Post ESTRO 2025 AFRIQUE DU NORD

BY SMC/STOR

LE 28 MAI 2025 À 18H00 (GMT+1)

Evenement VIRTUEL

Post Estro 2025
Cancers Thoraciques

Asmaâ Naim, MD, PhD

Oncologue-radiothérapeute

Professeur Agrégée à la faculté de médicine de Casablanca , UM6SS

Background

•Les cancers thoraciques évoluent dans un paysage thérapeutique en pleine mutation.

•Les **thérapies ciblées** et **l'immunothérapie** améliorent la survie, mais soulèvent de **nouvelles questions** sur le rôle et le timing de la **radiothérapie (RT)**.

•L'**ESTRO 2025** a mis en lumière des données majeures sur la **synergie RT–systémique**, les bénéfices cliniques concrets et les ajustements techniques à adopter.

•Objectif : partager les **résultats clés** et proposer une **réflexion pratique** sur l'intégration optimale de la RT dans les parcours de soins.

Management of stage III NSCLC in the IO era: Knife or beam?

CHAIRS:

Luca Boldrini
Italy

Gitte Fredberg Persson
Denmark

15:18 **For the motion - knife**

M. Rodriguez Perez
Spain

15:38 **Against the motion - beam**

G. Hanna
Ireland

15:58 **For the motion - rebuttal**

M. Rodriguez Perez
Spain

16:08 **Against the motion - rebuttal**

G. Hanna
Ireland

Chirurgie

Arguments en faveur de la chirurgie (Maria Rodriguez)

•**Contrôle local supérieur** : La chirurgie permet une résection complète de la tumeur, offrant un meilleur contrôle local de la maladie.

•**Évaluation pathologique précise** : La chirurgie permet une évaluation directe de la réponse tumorale au traitement néoadjuvant, ce qui peut guider les décisions thérapeutiques ultérieures.

•**Avancées en immunothérapie néoadjuvante** : Les données récentes suggèrent que l'ajout d'une immunothérapie avant la chirurgie améliore les taux de réponse pathologique complète.

Arguments en faveur de la radiothérapie (Gerry Hanna)

•**Traitement moins invasif** : La radiothérapie, en particulier la chimioradiothérapie concomitante suivie d'une immunothérapie de consolidation (comme le schéma PACIFIC), offre une alternative non chirurgicale efficace.

•**Adaptée aux patients inopérables** : Pour les patients présentant des comorbidités ou une fonction pulmonaire limitée, la radiothérapie est souvent la seule option curative.

•**Efficacité démontrée** : Des études ont montré que la radiothérapie associée à l'immunothérapie améliore la survie globale et la survie sans progression chez les patients atteints de NSCLC de stade III.

À l'issue du débat, un vote en ligne a révélé que
85 % des participants soutenaient l'approche **« Beam » (radiothérapie)**
11 % étaient en faveur de **« Knife » (chirurgie)**
4 % restaient indécis

08:45

EGFR-driven NSCLC and radiotherapy - pro

Dirk De Ruysscher

Netherlands

Pourquoi y repenser ?

- Les TKI EGFR (ex. osimertinib) ont transformé le traitement…
- …mais **le risque de rechute locale et métastatique persiste**
- Radiothérapie = **levier complémentaire** pour renforcer la réponse systémique

Enjeu actuel

- RT ≠ traitement par défaut
- Mais **à intégrer de manière stratégique**, **personnalisée**, **ciblée sur les zones à risque**

08:45

EGFR-driven NSCLC and radiotherapy - pro

Dirk De Ruysscher

Netherlands

Arguments en faveur de la RT

1. Complémentarité prouvée

- **ADAURA** : 25 % des rechutes restent **locales ou mixtes**
- La RT pourrait **prévenir l'oligoprogression**, verrouiller le site primitif

2. Oligoprogression et stade III

- Essais **TURBO-NSCLC**, **CURB**, et données post-CRT :
  - RT thoracique ciblée après TKI ou CRT → **prolonge le contrôle local**
  - **Bonne tolérance** dans la majorité des cas

3. Métastatique EGFR+

RT sur les lésions métastatiques résiduelles/actives en complément des TKI
→ amélioration du **PFS**, contrôle des symptômes

08:45

EGFR-driven NSCLC and radiotherapy - pro

Dirk De Ruysscher

Netherlands

Chez les patients EGFR+, la **radiothérapie ciblée**

peut **Prolonger la réponse systémique**,

Retarder les résistances

Renforcer le contrôle local

Sans impact majeur sur la tolérance

09:03

EGFR-driven NSCLC and radiotherapy - contra

Lizza Hendriks

Netherlands

- **Contexte**

– Pourquoi remettre en question la RT ?

Les patients EGFR+ vivent plus longtemps grâce aux TKI de 3e génération.

La RT ajoute une toxicité non négligeable (pneumopathies, risque cardiaque).

Les essais clés (ADAURA, FLAURA2, MARIPOSA) montrent un bénéfice systémique majeur sans besoin automatique de RT.

09:03

EGFR-driven NSCLC and radiotherapy - contra

Lizza Hendriks

Netherlands

Arguments majeurs contre la RT systématique

❖ Stade précoce :

PORT = aucun gain en OS, mais ↑ toxicité (études anciennes + ADAURA → TKI suffisent).

❖ Stade III (localement avancé) :

CRT + osimertinib (LAURA) = bon contrôle, mais quid des patients non irradiés ?

TKI seuls pourraient suffire dans certains profils à faible charge tumorale.

❖ Métastatique :

TKI (ex. osimertinib) > RT pour les métastases cérébrales

RT cérébrale (WBRT/SRS) n’apporte pas de gain démontré en OS

09:03

EGFR-driven NSCLC and radiotherapy - contra

Lizza Hendriks

Netherlands

Et pour les cas limites ?

- Oligoprogression : **bénéfice potentiel**, mais basé sur des données rétrospectives
- RT à envisager de manière **ciblée**, **personnalisée**, non systématique

09:03

EGFR-driven NSCLC and radiotherapy - contra

Lizza Hendriks

Netherlands

Dans le NSCLC EGFR+, les **TKI de 3e génération suffisent souvent pour le contrôle tumoral.**

La radiothérapie doit être **réservée à réservée à des cas sélectionnés**, en tenant compte du **rapport bénéfice/risque individuel**.

09:21

ALK-driven NSCLC and radiotherapy - pro

Gerard Walls

Belfast, Ireland

Les patients ALK+ ont une meilleure survie que les ALK−, mais…

- Les rechutes **distantes** restent **fréquentes** malgré les TKI.

- Ces rechutes sont **difficiles à traiter**, avec peu d'options et des toxicités élevées.
- **Le contrôle local par radiothérapie** reste essentiel pour :
  - Réduire le risque de dissémination
  - Préserver la qualité de vie (QOL)
  - Retarder la transformation en maladie métastatique

~~Accepter une PFS équivalente ALK+ ≈ ALK−~~

n'est **pas suffisant** à l'ère des traitements ciblés

09:21

ALK-driven NSCLC and radiotherapy - pro

Gerard Walls

Belfast, Ireland

Problème

Les TKI ALK retardent la progression, mais **que se passe-t-il si la tumeur primitive n'est pas irradiée ?**

→ Il **n'existe pas de certitude** : c'est un angle mort thérapeutique.

Données à l'appui

Contrôle du primitif améliore la survie

Analyses rétrospectives : bénéfice clair du contrôle local sur PFS et parfois OS

Exemples dans EGFR/ALK et autres oncogènes driver

ALINA (EGFR) et ADAURA : bénéfice en OS avec contrôle local (post-op + TKI)

Essais en cours

BOUNCE : RT de consolidation après TKI (phase 2)

HORIZON-01 : TKI vs TKI + RT du primitif (phase 3)

Pourquoi la RT reste pertinente ?

Les TKI contrôlent bien les métastases, mais pas toujours la tumeur primitive (surtout si elle est massive ou symptomatique)

Extrapolation logique depuis l'essai LAURA (EGFR+) vers les patients ALK+

09:21

ALK-driven NSCLC and radiotherapy - pro

Gerard Walls

Belfast, Ireland

Ne pas irradier le primitif est une prise de risque.

La RT **complète le contrôle systémique** et **réduit les risques de rechute locale**.

La stratégie optimale est probablement **TKI + RT ciblée du primitif**, comme le testent BOUNCE et HORIZON

09:39

ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

Poland

Contexte

- Les patients ALK+ présentent souvent des métastases cérébrales (ICM)
- L’arrivée des ALK inhibitors (TKI) de 2e et 3e génération (alectinib, ensartinib, lorlatinib) change la donne :Meilleure efficacité intracrânienne
- Moins de besoin de RT précoce ?

09:39

ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

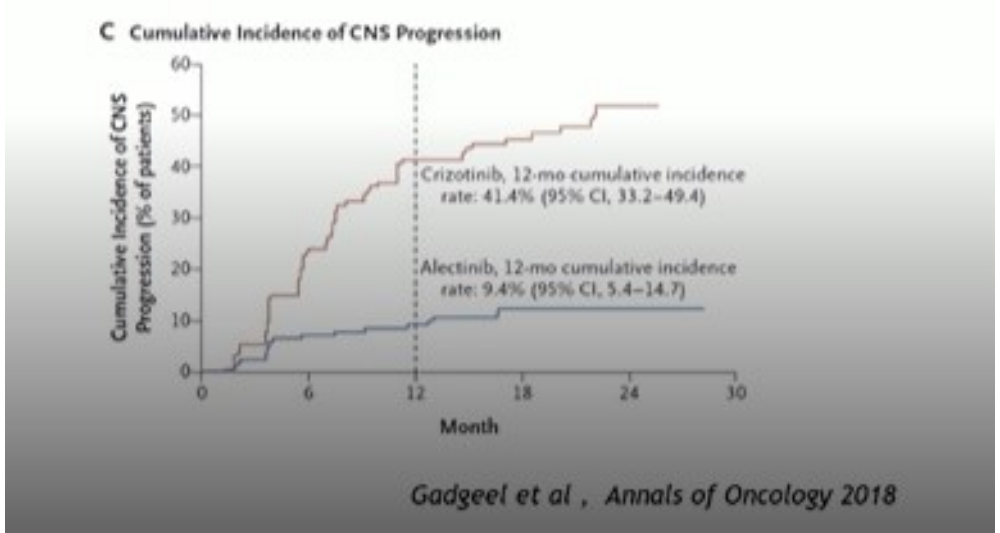
Poland

Contexte

- Les patients ALK+ présentent souvent des métastases cérébrales (ICM)
- L'arrivée des ALK inhibitors (TKI) de 2e et 3e génération (alectinib, ensartinib, lorlatinib) change la donne :Meilleure efficacité intracrânienne
- Moins de besoin de RT précoce ?

Données présentées

- Essai ALEX (alectinib vs crizotinib) :
  - Réduction de la progression IC
  - PFS indépendante de la RT cérébrale préalable



09:39

ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

Poland

Données présentées

- CROWN (lorlatinib) :
  - IC response 82 %,
  - IC CR → 71 %

➔RT précoce (WBRT/SRS) : Améliore PFS IC mais pas la survie globale, avec risques cognitifs

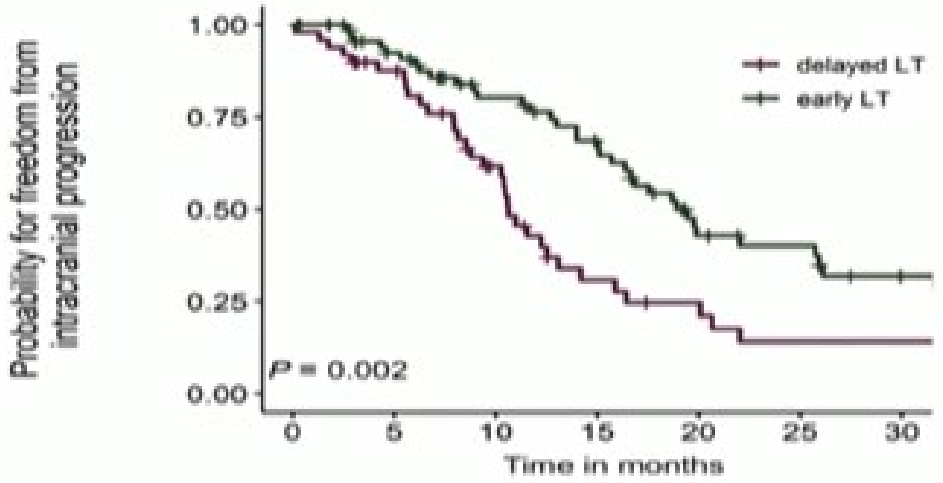
09:39

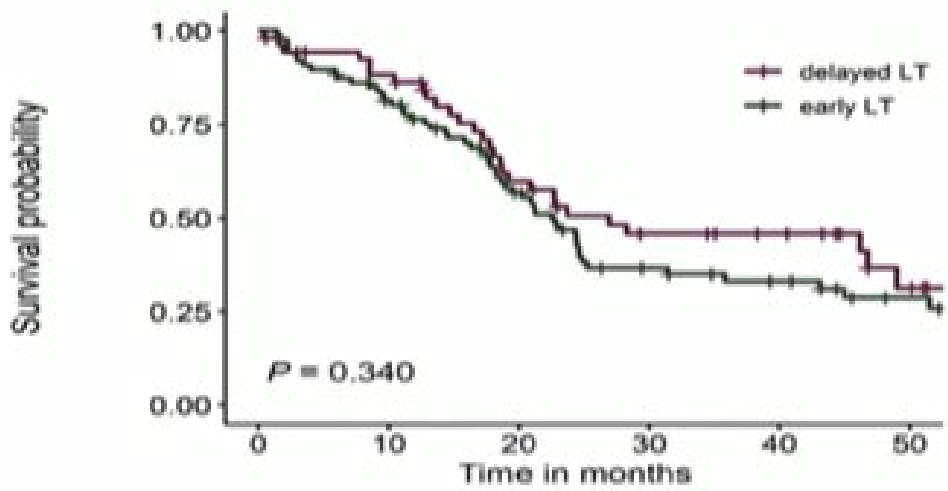
ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

Poland

➔RT précoce (WBRT/SRS) : Améliore PFS IC mais pas la survie globale, avec risques cognitifs





Crown Study

09:39

ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

Poland

- **Arguments principaux « CONTRA RT »**
  - **TKI récents très efficaces** en intracrânien
    → RT souvent inutile
  - **Palliation rapide des symptômes pulmonaires**
    → RT rarement nécessaire
- **Toxicité neurocognitive du WBRT** importante
- **Meilleur timing** pour la RT :
  En cas d'échec localisé, pas en upfront

09:39

ALK-driven NSCLC and radiotherapy - contra

Anna Wrona

Poland

À l'ère des **inhibiteurs ALK de 2e/3e génération**,

la **radiothérapie <u>ne doit plus être systématique en première ligne</u>**

chez les patients ALK+ :

Réserver la RT aux échecs ou situations ciblées, en évitant les

surtraitement

MINI ORAL
ESTRO_2025

- **Objectif de l'étude**

Évaluer si la consolidation par immunothérapie (ICI) après CRT modifie la radiosensibilité régionale du cœur et l'incidence des événements cardiaques (RMD) chez les patients NSCLC.

- **Méthodologie**

  Cohorte rétrospective monocentrique

  95 patients NSCLC traités par CRT ± ICI

  Analyse des RMD (rayon-induced myocardial damage) selon :

    Localisation cardiaque irradiée

    Dose moyenne cardiaque (MHD)

    Association avec la survie globale (OS)

MINI ORAL
ESTRO_2025

Résultats

- 31/95 patients (33 %) ont développé un RMD
- Pas de différence significative entre **CRT seul** et **CRT + ICI**
- En CRT+ICI : les **doses moyennes élevées au cœur (>14.5 Gy)** étaient **corrélées à une meilleure survie**
- En CRT seul : **doses faibles (<14.5 Gy)** associées à une meilleure survie

→ Suggère une **modification de la radiosensibilité sous ICI**

MINI ORAL
ESTRO_2025

Les ICI pourraient altérer les mécanismes de réponse cardiaque à la radiation, modifiant la relation entre dose cardiaque et événements myocardiques.

📌 Le seuil de dose cardiaque optimal pourrait différer selon que l'immunothérapie est administrée ou non.

Besoin d'essais prospectifs pour adapter les plans de traitement aux nouvelles interactions radio-immuno-toxiques

MINI ORAL
ESTRO_2025

MINI ORAL
ESTRO_2025

UNIVERSITÄTS KLINIKUM FREIBURG
dkfz.
Deutsches Konsortium für Translationale Krebsforschung
Partnerstandort Freiburg
DKTK

Impact of Estimated Dose of Radiation to Immune Cells (EDRIC) in Locally Advanced NSCLC: Secondary Analysis of the Randomized PET-Plan Trial

- **Essai PET-Plan (NCT00697333)**
  - → Réduction du volume cible par TEP pour le NSCLC stade III
  - → 24 centres, 13 pays, 2009–2016 (pré-PACIFIC)
  - → Omission d'irradiation nodale élective (50 Gy)
- **Résultats:**
  - **Cohorte :** 153 patients (92 % stade III, 46 % SBRT)
  - **Dose moyenne :** 57.9 ± 8.0 Gy
  - **Survie médiane :** 41.6 mois
  - **EDRIC influencée par :**
    - GTV et PTV
    - Non influencée par Dmax PTV
    - Pas de lien avec toxicité hématologique
- **Facteurs de mauvais pronostic (confirmés par PET-Plan & RTOG 0617)**
  - Lymphopénie induite par irradiation
  - **EDRIC élevée**
  - **Dose au cœur élevée**
  - **Dose moyenne corporelle (MBD)** comme substitut potentiel pour EDRIC

MINI ORAL
ESTRO_2025

Impact of Estimated Dose of Radiation to Immune Cells (EDRIC) in Locally Advanced NSCLC: Secondary Analysis of the Randomized PET-Plan Trial

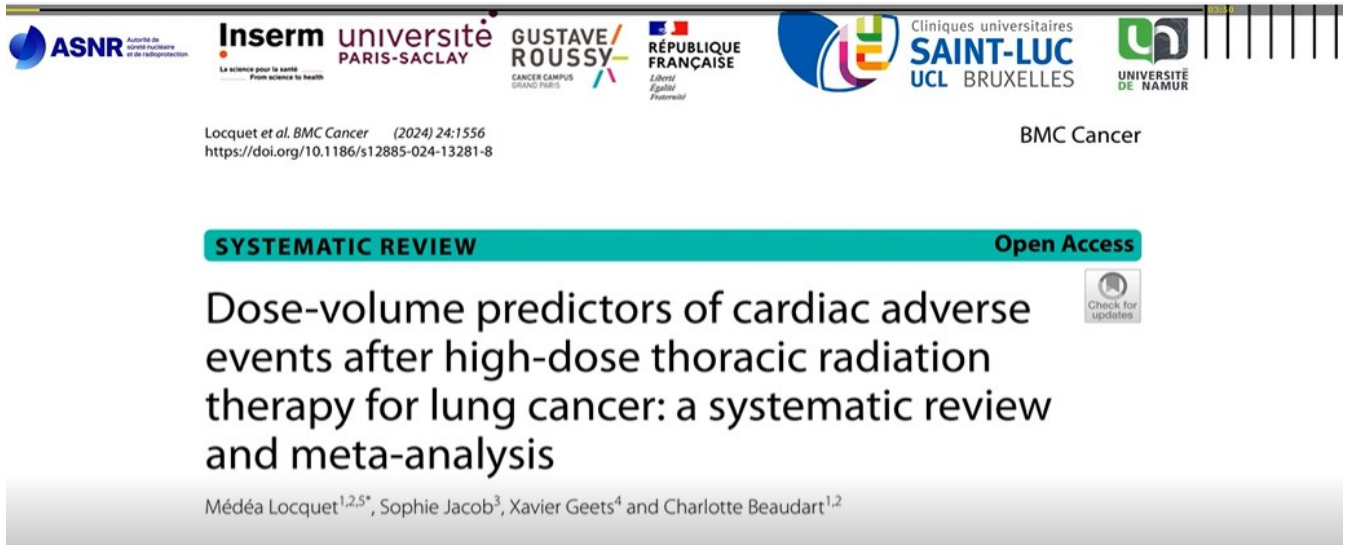
- **Essai PET-Plan (NCT00697333)**
  - → Réduction du volume cible par TEP pour le NSCLC stade
  - → 24 centres, 13 pays, 2009–2016 (pré-PACIFIC)
  - → Omission d'irradiation nodale élective (50 Gy)

- **Résultats:**
  - **Cohorte :** 153 patients (92 % stad
  - **Dose moyenne :** 57.9 ± 8.0 G
  - **Survie médiane :** 41.6
  - **EDRIC influencée**
    - ✅ GTV
    - 🚫 par Dm
    - avec te gique
  - **mauvais**
    - phopénie
    - iation
  - **EDRIC éle**
  - **Dose au co ée**
  - **Dose moyenne corporelle (MBD)** comme substitut potentiel pour EDRIC

L'EDRIC est un facteur **pronostique indépendant** de mauvaise survie globale (OS) et sans progression (LPFS)

EDRIC = biomarqueur immunologique précis mais complexe
MBD = outil pratique et robuste pour l'estimer de façon indirecte

més par PET-Plan & RTOG 0617)



Locquet *et al. BMC Cancer* (2024) 24:1556
https://doi.org/10.1186/s12885-024-13281-8

BMC Cancer

SYSTEMATIC REVIEW Open Access

Dose-volume predictors of cardiac adverse events after high-dose thoracic radiation therapy for lung cancer: a systematic review and meta-analysis

Médéa Locquet[1,2,5*], Sophie Jacob[3], Xavier Geets[4] and Charlotte Beaudart[1,2]

nR=21(1600)
nM=7

MINI ORAL
ESTRO_2025

Locquet et al. BMC Cancer (2024) 24:1556
https://doi.org/10.1186/s12885-024-13281-8

BMC Cancer

nR=21(1600)
nM=7

SYSTEMATIC REVIEW Open Access

Dose-volume predictors of cardiac adverse events after high-dose thoracic radiation therapy for lung cancer: a systematic review and meta-analysis

Médéa Locquet[1,2,5*], Sophie Jacob[3], Xavier Geets[4] and Charlotte Beaudart[1,2]

Paramètre	Seuil recommandé
Dose moyenne au cœur (Dmean)	🔽 < 10–12 Gy
Dose à 5% du cœur (D5)	🔽 < 30–35 Gy
Doses à volume élevé (V30, V40)	à minimiser au maximum

MINI ORAL
ESTRO_2025

Locquet *et al. BMC Cancer* (2024) 24:1556
https://doi.org/10.1186/s12885-024-13281-8

BMC Cancer

SYSTEMATIC REVIEW Open Access

Dose-volume predictors of cardiac adverse events after high-dose thoracic radiation therapy for lung cancer: a systematic review and meta-analysis

Médéa Locquet[1,2,5*], Sophie Jacob[3], Xavier Geets[4] and Charlotte Beaudart[1,2]

nR=21(1600)
nM=7

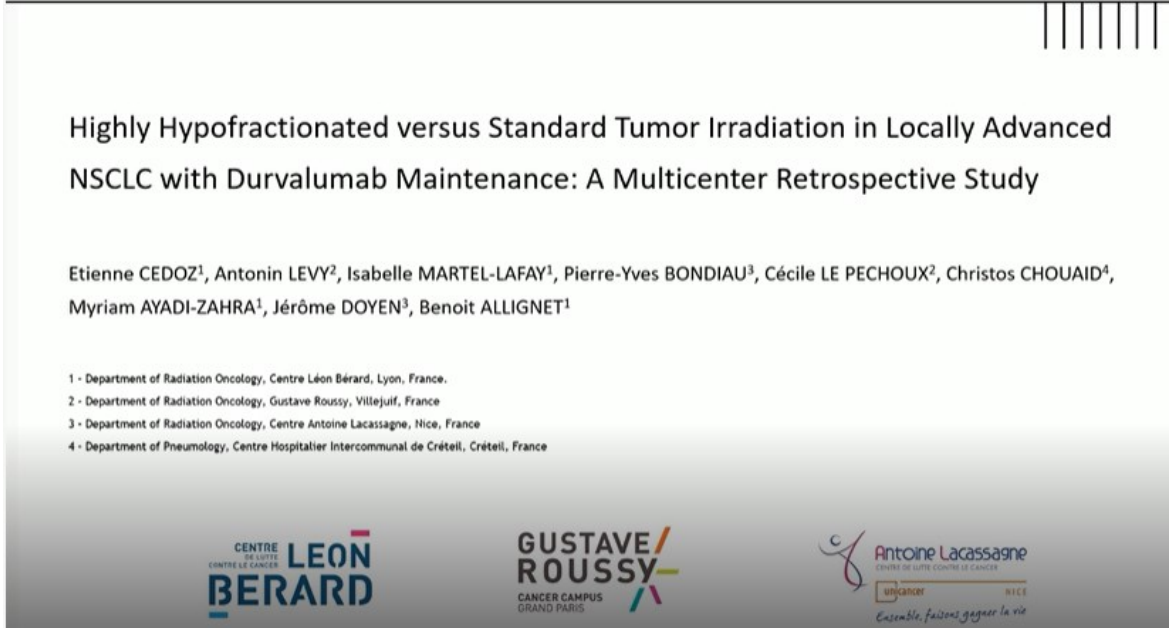
MINI ORAL
ESTRO_2025

Paramètre	Seuil recommandé
Dose moyenne au cœur (Dmean)	▼ < 10–12 Gy
Dose à 5% du cœur (D5)	▼ < 30–35 Gy
Doses à volume élevé (V30, V40)	à minimiser au maximum

Chaque Gray supplémentaire à la dose moyenne cardiaque

↓

une augmentation de 4 % du risque d'événements cardiaques.



Contexte :

- La stratégie PACIFIC (RT + durvalumab) reste limitée en cas de faible réponse locale.
- Hypothèse : une dose ablative par SBRT sur la tumeur primaire peut améliorer le contrôle et la réponse à l'immunothérapie.

Méthodologie :

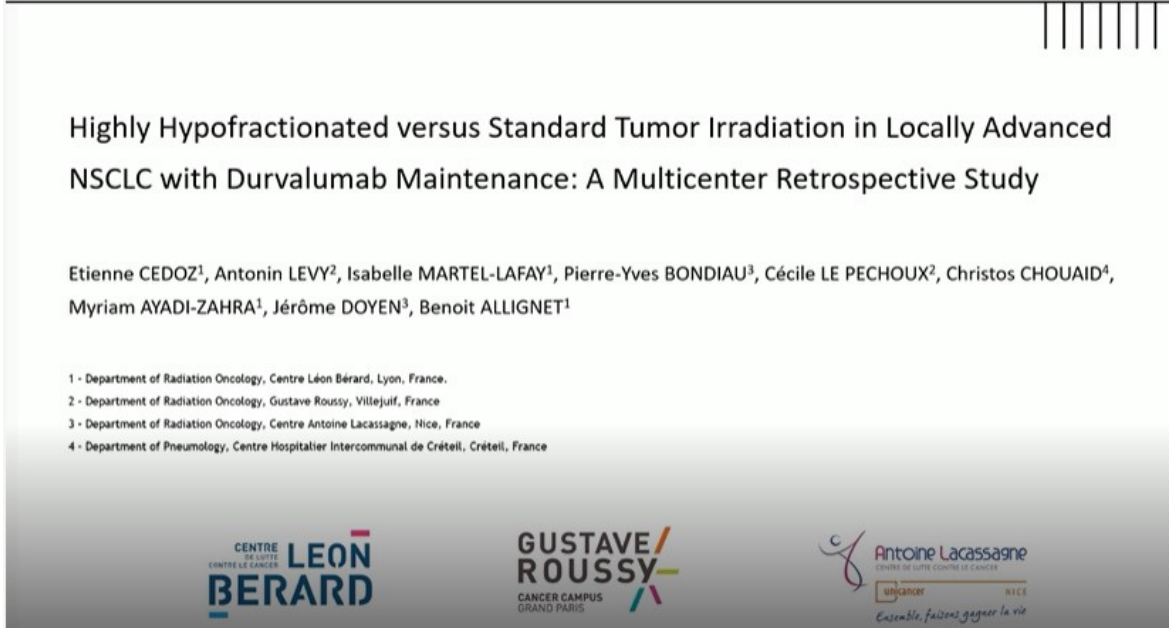
- Étude multicentrique rétrospective, patients LA-NSCLC.
- Comparaison :
  - SBRT tumorale + RT nodale conventionnelle
  - RT conventionnelle sur l'ensemble de la maladie
- Tous ont reçu du durvalumab en maintenance.

Résultats :

- SBRT associée à une amélioration du PFS.
- Tendance à un bénéfice en OS (non significatif).
- Toxicité bien tolérée, sans événements limitants majeurs.

MINI ORAL
ESTRO_2025

MINI ORAL
ESTRO_2025



Highly Hypofractionated versus Standard Tumor Irradiation in Locally Advanced NSCLC with Durvalumab Maintenance: A Multicenter Retrospective Study

Etienne CEDOZ[1], Antonin LEVY[2], Isabelle MARTEL-LAFAY[1], Pierre-Yves BONDIAU[3], Cécile LE PECHOUX[2], Christos CHOUAID[4], Myriam AYADI-ZAHRA[1], Jérôme DOYEN[3], Benoit ALLIGNET[1]

1 - Department of Radiation Oncology, Centre Léon Bérard, Lyon, France.
2 - Department of Radiation Oncology, Gustave Roussy, Villejuif, France
3 - Department of Radiation Oncology, Centre Antoine Lacassagne, Nice, France
4 - Department of Pneumology, Centre Hospitalier Intercommunal de Créteil, Créteil, France

L'irradiation en SBRT de la tumeur dans le NSCLC localement avancé semble prometteuse en synergie avec l'immunothérapie.

➔ Améliorer le contrôle tumoral sans surtoxicité,

Des essais prospectifs (ex : NRG LU004) sont en cours pour confirmer.

toxicité bien tolérée, sans événements limitants majeurs.

MINI ORAL
ESTRO_2025

Omitting clinical target volume of primary tumor versus standard irradiation for LS-SCLC: preliminary report of a randomized, non-inferior trial

Shuohan Zheng
Department of Radiation Oncology, Sun Yat-sen University Cancer Center, Guangzhou, China

Objectif :
Évaluer si l'omission du CTV de la tumeur primitive après chimio d'induction est non-inférieure à l'irradiation standard (PCTV) en termes de contrôle local, tout en réduisant la toxicité.

Méthodologie :
- Essai randomisé, ouvert, non-infériorité
- Patients : LS-SCLC après ≥2 cycles de chimio d'induction
- Comparaison :
  PCTV (standard) : GTV initial + marge (≈ 120 cm^3)
  PGTV (réduit) : GTV post-chimio + 5 mm (≈ 46 cm^3)

Résultats :
- Pas de différence significative sur OS, PFS, ou rechute locale
- Tendance à une toxicité moindre dans le bras PGTV (œsophagite, pneumopathie)

MINI ORAL
ESTRO_2025

Omitting clinical target volume of primary tumor versus standard irradiation for LS-SCLC: preliminary report of a randomized, non-inferior trial

Shuohan Zheng
Department of Radiation Oncology, Sun Yat-sen University Cancer Center, Guangzhou, China

🎯 Objectif :
Évaluer si l'omission du CTV de la tumeur primitive après chimi… est non-inférieure à l'irradiation standard (PCTV) en t… tout en réduisant la toxicité.

Omettre le CTV dans le LS-SCLC après réponse à la chimio
Ne compromet pas le contrôle local
Pourrait réduire la toxicité liée à la radiothérapie

🧪 Méthodologie
- Essai…
- …
- …induction
…V initial + marge (≈ 120 cm³)
…duit) : GTV post-chimio + 5 mm (≈ 46 cm³)

📊 Résultats :
- Pas de différence significative sur OS, PFS, ou rechute locale
- Tendance à une toxicité moindre dans le bras PGTV (œsophagite, pneumopathie)

MINI ORAL
ESTRO_2025

Dose-response analysis of esophageal dose surface maps for patients with small-cell lung cancer treated with twice-daily radiotherapy

Hild M Bekkevoll[1], Nina Levin[2, 3], Kathrine R Redalen[1], Bjørn Henning Grønberg[2, 3], Signe Danielsen[1, 2, 3]

[1] Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway

[2] Department of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway

[3] Department of Oncology, St. Olavs Hospital, Trondheim, Norway

MINI ORAL
ESTRO_2025

Dose-response analysis of esophageal dose surface maps for patients with small-cell lung cancer treated with twice-daily radiotherapy

Hild M Bekkevoll[1], Nina Levin[2, 3], Kathrine R Redalen[1], Bjørn Henning Grønberg[2, 3], Signe Danielsen[1, 2, 3]

[1] Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway

[2] Department of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway

[3] Department of Oncology, St. Olavs Hospital, Trondheim, Norway

La sévérité de la toxicité œsophagienne ne dépend pas seulement de la dose moyenne, mais aussi de la *surface exposée* :
👉 Plus la *longueur* ET la *circonférence* de l'œsophage irradiées sont grandes, plus le risque de toxicité est élevé.

MINI ORAL ESTRO_2025

Dose-response analysis of esophageal dose surface maps for patients with small-cell lung cancer treated with twice-daily radiotherapy

Hild M Bekkevoll[1], Nina Levin[2, 3], Kathrine R Redalen[1], Bjørn Henning Grønberg[2, 3], Signe Danielsen[1, 2, 3]

[1] Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway

[2] Department of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway

[3] Department of Oncology, St. Olavs Hospital, Trondheim, Norway

La sévérité de la toxicité œsophagienne ne dépend pas seulement de la dose moyenne, mais aussi de la *surface exposée* :

👉 Plus la *longueur* ET la *circonférence* de l'œsophage irradiées sont grandes, plus le risque de toxicité est élevé.

Paramètre	Seuil critique à surveiller
Longueur exposée (≥ EQD2 50 Gy)	≥ 7 cm
Circonférence exposée	≥ 60 %
Surface totale (longueur × circonférence)	élevée → attention accrue

NETHERLANDS CANCER INSTITUTE
ANTONI VAN LEEUWENHOEK

DLCA
DUTCH LUNG CANCER AUDIT

Real-world treatment outcomes comparing once- versus twice-daily RT in Limited Stage SCLC

Floris Bosch, **Zeno Gouw**, Ronald Damhuis, Liselotte van Bockel, Ida Coremans, Corine van Es, Annelies van der Geest, Katrien De Jaeger, Barbara Wachters, Hans Knol, Friederike Koppe, Bart Reymen, Dominic Schinagl, Femke Spoelstra, Caroline Tissing-Tan, Max Peters, Noëlle van der Voort van Zyp, Antoinet van der Wel, Erwin Wiegman, Robin Wijsman, Judith Dasselaar, José Belderbos

•Étude observationnelle nationale, registre DLCA

•**Utilisation:** 75 % des patients aux Pays-Bas reçoivent la RT en **BID**

◆ **Survie globale (<70 ans)**

- •**BID :** 37.5 mois
- •**OD :** 26.1 mois

➔ **BID significativement supérieur (p < 0.0001)** chez les <70 ans

HR OS : 0.67 (IC95% : 0.50–0.88)

◆ **Toxicité aiguë sévère**

- •**BID :** 27.3 %
- •**OD :** 21.6 %

→ Différence **non significative**

MINI ORAL ESTRO_2025

NETHERLANDS CANCER INSTITUTE
ANTONI VAN LEEUWENHOEK

DLCA
DUTCH LUNG CANCER AUDIT

Real-world treatment outcomes comparing once- versus twice-daily RT in Limited Stage SCLC

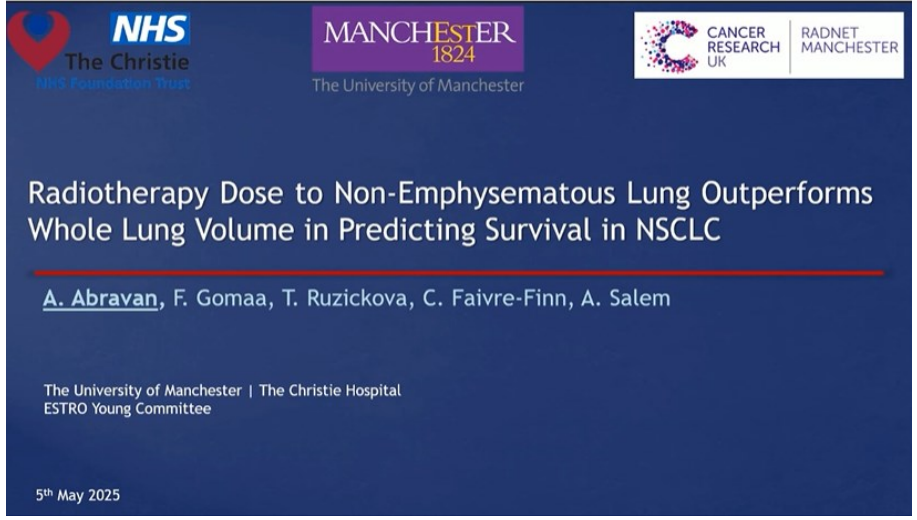
Floris Bosch, **Zeno Gouw**, Ronald Damhuis, Liselotte van Bockel, Ida Coremans, Corine van Es, Annelies van der Geest, Katrien De Jaeger, Barbara Wachters, Hans Knol, Friederike Koppe, Bart Reymen, Dominic Schinagl, Femke Spoelstra, Caroline Tissing-Tan, Max Peters, Noëlle van der Voort van Zyp, Antoinet van der Wel, Erwin Wiegman, Robin Wijsman, Judith Dasselaar, José Belderbos

- Étude observationnelle nationale, registre DLCA
- **Utilisation:** 75 % des patients a…
- **Survie globale (<…**
  - **BID**
  - …les <70 ans
  - **…** : 0.67 (IC95% : 0.50–0.88)
  - …2.6 %
  - → Différence **non significative**

Chez les patients **<70 ans**, la radiothérapie **deux fois par jour (BID)** est associée à **Une survie significativement prolongée**
Une toxicité modérément augmentée mais acceptable.

Ces données soutiennent l'usage étendu du **fractionnement BID** dans les centres de routine.

MINI ORAL ESTRO_2025



MINI ORAL ESTRO_2025

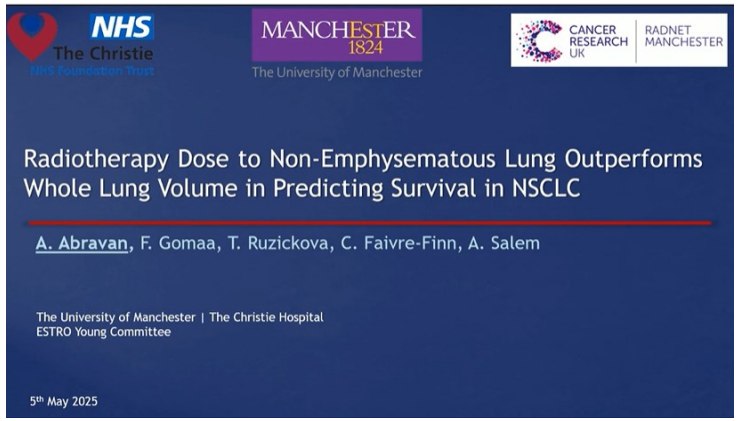
Contexte

- L'**emphysème** endommage certaines régions pulmonaires, les rendant **moins fonctionnelles**.
- Hypothèse : **irradiation des zones encore fonctionnelles** (non-emphysémateuses) impacte davantage la survie que l'irradiation globale.

Méthodologie

- 1 302 patients NSCLC stade III (intent curatif, 2016–2022)
- Emphysème défini par seuil Hounsfield Unit (HU) ≤ -950
- Comparaison :
  - Dose moyenne au poumon total
  - Dose moyenne au poumon non-emphysémateux

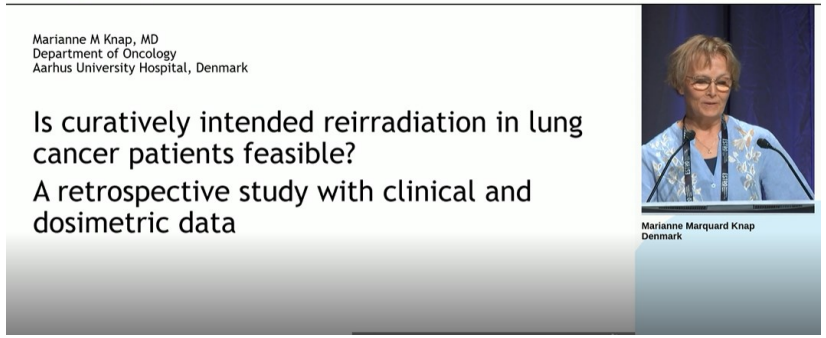
- Analyse multivariée ajustée (âge, sexe, PS, VEMS, PTV, chimio, immuno)



MINI ORAL
ESTRO_2025

Épargner le parenchyme pulmonaire encore sain (non-emphysémateux)

pourrait **<u>améliorer la survie</u>** après radiothérapie dans le NSCLC.



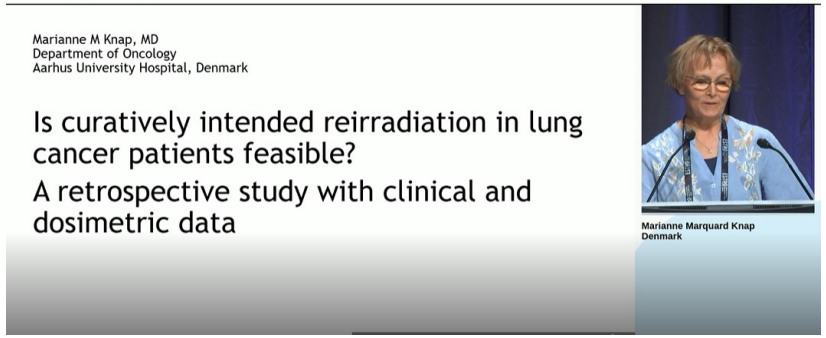
MINI ORAL
ESTRO_2025

Objectif

Évaluer si une **re-irradiation thoracique avec intention curative** est faisable chez les patients atteints de cancer pulmonaire (récidive locale, métastase pulmonaire, 2e primitif).

Méthodologie

Étude rétrospective observationnelle
56 patients re-irradiés
Planification basée sur l'EQD2 cumulée, avec fusion d'image (CT/IRM)
Surveillance: imagerie tous les 3 mois

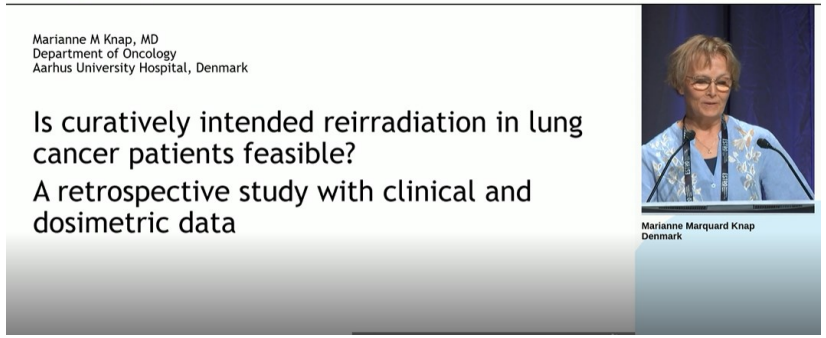


MINI ORAL
ESTRO_2025

Résultats

Toxicité après RT1 :

- 21 patients ont eu des toxicités G3 :
  - Œsophagite (8)
  - Pneumopathie (4)
  - Douleur pariétale (7)



MINI ORAL
ESTRO_2025

Résultats

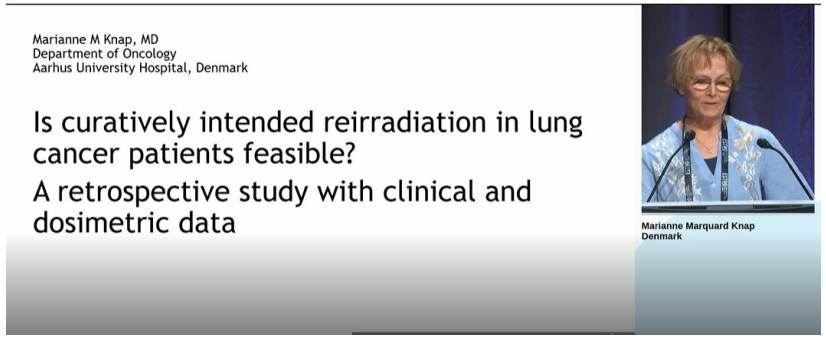
Toxicité après RT1 :

•21 patients ont eu des toxicités G3 :
- Œsophagite (8)
- Pneumopathie (4)
- Douleur pariétale (7)

Toxicité après RT2 :

•15 patients ont eu des toxicités G3–G5 :
- G4 pneumothorax (1)
- G5 hémorragie (1)
- Lésions pariétales récurrentes

➔ 3 cas de décès liés à la toxicité



MINI ORAL
ESTRO_2025

La re-irradiation thoracique est faisable à visée curative, mais le **risque de toxicité sévère** reste significatif.

La sélection des patients est cruciale :

Localisations périphériques

Les délais >24 mois

Approche SBRT.

MINI ORAL
ESTRO_2025

L'ajout d'un inhibiteur de l'ATM (AZD1390) à la RT thoracique **augmente significativement la toxicité œsophagienne**, sans bénéfice démontré à ce stade

→ **prudence dans le développement de combinaisons radio-sensibilisatrices sans chimiothérapie**.

Session Poster_ESTRO2025

E25-2425 - Impact of Prescribing to the PTV on GTV Dose Heterogeneity in lung SBRT: Insight from EORTC Studies.
Volha Hertsyk (Brussels - Belgium)

E25-4183 - Clinical Outcomes for Surgery for Mesothelioma After Radiation Therapy using Extended pleural Resection (SMARTER Trial: NCT04028570)
John Cho (Toronto - Canada)

E25-4491 - High Dose to Perfused but not Ventilated Lung is Associated with Clinical Toxicity
Neil Wallace (Australia)

E25-3123 - Radical Dose Re-Irradiation for Relapsed Non-Small Cell Lung Cancer; Real World Data on Impact of Guidelines and Survival Outcomes
Jin Howe Tee (United Kingdom)

E25-1556 - Effect of SABR on circulating tumor DNA detection in early-stage lung cancer: Interim results from a prospective, multi-center trial
Sympascho Young (Canada)

E25-4506 - Predicting tumour volume reduction in non-small cell lung cancer: Independent validation of a single parameter PSI model
Sarah Barrett (Ireland)

E25-1220 - Isolated nodal failure in stage III NSCLC after proton therapy in durvalumab era
Yuanyuan Lin (Spain)

E25-3731 - Lymphopenia induced by proton versus photon therapy in lung cancer: impact of dose to circulating lymphocytes, bone marrow and thoracic duct
Zuzanna Nowicka (Poland)

E25-3271 - Real world clinical outcomes for early-stage lung cancer treated with single-fraction stereotactic ablative radiotherapy in Australia
Jennifer Yeh (Australia)

Session Poster_ESTRO2025

EORTC
European Organisation for Research and Treatment of Cancer

Impact of Prescribing to the PTV on GTV Dose Heterogeneity in lung SBRT: Insight from EORTC Studies

ESTRO 2025

Volha Hertsyk[1], Nicolaus Andratschke[2], Enrico Clementel[1], Coreen Corning[1], Corinne Faivre-Finn[3], Catherine Fortpied[1], Matthias Guckenberger[2], Sarah Kelly[1,4,5], Ursula Nestle[6], Cecile Le Pechoux[7], Daniel Portik[1,8], Ajra Secerov-Ermenc[9], Luiza Souza[1], Nick Reynaert[10]

[1]EORTC Headquarters, Brussels, Belgium. [2]University Hospital Zürich, Department of Radiation Oncology, Zürich, Switzerland. [3]The Christie NHS Foundation Trust & University of Manchester, Manchester, UK. [4]European Society for Paediatric Oncology (SIOP Europe), Brussels, Belgium. [5]Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium. [6]Department of Radiation Oncology, Kliniken Maria Hilf, Moenchengladbach, Germany. [7]Department of Radiation Oncology, Gustave Roussy, Paris-Saclay University, Villejuif, France. [8]Department of Radiation Oncology (Maastro), GROW Research Institute for Oncology and Reproduction, Maastricht University Medical Centre+, Maastricht, The Netherlands. [9]Division of Radiotherapy, Institute of Oncology Ljubljana, Ljubljana, Slovenia, Faculty of Medicine, University of Ljubljana, Slovenia. [10]Institut Jules Bordet, Hôpital Universitaire de Bruxelles, Medical Physics Department, Brussels, Belgium.

PURPOSES

- In lung SBRT, accurate GTV dose delivery is critical.
- Dose is typically prescribed to the PTV (ICRU).
- This can cause GTV dose variability, especially in heterogeneous lung tissue.

This study **investigates dose** distribution **heterogeneity** within the GTV in lung SBRT plans when the dose prescribed is to the PTV.

METHODS

EORTC Studies

1822 OligoCare	1702 HALT	1945 OligoRare	22113 LungTech

Data Source: **232 lesions** from **167 patients.**

Extracted parameters included:

- prescribed PTV dose,
- mean GTV dose,
- dose calculation algorithm,
- target location.

Relative % difference between prescribed dose and GTV mean dose was used to account for different fractionation schedules.

CONCLUSIONS

PTV-based prescription in lung SBRT leads to substantial **GTV dose variability.**

Monte Carlo algorithms reveal **larger discrepancies**, likely due to better modeling of tissue heterogeneity.

GTV-based dose prescription would help to **improve precision** and **consistency** in dose evaluation and reporting

ACNOWLEDGMENTS

Funding for this research was provided by the Belgian National Lottery and its players, and by the EORTC Cancer Research Fund with generous contributions from private donors.

REFERENCES

[1] "About the non-consistency of PTV-based prescription in lung" S. Lebredonchel, T. Lacornerie, E. Rault, A. Wagner, N. Reynaert, F. Crop. Physica Medica, 2017.

RESULTS

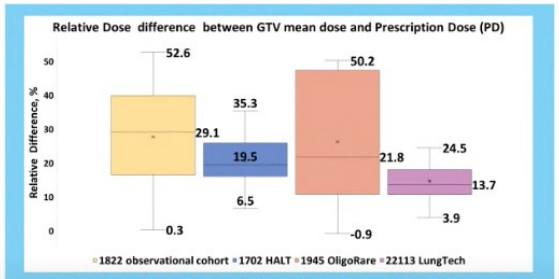


Figure 1. The relative dose difference for the mean dose to the GTV vs the Prescribed Dose, according to the Study

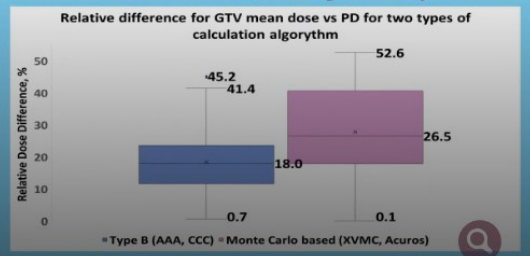


Figure 2. The relative dose difference for the mean GTV dose vs the Prescribed Dose, according to an algorithm.

Lesion Characteristics:

- Median PTV: 17.0 cc [range: 1.3 - 81.7 cc]
- Median GTV: 3.4 cc [range: 0.01 - 24.3 cc]* *without outliers*

Session Poster_ESTRO2025

EORTC
European Organisation for Research and Treatment of Cancer

Impact of Prescribing to the PTV on GTV Dose Heterogeneity in lung SBRT: Insight from EORTC Studies

ESTRO 2025

Volha Hertsyk[1], Nicolaus Andratschke[2], Enrico Clementel[1], Coreen Corning[1], Corinne Faivre-Finn[3], Catherine Fortpied[1], Matthias Guckenberger[2], Sarah Kelly[1,4,5], Ursula Nestle[6], Cecile Le Pechoux[7], Daniel Portik[1,8], Ajra Secerov-Ermenc[9], Luiza Souza[1], Nick Reynaert[10]

[1]EORTC Headquarters, Brussels, Belgium. [2]University Hospital Zürich, Department of Radiation Oncology, Zürich, Switzerland. [3]The Christie NHS Foundation Trust & University of Manchester, Manchester, UK. [4]European Society for Paediatric Oncology (SIOP Europe), Brussels, Belgium. [5]Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium. [6]Department of Radiation Oncology, Kliniken Maria Hilf, Moenchengladbach, Germany. [7]Department of Radiation Oncology, Gustave Roussy, Paris-Saclay University, Villejuif, France. [8]Department of Radiation Oncology (Maastro), GROW Research Institute for Oncology and Reproduction, Maastricht University Medical Centre+, Maastricht, The Netherlands. [9]Division of Radiotherapy, Institute of Oncology Ljubljana, Ljubljana, Slovenia, Faculty of Medicine, University of Ljubljana, Slovenia. [10]Institut Jules Bordet, Hôpital Universitaire de Bruxelles, Medical Physics Department, Brussels, Belgium.

PURPOSES

- In lung SBRT, accurate GTV dose delivery is critical.

CONCLUSIONS

PTV-based prescription in lung SBRT leads to

RESULTS

Prescrire la dose au PTV en SBRT pulmonaire induit une grande variabilité de dose au sein du GTV, tandis qu'une prescription directe au GTV améliorerait la précision et la cohérence dosimétrique.

Relative % difference between prescribed dose and GTV mean dose was used to account for different fractionation schedules.

contributions from private donors.

REFERENCES

[1] "About the non-consistency of PTV-based prescription in lung" S. Lebredonchel, T. Lacornerie, E. Rault, A. Wagner, N. Reynaert, F. Crop. Physica Medica, 2017.

Figure 2. The relative dose difference for the mean GTV dose vs the Prescribed Dose, according to an algorithm.

Lesion Characteristics:

- Median PTV: 17.0 cc [range: 1.3 - 81.7 cc]
- Median GTV: 3.4 cc [range: 0.01 - 24.3 cc]* *without outliers*

Session Poster_ESTRO2025

UHN Princess Margaret Cancer Centre

Clinical Outcomes for Surgery for Mesothelioma After Radiation Therapy using Extended pleural Resection (SMARTER Trial: NCT04028570)

B.C. John Cho[1], Penny Bradbury[2], Laura Donahoe[3], Marc de Perrot[3]
Departments of Radiation Oncology [1], Medical Oncology [2], and Thoracic Surgery[3]
Princess Margaret Cancer Centre, Toronto, Canada

ESTRO 2025

Purpose

Pleural mesothelioma is a rare, aggressive, incurable thoracic malignancy with no accepted standard of care. The best published survival outcomes were reported in the SMART trial[1] using a multidisciplinary approach using neoadjuvant hemithoracic (hemi-)RT followed by surgical resection and adjuvant chemotherapy. This protocol was highly selected, limiting the number of suitable patients. We developed the next protocol iteration, SMARTER, to allow less invasive, lung sparing surgery. We, hereby present our clinical outcomes.

		On Trial N=12	Off Trial N=12	p-value
Sex	Male	9 (75%)	8 (67%)	0.65
	Female	3 (25%)	4 (33%)	
Age	median (range years)	65 (54-84)	64 (44-77)	0.54
Tumor volume	(cm^3)	354±334	310±408	0.77
Laterality	Right	5 (42%)	9 (75%)	0.09
	Left	7 (58%)	3 (25%)	
Interval RT to OR	(days)	9±2	9±2	0.35
Surgery	EPD	8 (67%)	10 (83%)	0.49
	EPP	3 (25%)	2 (17%)	
	Partial PD	1 (8%)	0	
Resection margins	R0/1	11 (92%)	12 (92%)	0.31
	R2	1 (8%)	0	
Final histology	Epithelioid	11 (92%)	10 (83%)	0.54
	Biphasic	1 (8%)	2 (17%)	
BAP1 loss on IHC		8 (67%)	7 (58%)	0.67

Table 1. Patient Characteristics

Material and Methods

SMARTER was a 3+3 phase I trial (NCT04028570) with dose escalation of sub-ablative hemi-RT ranging from 0 Gy (boost only) to 6 Gy, 12 Gy and 18 Gy in 3 fractions combined with concomitant ablative radiation boost (39-54 Gy) to the gross disease followed by planned surgery 7-14 days later. The type of surgery (lung removing extrapleural pneumonectomy, EPP, vs. lung sparing extensive pleurectomy/decortication, EPD) was at the discretion of the surgeon. Patients with T1-3 N0-1 M0 histologically proven pleural mesothelioma (TNM 8th edition) with at least one tumor site greater than 2 cm in diameter targetable with ablative radiation deemed were eligible.

Results

Between 11/2019 and 02/2022, 27 patients were considered. Most had epithelioid mesothelioma (85%), 12 treated on trial protocol ("On trial"), 12 treated off trial ("Off Trial"), and 3 did not proceed with treatment. Clinical characteristics were similar between patients treated on and off trial (Table 1).

Toxicity / Trial patient	Grade 1 On	Grade 1 Off	Grade 2 On	Grade 2 Off	Grade 3 On	Grade 3 Off	Grade 4 On	Grade 4 Off	Grade 5 On	Grade 5 Off
Respiratory failure	0	0	0	0	0	0	0	0	0	1
Pneumonia	0	0	0	0	0	0	0	1	0	0
Brown-Sequard syndrome	0	0	0	0	1	0	0	0	0	0
Prolonged air leak	0	0	2	0	0	0	0	0	0	0
difficile infection	0	0	1	0	0	0	0	0	0	0
Urinary retention	1	0	0	0	0	0	0	0	0	0
Esophagitis	0	0	1	0	0	0	0	0	0	0
Atrial fibrillation	0	0	0	3	0	1	0	0	0	0

Table 2. Post-operative Toxicity

Of those treated on trial, 9 underwent EPD after up to 12 Gy hemi-RT, and 3 underwent EPP after 18 Gy hemi-RT with no dose-limiting toxicity. Patients treated off trial underwent EPD (n=10) or EPP (n=2) after up to 12 Gy hemi-RT. Two of these patients developed severe pulmonary complications. One underwent radiation (6 Gy + boost) and lung-sparing surgery after chemotherapy-ICB, and died from grade 5 pneumonitis for an overall hospital mortality of 4.2%. The other developed grade 4 pneumonia after chemotherapy followed by radiation (12 Gy + boost) and EPP (Table 2).

The median OS was 27.2 months and disease-free survival (DFS) 8.1 months after the start of radiation. OS and DFS were similar in patients treated on and off trial. Loco-regional recurrence was the most frequent site of recurrence.

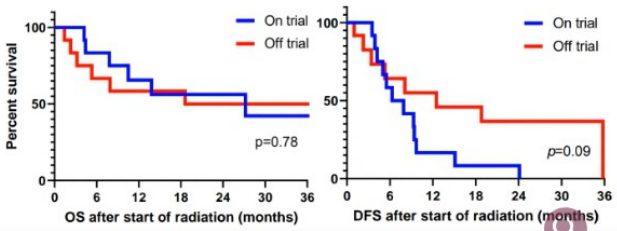


Figure 1. Overall and Disease Free Survival

Conclusions

SMARTER was feasible to deliver but resulted in poorer DFS compared to SMART. We hypothesize poorer outcomes were immune mediated. We have developed and currently accruing the next trial iteration, SMARTEST, to test the benefit of adding immunotherapy.

References

1. Cho BCJ, Donahoe L, Bradbury PA, Leighl N, Keshavjee S, Hope A, Pal P, Cabanero M, Czarnecka K, McRae K, Tsao MS, de Perrot M. Surgery for malignant pleural mesothelioma after radiotherapy (SMART): final results from a single-centre, phase 2 trial. Lancet Oncol. 2021 Feb;22(2):190-199.

Session Poster_ESTRO2025

UHN Princess Margaret Cancer Centre

Clinical Outcomes for Surgery for Mesothelioma After Radiation Therapy using Extended pleural Resection (SMARTER Trial: NCT04028570)

B.C. John Cho[1], Penny Bradbury[2], Laura Donahoe[3], Marc de Perrot[3]
Departments of Radiation Oncology [1], Medical Oncology [2], and Thoracic Surgery[3]
Princess Margaret Cancer Centre, Toronto, Canada

ESTRO 2025

Purpose

Results

Le protocole SMARTER pour mésothéliome pleural est réalisable, mais s'accompagne d'une survie sans progression (DFS) inférieure au protocole SMART, possiblement en lien avec l'absence d'immunothérapie.

Material and Methods

SMARTER was a 3+3 phase I trial (NCT04028570) with dose escalation of sub-ablative hemi-RT ranging from 0 Gy (boost only) to 6 Gy, 12 Gy and 18 Gy in 3 fractions combined with concomitant ablative radiation boost (39-54 Gy) to the gross disease followed by planned surgery 7-14 days later. The type of surgery (lung removing extrapleural pneumonectomy, EPP, vs. lung sparing extensive pleurectomy/decortication, EPD) was at the discretion of the surgeon. Patients with T1-3 N0-1 M0 histologically proven pleural mesothelioma (TNM 8th edition) with at least one tumor site greater than 2 cm in diameter targetable with ablative radiation deemed were eligible.

Table 2. Post-operative Toxicity

Of those treated on trial, 9 underwent EPD after up to 12 Gy hemi-RT, and 3 underwent EPP after 18 Gy hemi-RT with no dose-limiting toxicity. Patients treated off trial underwent EPD (n=10) or EPP (n=2) after up to 12 Gy hemi-RT. Two of these patients developed severe pulmonary complications. One underwent radiation (6 Gy + boost) and lung-sparing surgery after chemotherapy-ICB, and died from grade 5 pneumonitis for an overall hospital mortality of 4.2%. The other developed grade 4 pneumonia after chemotherapy followed by radiation (12 Gy + boost) and EPP (**Table 2**).

References

1. Cho BCJ, Donahoe L, Bradbury PA, Leighl N, Keshavjee S, Hope A, Pal P, Cabanero M, Czarnecka K, McRae K, Tsao MS, de Perrot M. Surgery for malignant pleural mesothelioma after radiotherapy (SMART): final results from a single-centre, phase 2 trial. Lancet Oncol. 2021 Feb;22(2):190-19

Session Poster_ESTRO2025

E25-1556 - Effect of SABR on circulating tumor DNA detection in early-stage lung cancer: Interim results from a prospective, multi-center trial

Lung

Effect of SABR on ctDNA detection in early-stage NSCLC: Interim results from a prospective, multi-centre trial (SABR-DETECT)

S. Young[1], S. Verma[1], T.A.C. Kennedy[2], M. Black[1], B. Messam[1], E. Churchman[1], J.M. Laba[1], G.B. Rodrigues[1], Y. Ung[2], M. Tsao[2], C.D. Goodman[1], X.M. Qu[1], P. Lang[1], B.P. Yaremko[1], A. Warner[1], W. Tang[3], R. Yu[3], A.V. Louie[2], D.A. Palma[1], D.A. Breadner[1]

[1] Verspeeten Family Cancer Centre, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada
[2] Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada
[3] Nanjing Geneseeq Technology Inc., Nanjing, Jiangsu, China

Background

- Definitive stereotactic ablative radiotherapy (SABR) is a curative approach in patients with stage I/IIA non–small-cell lung cancer (NSCLC) who are not candidates for surgery
- Patients with inaccessible tumors or at high risk of complications from biopsy are sometimes treated without a tissue diagnosis, based on a high likelihood of malignancy calculated by validated models
- Use of blood-based circulating tumor DNA (ctDNA) liquid biopsies for patients without tissue diagnosis may allow pathological confirmation and further molecular testing, but ctDNA detection rates are low in early stage NSCLC
- We hypothesize that liquid biopsies may have higher ctDNA detection rates after initiation of SABR

Methods

- This is a multi-institutional study. Patients planning to undergo standard of care SABR were enrolled in two cohorts:
  1. Patients with suspected stage I/IIA NSCLC and a pretreatment likelihood of malignancy of ≥60% using the Herder and/or Brock models (n=45)
  2. Patients with biopsy-proven NSCLC (n=30-60)
- Plasma collected for ctDNA analysis prior to the 1st fraction of SABR and 24-72 hours after 1st fraction (range: 7.5-18 Gy)
- ctDNA detected with SHIELDING™ ULTRA MRD panel of hotspot regions in 2365 cancer-related genes with ultra-high sensitivity
- In this planned interim analysis, we report on a secondary objective: to assess the impact of SABR on detection rates of ctDNA

Results

- Paired plasma samples (pre- and post-SABR) were tested for 56 patients, and after quality control, 53 paired samples were analyzable

Table 1 - Baseline characteristics

Characteristic	N (%)
Age, median (range)	80 (58-89) years
Gender	
Male	33 (59%)
Female	23 (41%)
Tissue confirmed diagnosis	24 (43%)
Histology (n=1)	
Non-squamous	14 (58%)
Squamous	10 (42%)

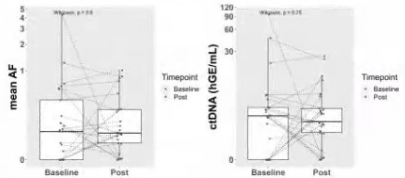
Table 2 – ctDNA detection rates (N=53)

Pre-SABR	Post-SABR	n (%)
detected	detected	15 (28%)
not detected	detected	8 (15%)
detected	not detected	2 (4%)
not detected	not detected	30 (53%)

47% detected either pre- or post-SABR

Results

Figure – Mean allelic frequency change (left) and ctDNA change (right) (Pre- and Post-SABR)



N = 25, excluding patients without detected mutation in both baseline and post-treatment sample

Table 3 – detection rates based on histology

	Squamous cell carcinoma	Adenocarcinoma
Pre-SABR	44% (4/9)	15% (2/13)
Post-SABR	56% (5/13)	39% (5/13)

Conclusions

- The rate of ctDNA detection increased by testing both pre- and post-SABR samples in patients with early-stage NSCLC
- If only one ctDNA collection is planned, post-SABR (within 24-72 hours) ctDNA may have higher detection rates
- We will continue to accrue and follow patients to assess the primary endpoint of whether minimal residual disease can prognosticate and predict for early recurrence in SABR patients

Acknowledgement
Thank you to the patients and their families.

Session Poster_ESTRO2025

E25-1556 - Effect of SABR on circulating tumor DNA detection in early-stage lung cancer: Interim results from a prospective, multi-center trial

Lung

Effect of SABR on ctDNA detection in early-stage NSCLC: Interim results from a prospective, multi-centre trial (SABR-DETECT)

S. Young[1], S. Verma[1], T.A.C. Kennedy[2], M. Black[1], B. Messam[1], E. Churchman[1], J.M. Laba[1], G.B. Rodrigues[1], Y. Ung[2], M. Tsao[2], C.D. Goodman[1], X.M. Qu[1], P. Lang[1], B.P. Yaremko[1], A. Warner[1], W. Tang[3], R. Yu[3], A.V. Louie[2], D.A. Palma[1], D.A. Breadner[1]

[1] Verspeeten Family Cancer Centre, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada
[2] Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada
[3] Nanjing Geneseeq Technology Inc., Nanjing, Jiangsu, China

Background

- Definitive stereotactic ablative radiotherapy (SABR) is a curative approach in patients with stage I/IIA non–small-cell lung cancer (NSCLC) who are not candidates for surgery
- Patients with inaccessible tumors or at high risk of complications from biopsy are sometimes treated without a tissue diagnosis, based on a likelihood of malignancy of ≥60% using the Herder and/or Brock models (n=45)
2. Patients with biopsy-proven NSCLC (n=30-60)
- Plasma collected for ctDNA analysis prior to the 1st fraction of SABR and 24-72 hours after 1st fraction (range: 7.5-18 Gy)
- ctDNA detected with SHIELDING™ ULTRA MRD panel of hotspot regions in 2365 cancer-related genes with ultra-high sensitivity
- In this planned interim analysis, we report on a secondary objective: to assess the impact of SABR on detection rates of ctDNA

Results

- Paired plasma samples (pre- and post-SABR) were tested for 56 patients, and after quality control, 53 paired samples were analyzable

Table 1 - Baseline characteristics

Characteristic	N (%)
Age, median (range)	80 (58-89) years

not detected	detected	8 (15%)
detected	not detected	2 (4%)
not detected	not detected	30 (53%)

47% detected either pre- or post-SABR

Results

Figure – Mean allelic frequency change (left) and ctDNA change (right) (Pre- and Post-SABR)

	Squamous cell carcinoma	Adenocarcinoma
Pre-SABR	44% (4/9)	15% (2/13)
Post-SABR	56% (5/13)	39% (5/13)

Conclusions

- The rate of ctDNA detection increased by testing both pre- and post-SABR samples in patients with early-stage NSCLC
- If only one ctDNA collection is planned, post-SABR (within 24-72 hours) ctDNA may have higher detection rates
- We will continue to accrue and follow patients to assess the primary endpoint of whether minimal residual disease can prognosticate and predict for early recurrence in SABR patients

Acknowledgement
Thank you to the patients and their families.

References Contacts

Faire une prise de sang juste après la radiothérapie SABR augmente les chances de détecter l'ADN tumoral circulant (ctDNA) chez les patients atteints de cancer du poumon précoce.

Session Poster_ESTRO2025

E25-4506 - Predicting tumour volume reduction in non-small cell lung cancer: Independent validation of a single parameter PSI model

Lung

Predicting tumour volume reduction in non-small cell lung cancer: Independent validation of a single parameter PSI model

Sarah Barrett[1,2], Mohammad U Zahid[3], Heiko Enderling[3,4], Conor McGarry[5,6] * Gerard M Walls [5,6] * Laure Marignol[1,2] *

[1]Applied Radiation Therapy Trinity, Discipline of Radiation Therapy, Trinity College Dublin, Ireland, [2]Trinity St. James's Cancer Institute, Dublin, Ireland, [3] Department of Radiation Oncology, Division of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, USA, [4]Institute for Data Science in Oncology, The University of Texas MD Anderson Cancer Center, Houston, USA [5]Patrick G. Johnston Centre for Cancer Research, Queen's University Belfast, Belfast, United Kingdom [6]Northern Ireland Cancer Centre, Belfast Health & Social Care Trust, Belfast, United Kingdom *Joint last author

Purpose/Background

- The Proliferation Saturation Index (PSI) model [1] has been shown to predict non-small cell lung cancer (NSCLC) tumour volume regression in response to conventionally fractionated radiation therapy (RT) [2]
- This study seeks to validate the performance of the model, as a single-parameter model, in an independent dataset

Material/Methods

- Seventy-one patients, with T1-3 N0 M0 disease, treated with 55Gy/20# RT alone, from the NI-HEART database were included [3]
- Model inputs were tumour volume measures from the CBCT imaging (days 1–3 or days 1-3 and day 10)
- Tumour volumes measured on remaining weekly CBCTs (mean acquisition days were 10, 17 and 24) were compared to the model simulated volumes at the same timepoint using scatter plots. R^2 values and Pearson Correlation Coefficients (PCC)

Results

- Prediction using volume measures from day 1-3 CBCTs showed fair agreement between the measured and simulated volumes (R^2=0.81, PCC=0.9) for the whole cohort. Inclusion of the day 10 CBCT, improved performance (R^2=0.91, PCC=0.95), see **Fig. 1**
- Model fit to the measured volumes for 4 individual patients can be seen in **Fig. 2**)
- Agreement between the simulated and measured volumes at the final image are displayed in **Fig. 3**.
- The model was robust to parameter variation with the maximum change in either R^2 or PCC being -1.53% in R^2 when α and λ were increased by 20%

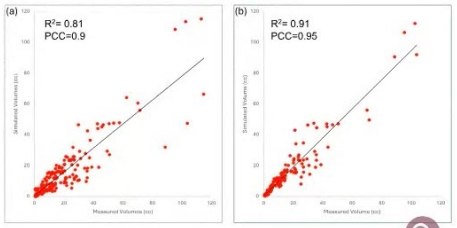


Figure 1. Measured vs simulated volume based on days 1-3 (a) and including CBCT on day 10 (b)

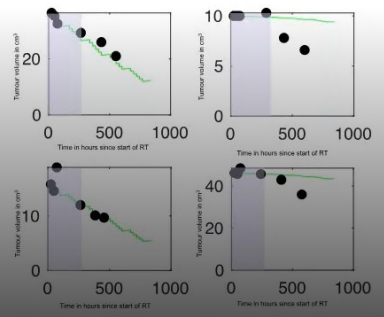


Figure 2. Individual plots of 4 patients, 2 displaying good predictive performance and 2 displaying poor performance.
Black dots are measured volumes, green curves are model-simulated volumes. Shaded area indicates data used to predict regression for each patient.

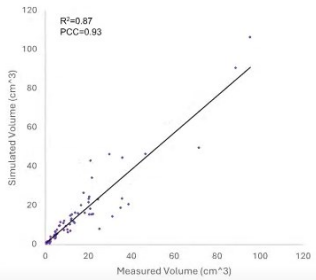


Figure 3. Scatter plot of measured vs simulated volume at end of RT (day 24) based on prediction from day 10

Conclusion

The PSI model demonstrates strong predictive capability for tumour volume regression in NSCLC patients undergoing mildly hypofractionated RT, by day 10 of RT.

These results highlight the potential utility of CBCT tumour volumes for early assessment of tumour response, which could be helpful in future adaptive RT paradigms.

References

1. Prokopiou S, et. al. A proliferation saturation index to predict radiation response and personalize radiotherapy fractionation. Radiat Oncol 2015 Jul 31;10:159.
2. Barrett S, et. al. Predicting Individual Tumour Response Dynamics in Locally Advanced Non-Small Cell Lung Cancer Radiation Therapy; a Mathematical Modelling Study. Int J Radiat Oncol Biol Phys 2025; in press.
3. Walls GM, et al. Association between statin therapy dose intensity and radiation cardiotoxicity in non-small cell lung cancer: Results from the NI-HEART study. Radiother Oncol 2023;186:109762

Session Poster_ESTRO2025

E25-4506 - Predicting tumour volume reduction in non-small cell lung cancer: Independent validation of a single parameter PSI model

Lung

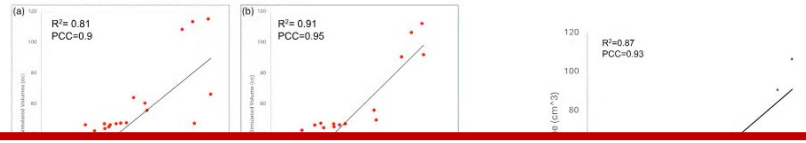
Predicting tumour volume reduction in non-small cell lung cancer: Independent validation of a single parameter PSI model

Sarah Barrett[1,2], Mohammad U Zahid[3], Heiko Enderling[3,4], Conor McGarry[5,6] * Gerard M Walls [5,6] * Laure Marignol[1,2] *

[1]Applied Radiation Therapy Trinity, Discipline of Radiation Therapy, Trinity College Dublin, Ireland, [2]Trinity St. James's Cancer Institute, Dublin, Ireland, [3] Department of Radiation Oncology, Division of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, USA, [4]Institute for Data Science in Oncology, The University of Texas MD Anderson Cancer Center, Houston, USA [5]Patrick G. Johnston Centre for Cancer Research, Queen's University Belfast, Belfast, United Kingdom [6]Northern Ireland Cancer Centre, Belfast Health & Social Care Trust, Belfast, United Kingdom *Joint last author

Purpose/Background

- The Proliferation Saturation Index (PSI) model [1] has been shown to predict non-small cell lung cancer (NSCLC) tumour volume regression in response to conventionally fractionated radiation therapy (RT) [2]
- This study seeks to validate the performance of the model as a single parameter model in an independent



Le modèle PSI prédit efficacement la réduction du volume tumoral en NSCLC dès les premiers jours de radiothérapie, ouvrant la voie à des traitements adaptatifs personnalisés.

compared to the model simulated volumes at the same timepoint using scatter plots. R^2 values and Pearson Correlation Coefficients (PCC)

Results

- Prediction using volume measures from day 1-3 CBCTs showed fair agreement between the measured and simulated volumes (R^2=0.81, PCC=0.9) for the whole cohort. Inclusion of the day 10 CBCT, improved performance (R^2=0.91, PCC=0.95), see **Fig. 1**
- Model fit to the measured volumes for 4 individual patients can be seen in **Fig. 2**)
- Agreement between the simulated and measured volumes at the final image are displayed in **Fig. 3**.
- The model was robust to parameter variation with the maximum change in either R^2 or PCC being -1.53% in R^2 when α and λ were increased by 20%

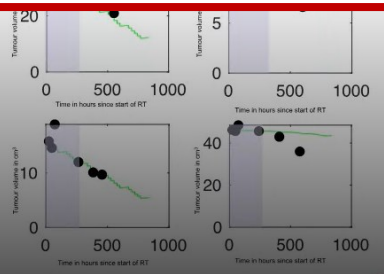


Figure 2. Individual plots of 4 patients, 2 displaying good predictive performance and 2 displaying poor performance.
Black dots are measured volumes, green curves are model-simulated volumes. Shaded area indicates data used to predict regression for each patient.

end of RT (day 24) based on prediction from day 10

Conclusion

The PSI model demonstrates strong predictive capability for tumour volume regression in NSCLC patients undergoing mildly hypofractionated RT, by day 10 of RT.

These results highlight the potential utility of CBCT tumour volumes for early assessment of tumour response, which could be helpful in future adaptive RT paradigms.

References

1. Prokopiou S, et. al. A proliferation saturation index to predict radiation response and personalize radiotherapy fractionation. Radiat Oncol 2015 Jul 31;10:159.
2. Barrett S, et. al. Predicting Individual Tumour Response Dynamics in Locally Advanced Non-Small Cell Lung Cancer Radiation Therapy; a Mathematical Modelling Study. Int J Radiat Oncol Biol Phys 2025; in press.
3. Walls GM, et al. Association between statin therapy dose intensity and radiation cardiotoxicity in non-small cell lung cancer: Results from the NI-HEART study. Radiother Oncol 2023;186:109762

Session Poster_ESTRO2025

E25-3731 - Lymphopenia induced by proton versus photon therapy in lung cancer: impact of dose to circulating lymphocytes, bone marrow and thoracic duct

Lung

Massachusetts General Hospital
Founding Member, Mass General Brigham

BTM · MEDICAL UNIVERSITY OF LODZ · NIH · NATIONAL SCIENCE CENTRE POLAND

Lymphopenia induced by proton versus photon therapy in lung cancer: impact of dose to circulating lymphocytes, bone marrow and thoracic duct

Zuzanna Nowicka[1], Chris Beekman[2], Radhe Mohan[3], Zhongxing Liao[4], Nadya Shusharina[2], Clemens Grassberger[5], Harald Paganetti[2]

[1]Medical University of Lodz, Department of Biostatistics and Translational Medicine, Lodz, Poland; [2]Department of Radiation Oncology, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA; [3]Department of Radiation Physics, The University of Texas MD Anderson Cancer Center Texas, USA; [4]Department of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA; [5]Department of Radiation Oncology, University of Washington, Seattle, Washington, USA

THE UNIVERSITY OF TEXAS MD Anderson Cancer Center — Making Cancer History® · NAWA POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE

Introduction

Radiation-induced lymphopenia (RIL) can negatively affect treatment outcomes, especially if immunotherapy is given concurrently or shortly after radiotherapy (RT). During RT for non-small-cell lung cancer (NSCLC) the circulating blood pool (heart, lungs, large vessels), lymphatic structures and bone marrow are all exposed to lymphodepleting radiation doses. The goal of this study is to explore which of the normal structures contribute to the observed lymphodepletion and recovery based on RIL rates in NSCLC patients undergoing photon- vs proton-based RT.

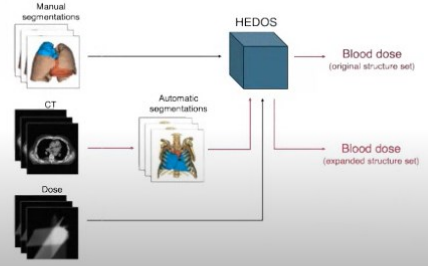


Figure 1. Study workflow. HEDOS – hematological dose model[1]

Material and methods

The study group was 109 patients with NSCLC treated with concurrent chemotherapy and proton (N=38; 34.9%) or photon RT to 60-74 Gy. To verify if a more precise blood dose calculation would improve RIL prediction, we used a time-dependent hematological dose (HEDOS) model[1] that did or did not include major vessels (original vs expanded structure set on **Figure 1**). We also contoured thoracic ducts and used bone contours from TotalSegmentator along with a distribution atlas of proliferating bone marrow (BM) to calculate radiation dose to BM[2]. Dose-volume parameters were used along with clinical factors to predict absolute lymphocyte counts (ALC) during RT.

Results

Lymphocyte count decreased during RT in the whole patient group, with 95 patients (87.1%) experiencing severe RIL (ALC <0.5×109/L). An example of differential histogram showing blood dose contributions for an expanded structure set in shown in **Figure 2A**. Irrespective of the structure set used for the blood dose calculation, the mean fractional blood dose (**Figure 2B**) and baseline ALC were predictors of ALC decline (both p<0.001), but treatment modality (protons vs protons) was not (p=0.279).

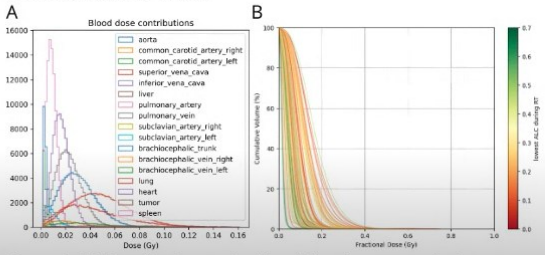


Figure 2. (A) Contributions to the blood dose from expanded structure set referenced on Figure 1. (B) Cumulative dose-volume histograms for blood dose (original HEDOS) of all patients colored by the lowest ALC observed during RT (lymphocyte nadir).

Results (continued)

Accounting for the radiation dose to large vessel dose did not improve predictions of lymphopenia (AIC=-209 vs -211 for models with and without vessel segmentations respectively). A model predicting severe RIL based on patient age, sex, baseline ALC and blood dose distribution parameters achieved area under the ROC curve (AUC) of 0.90 (95% CI: 0.82-0.97; **Figure 3**). Although the dose to BM was consistent with previous reports[3] (median bone marrow V3: 12.1%), the dose to BM or the thoracic duct was not predictive of lymphopenia or lymphopenia recovery (p=0.920 and p=0.228, respectively).

Results (continued)

A

	β	S.E.	p
Intercept	-7.195	3.214	**0.025**
Age –years]	0.099	0.037	**0.008**
Sex (Male vs Female)	-1.170	0.771	0.129
Baseline ALC (K/uL]	-1.280	0.539	**0.018**
Mean blood dose [Gy]	73.466	24.623	**0.003**
Blood dose skewness	1.020	0.785	0.194

B

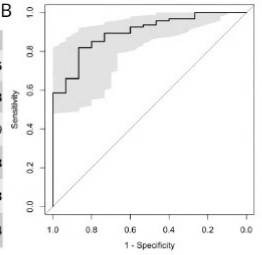


Figure 3. (A) Coefficients from model predicting severe RIL based on patient age, sex, baseline ALC and blood dose distribution parameters (original HEDOS). (B) ROC curve for the model from panel (A).

Conclusion

Patients with NSCLC undergoing proton- and photon-based treatment experience similar rates of RIL, which can be predicted based on dose to circulating blood and clinical factors. Dose to bone marrow or thoracic duct did not predict lymphopenia or lymphopenia recovery.

Acknowledgments This study was funded from the Polish National Science Centre and National Agency for Academic Exchange grant 2020/39/O/NZ5/01696 and from the US National Institutes of Health grants NIH-NCI R01 CA248901, NIH-NCI P01 CA261669 and NIH-NCI R21 CA248118.

References

1. Beekman C et al. A stochastic model of blood flow to calculate blood dose during radiotherapy. Phys Med Biol 2023;68:225007.
2. Campbell BA et al. Distribution Atlas of Proliferating Bone Marrow in Non-Small Cell Lung Cancer Patients Measured by FLT-PET/CT Imaging, With Potential Applicability in Radiation Therapy Planning. International Journal of Radiation Oncology*Biology*Physics 2015;92:1035–43.
3. MacManus M et al., Dose-response relationships between radiation exposure, bone marrow function as measured by 18F-FLT PET, and lymphocyte counts during chemoradiation for non-small cell lung cancer. IJROBP 2024

Contact: zuzanna.nowicka@umed.lodz.pl

Session Poster_ESTRO2025

Session Poster_ESTRO2025

E25-1220 - Isolated nodal failure in stage III NSCLC after proton therapy in durvalumab era

Lung

Isolated nodal failure in stage III NSCLC after proton therapy in durvalumab era

Yuanyuan Lin[1], Kyra van Keeken[2], Judith van Loon[2], Stéphanie Peeters[2], Bart Reymen[2], Angela van Baardwijk[2], Karolien Verhoeven[2], Lizza Hendriks[3], Esther Kneepkens[2], Mirko Unipan[2], Dirk De Ruysscher[2]

[1]Radiation Oncology, Hospital Duran i Reynals, Institut Català d'Oncologia (ICO)-L'Hospitalet, Barcelona, Spain. [2]Maastricht University Medical Center+, Dept. of Radiation Oncology (Maastro), GROW School for Oncology, Maastricht, The Netherlands. [3]Pulmonary Diseases, Maastricht UMC+, GROW - Research Institute for Oncology and Reproduction, Maastricht, Netherlands.

Background and purpose

Isolated nodal failure (INF) after selective nodal irradiation with 3DCRT or IMRT occurs in 2-3% of stage III NSCLC patients [1,2].

The potentially reduced incidental dose with proton therapy (PT) may increase INF rates. We aimed to evaluate the incidence of INF in stage III NSCLC patients after PT.

Material and methods

Consecutive stage III NSCLC patients treated with intensity-modulated proton therapy (IMPT) between 2019-2022 were retrospectively reviewed. The primary endpoint was INF incidence. Secondary endpoints were incidental dose to INF, recurrence patterns, overall survival (OS) and progression-free survival (PFS).

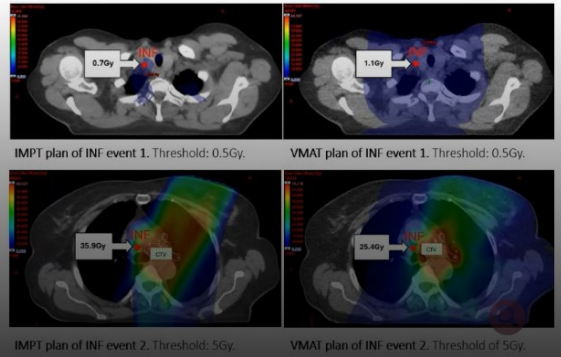
PT selection followed the Dutch model-based approach [3]. All PT plans were robustly optimized and evaluated. If PT was not possible, a backup photon fraction with volumetric modulated arc therapy (VMAT) was administered.

Based on the dose at planning CT, we estimated the hypothetical incidental dose to INF (assuming single-modality administration with IMPT or VMAT,) and actual incidental dose (accounting for fractions from both modalities).

Results

Ninety-six patients were included. Median age was 66 years (35-86). Stage (TNM8): IIIA (55.2%), IIIB (37.5%) and IIIC (7.3%). Overall, 89% of fractions were delivered with IMPT. Treatment was concurrent chemoradiotherapy in 80% of patients (70% initiated durvalumab), sequential chemoradiotherapy in 17% (19% initiated durvalumab), and radiotherapy alone in 3%. The median total dose was 60Gy, over a median of 30 fractions.

With a mean follow-up of 27 months (range 1-58), only two patients (2.1%) experienced INF with a 2-year cumulative risk of 3.3% (95% CI: 0–7.8%). The hypothetical incidental doses at INF are shown in Figure 1. The actual incidental dose: 0.7Gy and 30.7Gy. The incidental doses to INF were 30.7Gy and 0.7Gy, respectively. Mean OS (median OS not reached) was 39 months overall, and 44 and 36 months with or without durvalumab, respectively. Median PFS was 25 months (95% CI: 16-34) overall.



IMPT plan of INF event 1. Threshold: 0.5Gy. VMAT plan of INF event 1. Threshold: 0.5Gy.

IMPT plan of INF event 2. Threshold: 5Gy. VMAT plan of INF event 2. Threshold of 5Gy.

Figure 1: Dose distribution with IMPT or VMAT. Hypothetical incidental dose to the INF (assuming single-modality administration with IMPT or VMAT): 0.7Gy or 1.1Gy in INF event 1; 35.9Gy or 25.4Gy in INF event 2. CTV = clinical target volume. Threshold = minimum dose displayed in the plan.

	Entire cohort N = 96	cCRT N = 77	sCRT N = 16	RT alone N = 3	Durvalumab N = 57	No durvalumab N = 39
No recurrence	48 (50.0%)	42 (54.5%)	5 (31.3%)	1 (33.3%)	31 (54.4%)	17 (43.6%)
Isolated nodal failure	2 (2.1%)	1 (1.3%)	1 (6.3%)	0 (0%)	1 (1.8%)	1 (2.6%)
Local recurrence only	9 (9.4%)	5 (6.5%)	4 (25.0%)	0 (0%)	4 (7.0%)	5 (12.8%)
Locoregional recurrence only	4 (4.2%)	3 (3.9%)	1 (6.3%)	0 (0%)	4 (7.0%)	0 (0%)
Regional recurrence in the CTV only	1 (1.0%)	1 (1.3%)	0 (0%)	0 (0%)	1 (1.8%)	0 (0%)
Regional recurrence in and outside of the CTV only	1 (1.0%)	1 (1.3%)	0 (0%)	0 (0%)	0 (0%)	1 (2.6%)
Distant metastases with or without locoregional recurrence	31 (32.3%)	24 (31.2%)	5 (31.3%)	2 (66.7%)	16 (28.1%)	15 (38.5%)

Figure 2: Pattern of recurrence of the entire cohort and categorized by concurrent chemoradiotherapy (cCRT) vs. sequential chemoradiotherapy (sCRT) vs. RT alone, and by durvalumab vs. no durvalumab. CTV = clinical target volume.

Conclusion

The INF rate in stage III NSCLC treated mainly with IMPT, with or without durvalumab, is 2.1%, comparable to 3DCRT and IMRT cohorts.

Acknowledgments

The authors acknowledge financial support from the grant "In Memoriam del Dr. Manuel de Caralt Borell i del Dr. Miguel de Caralt Munné."

References

1. Martinussen, H. M. A. et al. Is selective nodal irradiation in non-small cell lung cancer still safe when using IMRT? Results of a prospective cohort study. Radiotherapy and Oncology 121, 322–327 (2016).
2. De Ruysscher, D. et al. Selective mediastinal node irradiation based on FDG-PET scan data in patients with non-small-cell lung cancer: A prospective clinical study. Int J Radiat Oncol Biol Phys 62, 988–994 (2005).
3. Langendijk, J. A. et al. Selection of patients for radiotherapy with protons aiming at reduction of side effects: The model-based approach. Radiotherapy and Oncology vol. 107 267–273.

Session Poster_ESTRO2025

E25-1220 - Isolated nodal failure in stage III NSCLC after proton therapy in durvalumab era

Lung

Isolated nodal failure in stage III NSCLC after proton therapy in durvalumab era

Yuanyuan Lin[1], Kyra van Keeken[2], Judith van Loon[2], Stéphanie Peeters[2], Bart Reymen[2], Angela van Baardwijk[2], Karolien Verhoeven[2], Lizza Hendriks[3], Esther Kneepkens[2], Mirko Unipan[2], Dirk De Ruysscher[2]

[1]Radiation Oncology, Hospital Duran i Reynals, Institut Català d'Oncologia (ICO)-L'Hospitalet, Barcelona, Spain. [2]Maastricht University Medical Center+, Dept. of Radiation Oncology (Maastro), GROW School for Oncology, Maastricht, The Netherlands. [3]Pulmonary Diseases, Maastricht UMC+, GROW - Research Institute for Oncology and Reproduction, Maastricht, Netherlands.

Background and purpose

Isolated nodal failure (INF) after selective nodal irradiation with 3DCRT or IMRT occurs in 2-3% of stage III NSCLC patients [1,2]

The potenti
(PT) may i
incidence o

Material a

Consecutiv
modulated
retrospecti
incidence.
recurrence
free surviva

PT selectio
All PT plan
was not po
modulated

Based on
hypothetica
modality a
incidental
modalities).

Results

Ninety-six patients were included. Median age was 66 years (35-86). Stage (TNM8): IIIA (55.2%), IIIB (37.5%) and IIIC (7.3%). Overall, 89% of fractions

	Entire cohort N = 96	cCRT N = 77	sCRT N = 16	RT alone N = 3	Durvalumab N = 57	No durvalumab N = 39
No recurrence	48 (50.0%)	42 (54.5%)	5 (31.3%)	1 (33.3%)	31 (54.4%)	17 (43.6%)
Isolated nodal failure	2 (2.1%)	1 (1.3%)	1 (6.3%)	0 (0%)	1 (1.8%)	1 (2.6%)

Le taux d'échec ganglionnaire isolé après protonthérapie pour un NSCLC stade III reste faible (2,1 %), similaire aux taux observés avec la RT conventionnelle, confirmant la sécurité de cette approche même à l'ère du durvalumab.

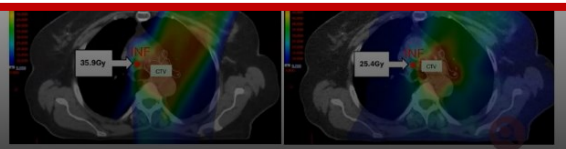


Figure 1: Dose distribution with IMPT or VMAT. Hypothetical incidental dose to the INF (assuming single-modality administration with IMPT or VMAT): 0.7Gy or 1.1Gy in INF event 1; 35.9Gy or 25.4Gy in INF event 2. CTV = clinical target volume. Threshold = minimum dose displayed in the plan.

IMPT plan of INF event 2. Threshold: 5Gy. VMAT plan of INF event 2. Threshold of 5Gy.

Acknowledgments

The authors acknowledge financial support from the grant "In Memoriam del Dr. Manuel de Caralt Borell i del Dr. Miguel de Caralt Munné."

References

1. Martinussen, H. M. A. et al. Is selective nodal irradiation in non-small cell lung cancer still safe when using IMRT? Results of a prospective cohort study. Radiotherapy and Oncology 121, 322–327 (2016).
2. De Ruysscher, D. et al. Selective mediastinal node irradiation based on FDG-PET scan data in patients with non-small-cell lung cancer: A prospective clinical study. Int J Radiat Oncol Biol Phys 62, 988–994 (2005).
3. Langendijk, J. A. et al. Selection of patients for radiotherapy with protons aiming at reduction of side effects: The model-based approach. Radiotherapy and Oncology vol. 107 267–273.

Session Poster_ESTRO2025

Real world clinical outcomes for early-stage lung cancer treated with single-fraction stereotactic ablative radiotherapy in Australia

Jennifer Yeh[1], Neil Wallace[1], Nick Hardcastle[2,3], Kevin Tu[1], Michelle Ryan[1], Nikki Plumridge[1], Mark Shaw[1], Michael MacManus[1,2], Greg Wheeler[1], Monique Youl[1], Andrew Wirth[1], Keelan Byrne[1], Tim Spelman[4], Shankar Siva[1,2], Susan Harden[1,2]

[1]Department of Radiation Oncology, Peter MacCallum Cancer Centre, Melbourne, Australia | [2]Sir Peter MacCallum Department of Oncology, University of Melbourne, Melbourne, Australia
[3]Department of Physical Science, Peter MacCallum Cancer Centre, Melbourne, Australia | [4]Centre for Health Services Research, Peter MacCallum Cancer Centre, Melbourne, Australia

Purpose/Objective

- SF SABR for lung metastases was investigated with the TROG 13.01 SAFRON II trial[1]
- Scope was extended to primary early-stage lung cancer during COVID-19, based on 2 phase II trials (2,3)
- SF SABR continues to be used for selected cases, often those with comorbidities, frailties, or living in remote/rural locations.
- We investigated the real-world efficacy of SF SABR for people with early-stage lung cancer treated at Peter Mac.

Methods

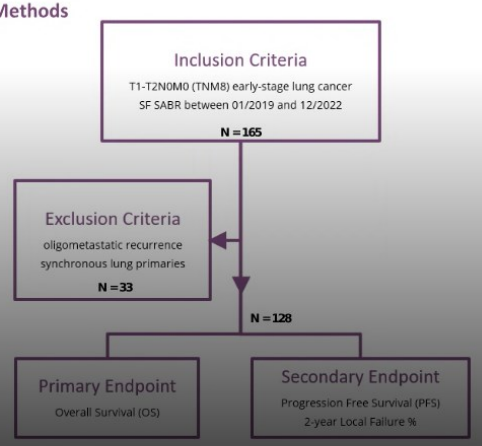


Figure 1. Schematic of study method

Results

A total of 128 patients with early-stage lung cancer were treated with SF SABR.

- Male (53.9%), Caucasian (93%), Smoking history (90.6%)
- Median age 77 years (IQR 69.5-82 years)
- ECOG Performance 2 (46.1%)
- Metro 68%, Regional 10.9%, Rural 21.1%
- Biopsy proven (39.8%), adenocarcinoma (58.8% of those biopsied), T1 tumor (86.7%)

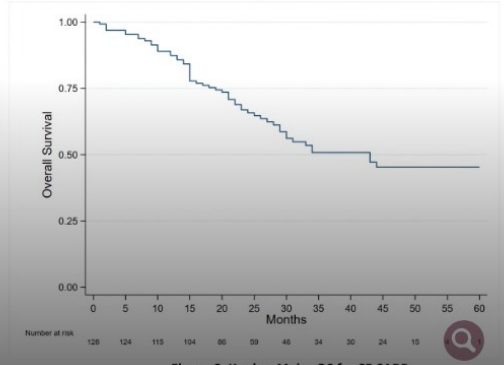


Figure 2. Kaplan-Meier OS for SF-SABR

Median OS was 43 months (IQR 19-65 months) (Figure 2), comparable to the 44-month median OS reported by the Cleveland Clinic[4]. Similarly, our 2-year local failure was 10.9%, compared to 7.3%. Median follow-up was 21.5 months (IQR: 12-34.5 months). Median PFS was 54 months.

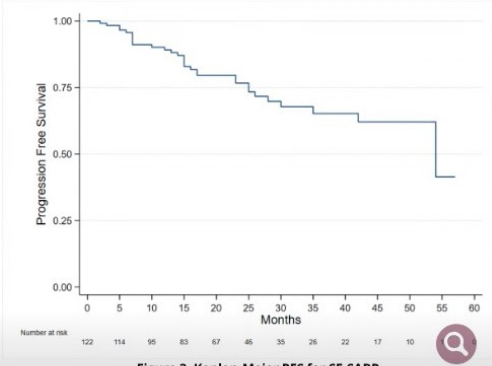


Figure 3. Kaplan-Meier PFS for SF-SABR

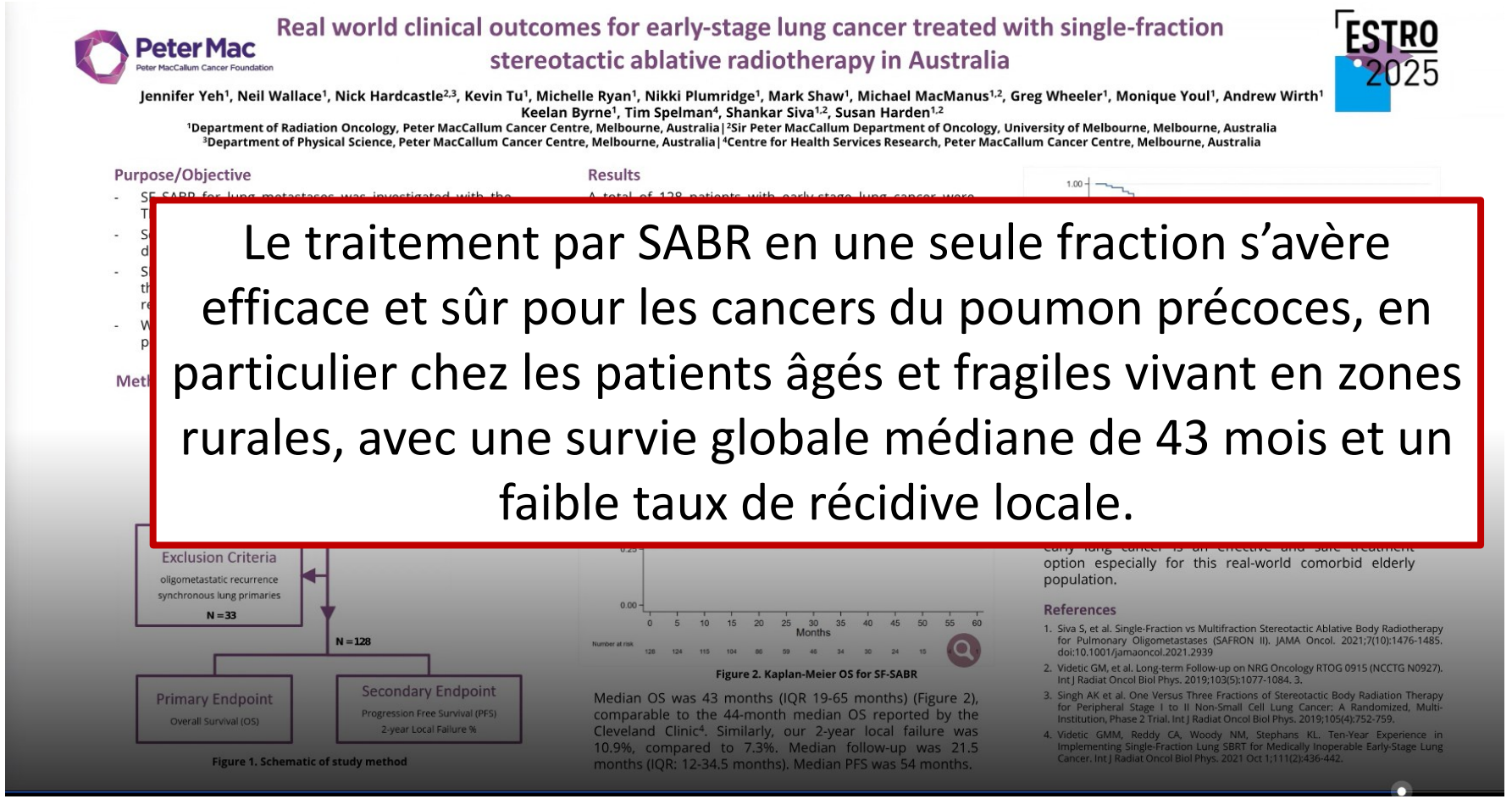
Conclusion

In our experience, single fraction SABR treatment for early lung cancer is an effective and safe treatment option especially for this real-world comorbid elderly population.

References

1. Siva S, et al. Single-Fraction vs Multifraction Stereotactic Ablative Body Radiotherapy for Pulmonary Oligometastases (SAFRON II). JAMA Oncol. 2021;7(10):1476-1485. doi:10.1001/jamaoncol.2021.2939
2. Videtic GM, et al. Long-term Follow-up on NRG Oncology RTOG 0915 (NCCTG N0927). Int J Radiat Oncol Biol Phys. 2019;103(5):1077-1084. 3.
3. Singh AK et al. One Versus Three Fractions of Stereotactic Body Radiation Therapy for Peripheral Stage I to II Non-Small Cell Lung Cancer: A Randomized, Multi-Institution, Phase 2 Trial. Int J Radiat Oncol Biol Phys. 2019;105(4):752-759.
4. Videtic GMM, Reddy CA, Woody NM, Stephans KL. Ten-Year Experience in Implementing Single-Fraction Lung SBRT for Medically Inoperable Early-Stage Lung Cancer. Int J Radiat Oncol Biol Phys. 2021 Oct 1;111(2):436-442.

Session Poster_ESTRO2025



Peter Mac
Peter MacCallum Cancer Foundation

Real world clinical outcomes for early-stage lung cancer treated with single-fraction stereotactic ablative radiotherapy in Australia

ESTRO 2025

Jennifer Yeh[1], Neil Wallace[1], Nick Hardcastle[2,3], Kevin Tu[1], Michelle Ryan[1], Nikki Plumridge[1], Mark Shaw[1], Michael MacManus[1,2], Greg Wheeler[1], Monique Youl[1], Andrew Wirth[1]
Keelan Byrne[1], Tim Spelman[4], Shankar Siva[1,2], Susan Harden[1,2]
[1]Department of Radiation Oncology, Peter MacCallum Cancer Centre, Melbourne, Australia | [2]Sir Peter MacCallum Department of Oncology, University of Melbourne, Melbourne, Australia
[3]Department of Physical Science, Peter MacCallum Cancer Centre, Melbourne, Australia | [4]Centre for Health Services Research, Peter MacCallum Cancer Centre, Melbourne, Australia

Le traitement par SABR en une seule fraction s'avère efficace et sûr pour les cancers du poumon précoces, en particulier chez les patients âgés et fragiles vivant en zones rurales, avec une survie globale médiane de 43 mois et un faible taux de récidive locale.

Purpose/Objective

- SF-SABR for lung metastases was investigated with the
- S
- S
- W

Meth

Exclusion Criteria
oligometastatic recurrence
synchronous lung primaries
N = 33

N = 128

Primary Endpoint
Overall Survival (OS)

Secondary Endpoint
Progression Free Survival (PFS)
2-year Local Failure %

Figure 1. Schematic of study method

Results

A total of 128 patients with early-stage lung cancer were

Figure 2. Kaplan-Meier OS for SF-SABR

Median OS was 43 months (IQR 19-65 months) (Figure 2), comparable to the 44-month median OS reported by the Cleveland Clinic[4]. Similarly, our 2-year local failure was 10.9%, compared to 7.3%. Median follow-up was 21.5 months (IQR: 12-34.5 months). Median PFS was 54 months.

option especially for this real-world comorbid elderly population.

References

1. Siva S, et al. Single-Fraction vs Multifraction Stereotactic Ablative Body Radiotherapy for Pulmonary Oligometastases (SAFRON II). JAMA Oncol. 2021;7(10):1476-1485. doi:10.1001/jamaoncol.2021.2939
2. Videtic GM, et al. Long-term Follow-up on NRG Oncology RTOG 0915 (NCCTG N0927). Int J Radiat Oncol Biol Phys. 2019;103(5):1077-1084. 3.
3. Singh AK et al. One Versus Three Fractions of Stereotactic Body Radiation Therapy for Peripheral Stage I to II Non-Small Cell Lung Cancer: A Randomized, Multi-Institution, Phase 2 Trial. Int J Radiat Oncol Biol Phys. 2019;105(4):752-759.
4. Videtic GMM, Reddy CA, Woody NM, Stephans KL. Ten-Year Experience in Implementing Single-Fraction Lung SBRT for Medically Inoperable Early-Stage Lung Cancer. Int J Radiat Oncol Biol Phys. 2021 Oct 1;111(2):436-442.

Session Poster_ESTRO2025

Radical Dose Re-Irradiation for Relapsed Non-Small Cell Lung Cancer ; Real World Data on Impact of Guidelines and Survival Outcomes

Jin Tee[1] Cathryn Crockett[1], Jolyne O'Hare[1], Karen Tumelty[1], Linda Young[1], Jonathan McAleese[1,2]

1) Northern Ireland Cancer Centre, Belfast City Hospital, Belfast Health and Social Care Trust

2) School of Medicine, Dentistry & Biomedical Sciences, Queen's University Belfast.

Introduction

Early detection and treatment of recurrences in order to salvage cure is an advantage of close follow-up for radically treated patients with NSCLC. Previous studies detected isolated intrathoracic relapse (ITR) in 12-15% and second primary (SP) in 10-11% of patients.[1] Patients with SP received Salvage Cure Treatment (SCT) in 40-58% of patients.[1-3] However, SCT for an ITR was much lower; 24% after initial surgery and only 3% after initial radical radiotherapy (RR). [1-3]

At our centre, radical re-irradiation (reRR) is defined as a second RR course delivered to any lung region. National reRR guidelines were adopted in 2018. In this study, the rate and outcomes of SCT for ITR, and possible reasons it was not utilised, were determined

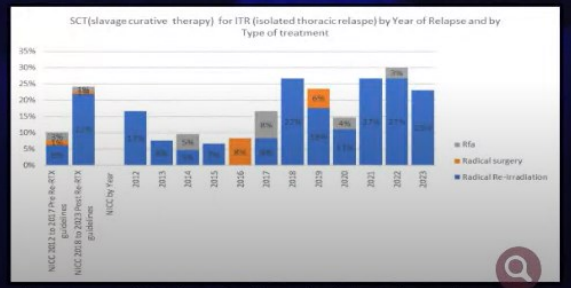


Figure 1. Rates of SCT for Isolated thoracic relapse and type of treatment

Methods

Analysis of a peer review database for patients receiving initial RR for NSCLC between 2000-2024, for whom there was a relapse in the years 2012 to 2023. Updated data is presented for the meeting. SCT was defined as curative intent radiotherapy, radiofrequency ablation (RFA) or surgery. Second primary was defined using the Martini criteria.

Cox-proportional Multivariate analysis of survival was performed using factors recognised to potentially impact survival (age, WHO performance status, gender).

Results

Of 2424 patients who received RR, 1218 (50%) suffered a relapse during a median follow-up of 19 months. 262 (11%) had Intrathoracic Relapse (ITR) and 58 (2%) Second Primary (SP).

Only 16% of ITR received SCT compared to 64% of SP, 33% of ITR received palliative anti-cancer therapy (PACT) compared to 9% of SP, and 51% of ITR only best supportive care (BSC) compared to 28% of SP.

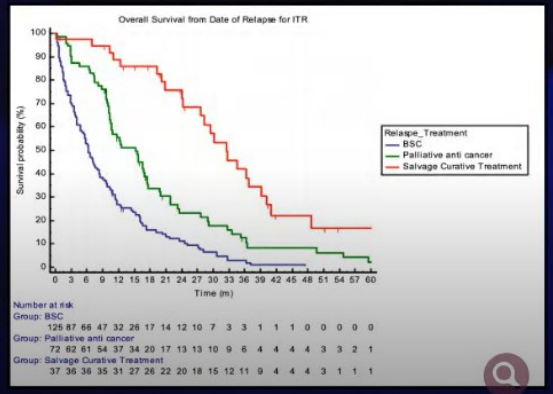


Figure 2. KP curve showing comparisons of OS for different treatments

Regarding ITR relapses; Most SCT type (86%) was with reRR. The rate of SCT rose over the period from 8% (pre 2018) to 20% (post 2018) (p=0.01), largely as a result of an increase in reRR.

The median survival (and 2 year overall survival) for those treated with BSC was 6.3 months (11%), compared to 15.3 months (23%) for PACT and 32.6 months (69%) for SCT.

SCT was significantly associated with improved survival on multivariate analysis.

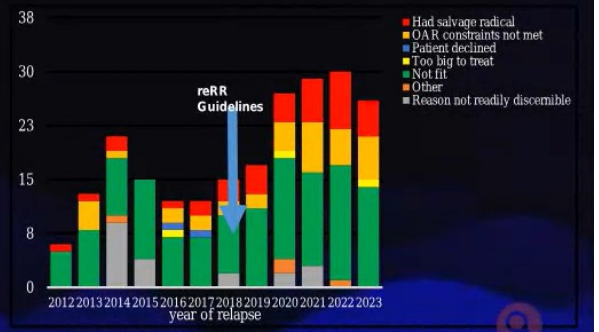


Figure 3. ITR salvage treatment and reasons for salvage treatment not given

Conclusion

In this retrospective single-centre cohort study there was a rise in the SCT rate which exceeded previously reported rates, after the introduction of reRR guidelines.

Most ITRs were treated with reRR. SCT was associated with meaningful survival outcomes, though patient selection is likely to be important. Follow-up programs should include access to re-irradiation to harness the benefit of detecting isolated locoregional relapse.

Contact

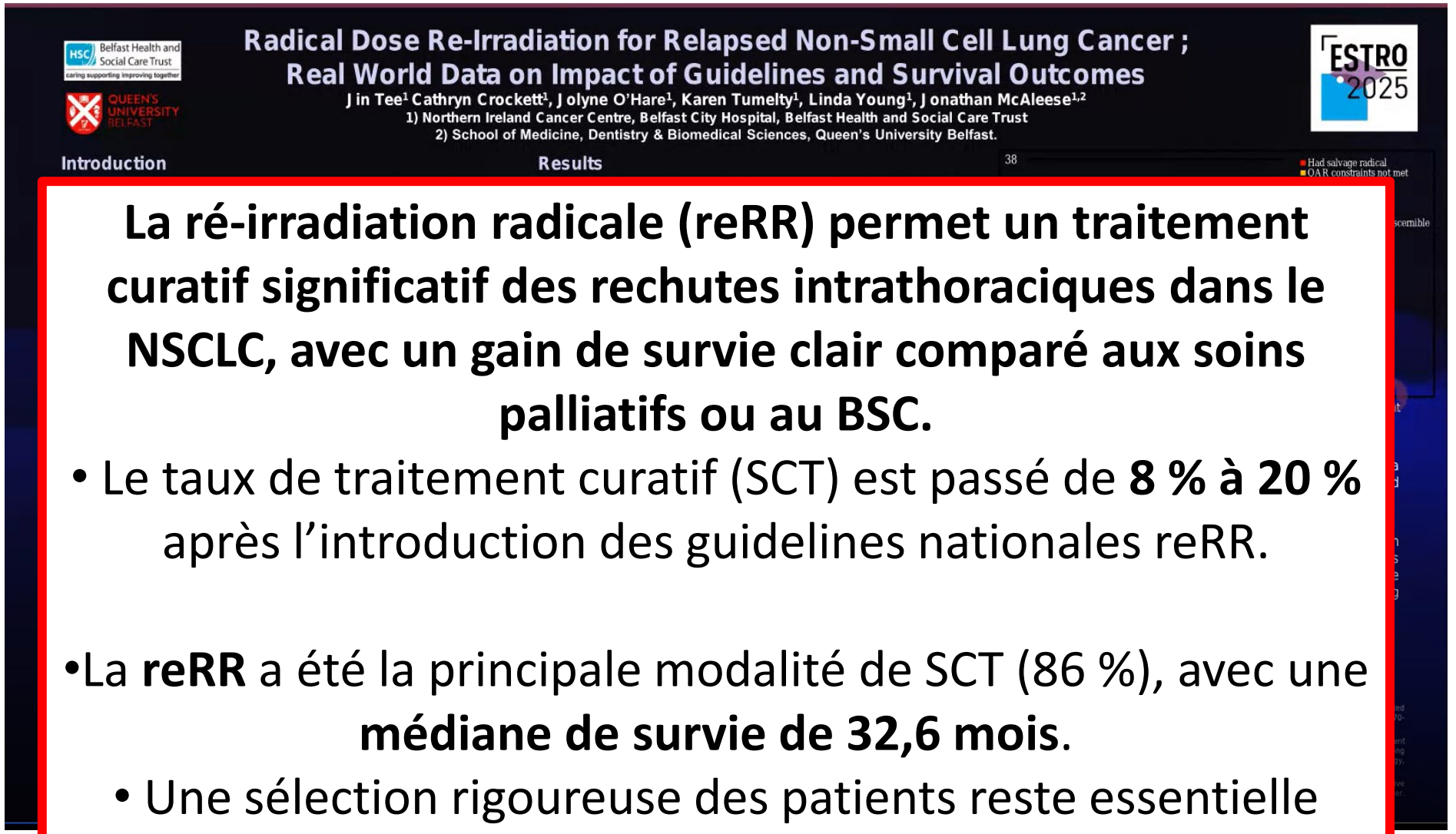
Jin.Tee@belfasttrust.hscni.net

Jonathan.McAleese@belfasttrust.hscni.net

References

1. Westeel et al. (2022). Chest CT scan plus Xray versus Chest Xray for follow-up of completely resected non-small-cell lung cancer (IFCT-0302). Lancet Oncology 11/08/2022. https://doi.org/10.1016/S1470-2045(22)00451-X
2. Evison M et al., Predicting the Risk of Disease Recurrence and Death Following Curative-intent Radiotherapy for Nonsmall Cell Lung Cancer: The Development and Validation of Two Scoring Systems From a Large Multicentre UK Cohort, Clinical Oncology, https://doi.org/10.1016/j.clon.2020.09.0013
3. Brooks E et. Al. (2019) Salvage Therapy for Locoregional Recurrence After Stereotactic Ablative Radiotherapy for Early-Stage NSCLC. International Association for Study of Lung Cancer Elsevier. https://doi.org/10.1016/j.jtho.2019.10.016

Session Poster_ESTRO2025



La ré-irradiation radicale (reRR) permet un traitement curatif significatif des rechutes intrathoraciques dans le NSCLC, avec un gain de survie clair comparé aux soins palliatifs ou au BSC.

- Le taux de traitement curatif (SCT) est passé de **8 % à 20 %** après l'introduction des guidelines nationales reRR.

- La **reRR** a été la principale modalité de SCT (86 %), avec une **médiane de survie de 32,6 mois**.
- Une sélection rigoureuse des patients reste essentielle pour maximiser les bénéfices

TAKE HOME MESSAGES

• *Les inhibiteurs de tyrosine kinase (TKI)* ont transformé la prise en charge du NSCLC EGFR/ALK+, mais ne suffisent pas toujours à eux seuls.

• La **radiothérapie reste un allié stratégique** dans les situations d'oligoprogression, de masse résiduelle ou pour consolider la réponse.

• **RT à l'ère des TKI** devient plus ciblée, moins toxique, mais toujours aussi cruciale pour optimiser les résultats à long terme.

• Les essais **CROWN, LAURA, BOUNCE, HORIZON** confirment un **bénéfice en survie** lorsqu'une RT ciblée est intégrée intelligemment.

• Une **décision multidisciplinaire individualisée** est essentielle : adapter l'intensité et le moment de la RT au parcours du patient.