



PROJET DE RECHERCHE : LES MÉTASTASES CÉRÉBRALES, CRITÈRES RANO ET CORRÉLATION CLINICO-RADIOLOGIQUE

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Présentation

- Introduction
- RANO-BM
- Projet
- Matériel et Méthode
- Résultats
- Discussion
- Conclusions



Introduction : Métastase cérébrale

- Incidence
- Symptomatologie variable
- Traitements systémiques/ciblé



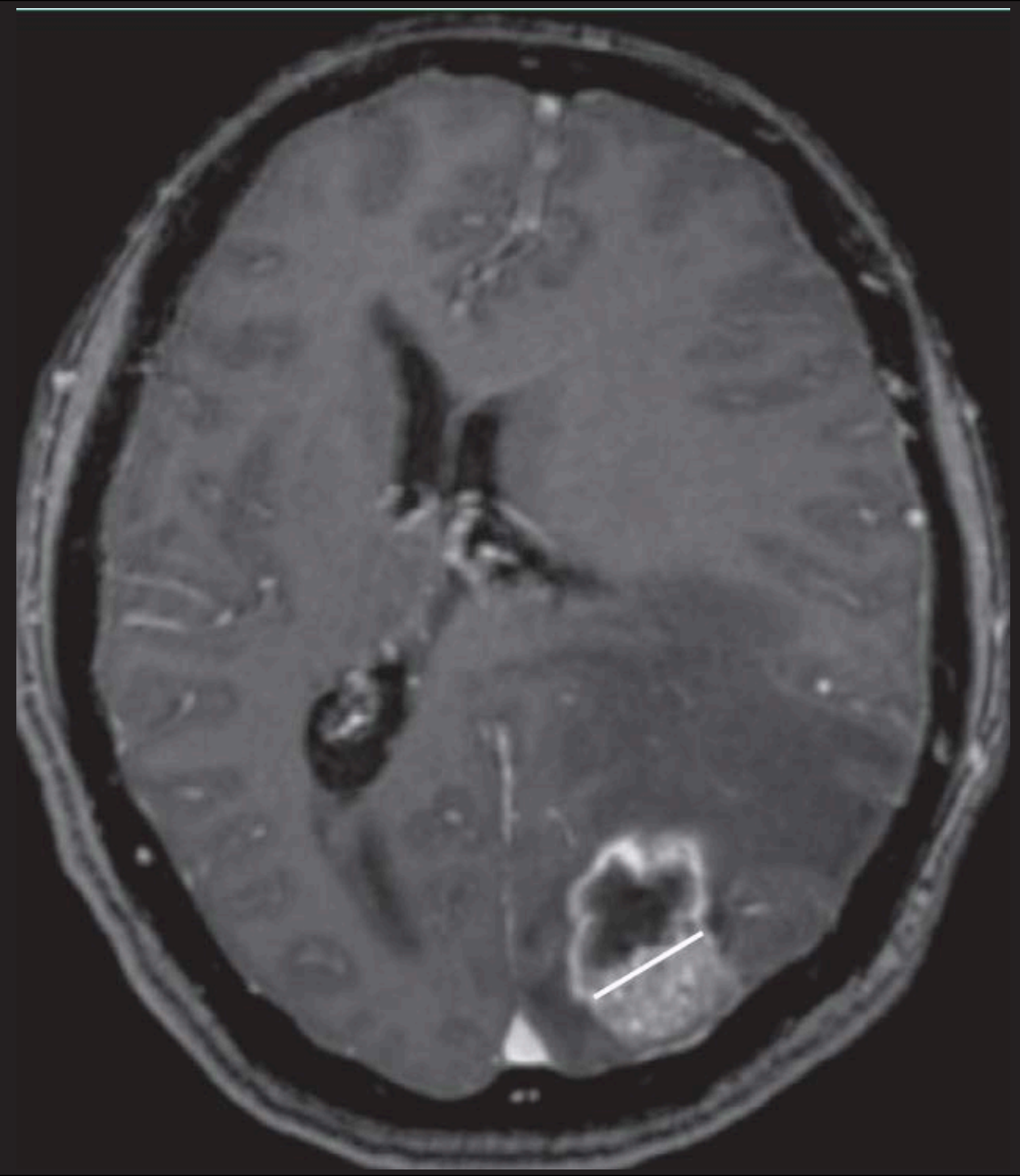
RANO – BM

- « Response Assessment in Neuro-Oncology »
- Groupe multidisciplinaire
- Critères :
 - Réponse
 - Progression



RANO – BM

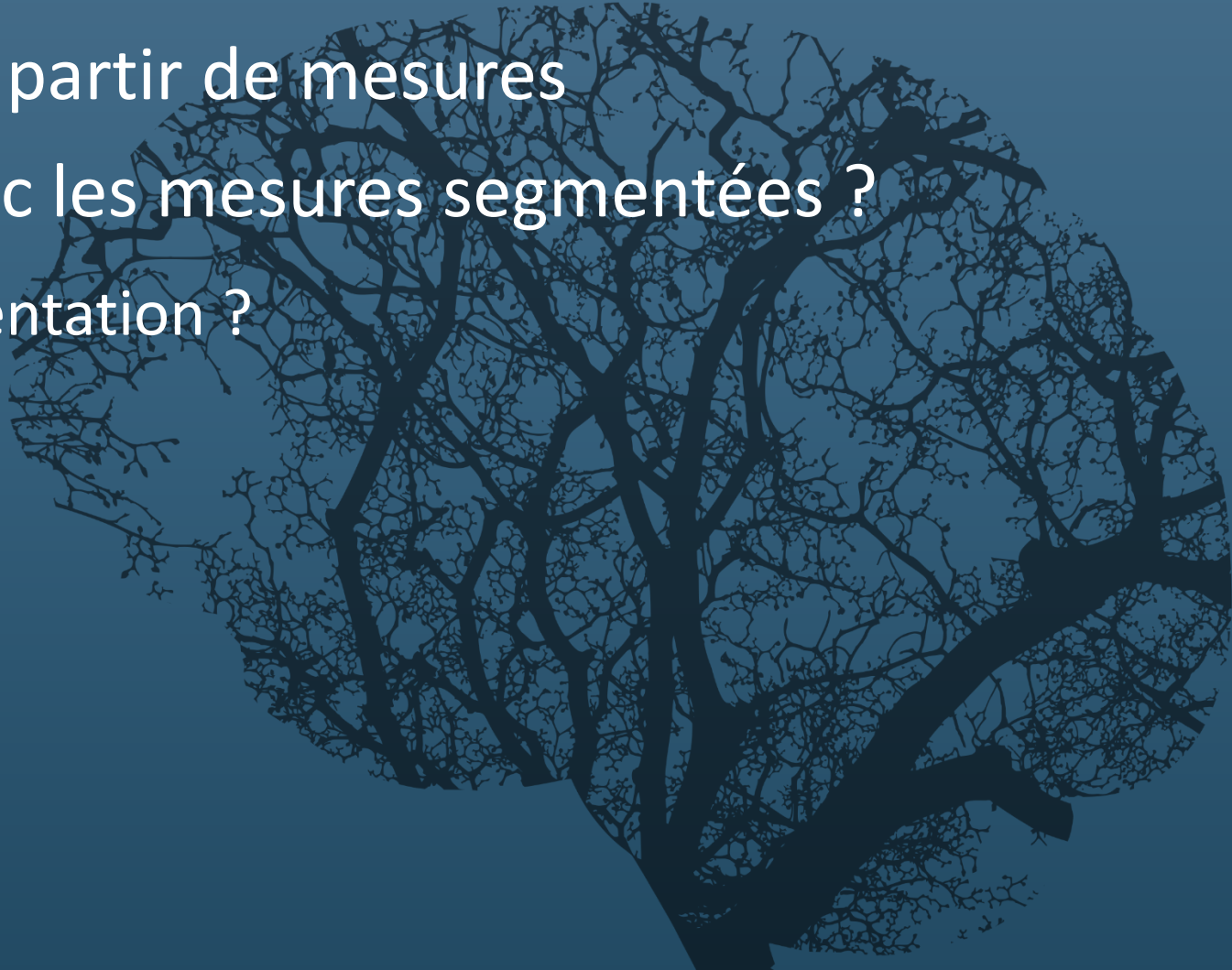
- Lésion mesurable
- Mesure unidimensionnelle
- Kyste / cavité chirurgicale
- Volumétrie



Projet

Est-ce que les volumes calculés à partir de mesures unidimensionnelles corréleront avec les mesures segmentées ?

Est-ce que je dois faire de la segmentation ?



Matériel et Méthode

- Étude rétrospective :
 - Métastase parenchymateuse cérébrale
 - 2 GK
- Mesure et segmentation
- Volume : sphère / ellipse
$$V = \frac{4}{3} \times \pi \times r^3$$
- Corrélation établi par la méthode du R^2



Résultats

56 patients :

- 1 à 37 métastases (médiane = 4)
- Suivi 1-108 mois (médiane = 8,9 mois)
- Suivi radiologique 1-18 (médiane = 5)
- Total 360 métastases
- 1668 mesures



Résultats

Prétraitement : 1D

$$R^2 = 0,84$$

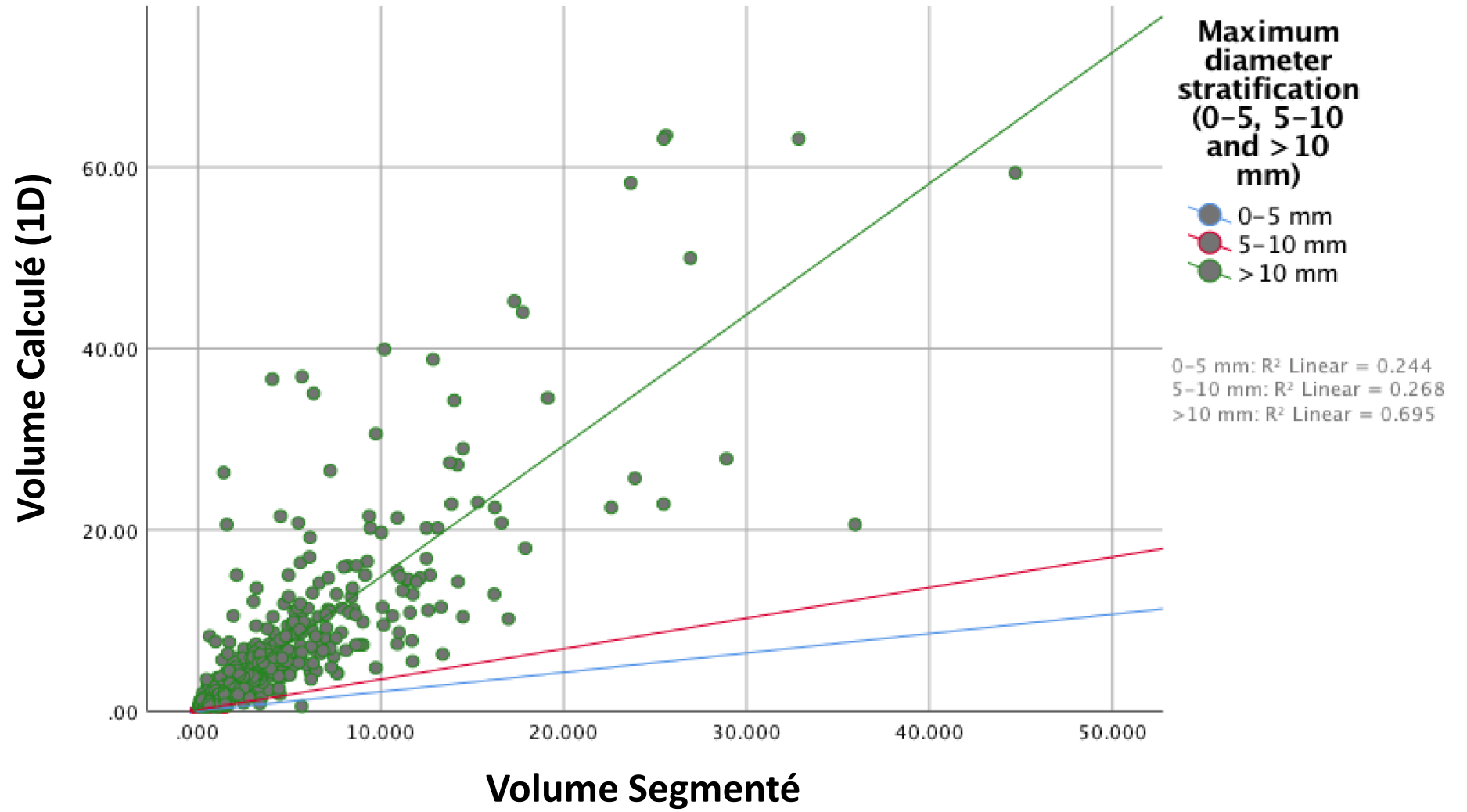
Post-traitement : 3D

$$R^2 = 0,94$$



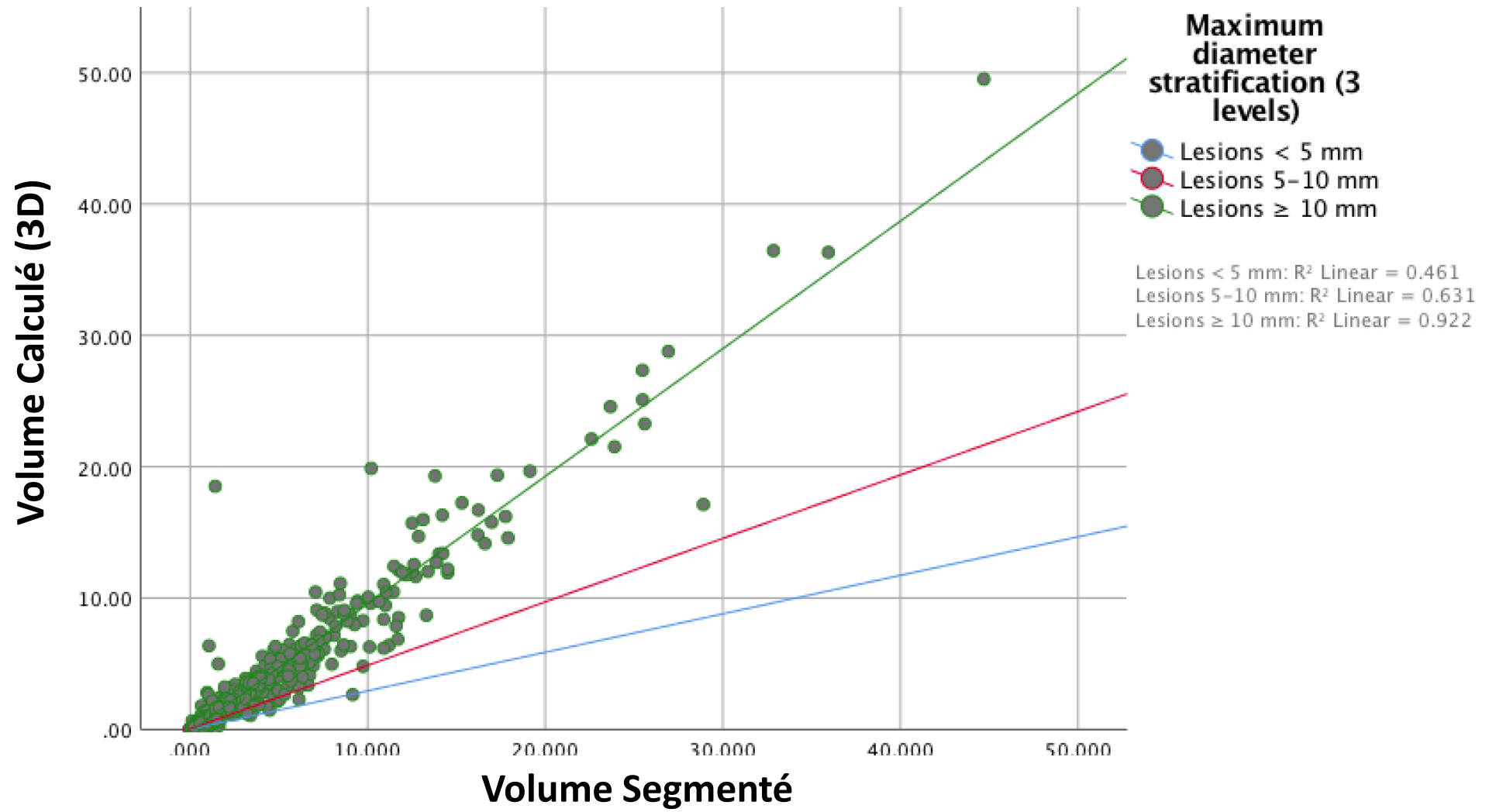
Résultats

Variation du Volume Calculé (1D) en corrélation au Volume Segmenté selon le diamètre maximal de la métastase



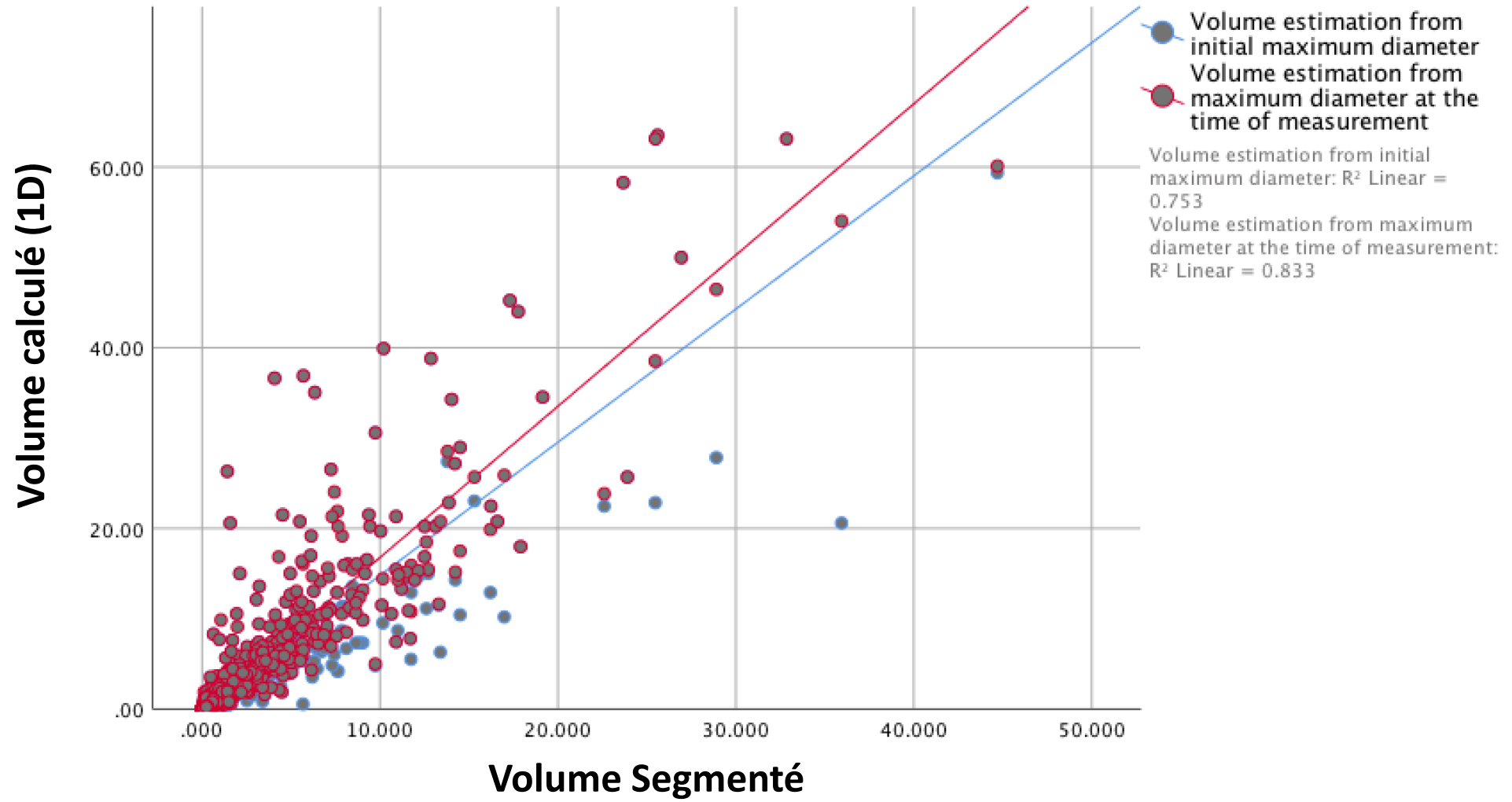
Résultats

Variation du Volume Calculé (3D) en corrélation au Volume Segmenté selon le diamètre maximal de la métastase



Résultats

Corrélation du volume estimé (1D) avec le volume segmenté en fonction du plus long axe de la métastase



Résultats

- Lésions > 10mm
 - ↑ 20 % diamètre (1D)
 - 90 %
 - + 830 %
 - ↓ 30 % diamètre (1D)
 - 99 %
 - + 400 %



Résultats – Clinique

- Contrôle local
- Faible risque
 - Radionécrose : 4 %
 - Œdème radio-induite : 8 %
- ↓ Effets secondaires

Outcome following the second SRS

	n (%)
Local response (per RANO-BM criteria)	
Complete response	10 (15%)
Partial response	14 (20%)
Stable lesion	23 (34%)
Progressive lesion	21 (31%)
Actuarial local control from second SRS	68%
1-year	54%
2-year	54%
5-year	
Actuarial survival from second SRS	
1-year	92%
2-year	65%
5-year	20%

Metastasis-level management

Résultats – Clinique

	At first SRS	At second SRS
Prior management, n (%)		
Surgical resection	12 (16%)	12 (16%)
WBRT	20 (27%)	26 (35%)
Focal radiation therapy	0	3 (4%)
Indication for SRS, n (%)		
Primary SRS	47 (63%)	0
Boost following WBRT	7 (9%)	0
Adjuvant following surgery	7 (9%)	0
Treatment of recurrence following prior treatments	14 (19%)	75 (100%)
RPA class, n (%)		
1	29 (39%)	37 (49%)
2	46 (61%)	37 (49%)
3	0	1 (2%)
Median KPS (range)	90 (70-100)	90 (50-100)
Active primary cancer	44 (59%)	39 (52%)
Neurological status		
Uncontrolled seizures	11 (15%)	7 (9%)
Focal motor deficit	21 (28%)	19 (25%)
Speech deficit	3 (4%)	3 (4%)
Other neurological deficit	9 (12%)	11 (15%)
Median volume, cc (range)	0.86 (0.01-27.3)	1.19 (0.07-20.6)
Median margin dose, Gy (range)	20 (14-24)	18 (12-20)
Median maximum dose, Gy (range)	36 (23.5-48)	36 (22.5-45)
Median Isodose line, % (range)	50 (45-85)	50 (30-80)
Median number of isocenters, n (range)	3 (1-29)	5 (1-35)

Discussion – Comparaisons

Repeat stereotactic radiosurgery as salvage therapy for locally recurrent brain metastases previously treated with radiosurgery

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Journal of Neurosurgery, 2016

- 46 metastases in 32 patients

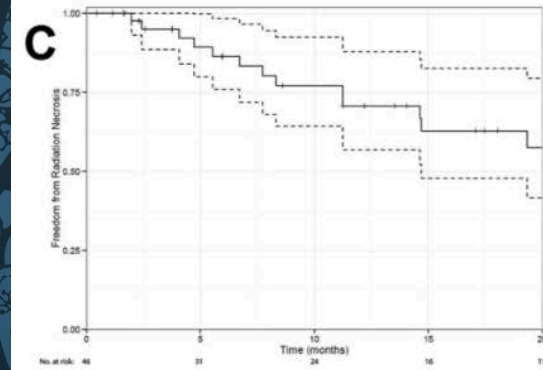
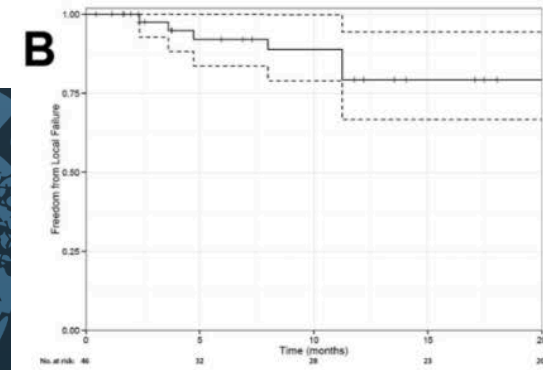
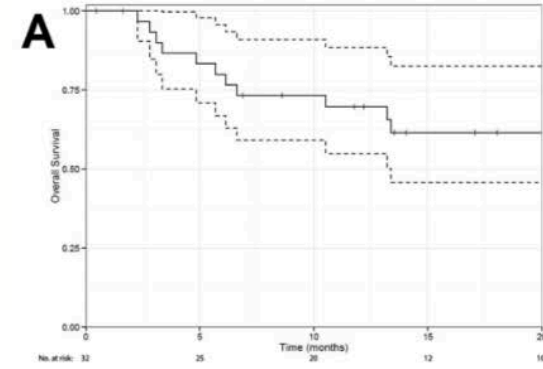


FIG. 3. Kaplan-Meier plots for OS (A), freedom from local failure (B), and freedom from radiation necrosis (C), all following re-treatment with SRS. Dashed lines represent 95% CIs. The number of cases reaching each time marker is noted at the bottom of each graph.



World Neurosurgery, August 2017

24 tumors in 22 patients

Repeat Stereotactic Radiosurgery for Locally Recurrent Brain Metastases

Paul Koffer^{1,2}, Jason Chan³, Paul Rava⁴, Daniel Gorovets^{1,2}, Daniel Ebner¹, Guy Savir^{1,2}, Timothy Kinsella¹, Deus Cielo⁵, Jaroslaw T. Hepel¹

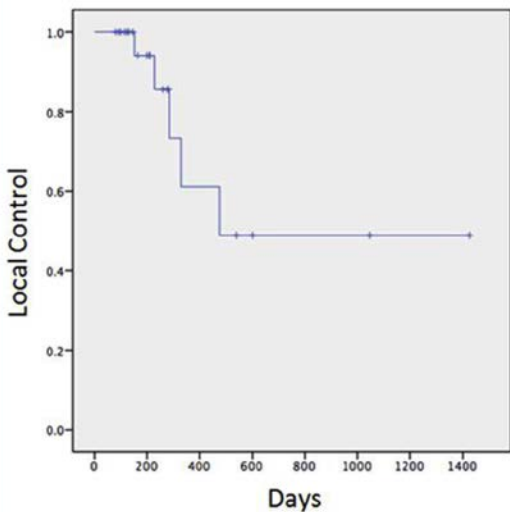


Figure 1. Local control rate after SRS-2.

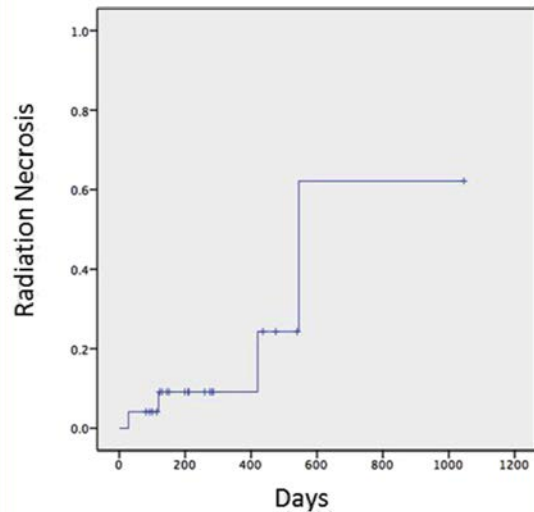


Figure 2. Radiation necrosis rate after SRS-2.

Conclusions

- RANO
 - Volumétrie
 - Critères de progression/réponse
- Re-traitement : Sécuritaire, contrôle local
- Nouveau seuil (à venir)



Références

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