EBRT/TA) vs systemic therapy alone (hazard ratio, 0.94; 95% CI, 0.91-0.97; $P < .001$).

Uhlig et al, AMA Network Open. ***2019****;2(8):e199702.doi:10.1001*

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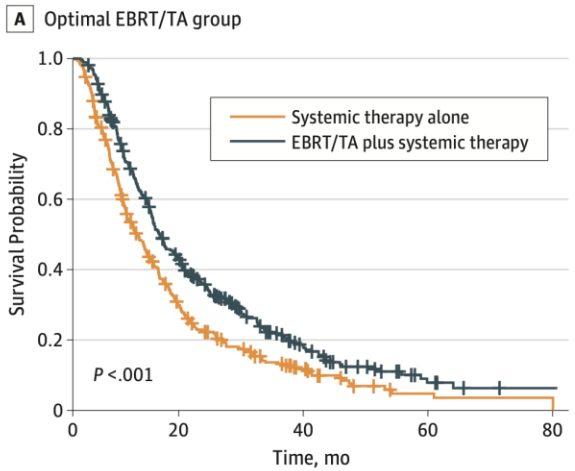
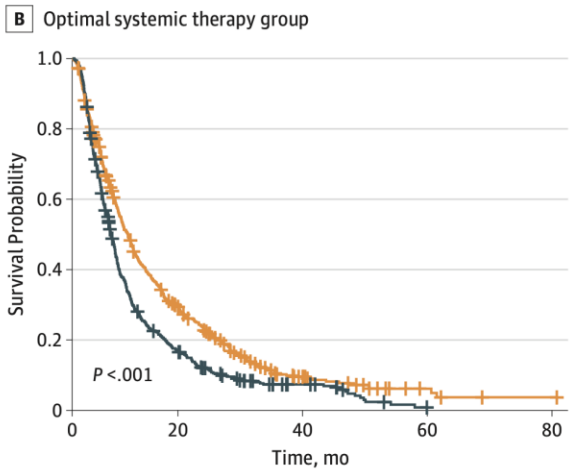
Figure 4. Subgroup Analyses Showing the Potential Benefit of External Beam Radiotherapy/Thermal Ablation (EBRT/TA) and Systemic Therapy vs Systemic Therapy Alone in Selected Populations



No. at risk					
Systemic therapy alone	322	68	16	4	1
EBRT/TA plus systemic therapy	363	124	33	1	1



No. at risk					
Systemic therapy alone	495	114	19	5	1
EBRT/TA plus systemic therapy	487	63	17	0	0

Optimal EBRT/TA group consisted of patients with T1 to T2 category disease, N0 to N1 category disease, and oligometastatic squamous cell carcinoma. Optimal systemic therapy group consisted of patients with T3 to T4 category disease, N2 to N3 category disease, 2 or more distant metastases, and adenocarcinoma.

Uhlig et al, JAMA Network Open. ***2019****;2(8):e199702.doi:10.1001*

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Evidence - Meta-analysis, 2025

Lung cancer

BMJ Open Respiratory Research

IPDMA – RADICAL – NSCLC: individual participant data meta-analysis and systematic review of radical local therapy for oligometastatic NSCLC

Krishna Tiwari,[1] Muhammad Aaqib Shamim,[1] Isha Yadav,[1] Rakesh Dodiya,[1] Ajay Kumar Kondeti,[2] Naveen Dutt,[3] Parmod Kumar,[4] Sonali Kar,[5] Vikas Tiwari,[6] Pradeep Dwivedi,[1] Surjit Singh,[1] Shoban Babu Varthya [1]

https://doi.org/10.1136/bmjresp-2025-003276

https://bmjopenrespres.bmj.com/content/12/1/e003276#ref-3

Evidence - Meta-analysis

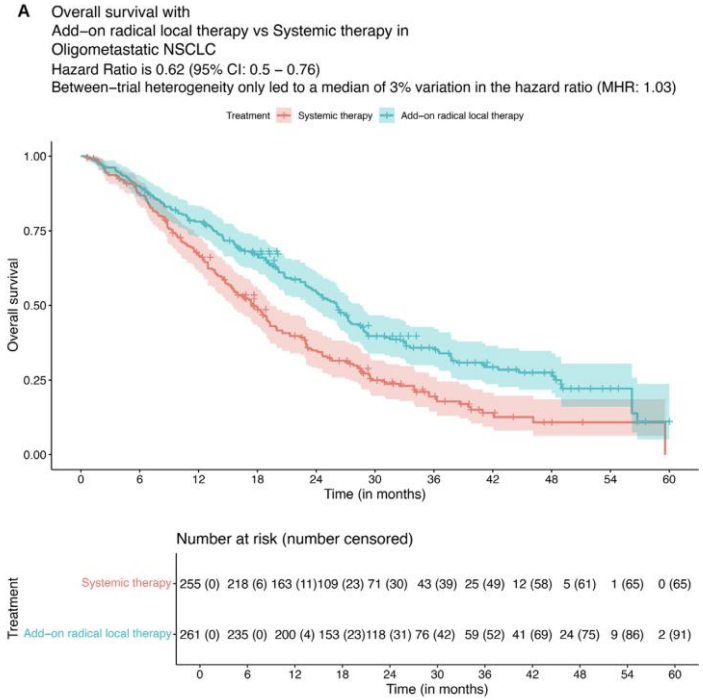
Meta-analysis of 10 RCTs with individual patient data analysis for NSCLC only

n= 752

Tiwari K, Shamim MA, Yadav I, Dodiya R, Kondeti AK, Dutt N, et al. IPDMA – RADICAL – NSCLC: individual participant data meta-analysis and systematic review of radical local therapy for oligometastatic NSCLC. BMJ Open Respiratory Research. 2025;12:e003276. https://doi.org/10.1136/bmjresp-2025-003276

https://bmjopenrespres.bmj.com/content/12/1/e003276#ref-3

Overall Survival



Tiwari K, Shamim MA, Yadav I, Dodiya R, Kondeti AK, Dutt N, et al. IPDMA – RADICAL – NSCLC: individual participant data meta-analysis and systematic review of radical local therapy for oligometastatic NSCLC. BMJ Open Respiratory Research. 2025;12:e003276. https://doi.org/10.1136/bmjresp-2025-003276
https://bmjopenrespres.bmj.com/content/12/1/e003276#ref-3

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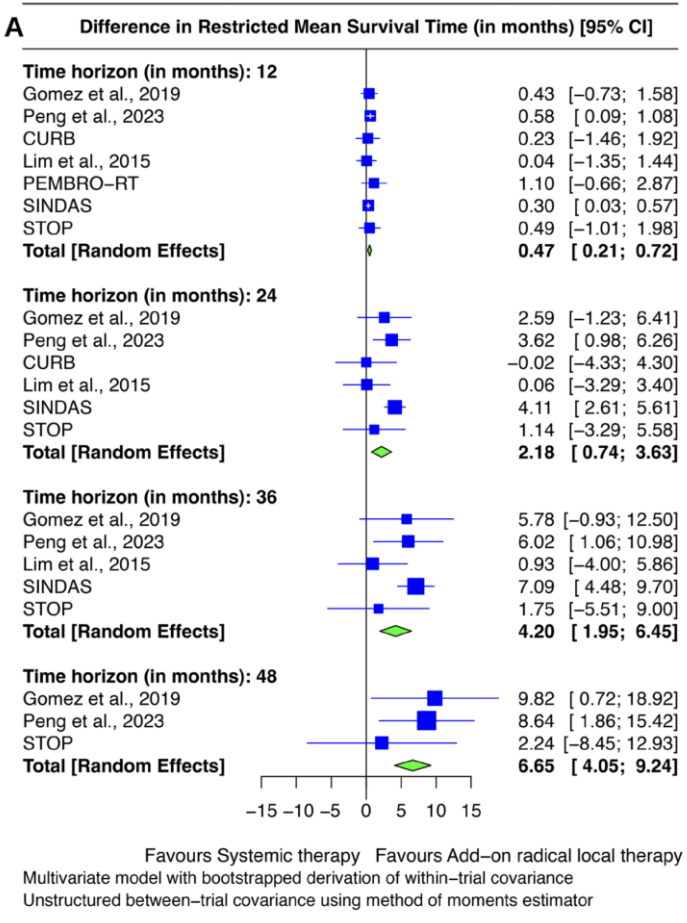

Tiwari K, Shamim MA, Yadav I, Dodiya R, Kondeti AK, Dutt N, et al. IPDMA – RADICAL – NSCLC: individual participant data meta-analysis and systematic review of radical local therapy for oligometastatic NSCLC. BMJ Open Respiratory Research. 2025;12:e003276. https://doi.org/10.1136/bmjresp-2025-003276
https://bmjopenrespres.bmj.com/content/12/1/e003276#ref-3

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- Case study
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- **Guidelines**
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Consensus Guidelines, STS 2025

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https://doi.org/10.1016/j.athoracsur.2024.11.010

CLINICAL PRACTICE GUIDELINE

The Society of Thoracic Surgeons (STS) Clinical Practice Guideline on Surgical Management of Oligometastatic Non-small Cell Lung Cancer

Mara B. Antonoff, MD,[1] Kyle G. Mitchell, MD, MSc,[1] Samuel S. Kim, MD,[2] Hai V. Salfity, MD, MPH,[3] Svetlana Kotova, MD,[4,5] Robert Taylor Ripley, MD,[6] Alfonso L. Neri, BSN, RN,[7] Pallavi Sood, PT, PhD,[7] Saumil G. Gandhi, MD, PhD,[8] Yasir Y. Elamin, MD,[9] Jessica S. Donington, MD,[10] David R. Jones, MD,[11] Elizabeth A. David, MD, MAS,[12] Stephen G. Swisher, MD,[1] Isabelle Opitz, MD,[13] J. W. Awori Hayanga, MD, MPH,[14] and Gaetano Rocco, MD[11]

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https://doi.org/10.1016/j.athoracsur.2024.11.010

Among patients with oligometastatic NSCLC, pulmonary resection used as local consolidative therapy offers a therapeutic benefit as demonstrated by prolonged OS and PFS compared with best supportive care or maintenance systemic therapy. As such, pulmonary resection should be considered as a local consolidative therapeutic modality in patients with oligometastatic NSCLC.	I	B-R
There is currently insufficient evidence to support routine systematic lymphadenectomy at the time of pulmonary resection for oligometastatic lung cancer; however, there may be prognostic utility and individual benefits must be weighed with risks.	IIb	B-NR
Currently, there is insufficient evidence to recommend lobectomy over parenchymal-sparing sublobar resection for oligometastatic lung cancer.	IIb	B-NR
The benefit of local consolidative therapy likely extends beyond 3 metastases, and surgery should be considered in appropriately selected patients.	IIa	B-R
Among patients with oligoprogressive disease, surgery may be considered provided that all sites of disease are either addressable with local consolidative therapy or responsive to systemic therapy.	IIb	B-R
There is insufficient evidence to support any surgical approach over another for pulmonary resection as local consolidative therapy in oligometastatic lung cancer.	IIb	C-LD
Patients with oligometastatic NSCLC and disease stability should receive multidisciplinary evaluation including surgical consultation.	I	B-NR

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- Biology
- Classification of Oligometastatic disease (OMD)
- Selected evidence
- Guidelines
- **Next steps in Practice & Development**

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Next Steps - Development

- Ongoing trials/registry data
- Evaluate different combinations of systemic Rx
- Explore different effects of
  - Radiotherapy
  - Surgery
  - Ablation
- Basic research

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Next Steps - Practice

- Educate wider community
  - Engage with colleagues
  - Engage with patients

- Early LCT *may* be better
- Surgery provides tissue for banking
- Surgery/RT/ablation complementary
- Surgery as 1st line LCT?

- Emphasise surgical/ERAS improvements
- Importance of preventing frailty in this group

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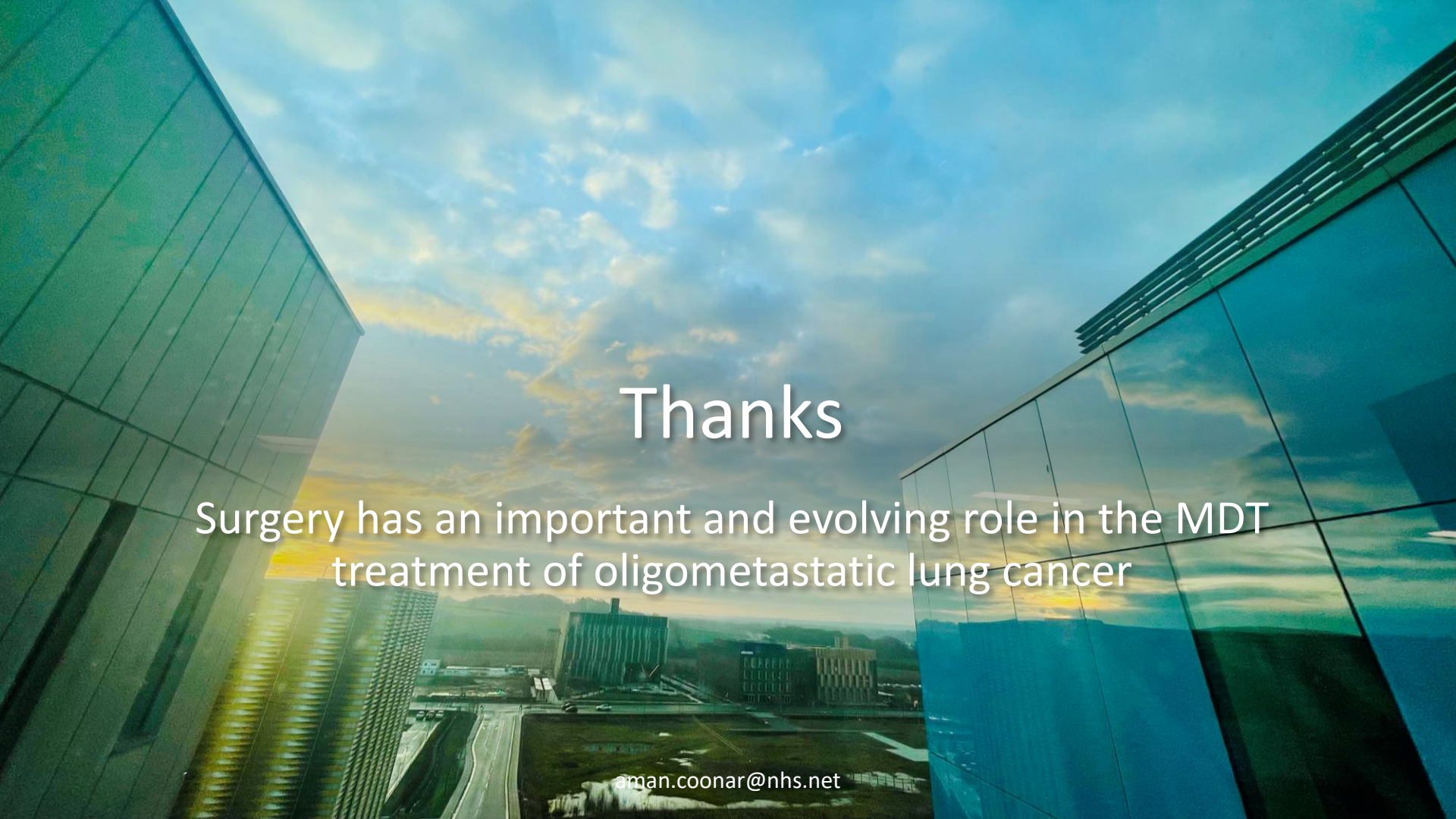

Thanks

Surgery has an important and evolving role in the MDT treatment of oligometastatic lung cancer

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