



Radiothérapie des cancers ORL

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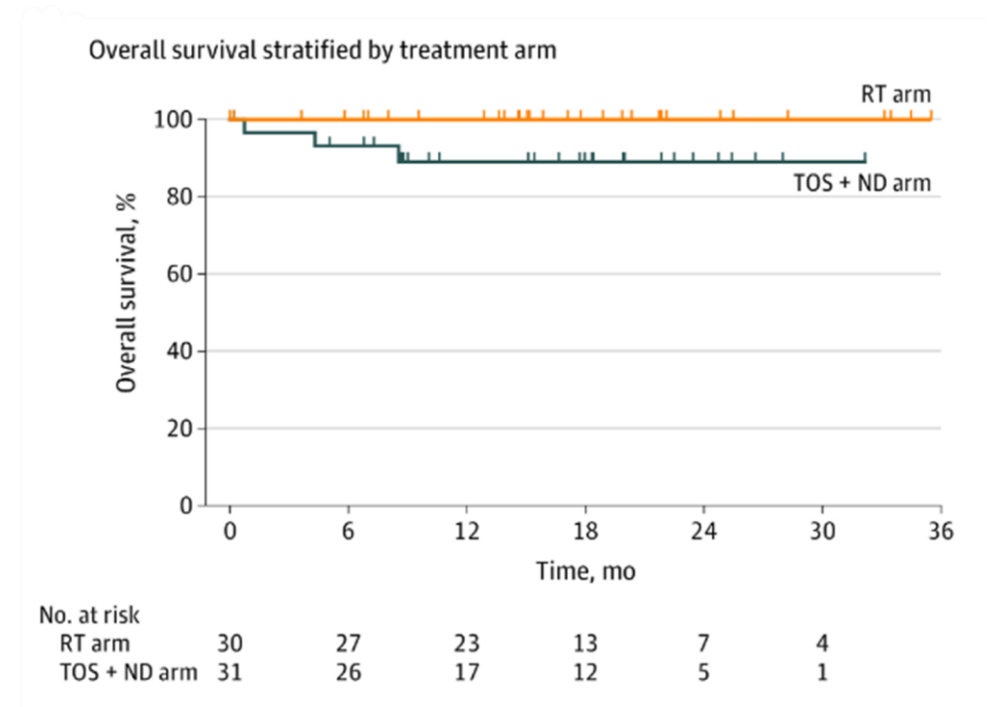
Quantif LITIS EA4108

Liens intérêts

- ✓ Merck
- ✓ Varian
- ✓ Astra Zeneca
- ✓ Amgen
- ✓ MSD
- ✓ Brainlab

Prérequis

- ✓ Traitement majeur dans les CE de la tête et du cou
- ✓ Exclusif
 - ✓ T1N0 laryngé
 - ✓ Patient âgé
- ✓ Radiochimiothérapie (+/- Cetuximab)
 - ✓ Oropharyngé
- ✓ Post-opératoire
 - ✓ Exclusif
 - ✓ Radiochimiothérapie (facteurs de risque T, N...)



Faisons toujours la même chose

(R)évolution en radiothérapie



1900

Premiers traitements



1910

250 kV



1950

Co 60



1970

LINAC
(Accélérateurs Linéaires)



1995

Imagerie
portale 2D

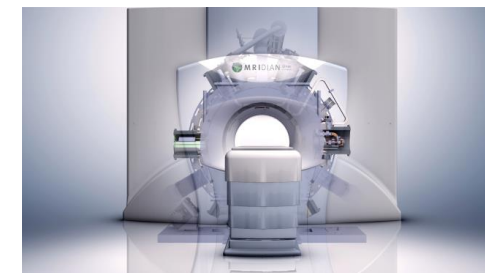


2000

RCMI
Cone beam CT
(CBCT) 3D



2005 - 2025



SBRT, Radiothérapie adaptative,
(Images stéréoscopiques
Asservissement respiratoire...)

Dose physique

Modalités d'irradiation

- volume irradié
- facteurs temps

Traitements associés

- sensibilisants
- protecteurs
- autres agressions

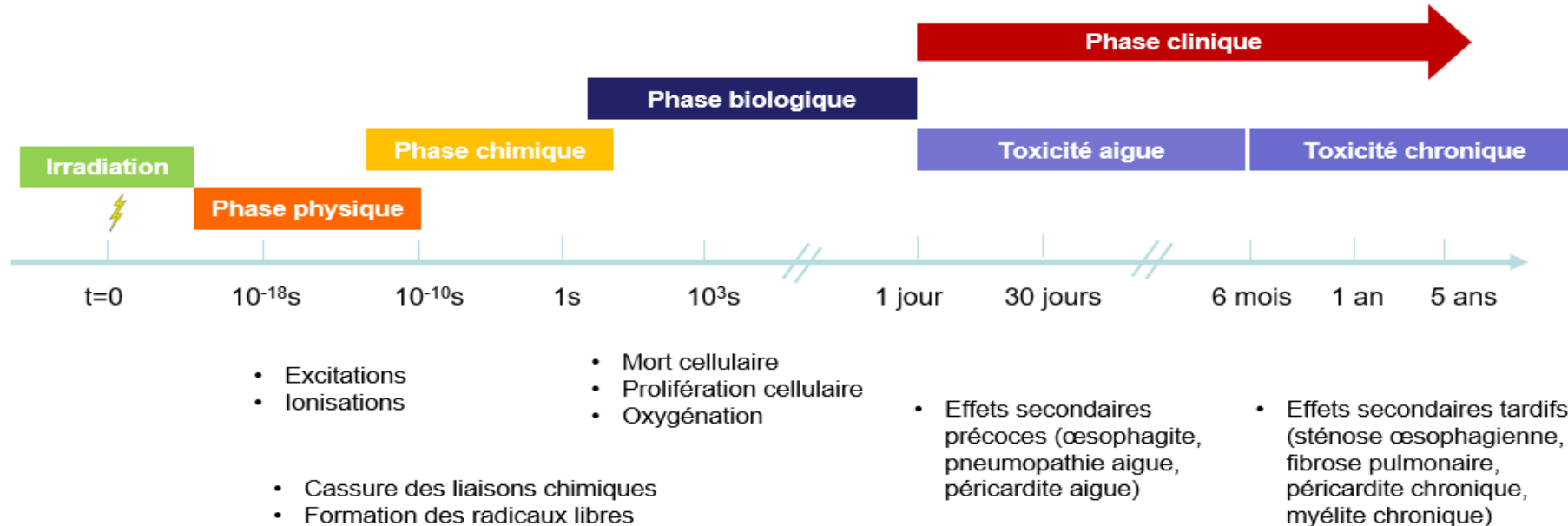
Facteurs biologiques

- réparation
- prolifération
- oxygénation
- réserve fonctionnelle

Facteurs liés au patient

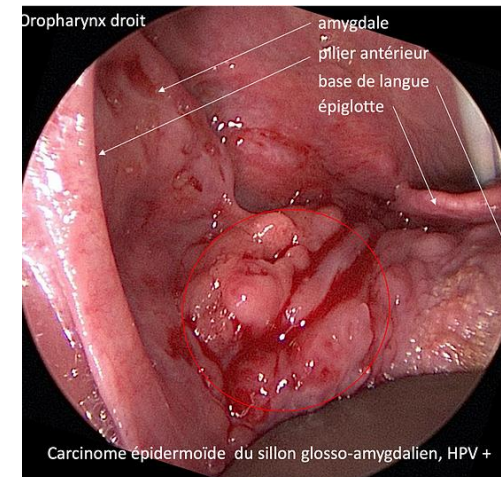
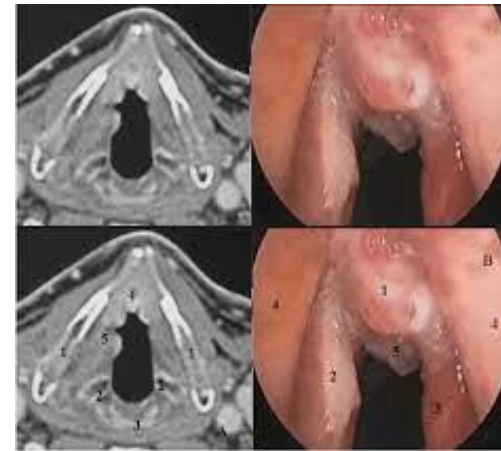
- âge, habitus
- antécédents pathologiques
- prédisposition génétique

Effet biologique



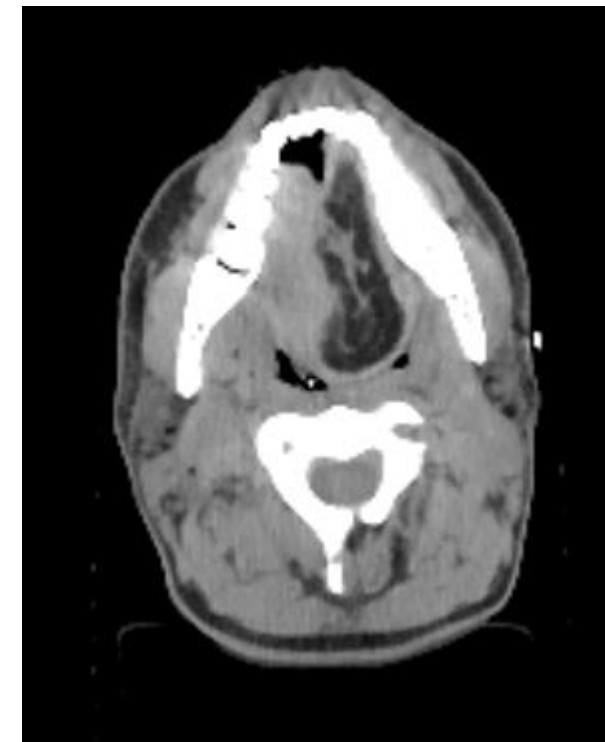
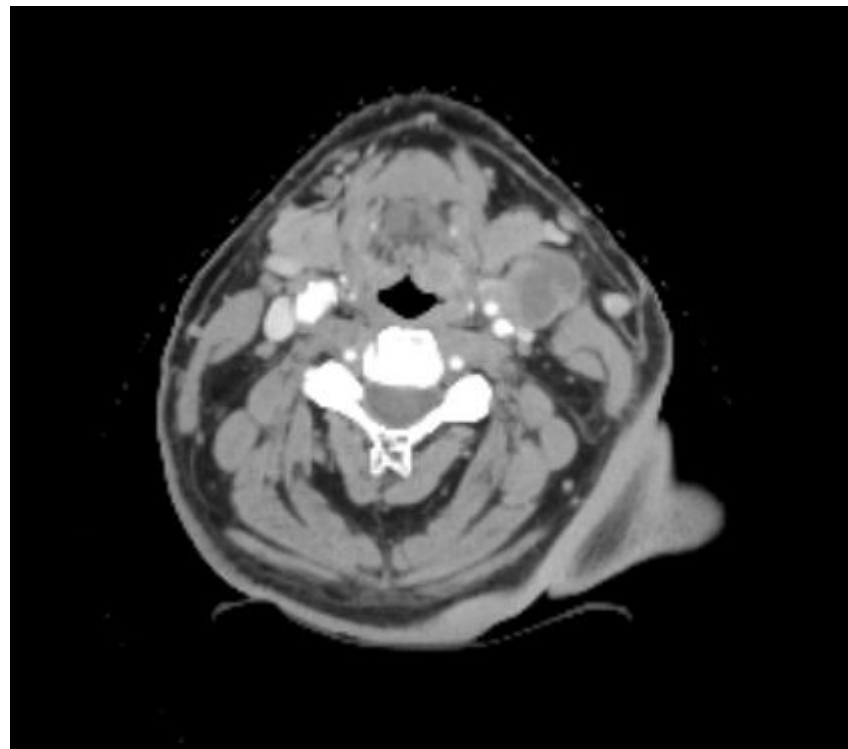
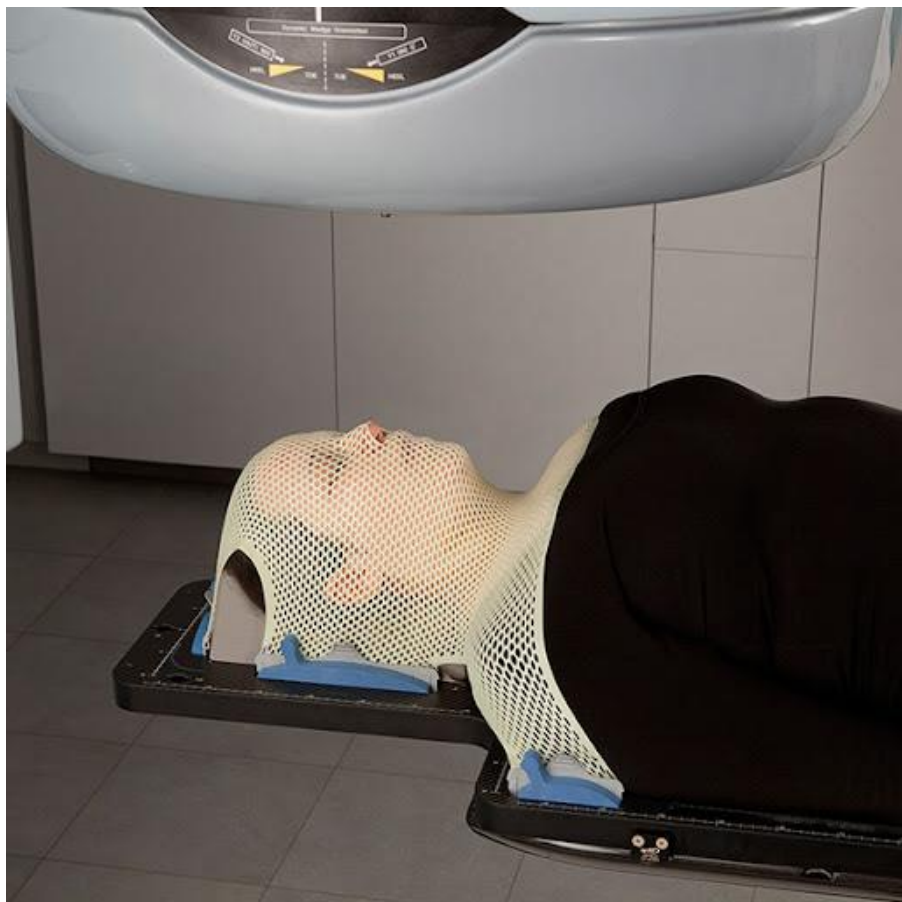
Evaluation clinique

- ✓ Antécédents
 - ✓ Comorbidités
- ✓ Histoire de la maladie
- ✓ Examen clinique
- ✓ Corrélation
 - ✓ Imagerie - Clinique



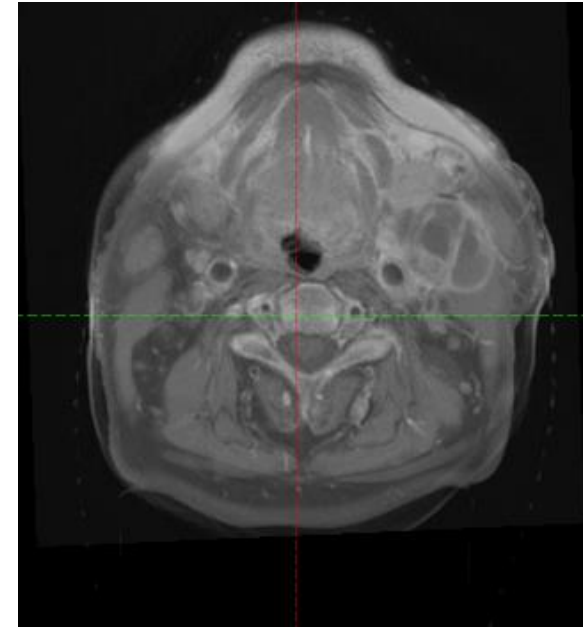
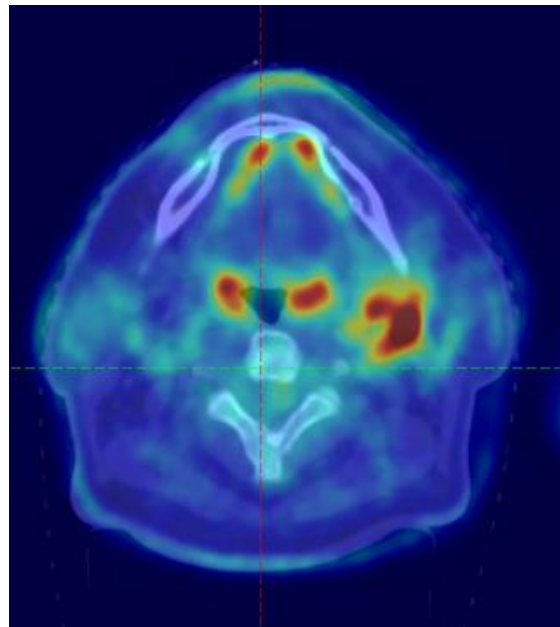
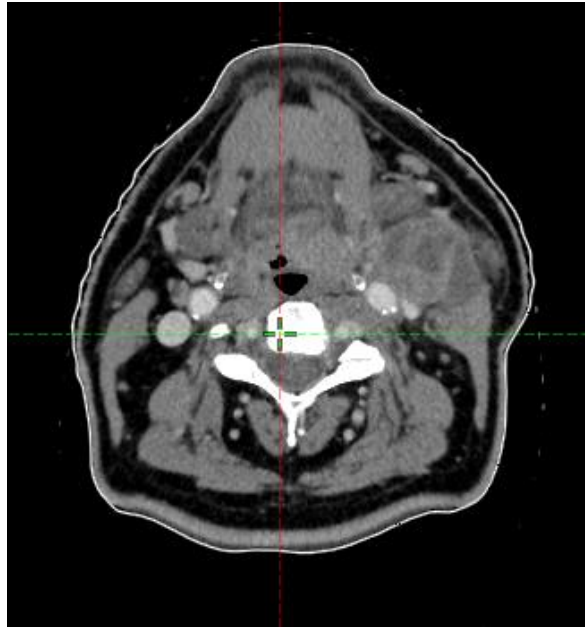
Imagerie de positionnement

Systèmes de contention



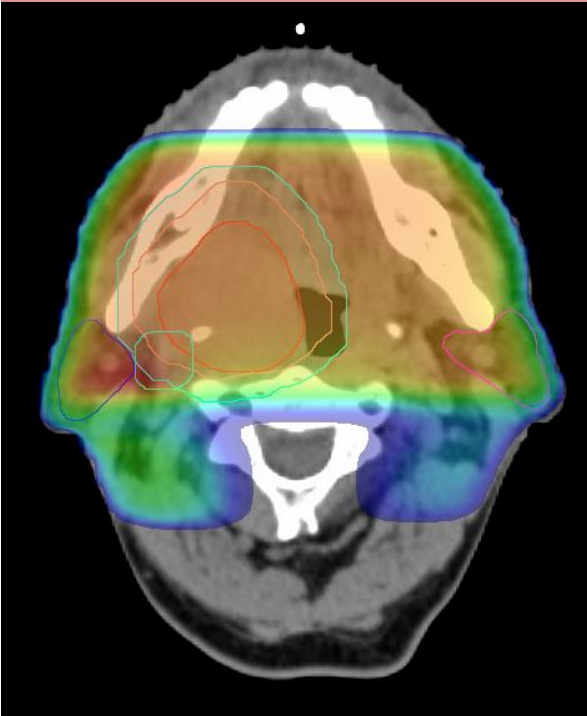
Imagerie de positionnement

Multimodalités

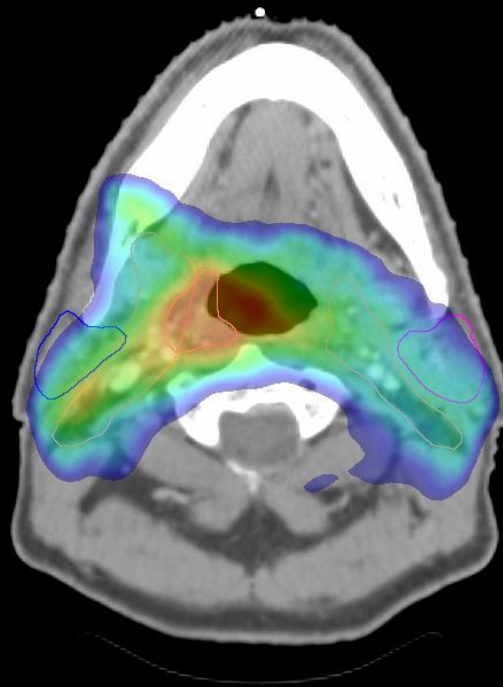


Dosimétrie

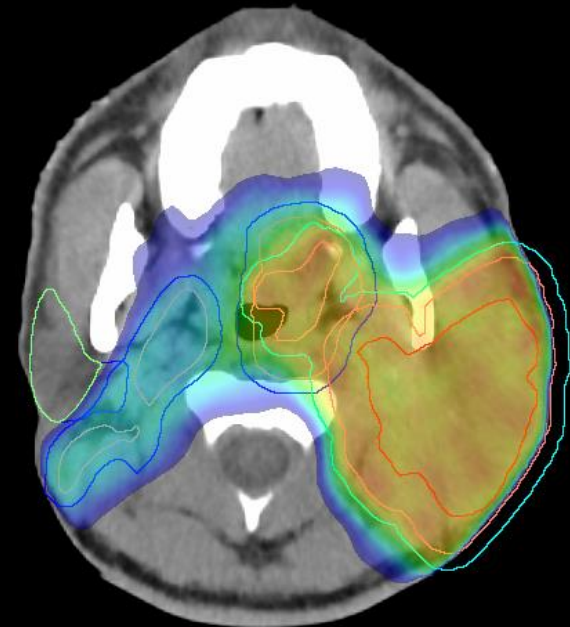
Conformationnelle



IMRT par faisceaux statiques

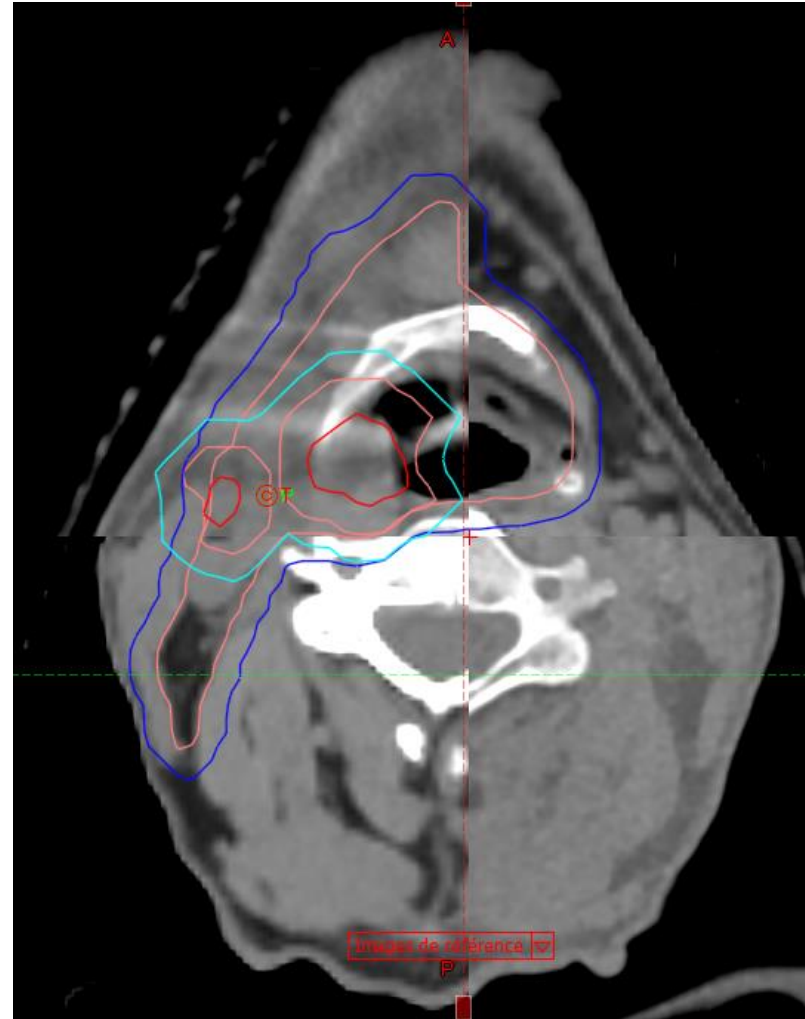


IMRT rotationnelle

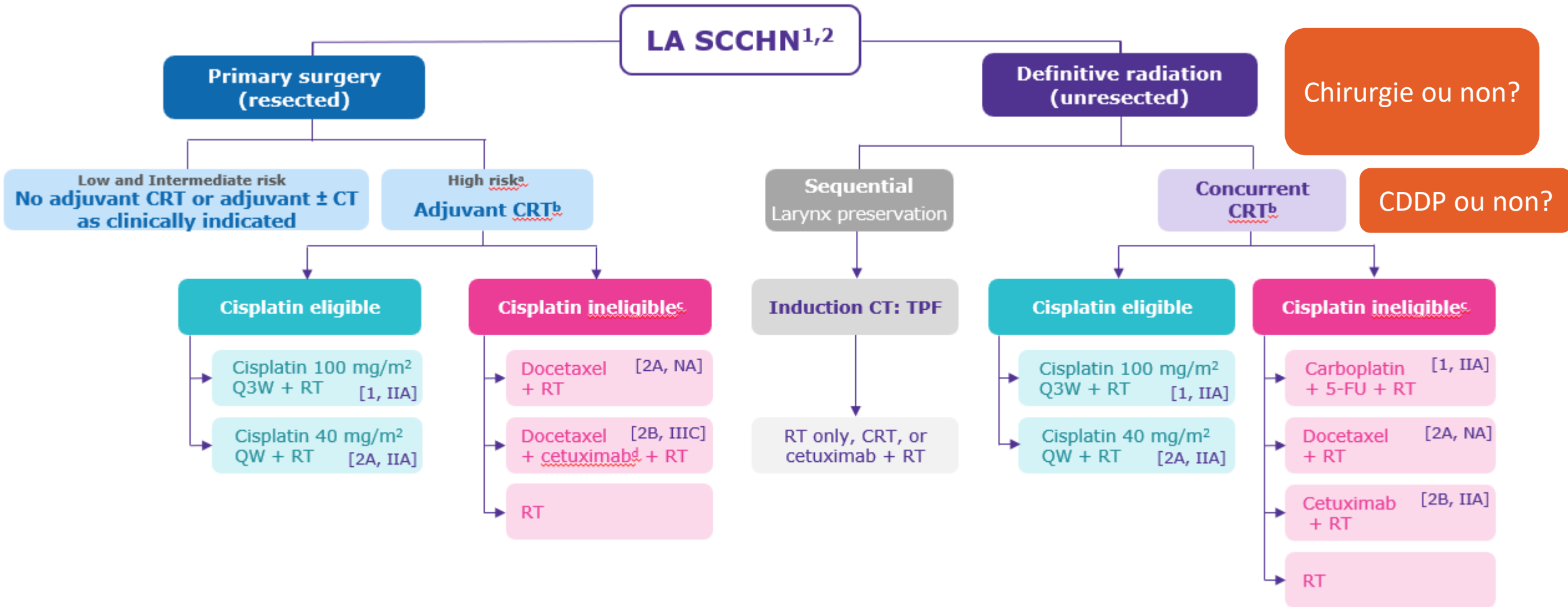


Traitement

- ✓ Traitement fractionné
 - ✓ 5 à 7 semaines de traitement
- ✓ Problématique des modifications anatomiques
 - ✓ Radiothérapie adaptative
- ✓ Gestion des effets secondaires



Où en sommes-nous?



Axe de recherche

✓ Stratégie

- ✓ Traitement néoadjuvant
- ✓ Maintenance / consolidation

✓ Radiothérapie

- ✓ Dose
- ✓ Energie
- ✓ Volume
- ✓ Nanoparticules
- ✓ Adaptative

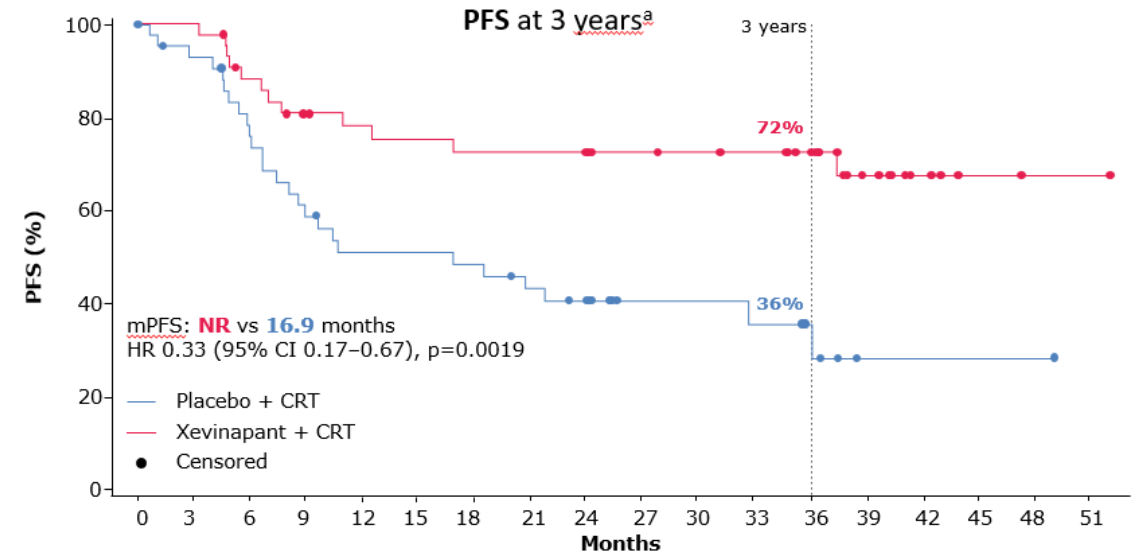
✓ Prise en charge globale

- ✓ Nutrition

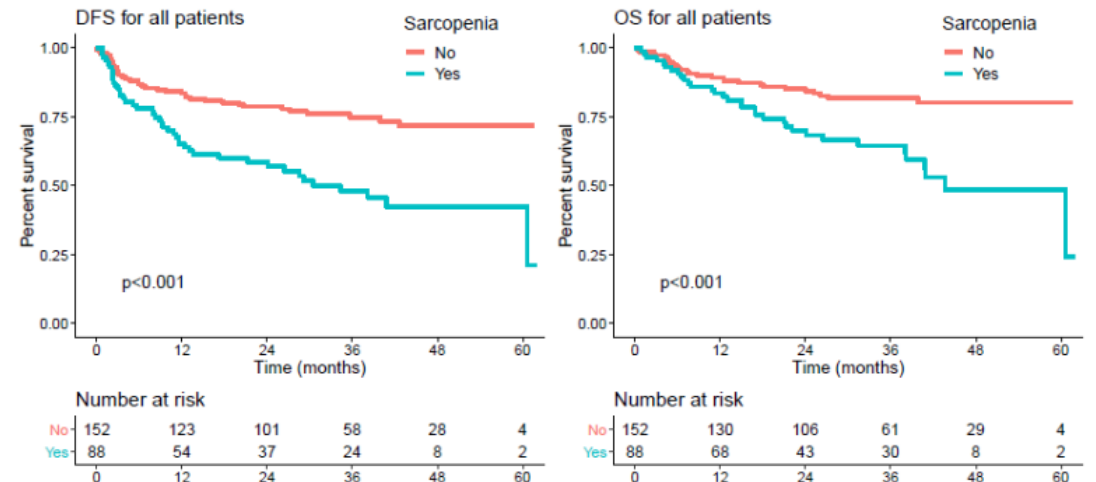
✓ Evaluation

- ✓ Biologie
- ✓ Imagerie

Phase II Xevinapant



Sarcopenie



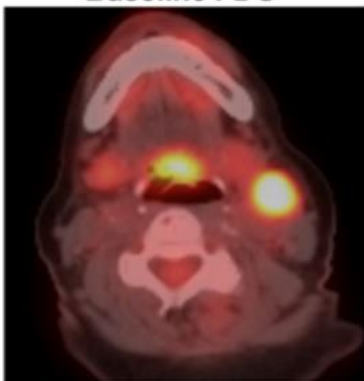
Dose de radiothérapie

FDG

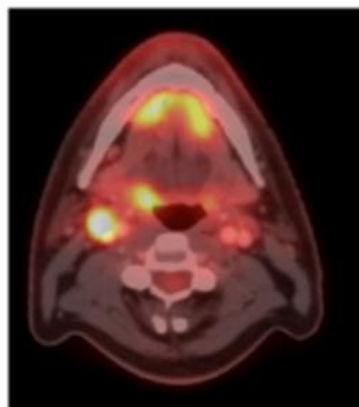
Fmiso

Trial Schema

Patient 1
Baseline FDG

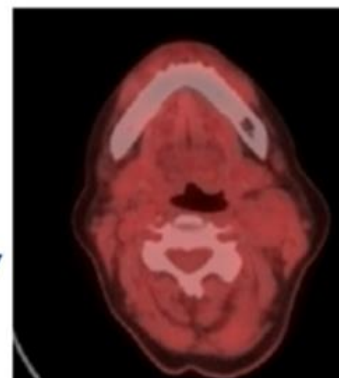


Patient 2
Baseline FDG

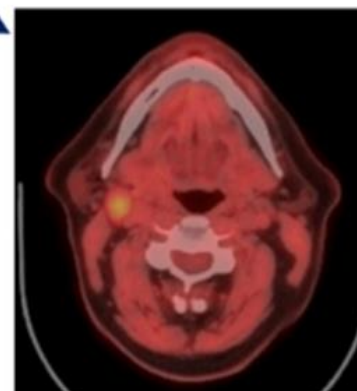


1 cycle of
cisplatin
+
20Gy

Intra-Tx week 2
FMISO PET (Negative)



Intra-Tx week 2
FMISO PET (Positive)



30Gy +
2 cycles of
Cisplatin

111 patients

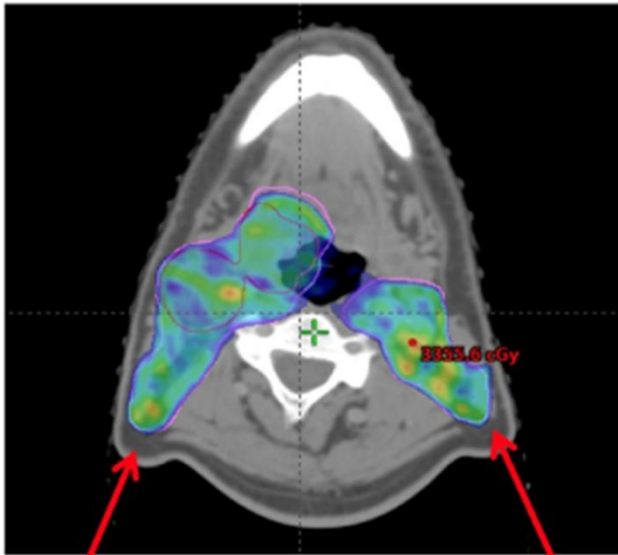
70Gy +
3 cycles of
Cisplatin

39 patients



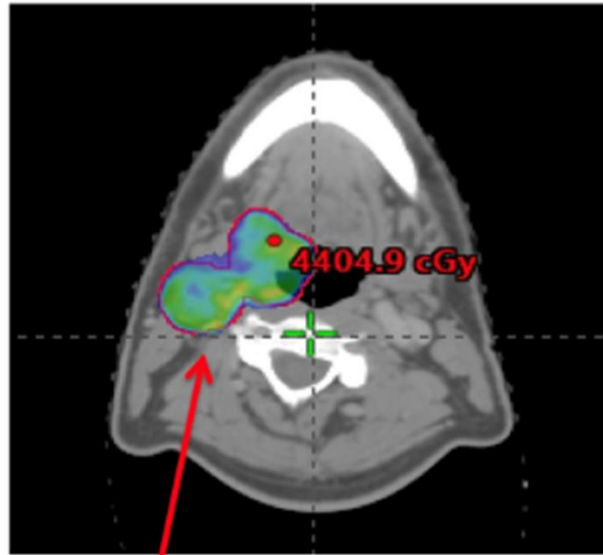
Dose de radiothérapie

Radiation Planning



First Phase: 30Gy in 2 Gy per day

Every patients treated to 30Gy



Second Phase: 40Gy in 2 Gy per day

Only happens if there is hypoxia

Local Failure

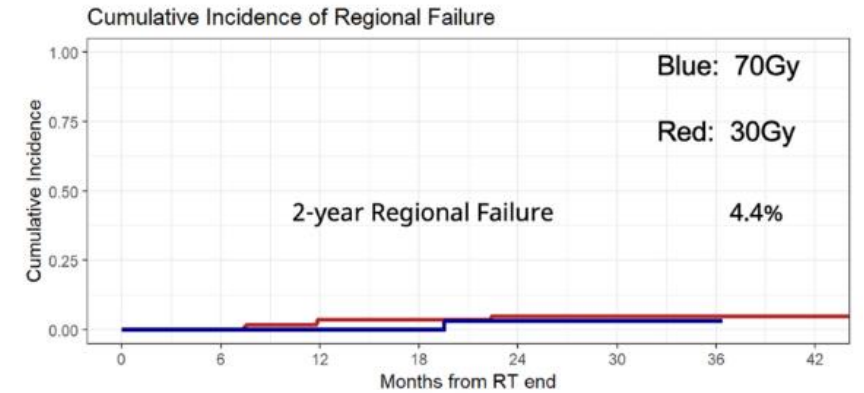
Median FU: 28 months (12-46 months)



	30Gy								70Gy							
At Risk	111	111	111	95	67	43	19	5	39	39	39	32	25	16	3	0
Events	0	0	0	3	4	4	4	4	0	0	0	0	1	1	1	1

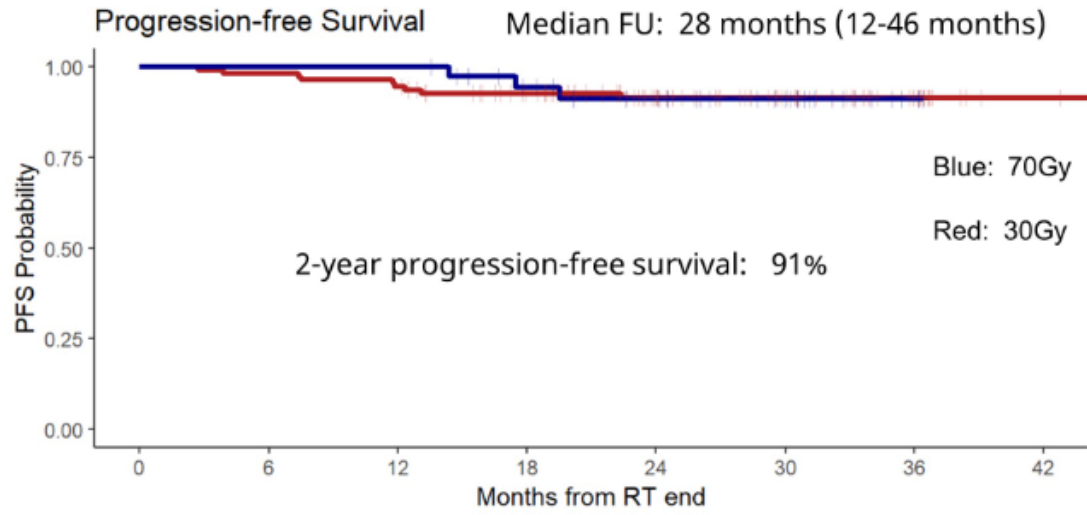
Regional Failure

Median FU: 28 months (12-46 months)

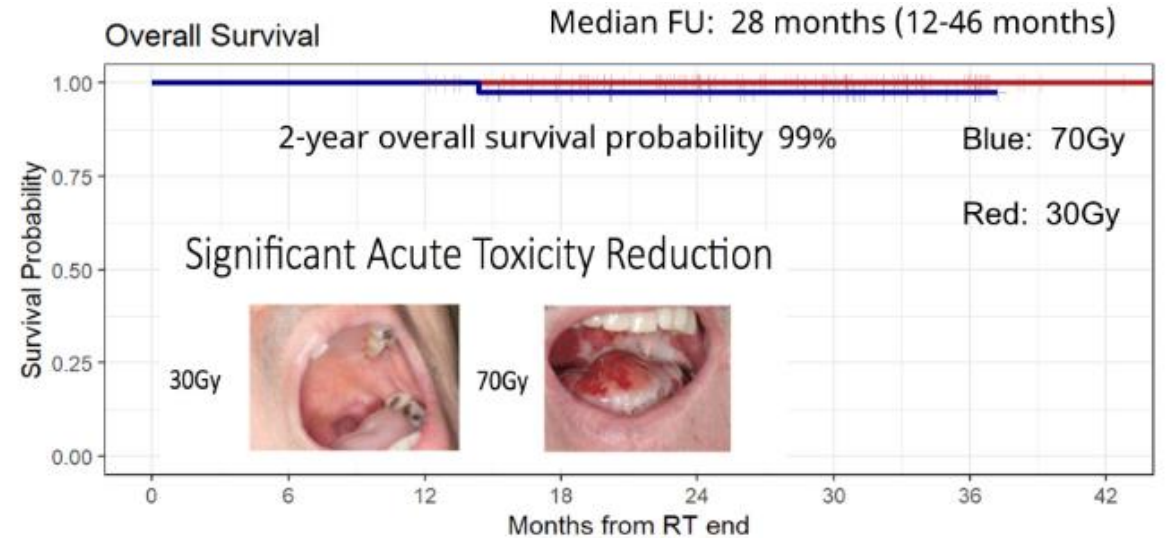


	30Gy								70Gy							
At Risk	111	111	107	94	65	42	18	4	39	39	39	32	25	16	3	0
Events	0	0	4	4	5	5	5	5	0	0	0	0	1	1	1	1

Dose de radiothérapie



	0	6	12	18	24	30	36	42
30Gy								
At Risk	111	109	105	90	63	40	18	4
Events	0	2	6	8	9	9	9	9
70Gy								
At Risk	39	39	39	31	25	16	3	0
Events	0	0	0	2	3	3	3	3



	0	6	12	18	24	30	36	42
30Gy								
At Risk	111	111	111	98	69	45	19	5
Events	0	0	0	0	0	0	0	0
70Gy								
At Risk	39	39	39	32	26	17	4	0
Events	0	0	0	1	1	1	1	1

Acute toxicity 10% versus 40% de grade 3-4

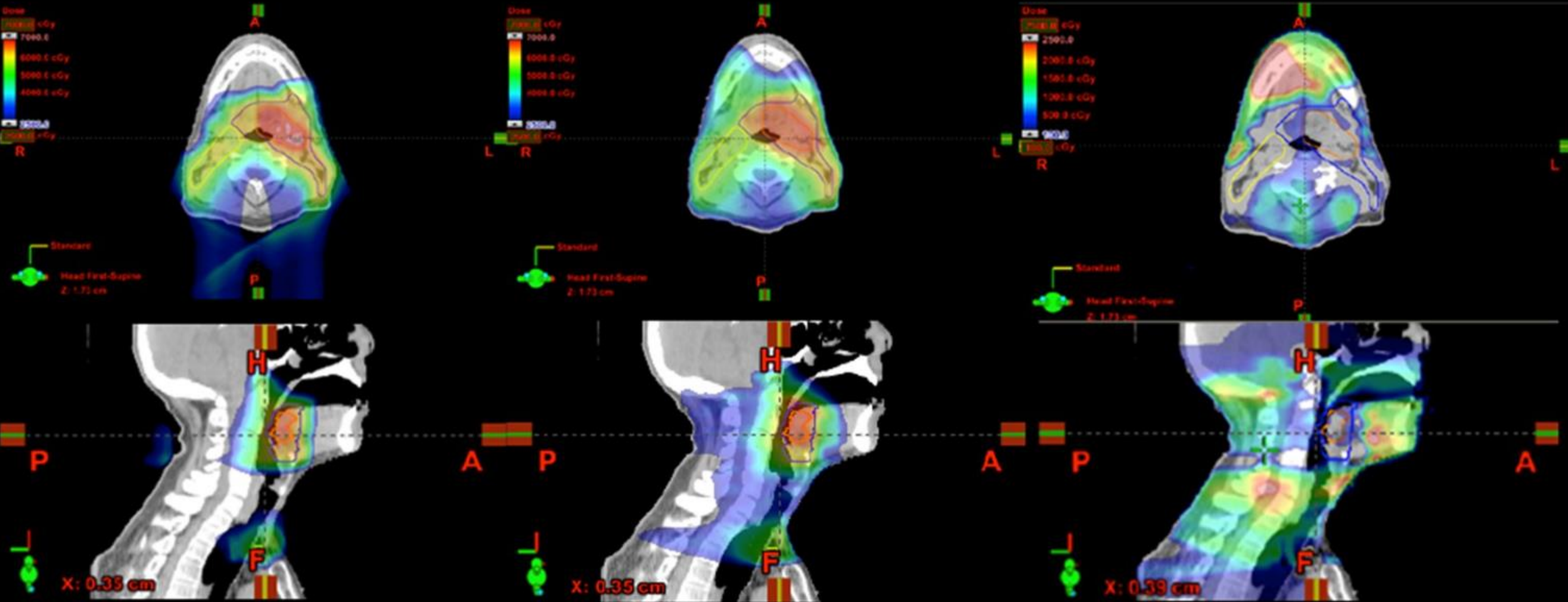
Late toxicity 2% versus 11% de grade 1

Type d'énergie

IMPT PROTON

IMXT PHOTONS

Added Dose w/ IMXT

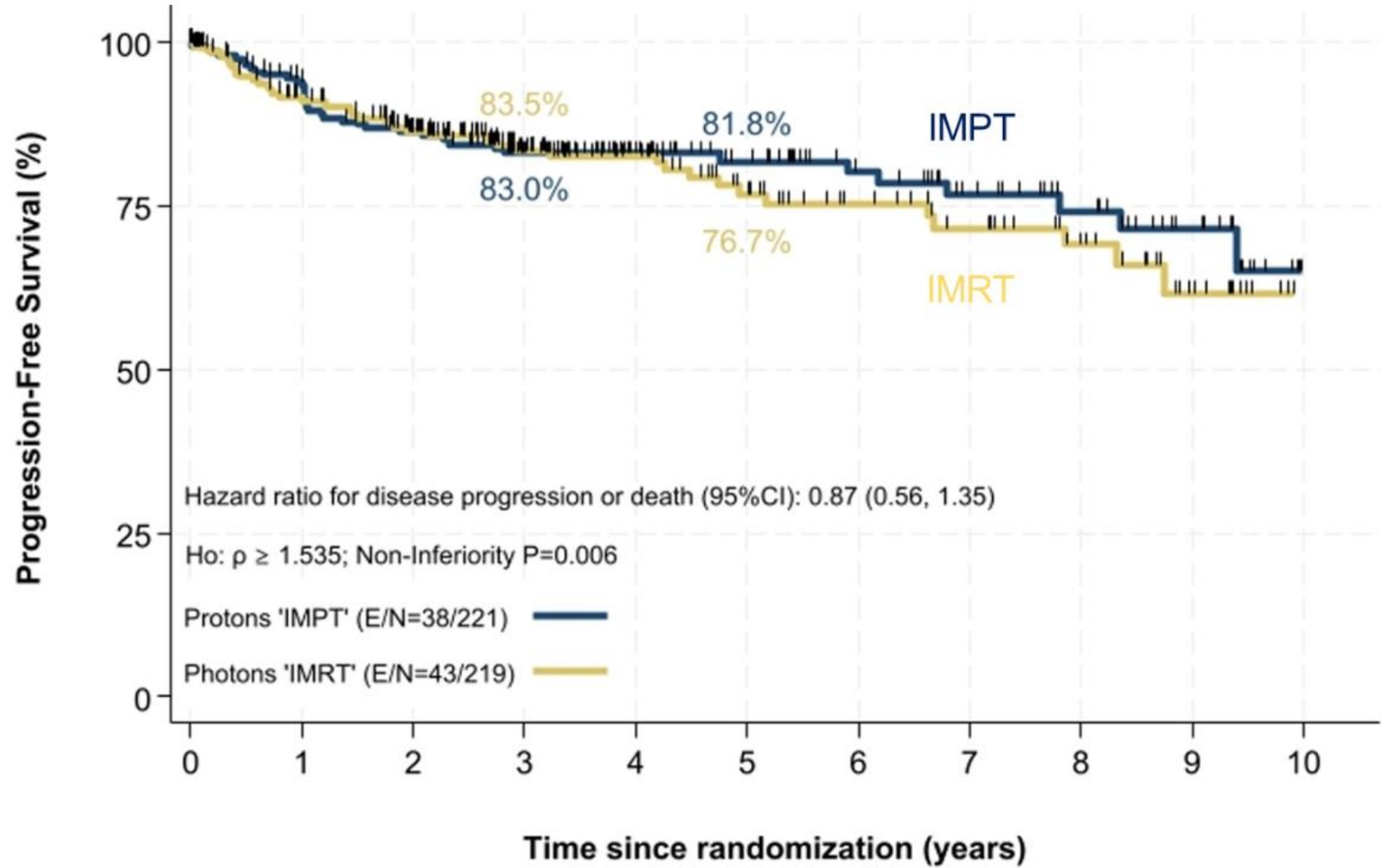


RED is high dose, **GREEN** is intermediate dose, **BLUE** is lower dose

Type d'énergie

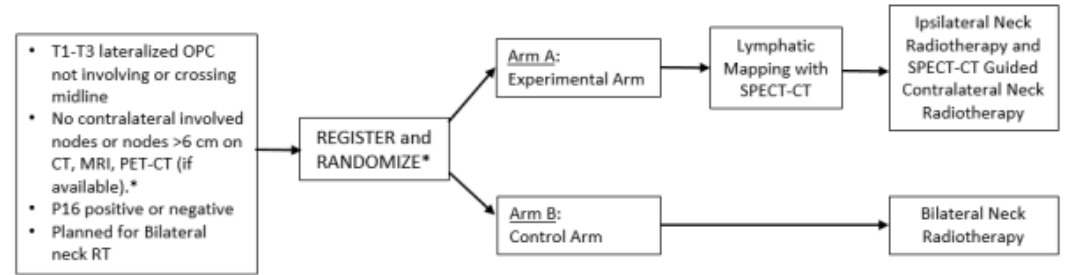
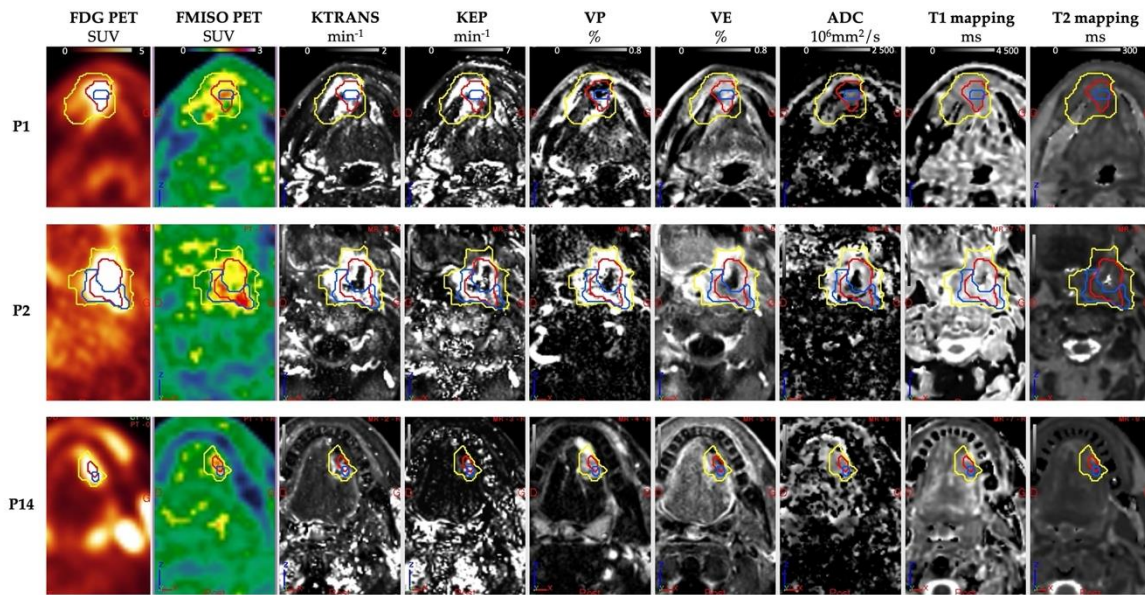
Progression-Free Survival (ITT)

IMPT is Non-Inferior to IMRT

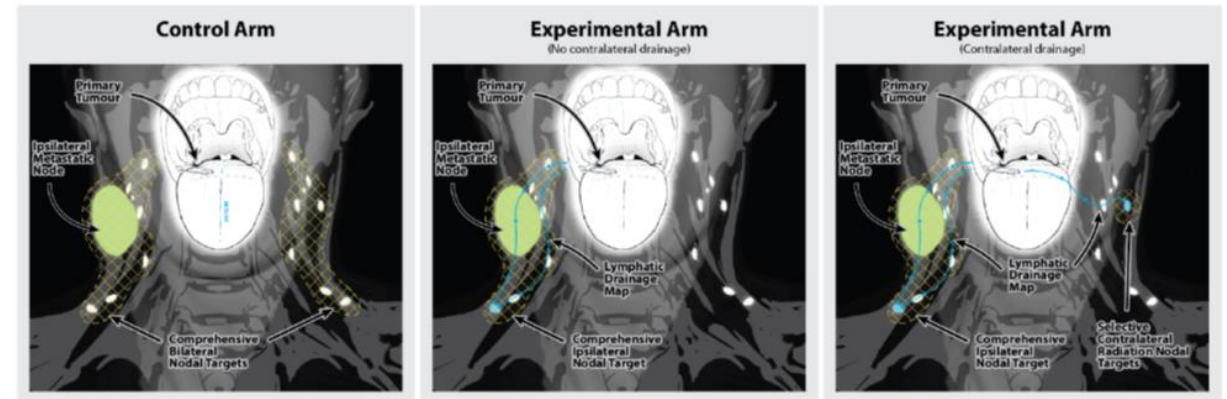


	0	1	2	3	4	5	6	7	8	9	10
IMPT (E/N=38/221)	221 (12)	173 (14)	147 (5)	107 (0)	78 (1)	64 (1)	49 (2)	39 (1)	30 (1)	18 (1)	0 (0)
IMRT (E/N=43/219)	219 (17)	176 (10)	150 (4)	108 (1)	82 (5)	58 (1)	45 (2)	37 (1)	25 (2)	11 (0)	0 (0)

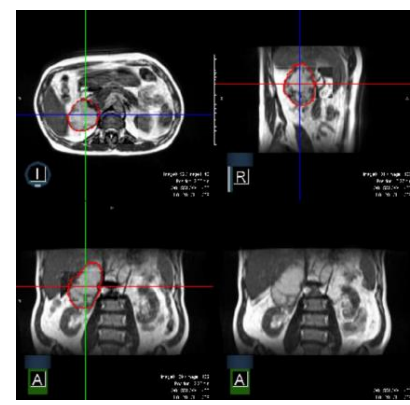
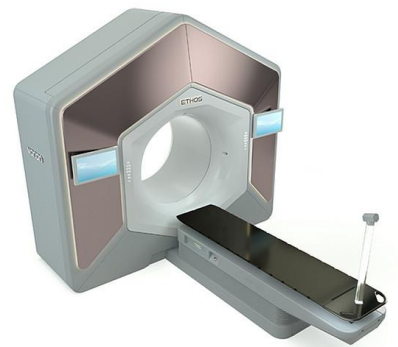
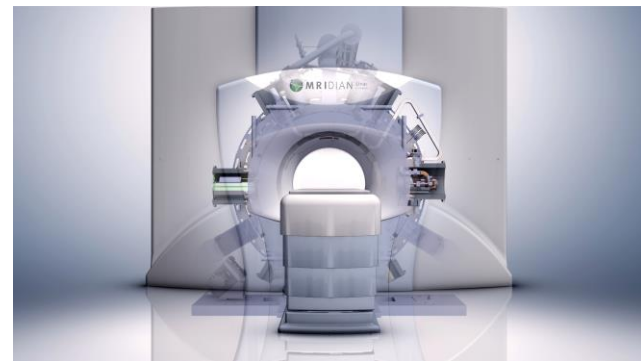
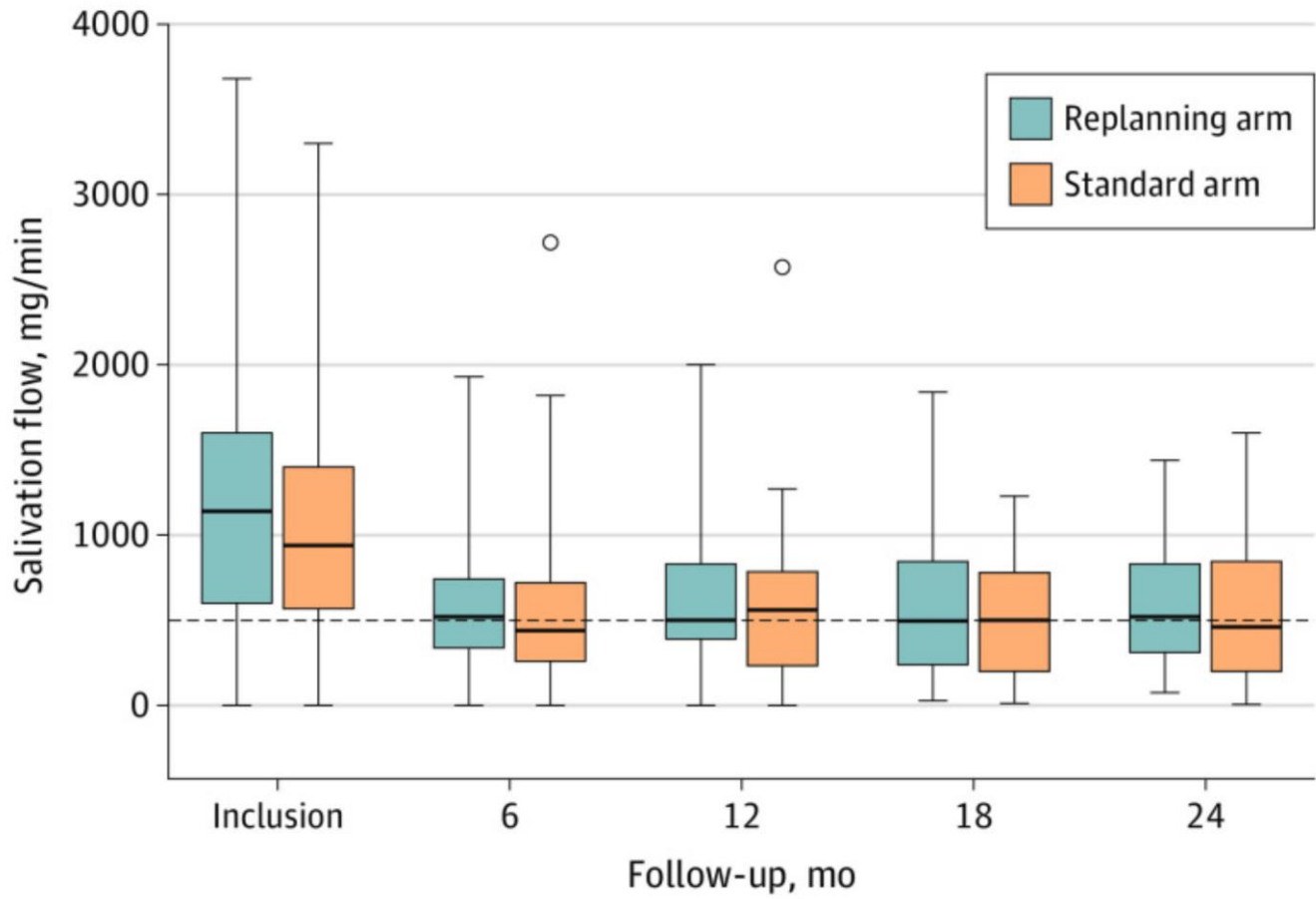
Sélection des volumes



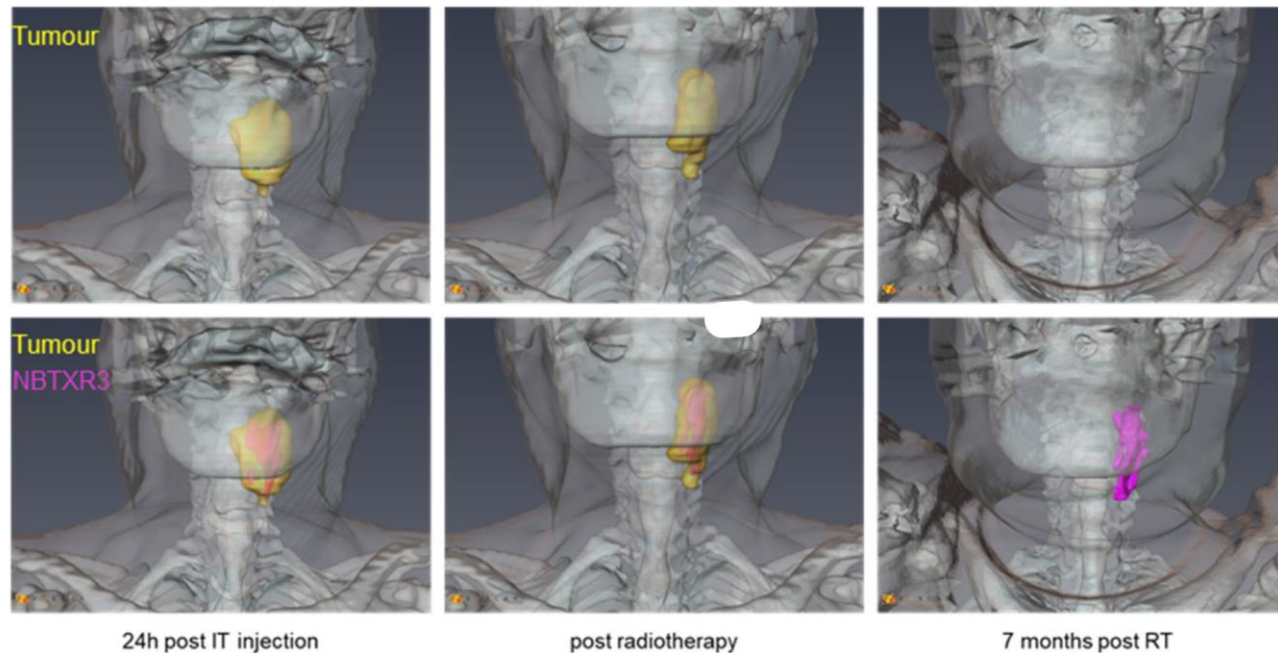
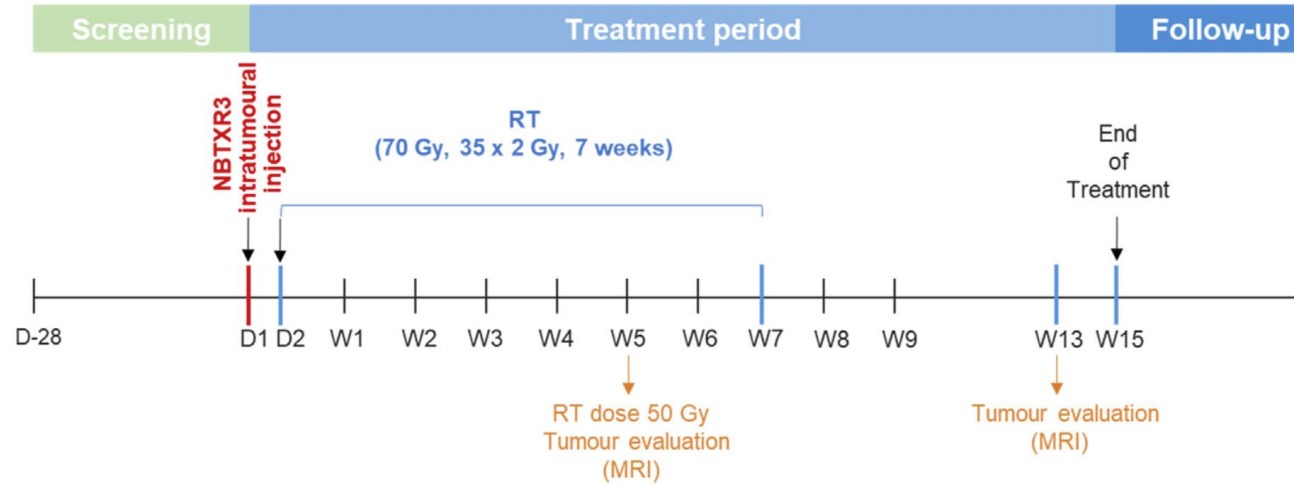
*If a PET/CT has already been done and reviewed as per standard of care prior to Registration, Randomization should occur immediately after the Registration step. If a PET/CT must be done post Registration, Randomization must occur within 4 weeks of Registration (recommended within 2 weeks if scheduling allows).



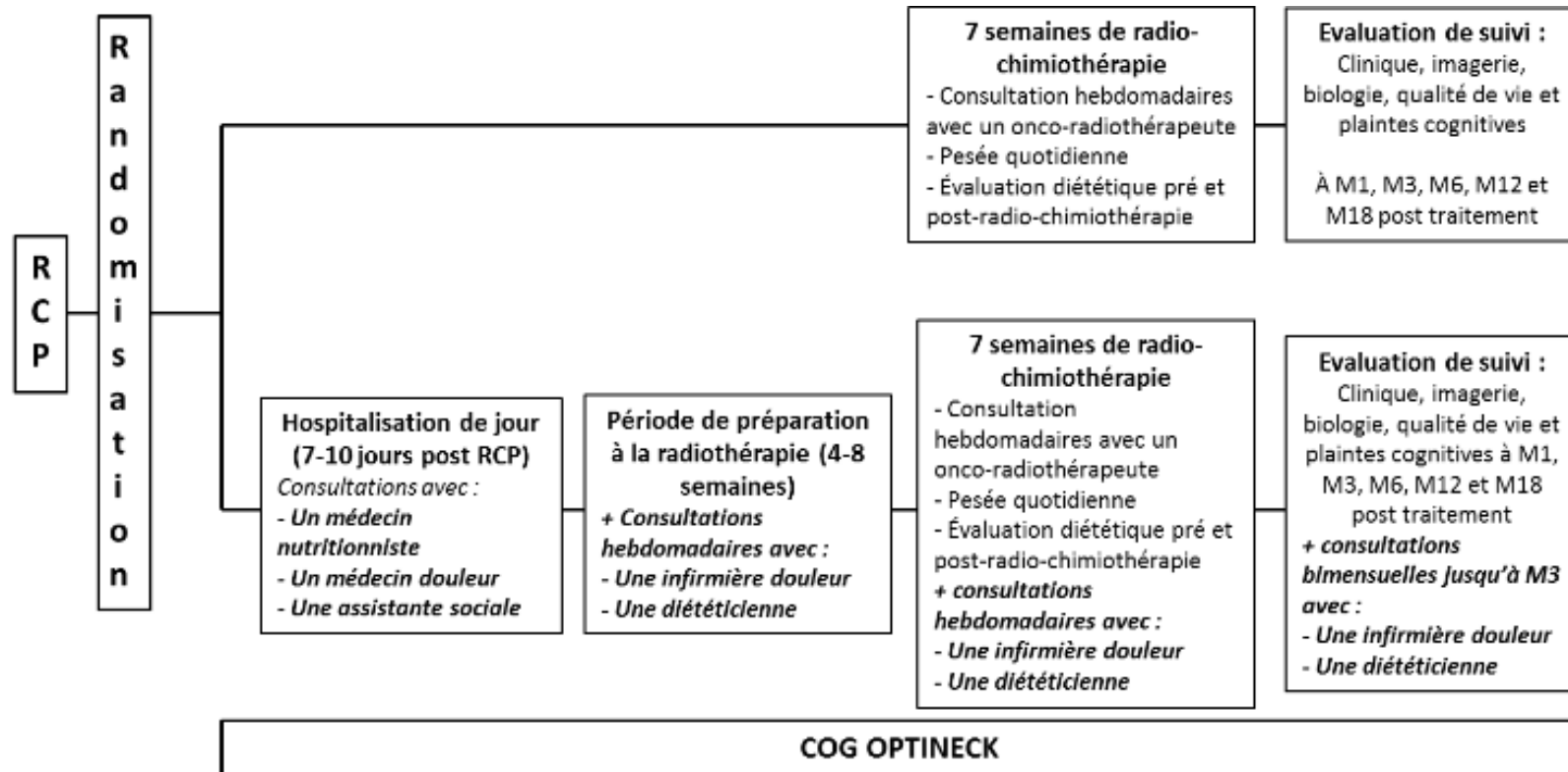
Radiothérapie adaptative



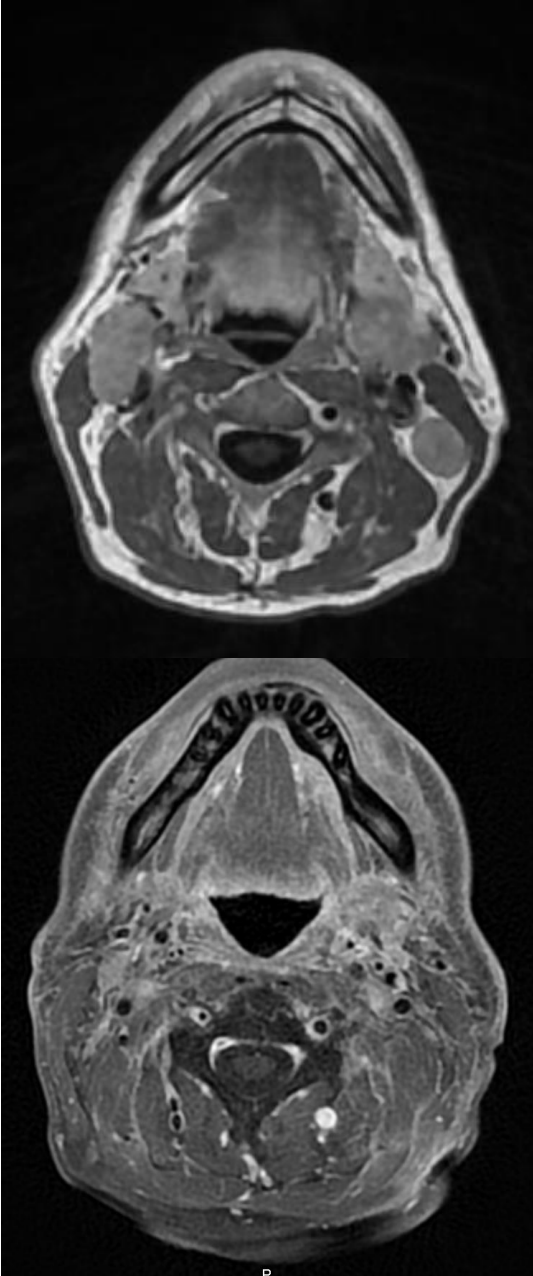
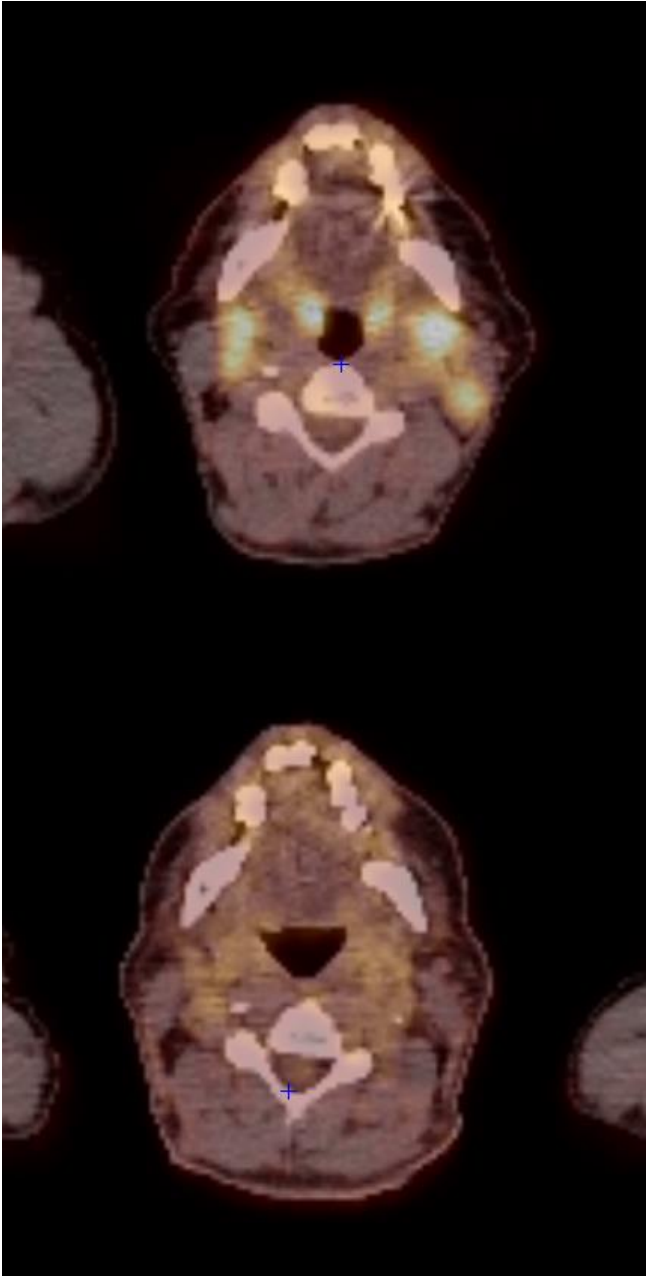
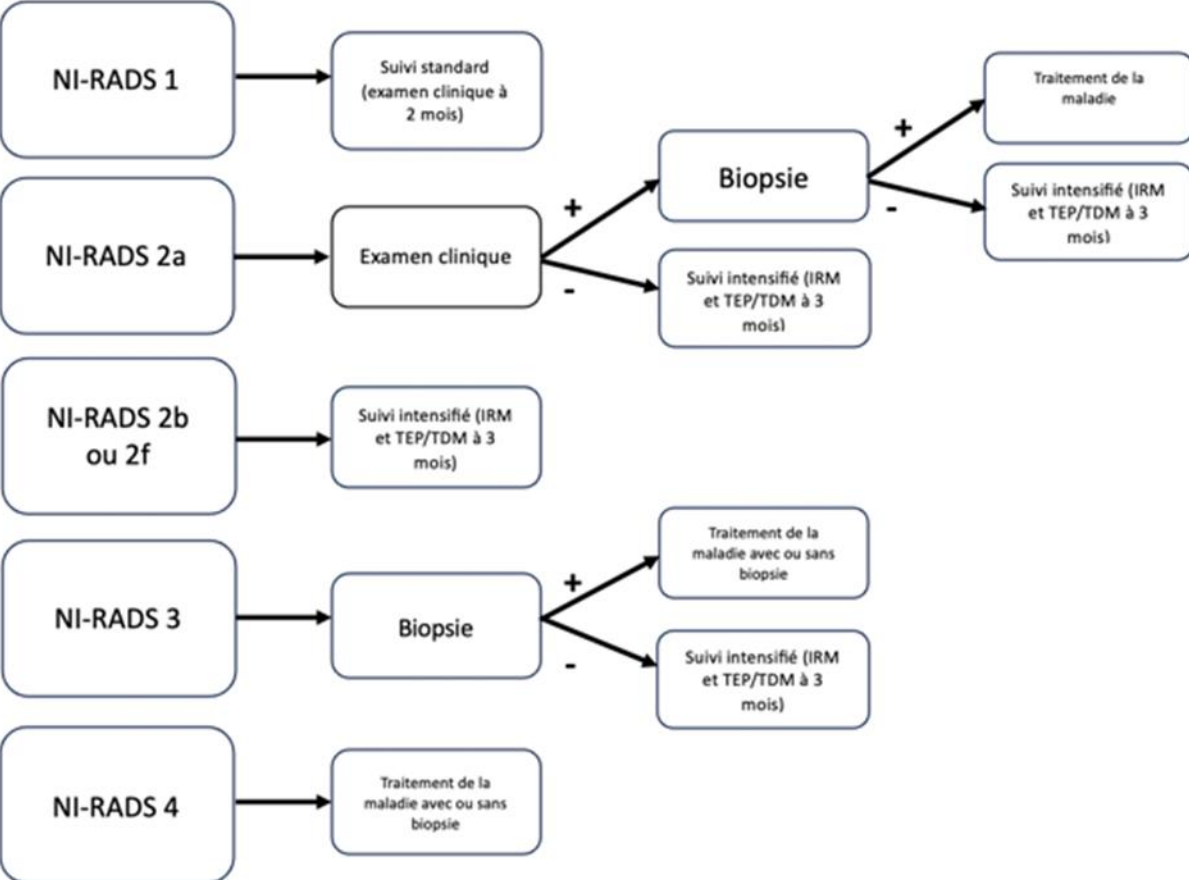
Nanoparticules Augmentation de l'efficacité



Nutrition



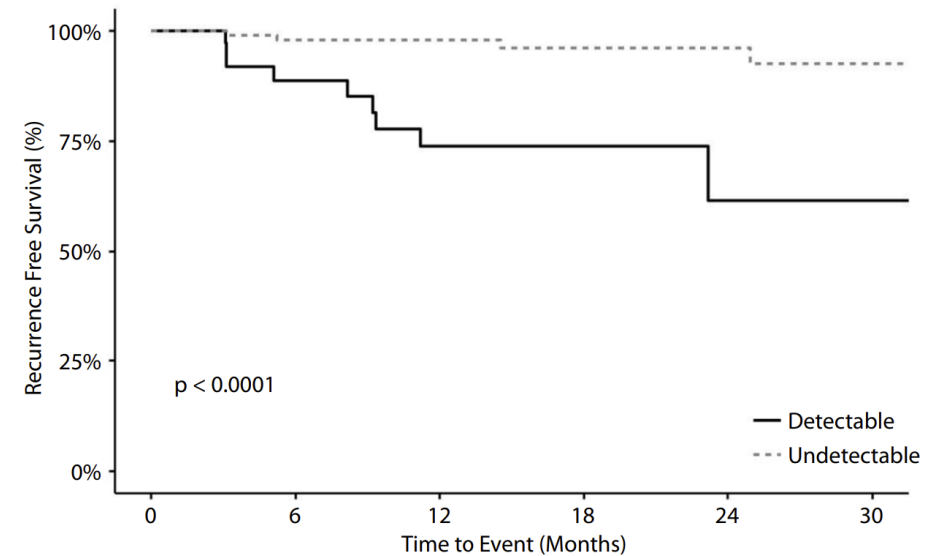
Evaluation thérapeutique: Imagerie



Evaluation thérapeutique Biologie

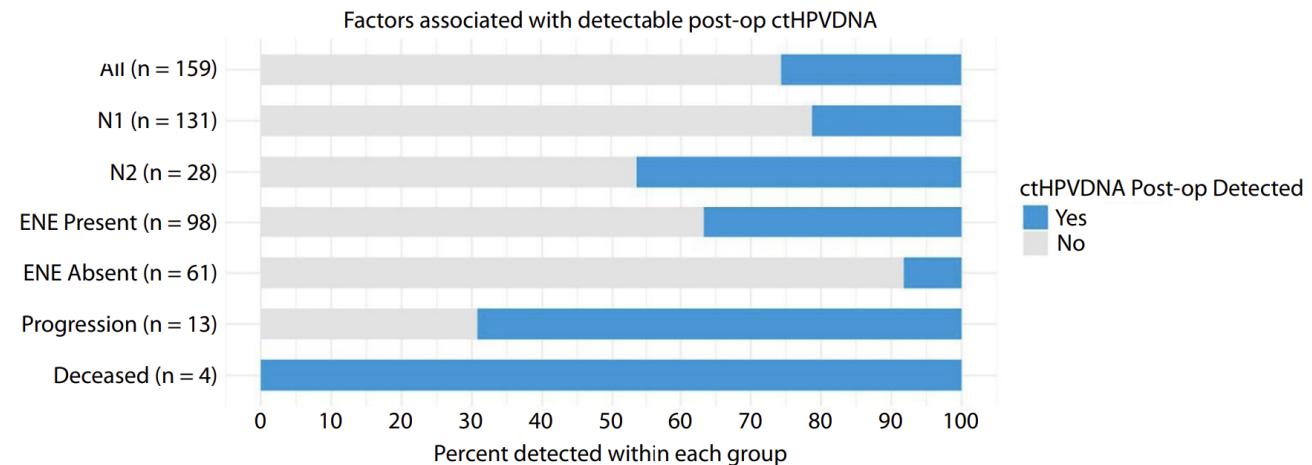
ADN HPV circulant

- ✓ 159 pts
- ✓ Détectabilité ADN HPV circulant
 - ✓ Préopératoire : 94%
 - ✓ Post-opératoire: 41%
- ✓ Détectabilité ADN HPV circulant post-op liée à: age, invasion lymphovasculaire, ENE



Number at risk

Detectable-	41	27	18	11	4	2
Undetectable-	118	91	68	48	31	15



Conclusion

- ✓ Pathologies et pronostics très hétérogènes
- ✓ Déception de l'escalade thérapeutique (CT, immunothérapie)
- ✓ Nombreuses voies d'amélioration
 - ✓ Radiothérapie
 - ✓ Association thérapeutique
- ✓ Techniques de radiothérapie
 - ✓ Volume
 - ✓ Dose
 - ✓ Adaptatif



Merci