4th INTERNATIONAL WORKSHOP ON INTERIM PET IN LYMPHOMA

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Poster Discussion - technical

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issues addressed

- ✓ Medical imaging data management in clinical trials-imaging data transfer networks - 2
- ✓ SUV standardization in multicenter trials - 1
- ✓ Parametric imaging for monitoring DLBCL therapy - 1
- ✓ Pretherapy (prognostic) value of MTV in mantle cell - 1
- ✓ CECT combined with low-dose FDG PET/CT - 1
- ✓ Discrimination btw benign and malignant processes – 2
- ✓ BMB vs staging FDG-PET in DLBCL - 1
- ✓ 89Zr-rituximab immunoPET to assess BM toxicity - 1

Imaging data transfer and management in clinical trials

key elements for image exchange

- Friendly applications, min training time
- 24/7 availability of problem solving tools, no need for on-site staff availability
- Accommodation of simultaneous readers
- High upload and navigation speed
- Compliance with regulations
- Cost friendliness

B2. Paediatric Hodgkin Network (PHN) - Transfer and storage of PET, PET/CT, CT and MRI to facilitate central review (CR) within large multicentric trial. L. Kurch, S. Bertling, A. Elsner, M. Wallinder, M. Kaminska, T. Georgi, L. Tchavdarova, K. Ruschke, D. Körholz, C. Mauz-Körholz, O. Sabri, R. Kluge. Universities Leipzig and Halle; HERMES Med.Sol., Stockholm, SE

randomized phase III EuroNET-PHL-C1 trial investigating different combination chemotherapy regimens to compare their efficacies in treating pediatric HL patients

Primary: 5-yr EFS in pts with an adequate response after 2 x OEPA (vincristine, etoposide, prednisone, and doxo) (without RT) is consistent with an estimated target of 90% EFS

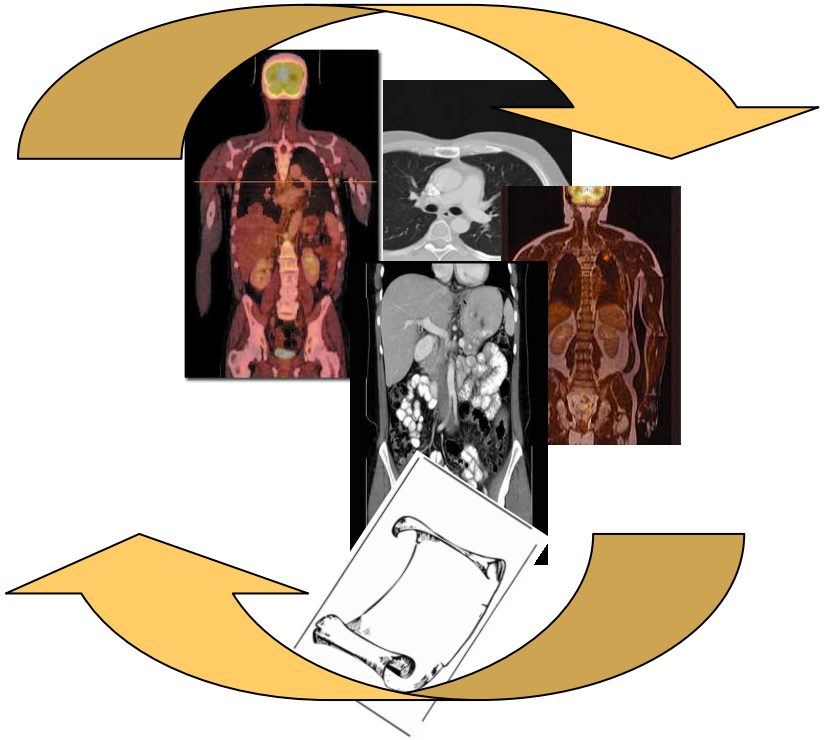
Interim FDG PET determines IFRT vs no IFRT after completion of rx

Secondary: the impact of real-time central staging and response assessment on treatment outcome

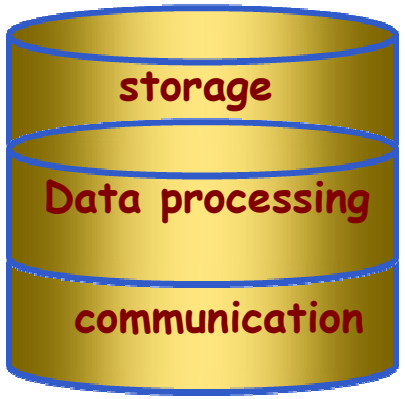
Real time central review for staging and response evaluation

IMAGE SUBMISSION

LOCAL SITE TREATMENT



Central Server



HERMES Med Sol platform

CENTRAL DECISION

EXPERT BOARD

Paediatric Hodgkin Network

Executive Agency for Health and Consumers

PETER-ESCHER-STIFTUNG
für krebskranke Kinder

DEUTSCHE KREBSHILFE

HERMES

Universitätsklinikum Leipzig
Anstalt öffentlichen Rechts

Current data

129 sites in 13 European countries, joined

~6300 imaging data sets transferred (>2.0 TB)

Data available in 20-30 secs from the CS to the reader for evaluation

The network is also ready to,
-assess inter and intra-subject variability in SUVs, reference sites

- be used also in other trials

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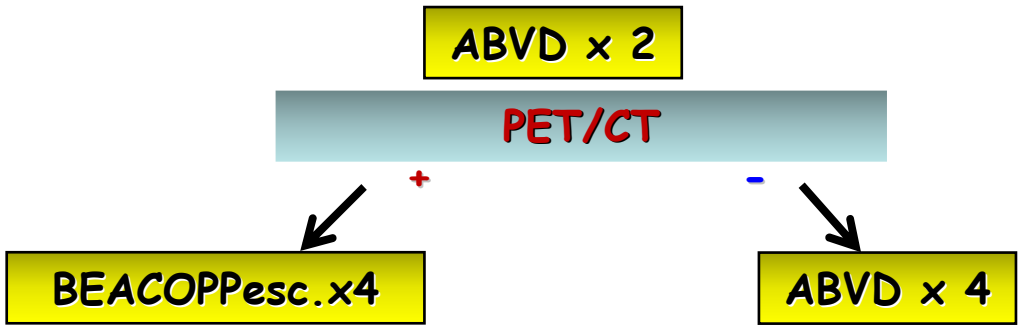
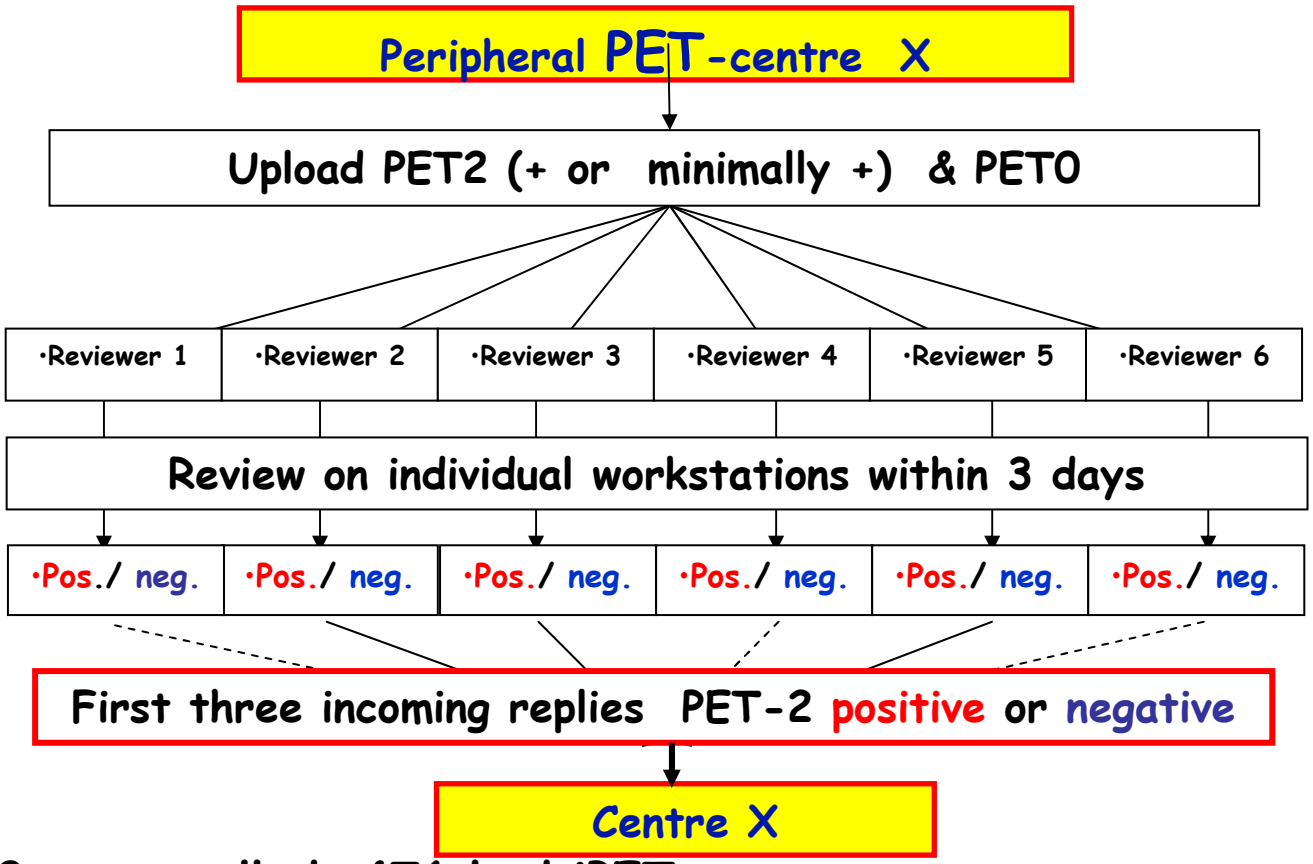
C5. WIDEN: a tool for medical imaging clinical trial management. S. Chauvie; A. Biggi, A. Stancu; P. Cerello, A. Gallamini. Medical Physics, Nuclear Medicine and Hematology Unit, S. Croce e Carle Hospital, Cuneo, National Institute of Nuclear Physics, Torino, I

WIDEN ® (Web-based Imaging Diagnosis by an Expert Network) is an electronic tool for online imaging review, set-up for prospective multicenter Italian clinical trial HD0607 (NCT 00795613)

advanced HL, std ABVDx2, PET0, PET2 uploaded to a dedicated web site via WIDEN® for review

Review available within 72 hrs from upload for randomization: to BEACOPP$_{esc}$ if PET2+ vs. ABVD if PET2-





Results: 508 pts enrolled, 476 had iPET

Lan traffic time	mean	median
upload	6'42"	1'35"
download	3'28"	1'52"

- median time btwn upload and end of review 40h 40'
- overall concordance among reviewers 0.78 - Krippendorf's alpha

Conclusions: WIDEN® effective system for imaging data exchange, analysis Data security, low cost, feasibility and prompt scan review confirmed

C2. HARMONISING SUVs IN MULTICENTRIC TRIALS USING 18F-FDG PET FOR THERAPY MONITORING IN NHL PATIENTS.

Narinée Hovhannisyan, Charline Lasnon, Christophe Fruchart, Jean-Pierre Vilque and Nicolas Aide. Depts Nuclear Medicine & Haematology, François Baclesse Cancer Ctr, Caen, FR

PET is an attractive imaging tool to quantify tumor metabolism, however, pre and post-treatment scans can be from different generation PET systems

Point spread function (PSF) reconst. improves spatial resolution and decreases partial volume effect in small lesions

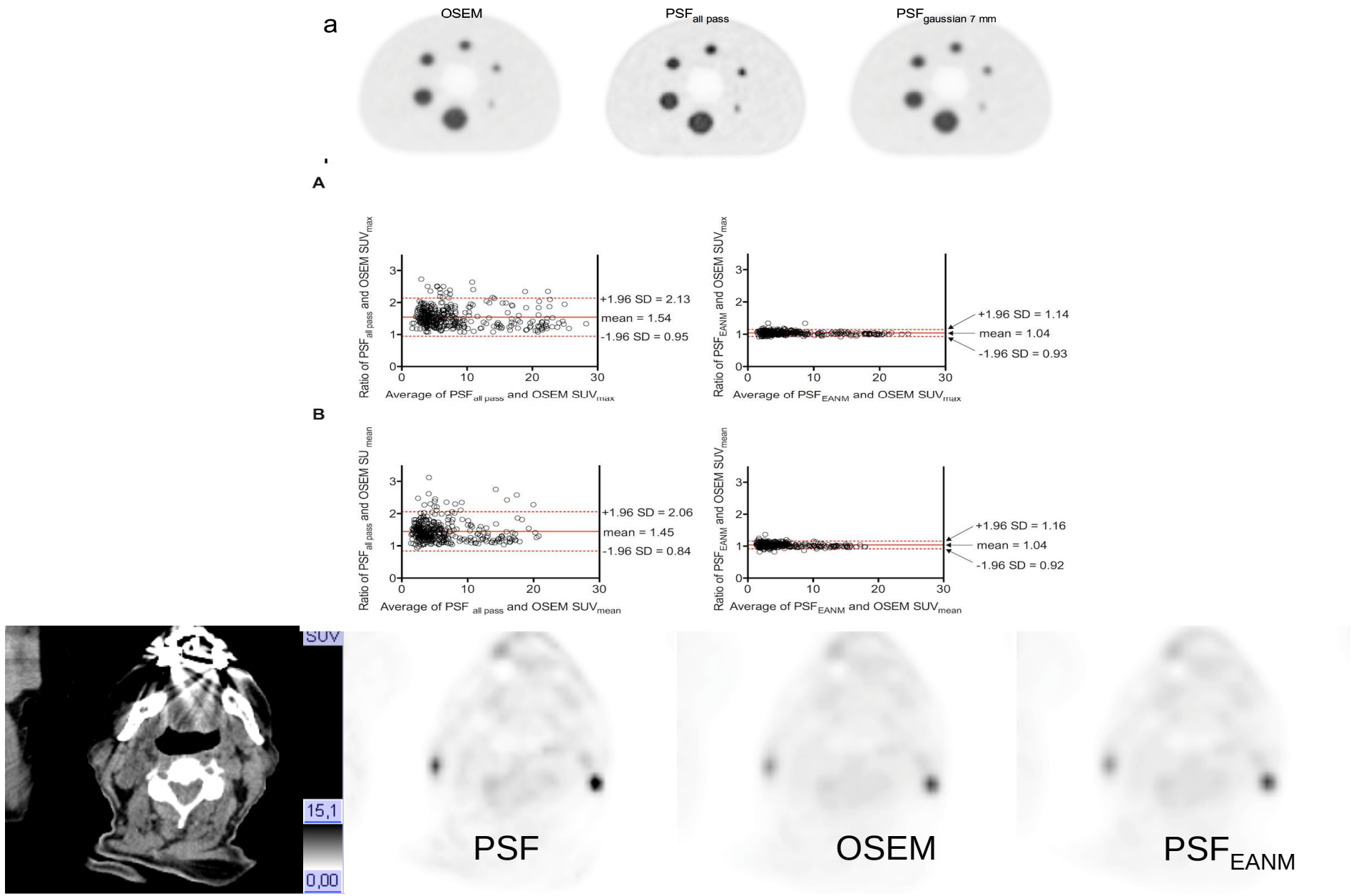
prospectively evaluate in NHL pts a strategy based on 2 image sets:

- **-Images optimised for diagnostic aims for tm detection**
- **-Data adhering to EANM stds used for quant. analysis**

Methods: NEMA NU-2 phantom used to determine optimal filter. to obtain recovery coefficients (RCs) as close as possible to EANM guidelines (PSF_{eanm})

a pt had a pre-rx scan on a former generation PET system and a post-rx scan on a PET with an advanced algorithm,
SUVs of OSEM reconst. to SUVs of PSF and then PSF_{eanm} compared.

389 lesions analysed in 26 consecutive NHL pts



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Conclusions

- **It is feasible to avoid reconstruction-dependent variability**
  - **Residual error is well below the cut-off value used to discriminate between responders and non responders**

- **This could be useful**
  - **For therapy monitoring in sites running different generation PET systems**
  - **When pooling SUV data in multicentric trials, for diagnostic/prognostic purpose**

B8. FEASIBILITY OF PARAMETRIC IMAGING FOR LONGITUDINAL MONITORING BY FDG PET/CT IN DIFFUSE LARGE B CELL LYMPHOMA (DLBCL). H. Necib, T. Eugène, T. Carlier, C. Bodet-Milin, F. Kraeber-Bodéré University Hospital-ICO-Gauducheau, Nantes, France.

Preliminary study, 3 DLBCL pts with different response profiles and long-term fu data retrospectively analyzed

Each pt underwent PET/CT at baseline and during treatment

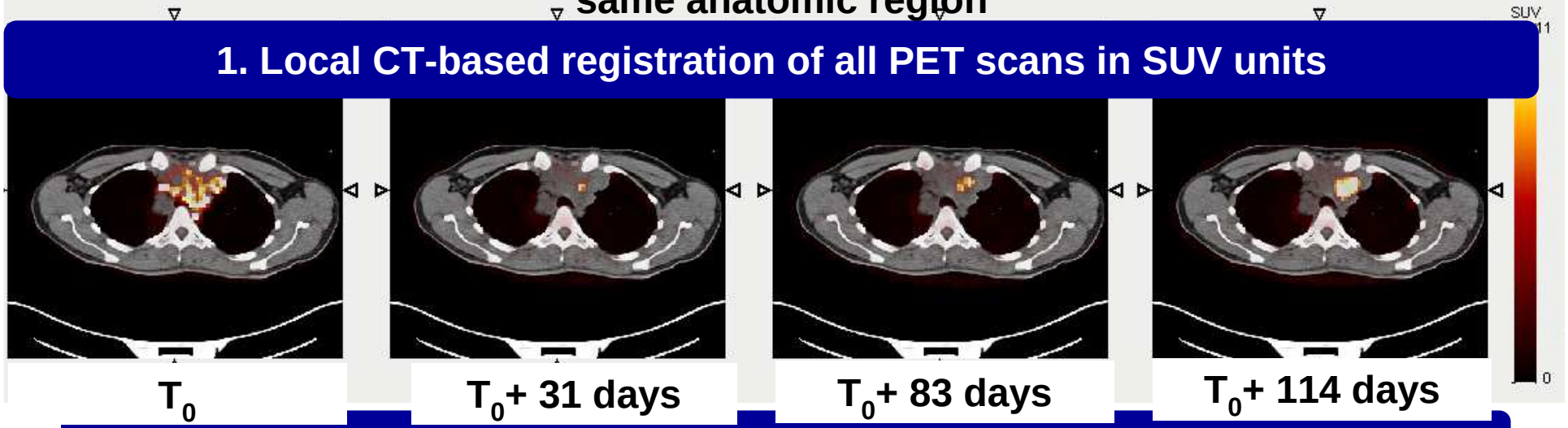
How do the tumor uptakes change over the course of therapy?

PET/CT, baseline & during treatment, time series of PET volumes analyzed using an automated factor analysis (FA), estimating the characteristic time function (factors) for each tm

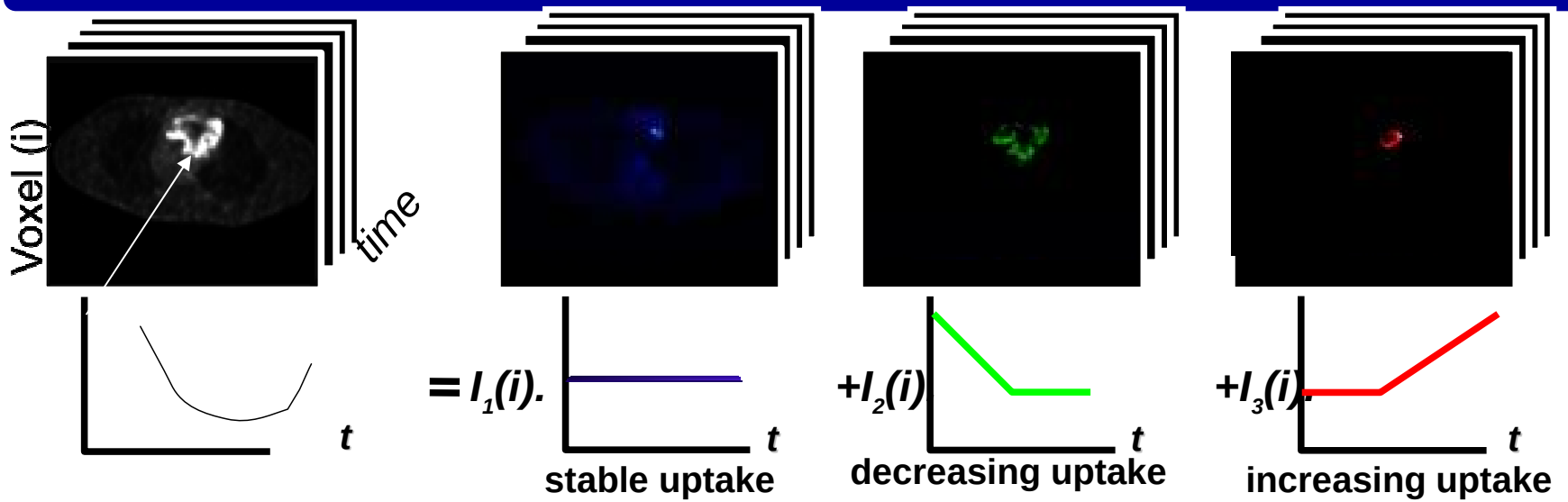
Results: For each pt, FA identified a constant factor,
- **without significant SUV change over time, and/or**
- **decreasing factor for responding tms, and/or**
- **increasing factor for tm progression**

PET/CT registered with the first scan, each voxel always corresponded to the same anatomic region

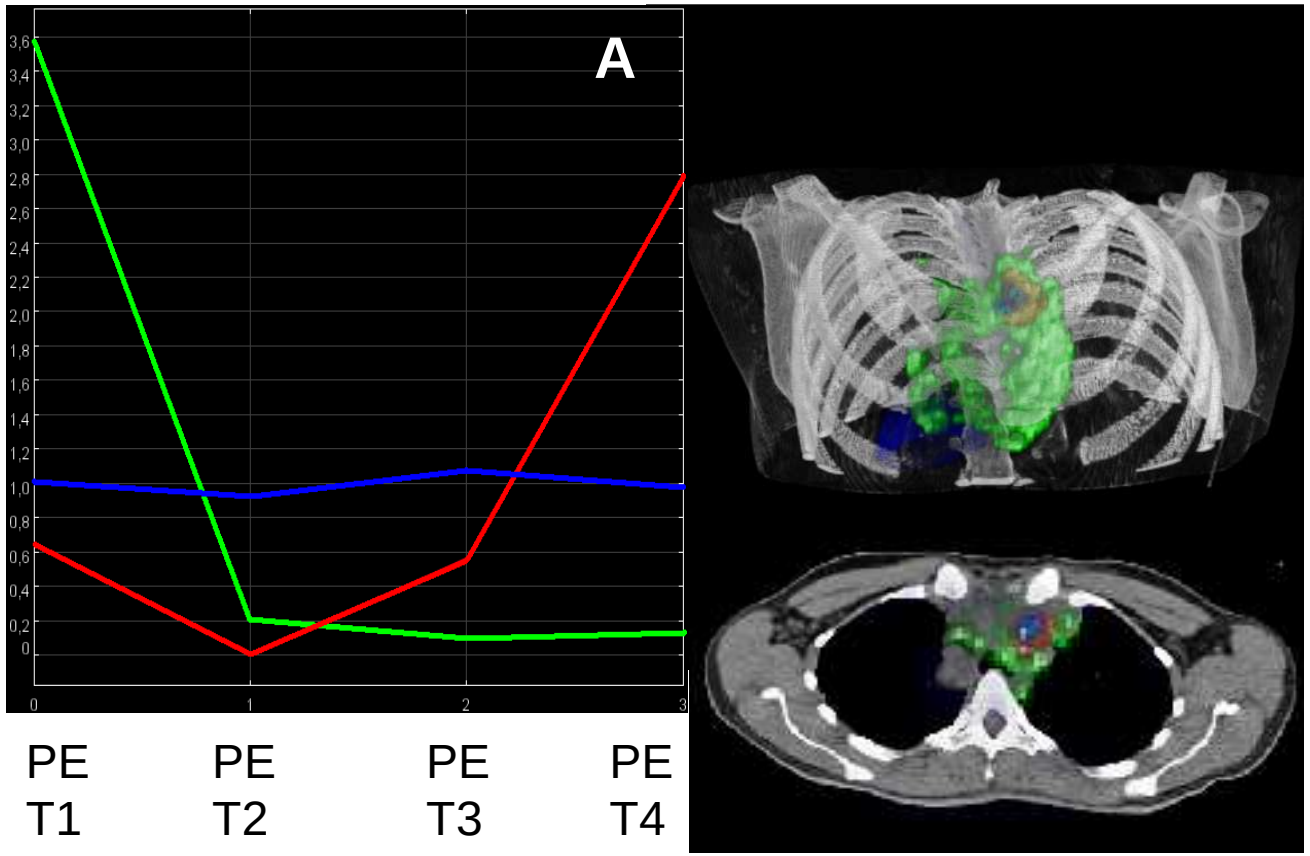
1. Local CT-based registration of all PET scans in SUV units



2. Factor analysis of the time series i(t) of the registered PET volumes



PETs analyzed using a factor analysis, where factors represented 3 trends : a flat factor: no change in SUV over time, a decreasing curve: responding to therapy, and an increasing curve corresponding to growing or recurrent tms.



Results:

FA results were c/w visual + SUV variations confirmed by fu

Parametric images depicted regions with different response rates

Conclusions: longitudinal monitoring of response in DLBCL feasible. Parametric imaging may provide info on tm response heterogeneity

further investigations warranted to highlight the clinical benefit of parametric imaging on treatment response assessment

B12. PROGNOSTIC IMPACT OF 18F-FDG PET/CT METABOLIC TUMOR VOLUME, MTV, IN PRETHERAPEUTIC MANTLE CELL LYMPHOMA. Cazeau AL, Mesguich C, Godbert Y, Soubeyran I, Mendiboure J, Soubeyran P. Médecine Nucléaire, Anatomopathologie, Statistiques, Oncologie Institut Bergonie CRLCC Bordeaux France

to assess prognostic value of MTV and SUV_{max} in MCL before chemo

retrospective, N=18

→ staging: 13

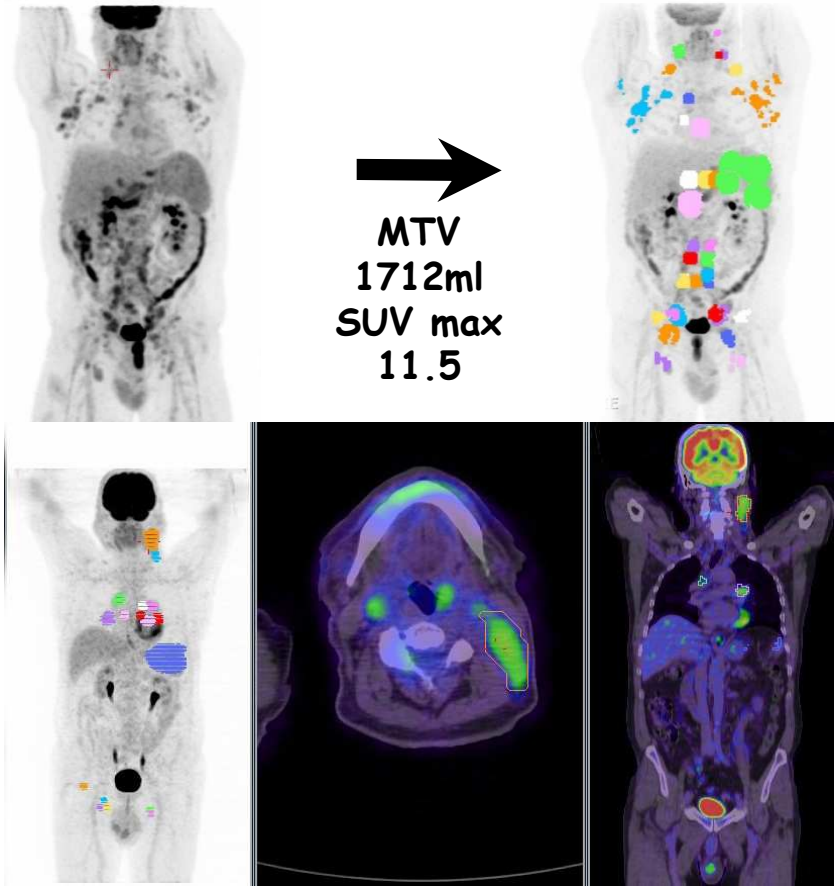
→ relapse: 5

R-CHOP, R-DHAP in 17/18, ASCT in 3

MTV: Philips Tumor Track® SW

Autosegmentation SUVmax 40% thrshd

Correlation with MIPI, OS and PFS



Axial and coronal view of ROI delineation issue from MIP

Results: Med SUVmax: 6.9 ; Med MTV: 623ml

MTV< 570ml, PFS >2 yrs, except for one pt who relapsed at 16 mo

MTV> 570ml pts relapsed earlier/died, except 1 pt in CR for 3 yrs

No SUVmax cut-off for prognosis; trend for correlation btwn MTV & MIPI

	Age yo	First line of treatment	Ann Abor	MIPI	SUV max	MTV ml	PFS (month)	Follow-up (month)	last clin.state	ASCT
1	79	yes	III	7	6,2	25	29	35	PD	-
2	52	yes	I	3	10,4	32	19	66	CR	-
3	66	yes	IV	3	5,7	54	30	30	CR	-
4	50	yes	IV	2	10,7	293	35	35	CR	+
5	48	no	IV	5	5,4	436	24	26	SD	-
6	65	yes	IV	3	5,5	463	16	36	PD	-
7	54	yes	IV	2	5,4	560	9	9	CR	+
8	79	yes	III	2	14,7	561	40	42	PD	-
9	92	yes	III	6	7	573	0	0	PD	-
10	73	no	IV	5	11,8	674	10	49	PD	-
11	69	yes	III	3	6,1	871	24	37	PD	-
12	70	no	III	3	6	1083	7	11	PD	-
13	67	yes	IV	4	8	1115	17	50	PD	-
14	85	no	IV	8	6,7	1351	0	15	PR	-
15	68	yes	IV	3	7,6	1471	18	48	CR	-
16	52	yes	IV	5	11,5	1712	49	67	CR	+
17	77	yes	IV	6	8	2076	8	14	†	-
18	78	yes	IV	6	5,7	2889	7	16	†	-

low MTV relapse at 16 mo
short f-u

high MTV in CR for 3 yrs after ASCT

Conclusion: In MCL, baseline MTV could predict outcome. Further investigation necessary towards designing risk-adapted strategies

C3. CLINICAL IMPACT OF CONTRAST-ENHANCED COMPUTED TOMOGRAPHY (CECT) COMBINED WITH LOW-DOSE FDG PET/CT ON LYMPHOMA PATIENT MANAGEMENT. Chalaye J, Luciani A, Meignan M, Enache C, Beaussart P, Sassanelli M, Evangelista E, Lhermite C, Safar V, Haioun C, Rahmouni A, Itti E. H. Mondor hospital, AP-HP/Paris-Est University, Créteil, FR

Prospectively evaluate clinical impact of ceCT + FDG PET/ld CT

237 ceCT in 163 lymphoma pts, PET/ldCT on same day/scanner staging (n=41), interim (n=73), post-therapy (n=115), and fu (n=8)

Clinical impact determined from the reports

Results:

Whole-body equivalent dose	
PET/CT	ceCT
Total: 18±3 mSv (PET 7±1, ldCT 11±2)	Total: 33±4 mSv +189%

ceCT no clinical impact on management in 92%, a +ve impact in only 7 cases – DVT-anticoag. (n=5), up-staging due to splenic inv. (n=2)

DVT seen in 9 additional cases without impact on planned anticoag

Conclusions: Clinical impact of ceCT limited. Optimization is needed to reduce rad. exposure.

C4. ROLE OF 18F-FDG PET-CT UPTAKE PATTERNS IN WALDEYER'S RING TO DIFFERENTIATE THE BENIGN LESIONS TO THE MALIGNANT IN NHL. G. Biscontini ; G. Gini , A.Olivieri, C. Bocci, J. Olivieri, P. Cinti; B. Rossi; P. Leoni; G. Ascoli. Nuclear Medicine Unit, Clinic Of Hematology, Ancona, IT

to evaluate FDG uptake patterns and intensities in the Waldeyer's ring to improve the ability to differentiate benign from malignant

N=50 NHL pts and suspected presence of disease in Waldeyer. CT scan, (performed in all) positive in the Waldeyer's ring in 5

Results: PET images showed increased uptake in the,

In 5/50 cases with disease, asymmetric uptake in Waldeyer's ring, SUV >4; with cervical LN involvement

In 45/50 cases without disease, symmetric uptake in Waldeyer's ring, SUV <4 without cervical LN involvement

Conclusions: asymmetric FDG distribution in Waldeyer's ring, involvement of adjacent LNs and a SUVmax > 4 are suspected parameters for disease involvement and could change staging

B1. Dual-Point FDG-PET: a new scanning technique to distinguish unspecific and neoplastic FDG uptake in Hodgkin lymphoma

A. Bianchi, A. Borra, JM.Zaucha, B. Malkowski, A. Thyss, N. Mounier, M. Razzouk, J. Darcourt, C. Zwarthoed, S. Chauvie, M. Miglino, R Battistini A. Biggi, A. Gallamini., Samsung Med. Ctr, Sungkyunkwan Univ Sch. Med

B5. STAGING FDG-PET MIGHT REPLACE BONE MARROW BIOPSY IN DIFFUSE LARGE B-CELL LYMPHOMA. RESULTS FROM A MULTI-CENTER IAEA-SPONSORED STUDY. Cerci JJ, Györke T, Paez D, Fanti S, Meneghetti JC, Redondo F, Celli M, Auewarakul CU, Gujral S, Rangarajan V, Gorospe C, Arevalo A, Kuzu I, Morris TP, Dondi M, Carr R.

C1. Bone marrow activity on 89Zr-rituximab immunoPET/CT predicts hematological toxicity in lymphoma patients treated with radioimmunotherapy. M Vaes*, T Guiot*, DJ Vugts**, N Meuleman*, G Ghanem*, B Vanderlinden*, M Paesmans*, GAMS van Dongen**, D Bron*, P Flamen*, K Muylle*. *Jules Bordet Institute, Brussels,**VUmc, Amsterdam.