



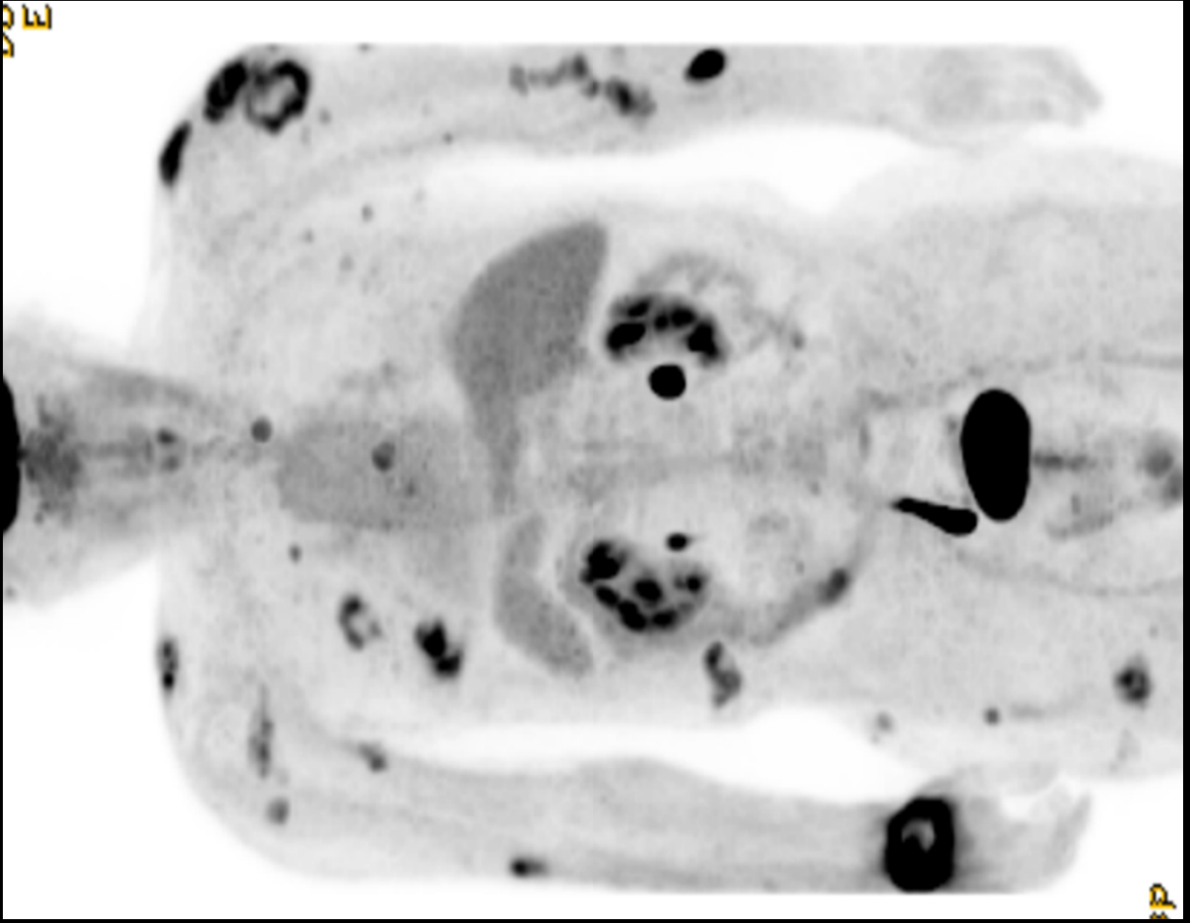
PET in ENKL

Won Seog Kim

Samsung medical center, Seoul, Korea

SAMSUNG MEDICAL CENTER

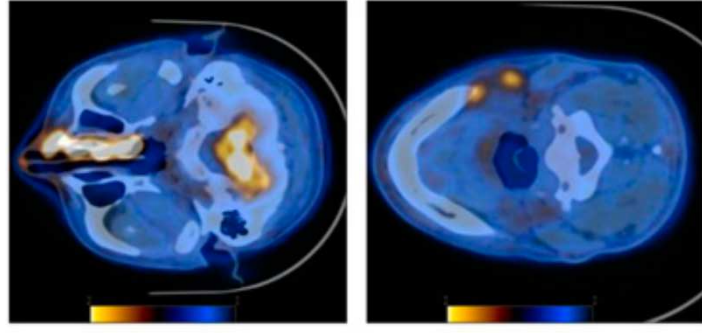
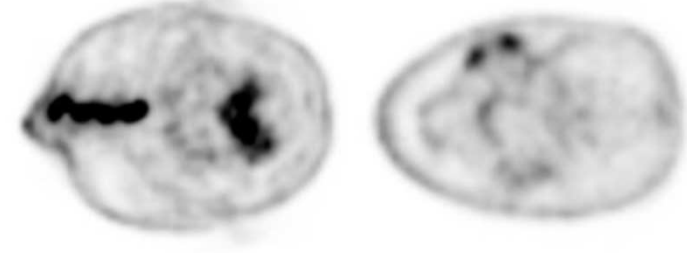
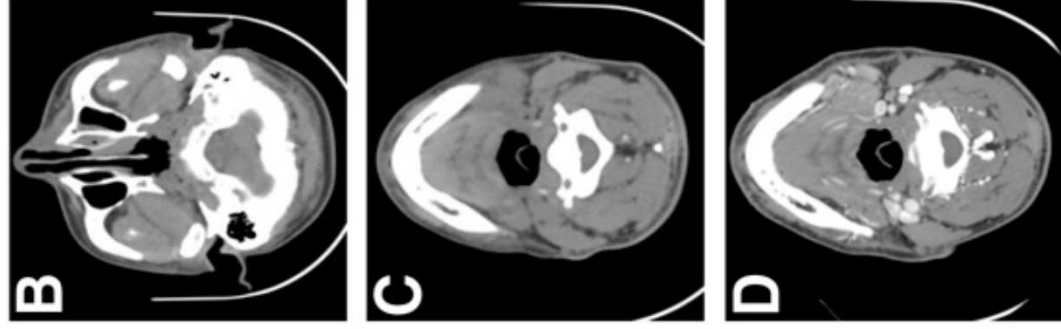
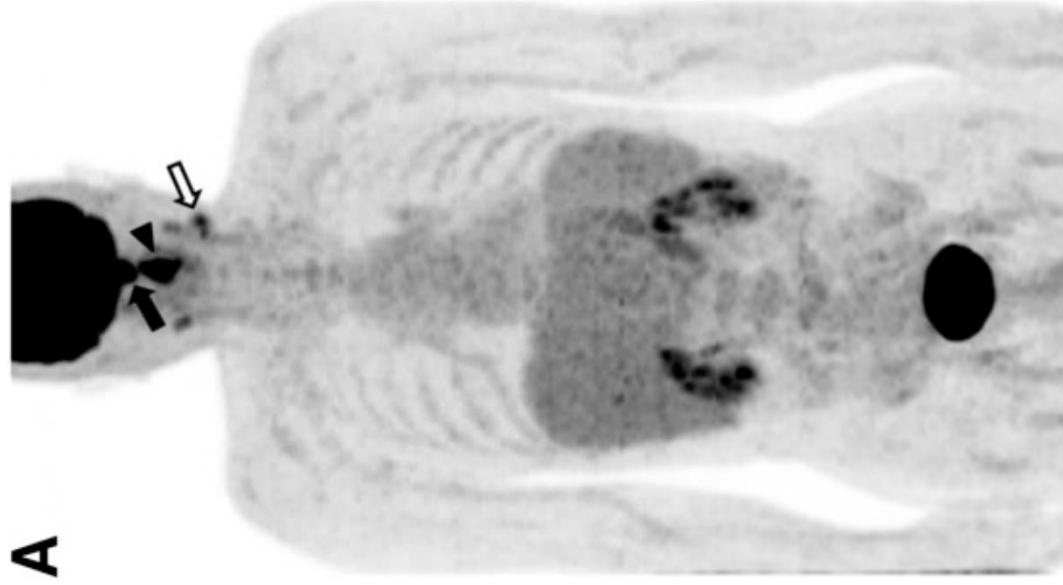






Role of PET/CT for initial staging of

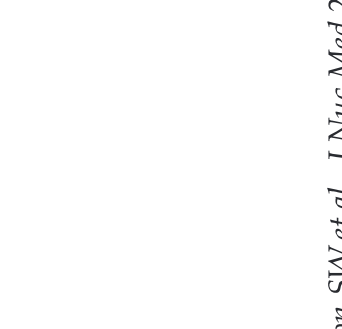
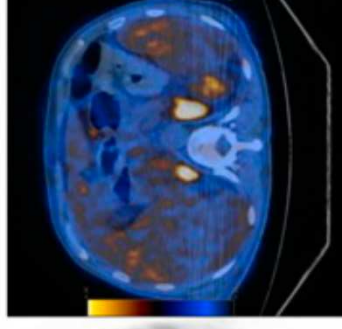
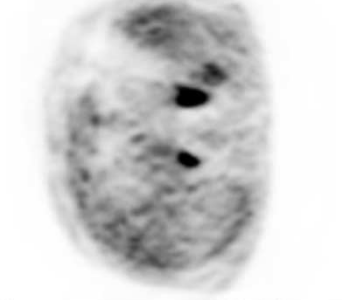
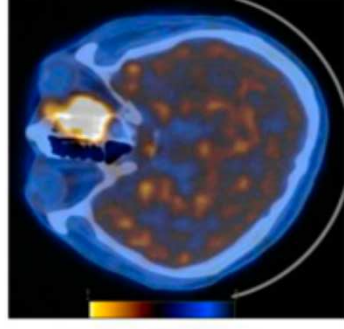
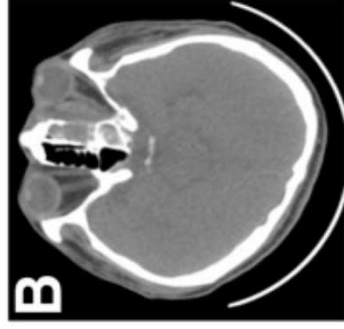
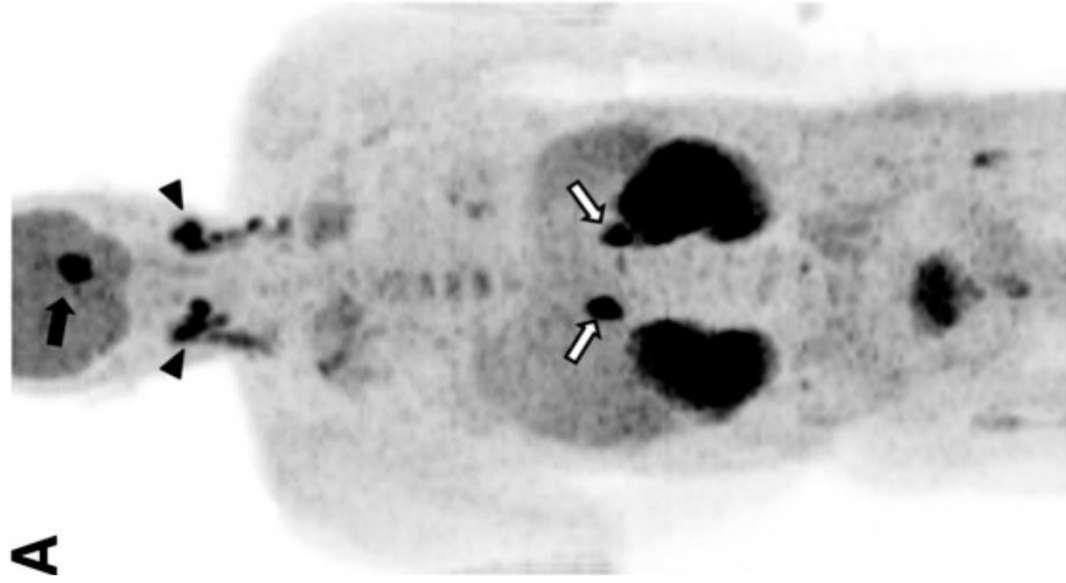
ENKL





Role of PET/CT for initial staging of

ENKL



Role of PET/CT for initial staging of

ENKL

	Region-based analysis					Diagnostic performance		
Parameter	TP	TN	FP	FN	Total	Sensitivity	Specificity	Accuracy
PET/CT	127	1167	3	3	1300	97.7%	99.7%	99.5%
CSMs	105	1168	2	25	1300	80.7%	99.8%	97.9%

P <0.001 Not significant <0.001



Case

Extranodal NK/T cell lymphoma (2013.10 Lt.nasal cavity Bx)

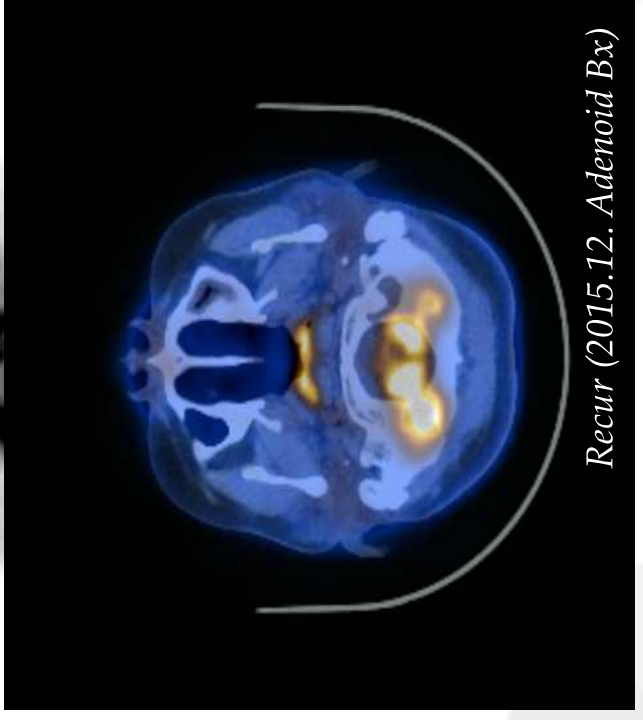
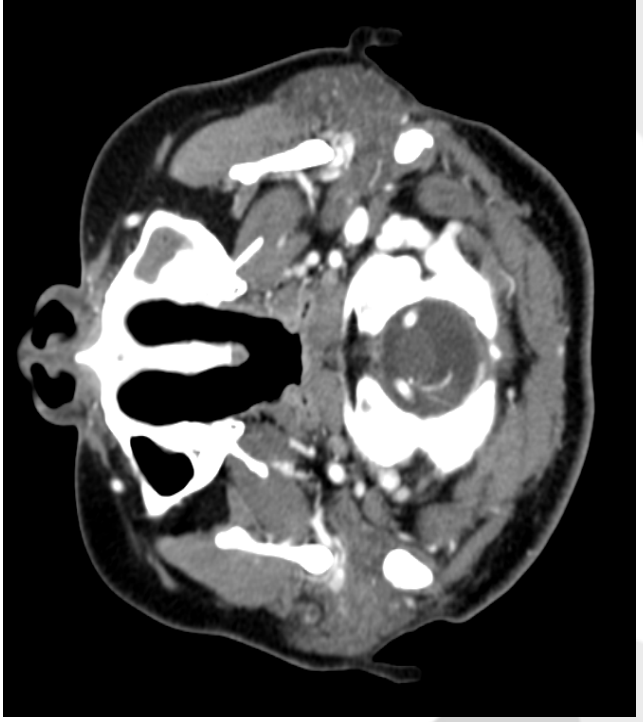
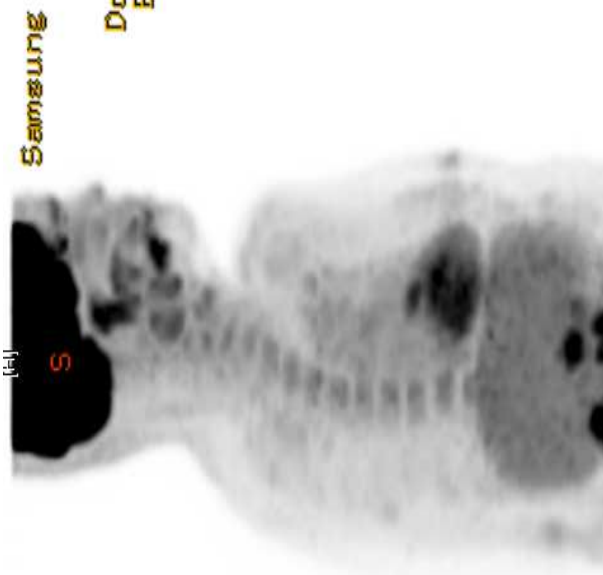
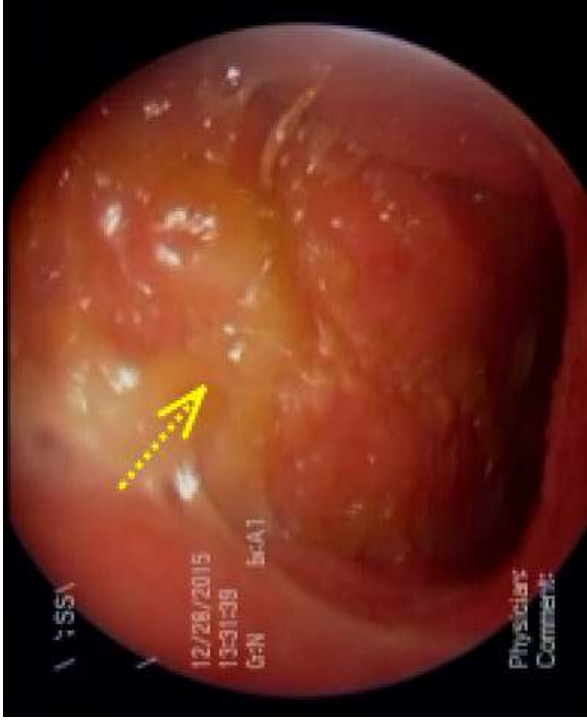
- s/p CCRT with CDDP #1~4 (13.10.30-13.11.20)
- s/p VIDL #1~2 (13.12.30-14.01.28) ➡ CR

EBV DNA

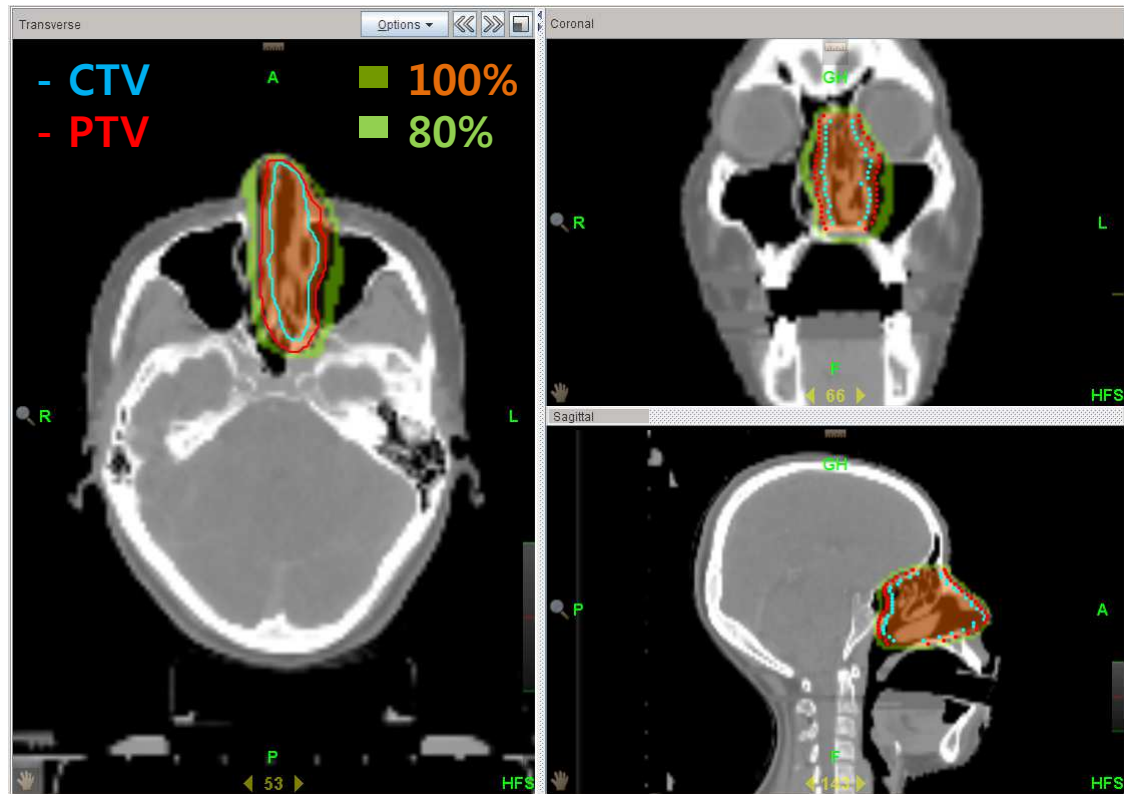
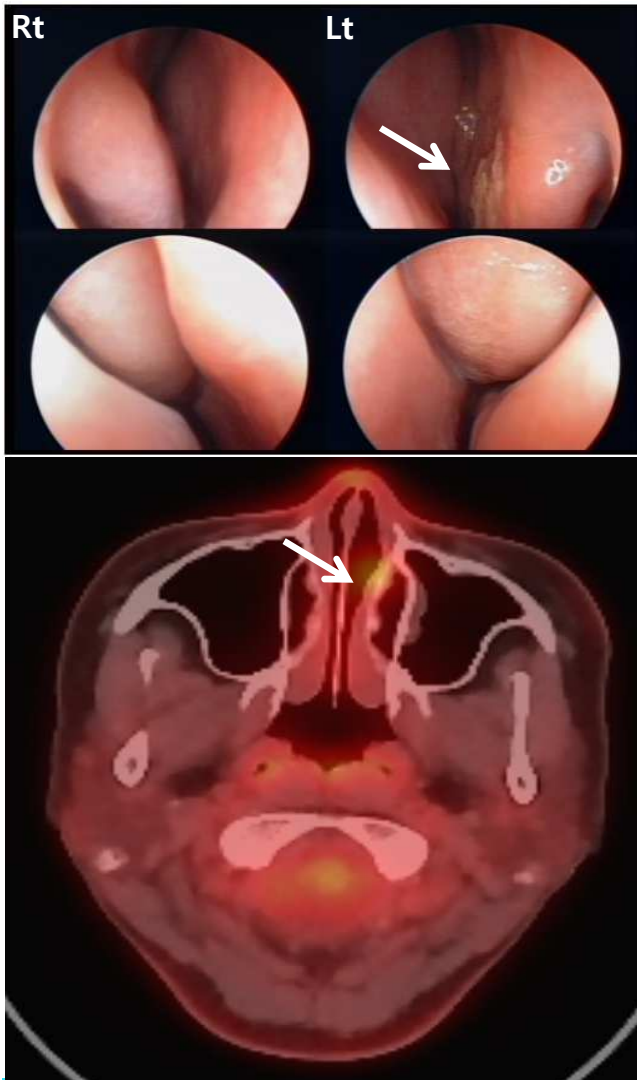
- EBV : Less than detection limit 05/15-2015
- EBV : 9.69 copies/uL whole blood (9690 copies/mL whole blood)
12/12/2015

No lesion in conventional CT/ENT exam

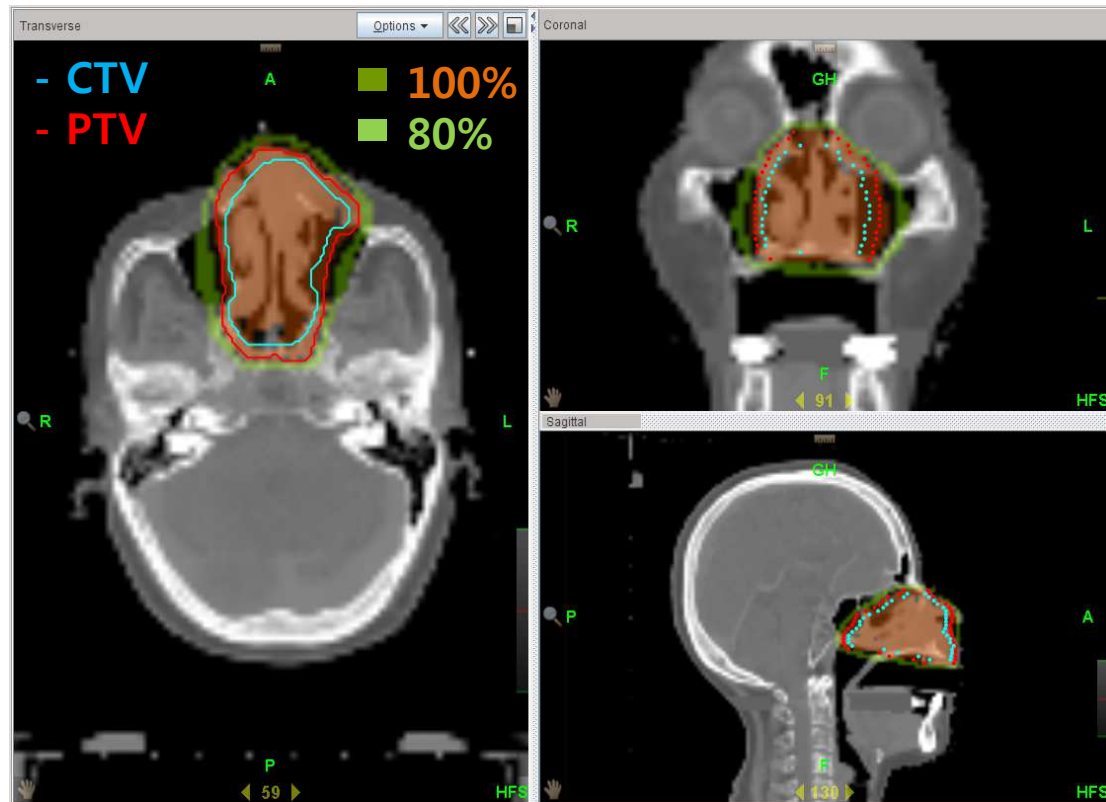
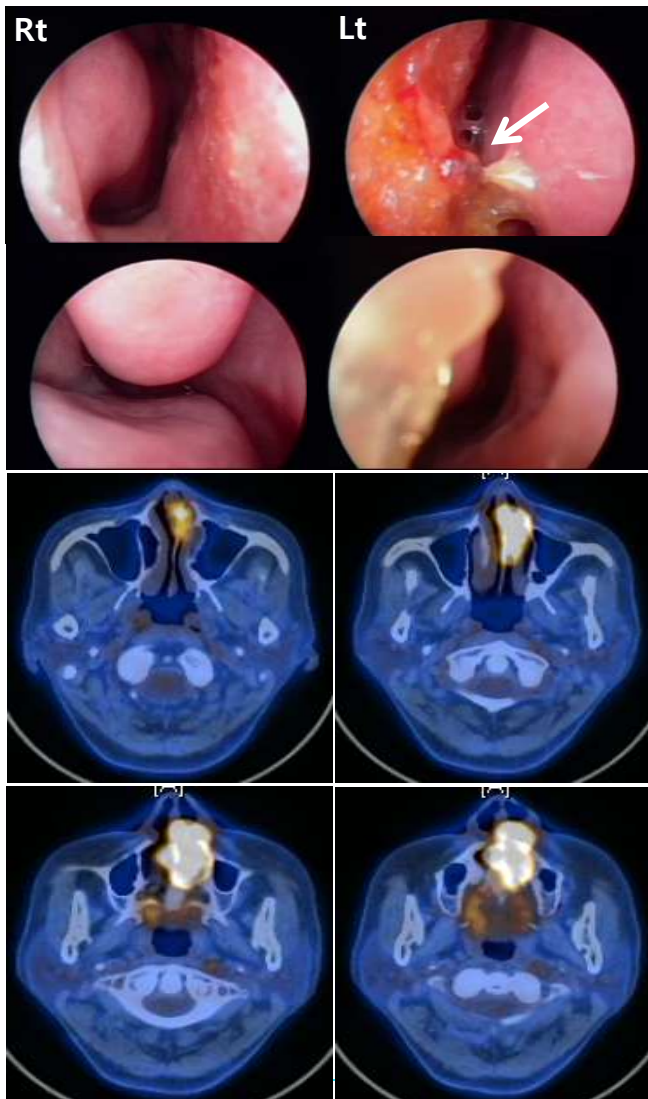




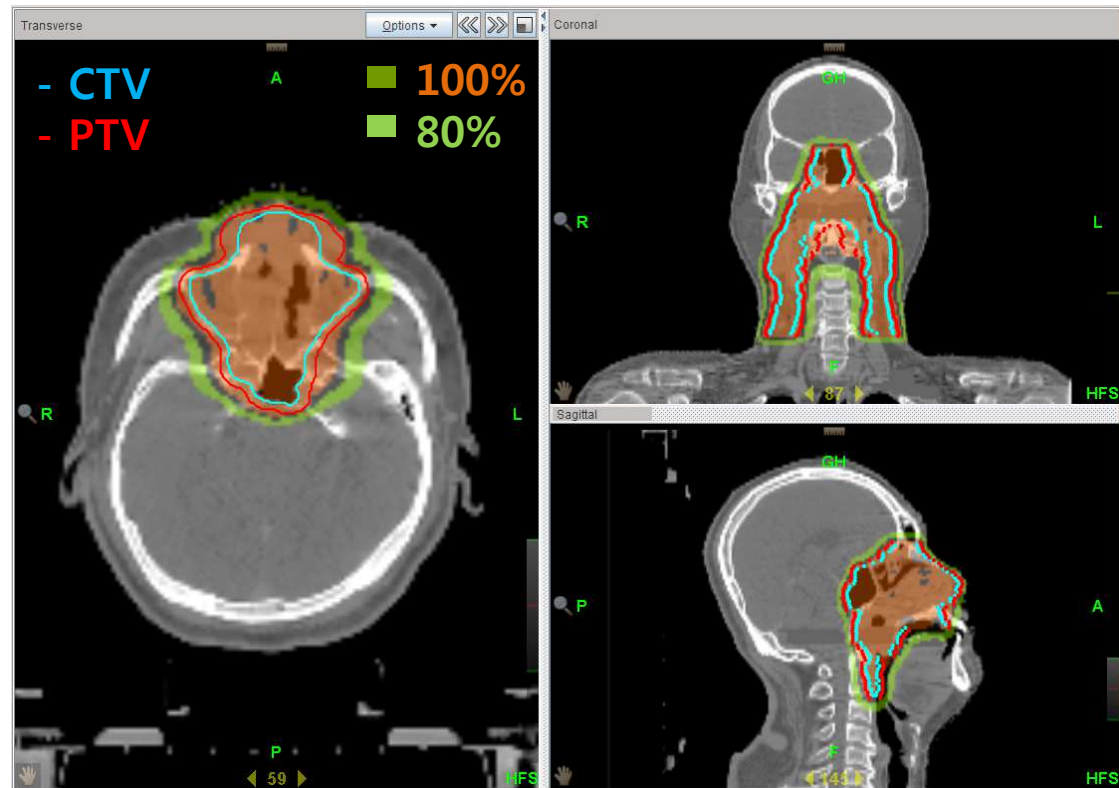
Small sized lesion, confined to Lt. inferior turbinate



Lt. septum mass extended to Lt. ant. maxillary sinus



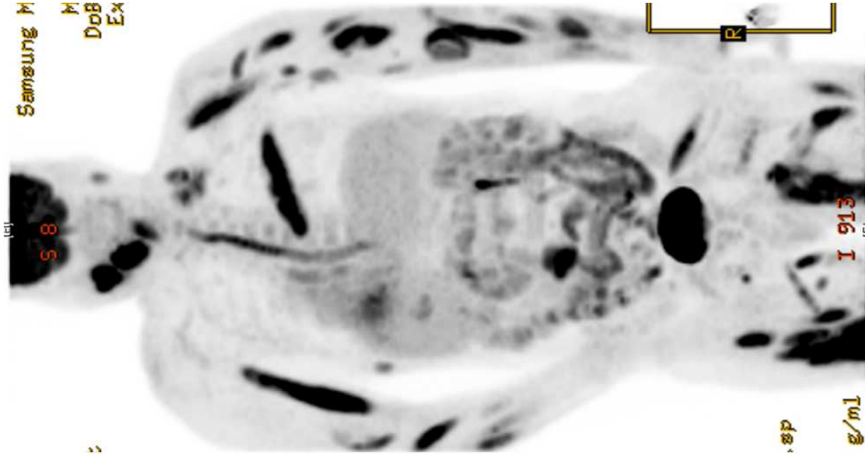
Both. nasal cavity to nasopharynx,
both upper neck (+)



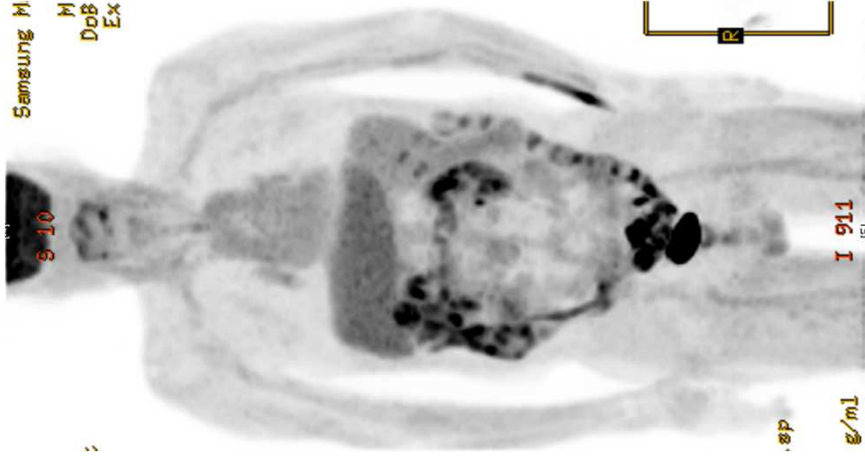


PET in response evaluation

15.05.02 Skin Bx : Extranodal NK/T cell lymphoma
 15.06.25 GDP #2 - #6

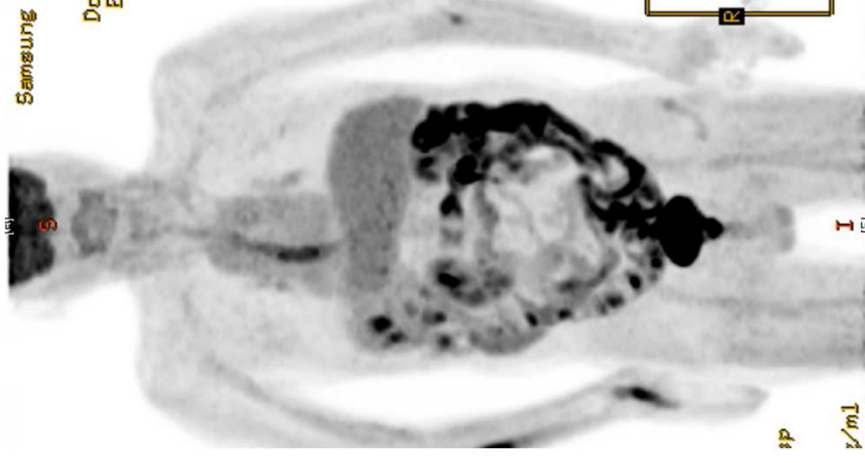


EBV : 14.54 copies/uL



GDP #3

1.13 copies/uL



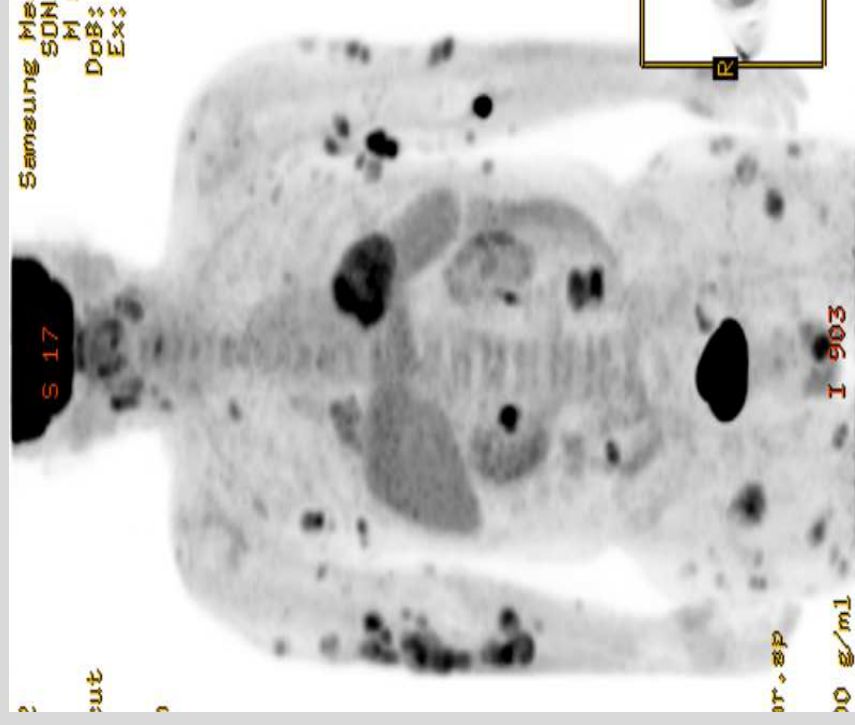
GDP #6

Less than detectable level

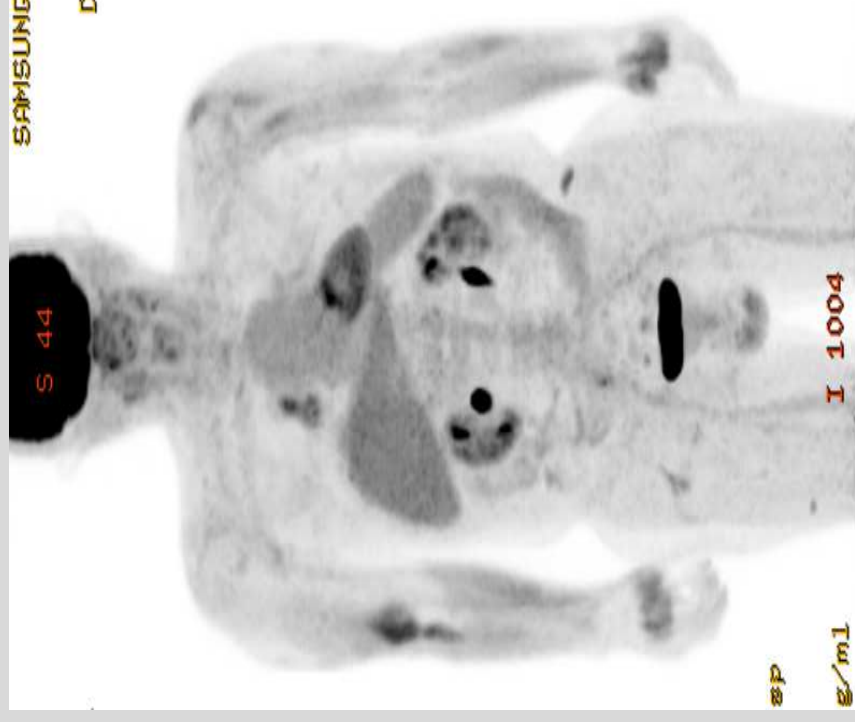


Brentuximab after 4 cycles

2013.12.05



2014.03.18





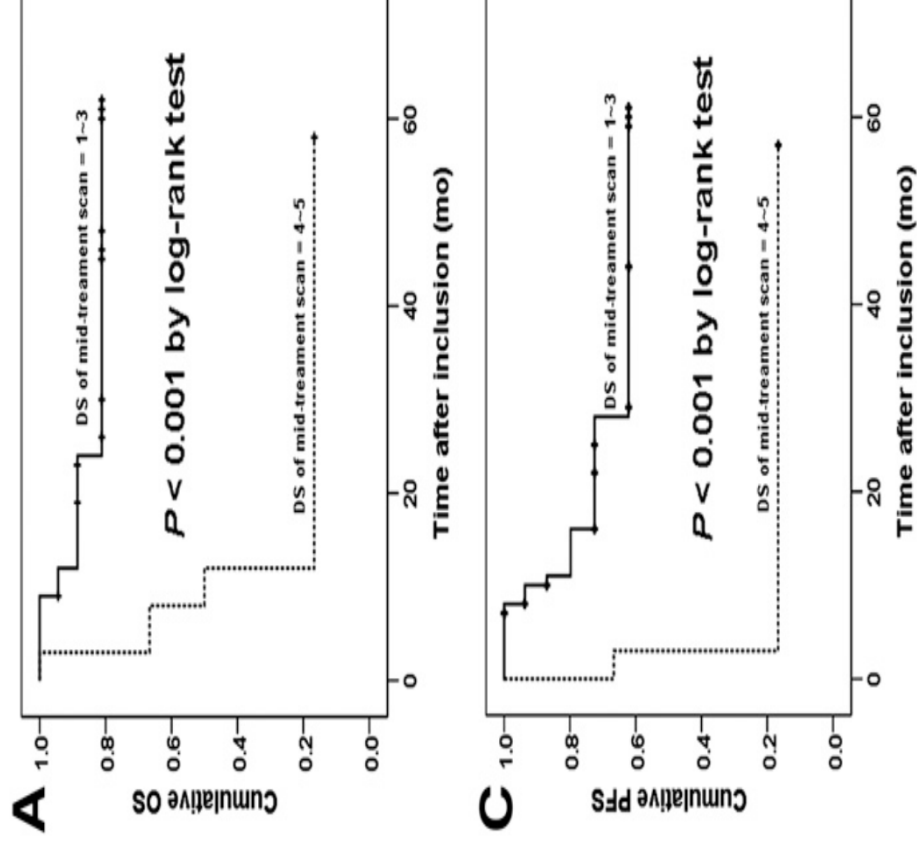
Midtreatment PET/CT for early response assessment

N 24

DS Patients

1 14 (58)
2 1 (4)
3 3 (13)
4 0 (0)
5 6 (25)

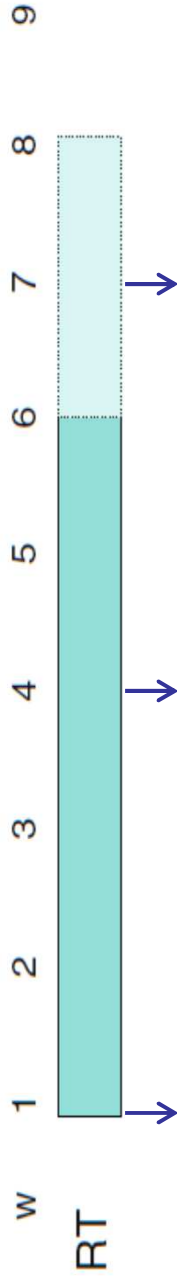
PET/CT after SMILE#3





Pitfalls of Midtreatment PET / CT

RT-2/3DeVIC



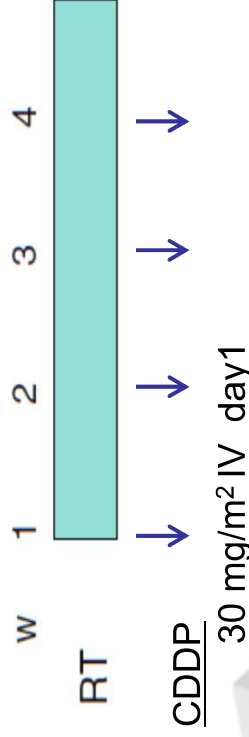
2/3 DeVIC

CBDCA	200 mg/m ² IV	day 1
ETP	67 mg/m ² IV	days 1-3
IFM	1.0 g/m ² IV	days 1-3
DMS	40 mg/day IV	days 1-3

RT (50-50.4 Gy; 1.8--2.0 Gy /fraction)

- CT-based 3 dimensional RT planning
- Clinical target volume for stage IE : the entire nasal cavity nasopharynx, and the volume + ≥ 2 cm to gross tumor
- Clinical target volume for stage IIE : included the cervical node area
- Planning target volume : clinical target volume + 5mm
- Incorporated an intraoral spacer and 2-step cone done technique
- Supported by an RT quality assurance program

CCRT-VIPD



VIPD x3 (9 weeks)

ETP	100 mg/m ² IV	days 1-3
IFM	1,2000 mg/m ² IV	days 1-3
CDDP	33 mg/m ² IV	days 1-3
DMS	40 mg/day PO/IV	days 1-4

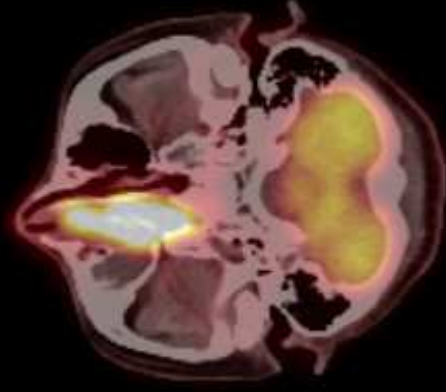
RT (median dose 40 Gy; 1.8-2.0 Gy / fraction)

- CT-based 3 dimensional RT planning
- Target volume : the gross clinical lesions + adequate margins

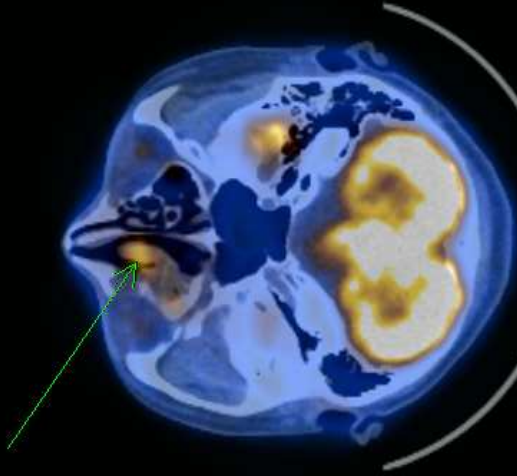


Case

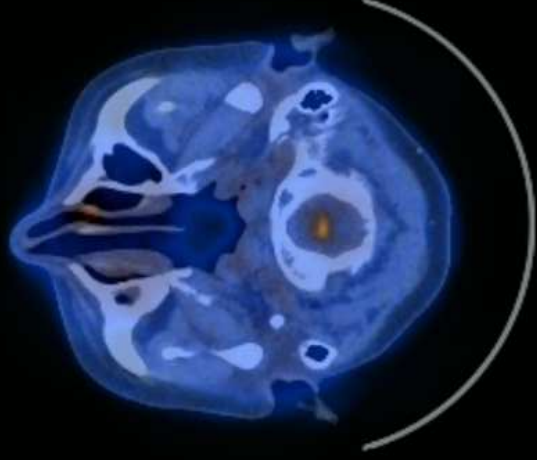
37/F nasal ENKL stage I



Initial



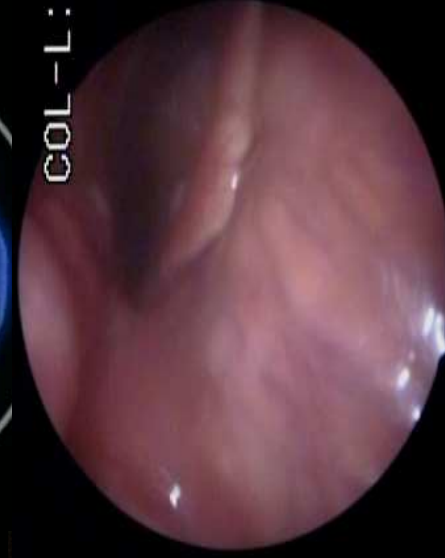
After CCRT



After VIDL#2



Initial



After CCRT

COL-L:



Pitfalls of Midtreatment PET/CT

N 557 from 11 countries

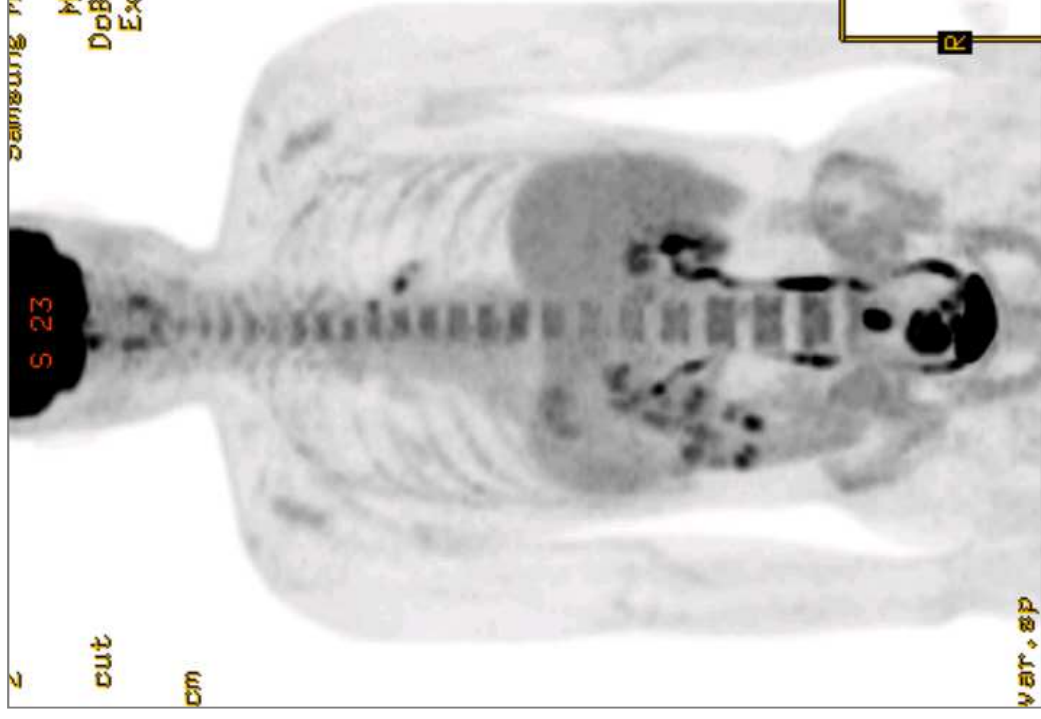
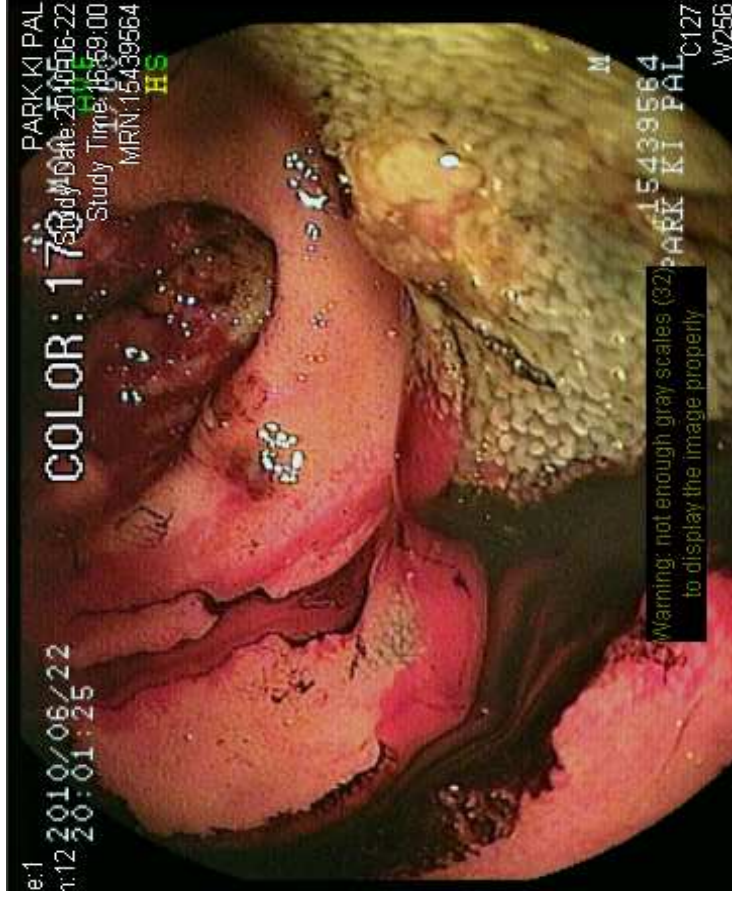
Stage

I	228 (43%)
II	116 (22%)
III	16 (3%)
IV	167 (32%)

Primary treatment	
Chemotherapy	202 (38%)
Concurrent chemoradiotherapy followed by chemotherapy	193 (37%)
Chemotherapy followed by radiotherapy	79 (15%)
Concurrent chemoradiotherapy	24 (5%)
Radiotherapy	20 (4%)
Radiotherapy followed by chemotherapy	9 (2%)
Chemotherapy regimen	
SMILE	134 (25%)
DeVIC	39 (7%)
VIPD	60 (11%)
VIDL	77 (15%)
MIDDLE	20 (4%)
IMEP	47 (9%)
ESHAP	6 (1%)
ICE	30 (6%)
Various gemcitabine-containing regimen†	10 (2%)
L-asparaginase-containing regimen†	29 (6%)
Non-anthracycline-based regimen†	31 (6%)



Fever/abdominal pain/hematochezia

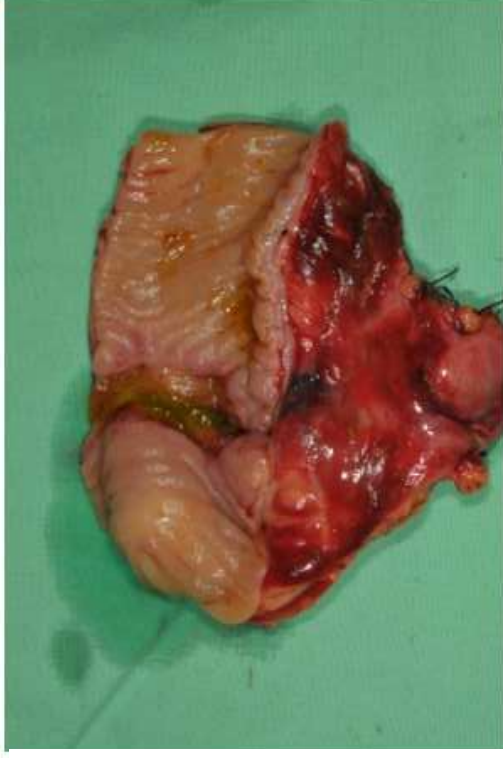


Extranodal NK/T cell lymphoma
CD3(+), CD56(+), EBV (+)



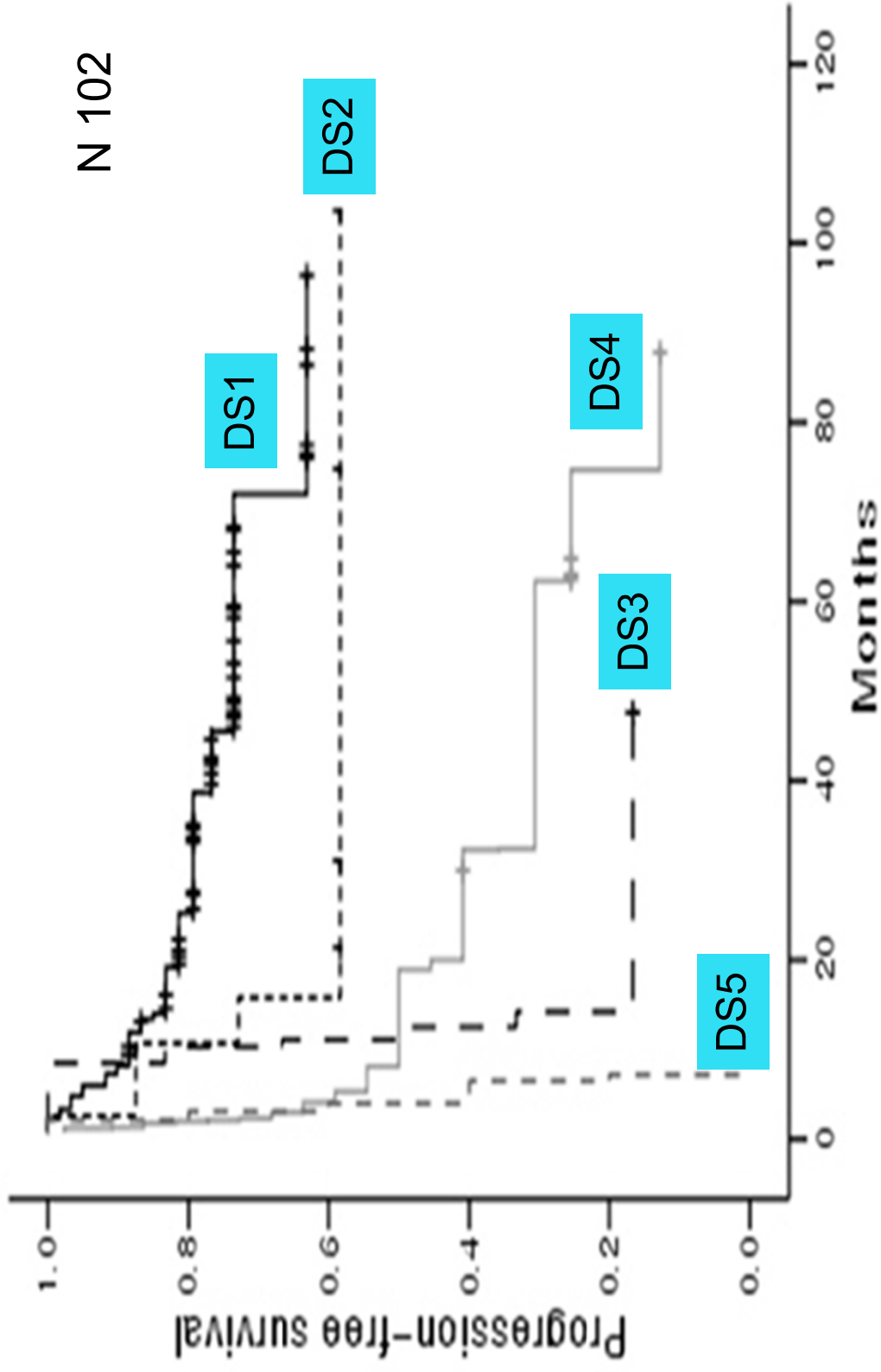
Hospital Course

- SMILE#1-2 : PR
- Bowel perforation

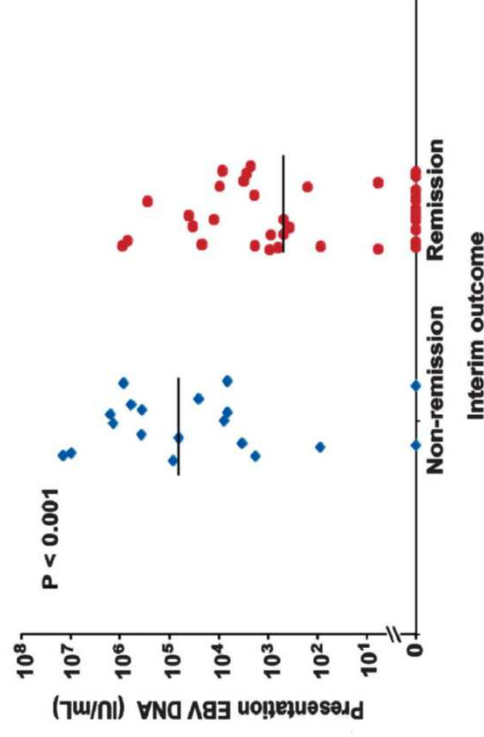
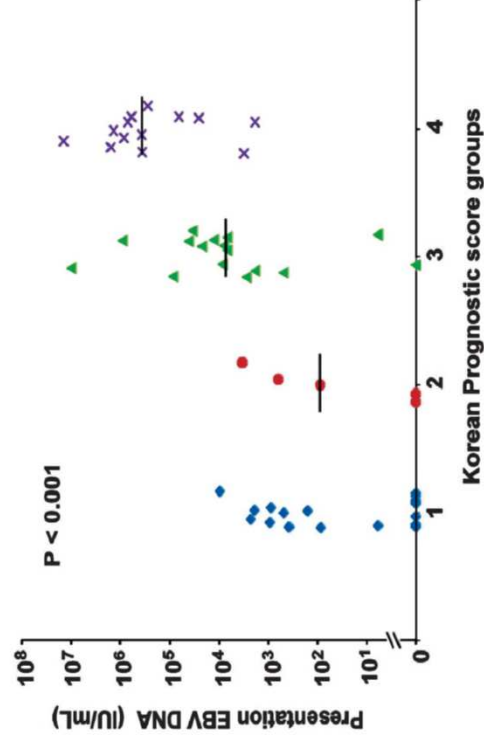
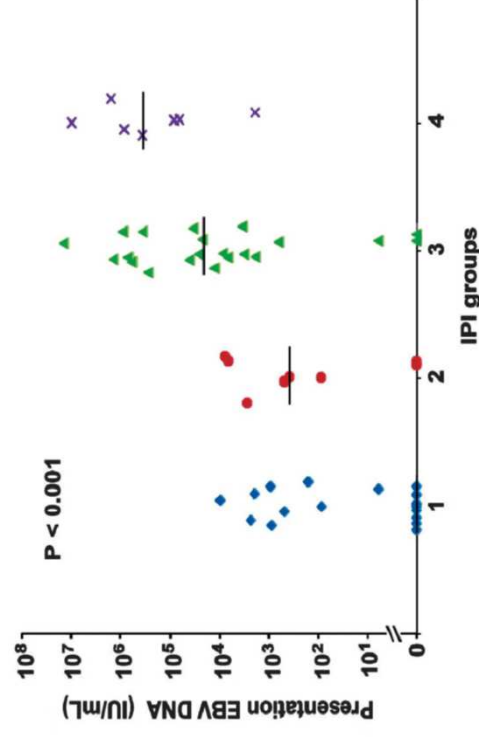
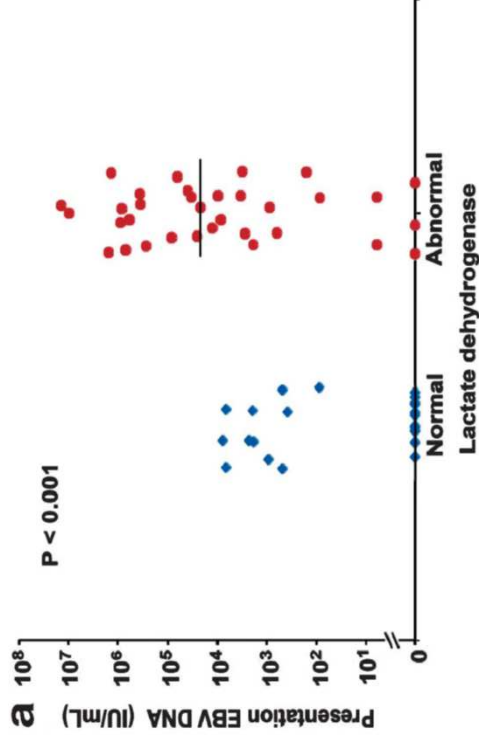




End of treatment

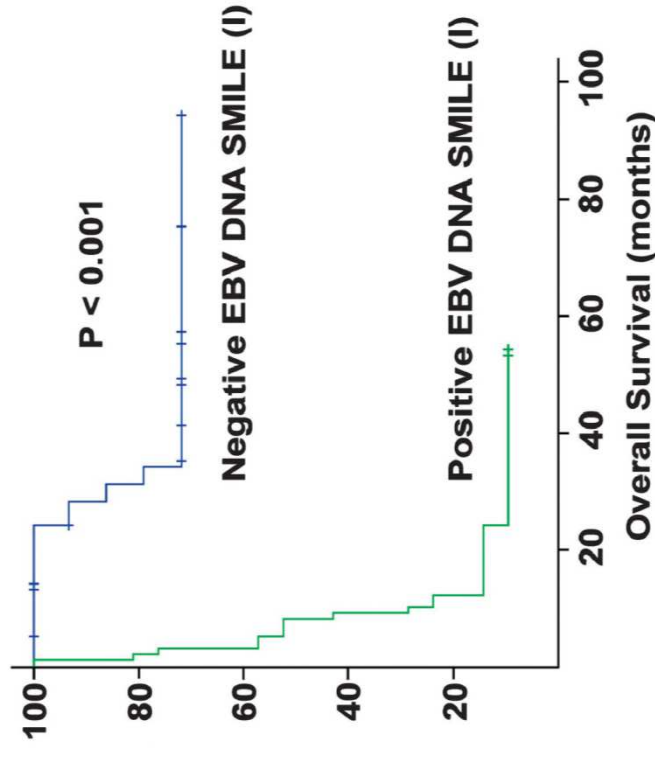
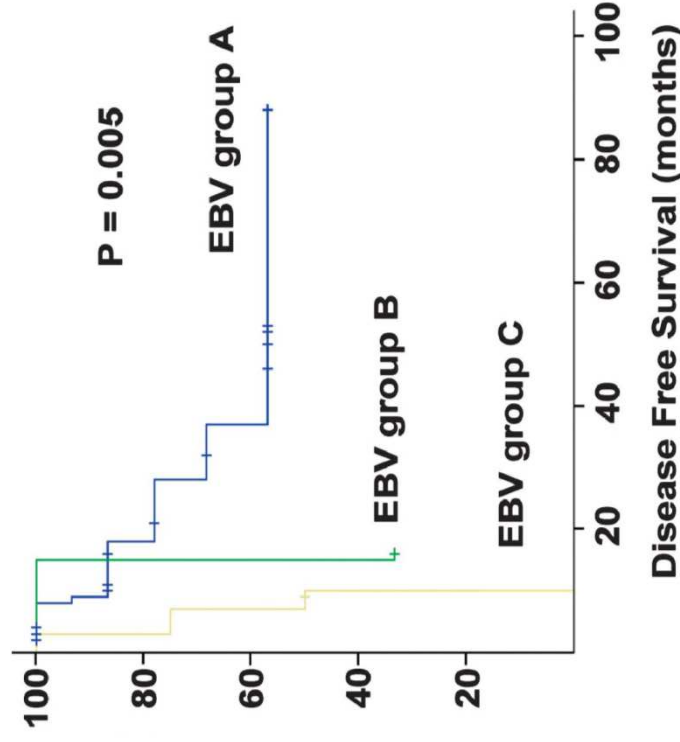


EBV DNA monitoring after SMILE : Midtreatment





EBV DNA monitoring after SMILE : Midtreatment



After SMILE(1)

Group A : persistently detectable

Group B : persistently detectable < presentation

Group B : persistently detectable > presentation

Response evaluation based in PET/CT and EBV DNA

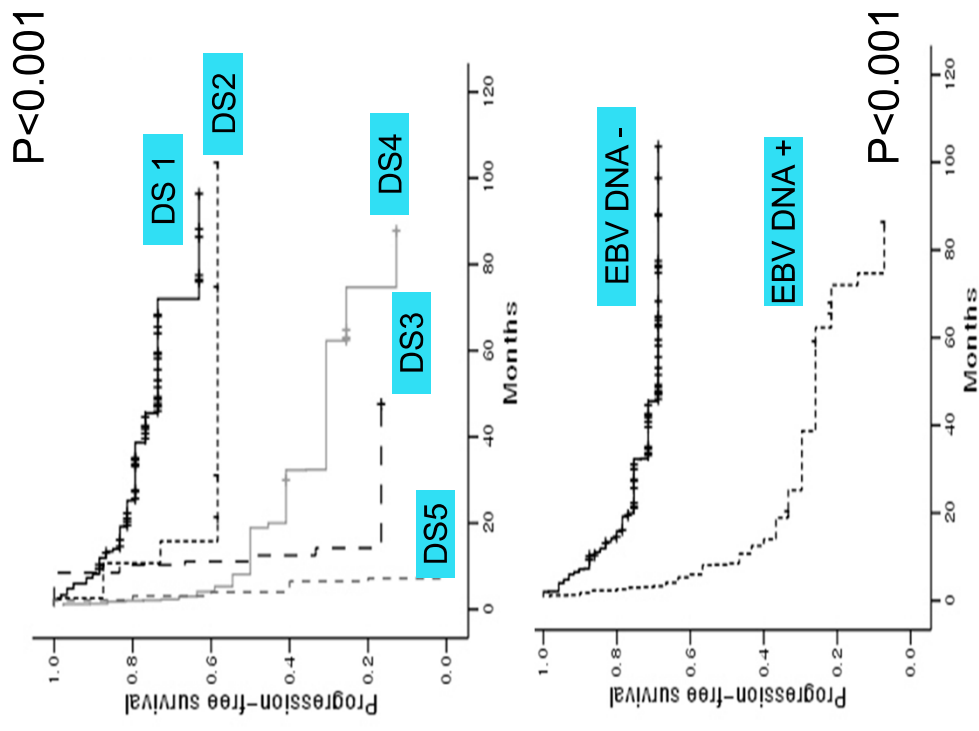
N 102



Stage I-II / III-IV	68/34
EBV DNA - / +	54/48
CCRT+Chemo	56
CCRT	5
Chemo	41



PFS based on DS and EBV DNA



	Pre-treatment		Post-treatment	
	Number of patients	Treatment failure	Number of patients	Treatment failure
Deauville score				
1	2	1 (50%)	61	15 (25%)
2	2	1 (50%)	8	3 (38%)
3	3	0	6	5 (83%)
4	25	12 (48%)	22	17 (77%)
5	70	31 (44%)	5	5 (100%)
Epstein-Barr virus DNA				
Negative	54	21 (39%)	72	20 (28%)
Positive	48	24 (50%)	30	25 (83%)

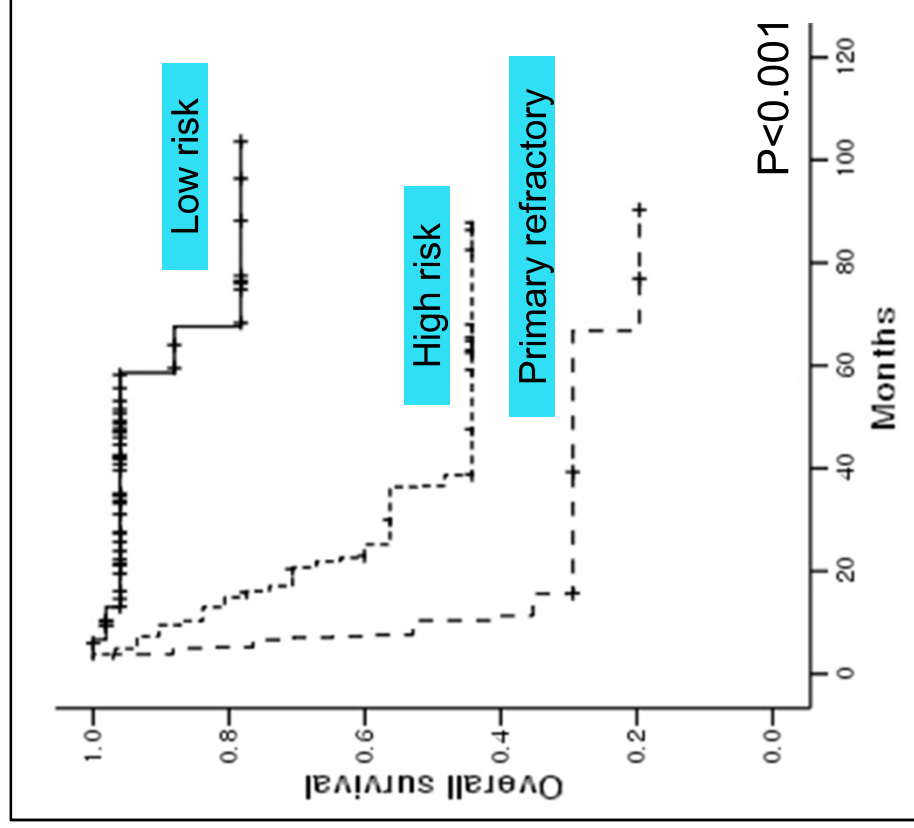
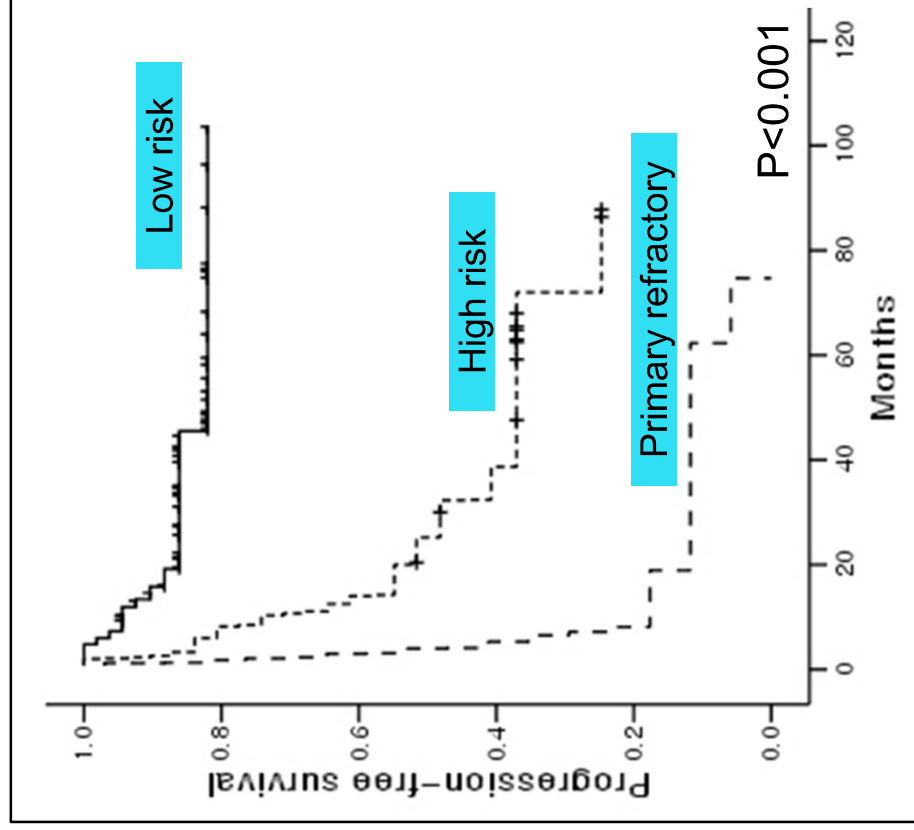


Relapse rate based on EOT





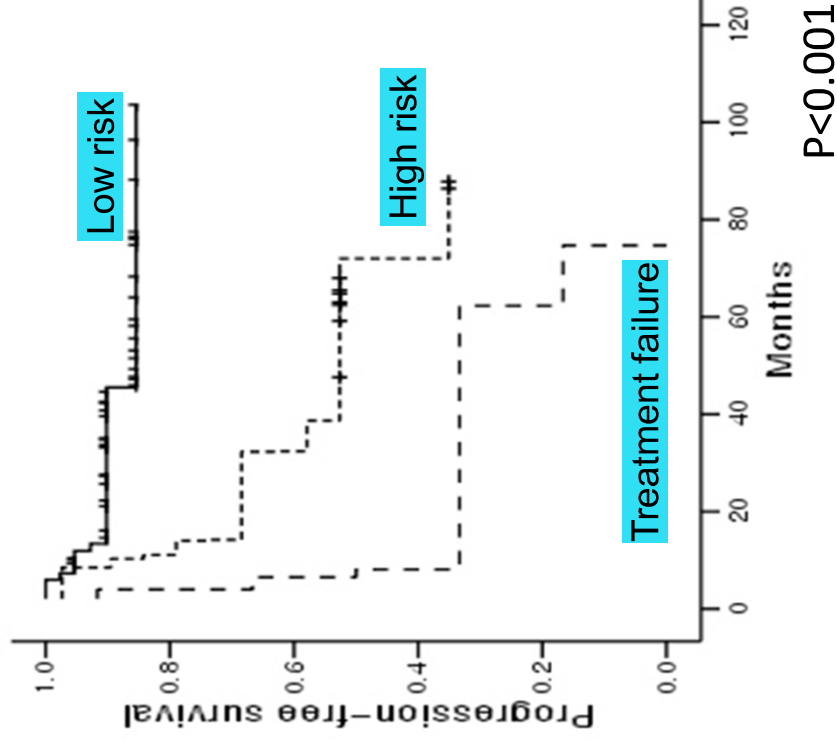
Survivals based on PET/CT and EBV DNA



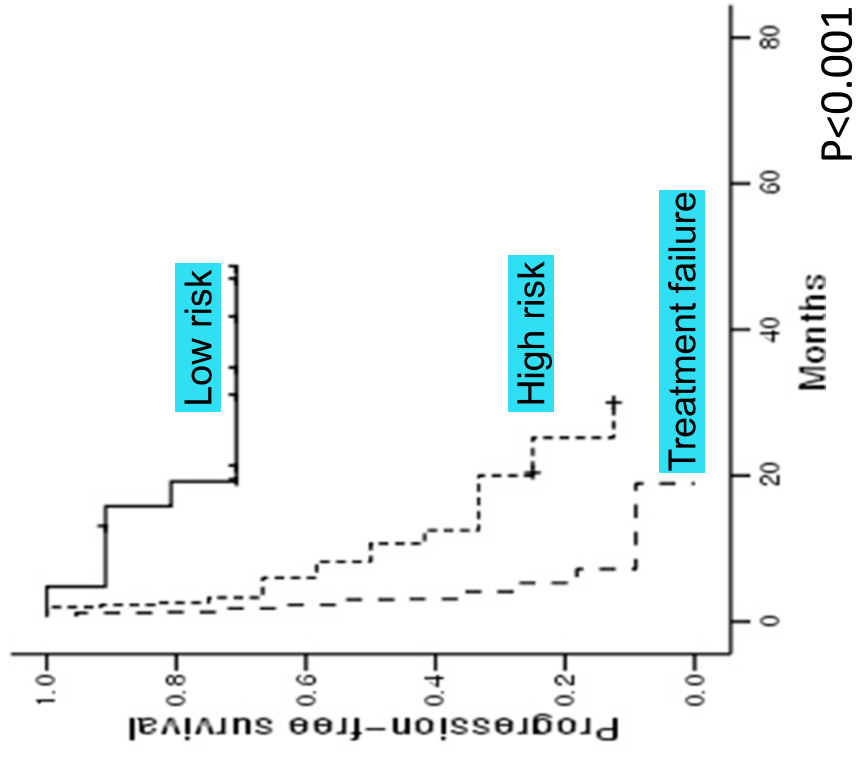


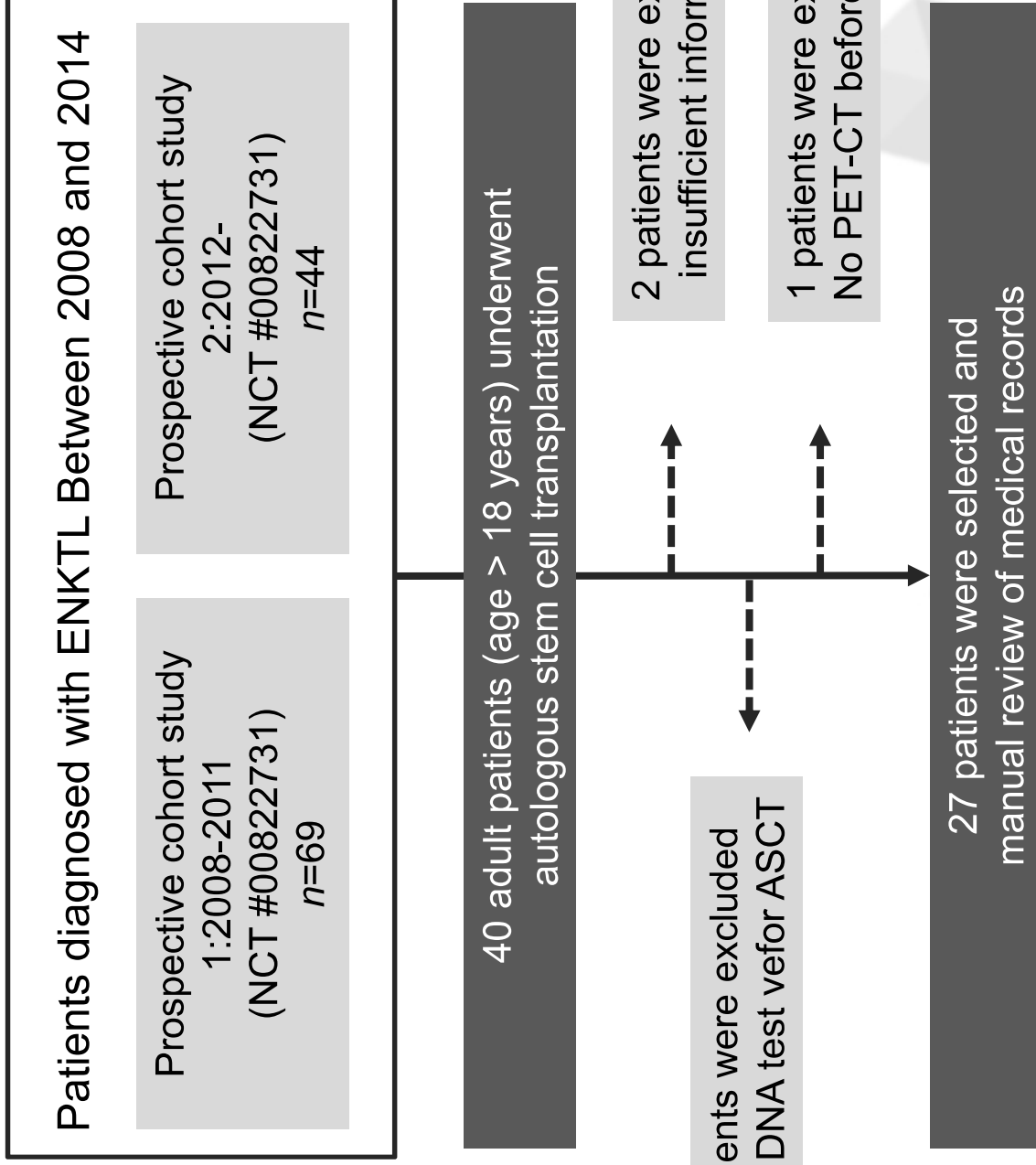
PFS based on PET/CT and EBV DNA

Stage I/II



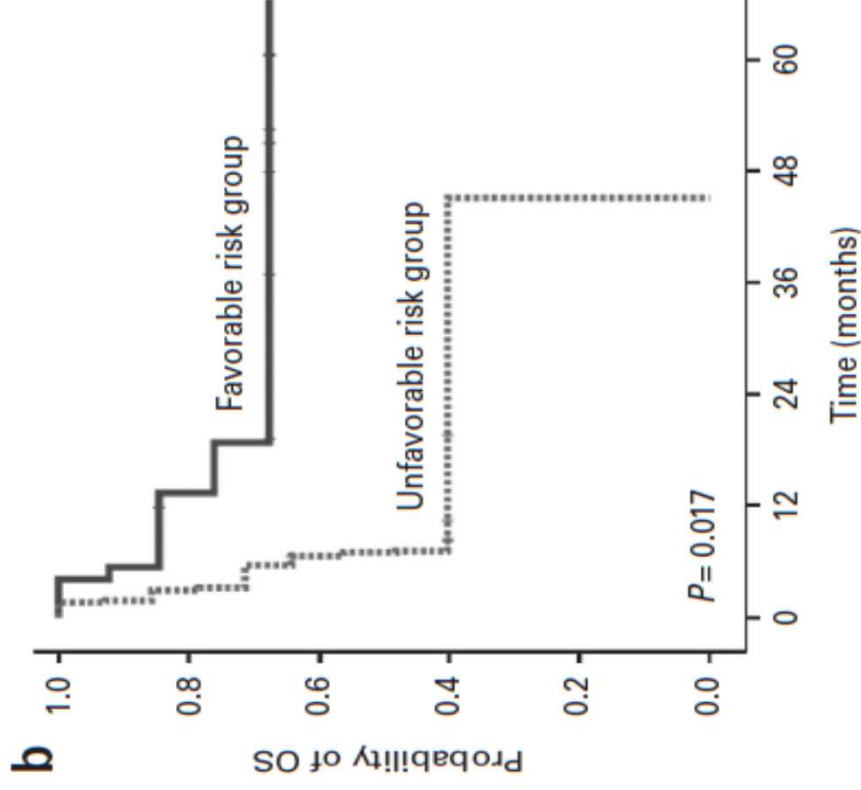
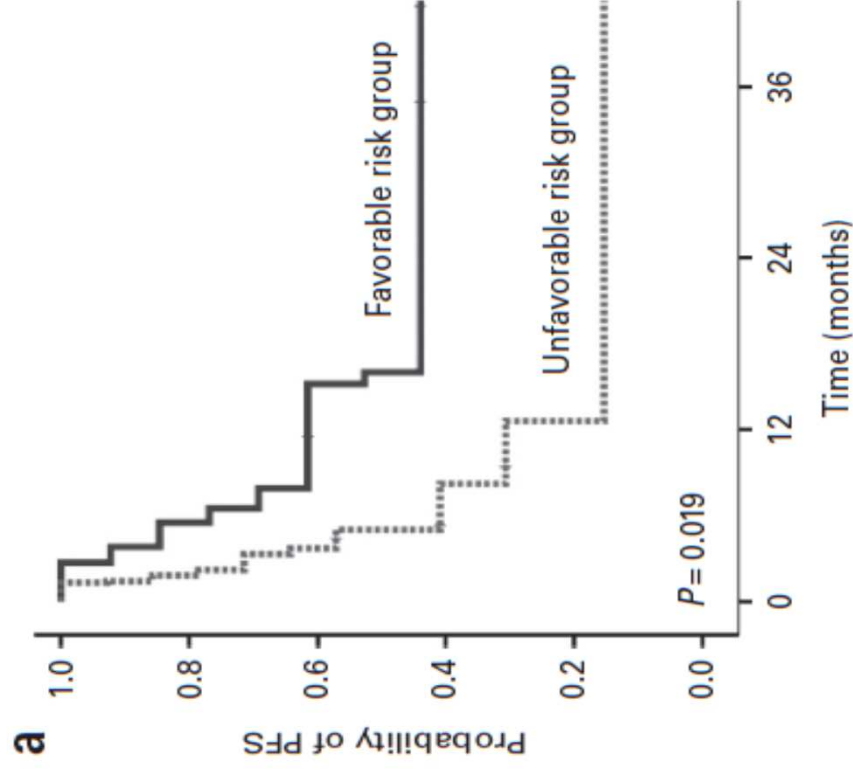
Stage III/IV







PFS and OS according to EOT response criteria



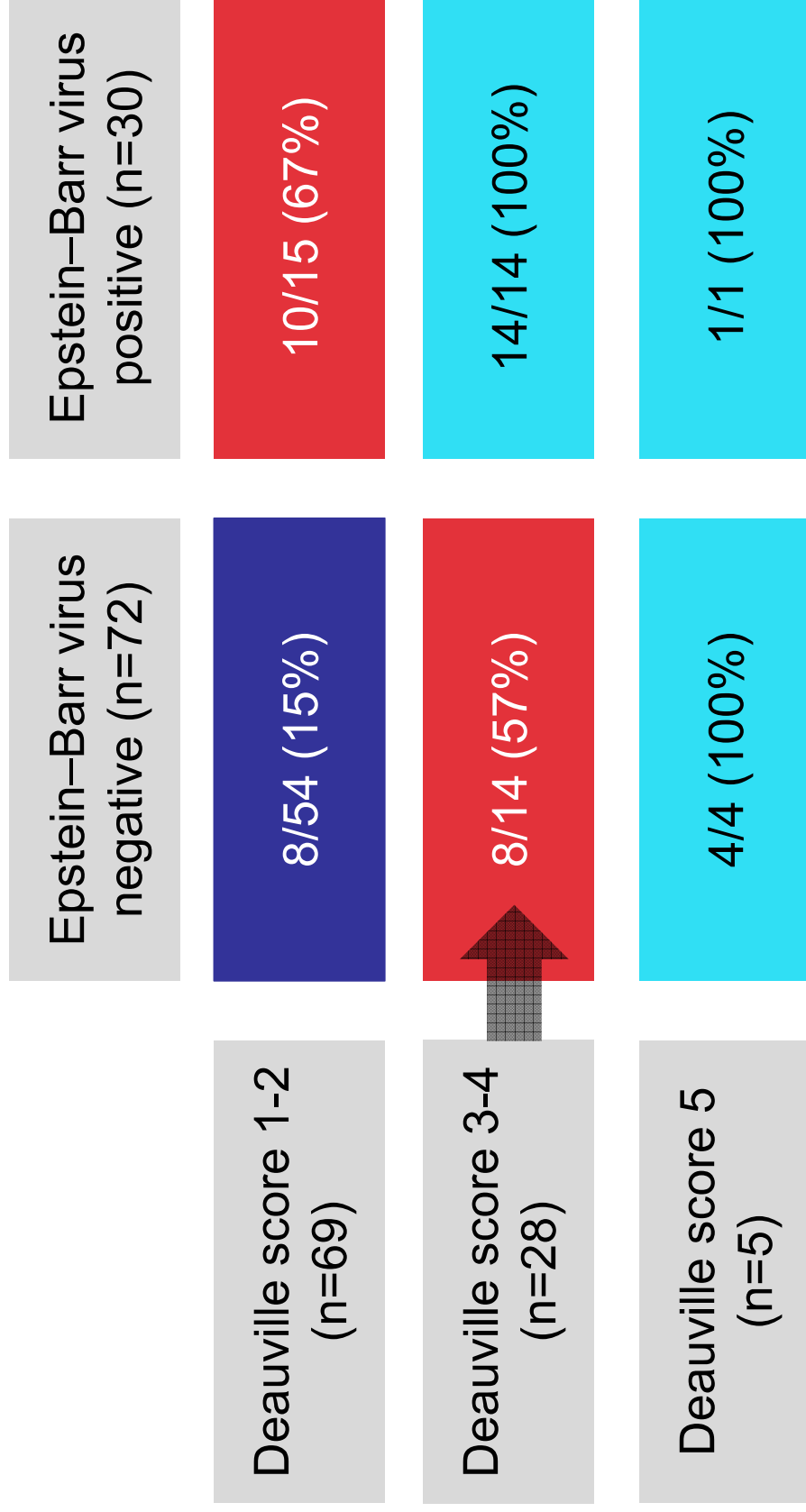
Treatment recommendation according to EOT response criteria

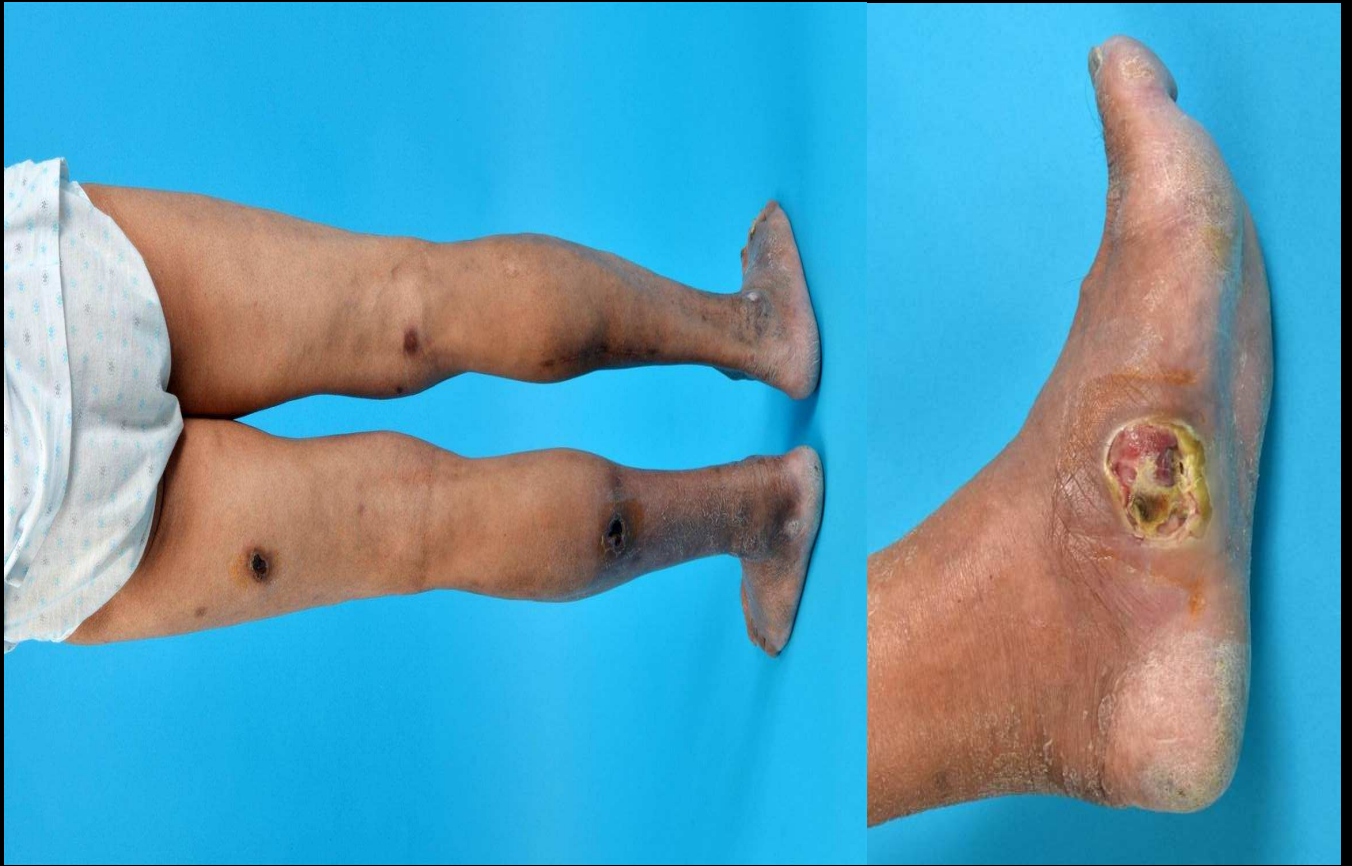
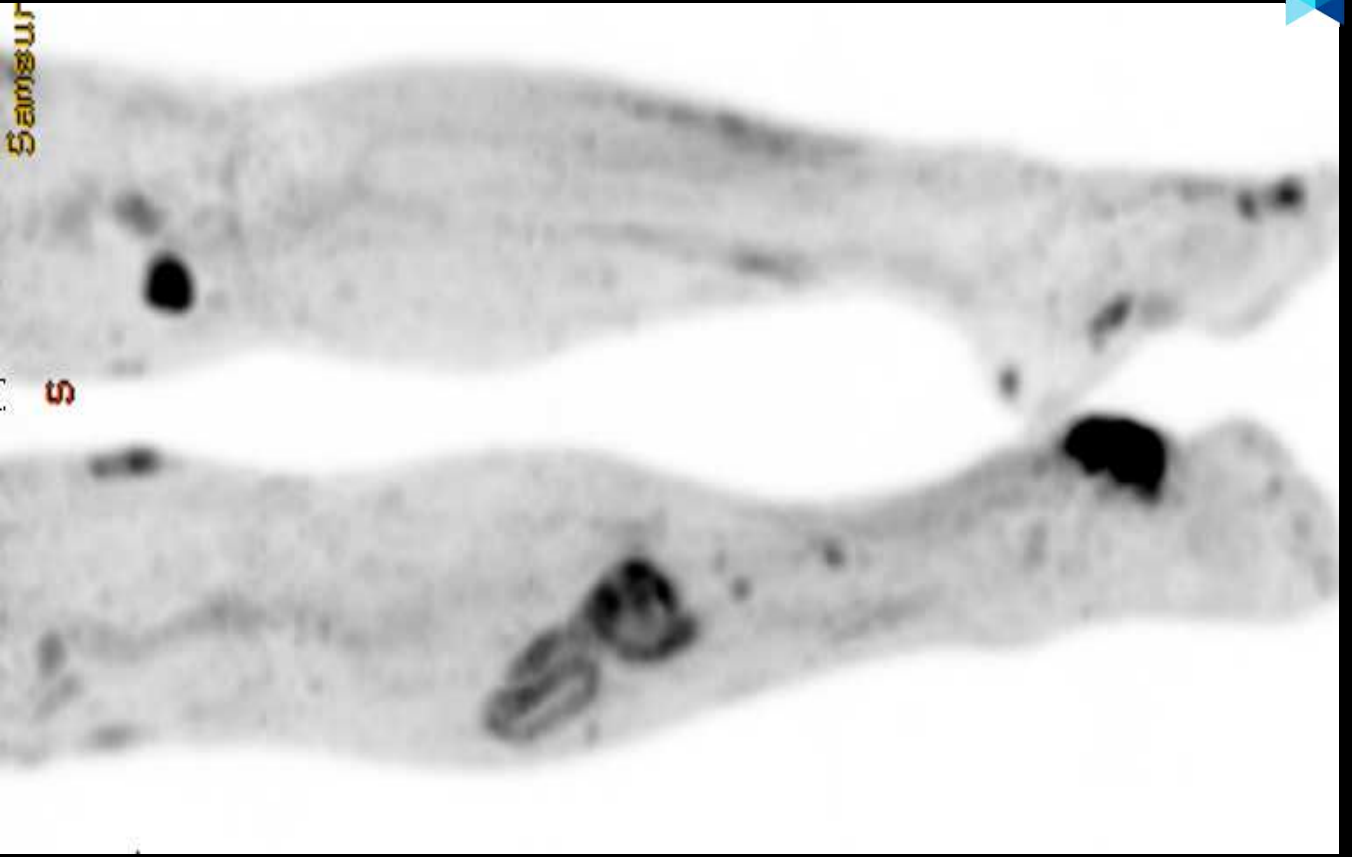
- Low risk
- High risk
- Failure

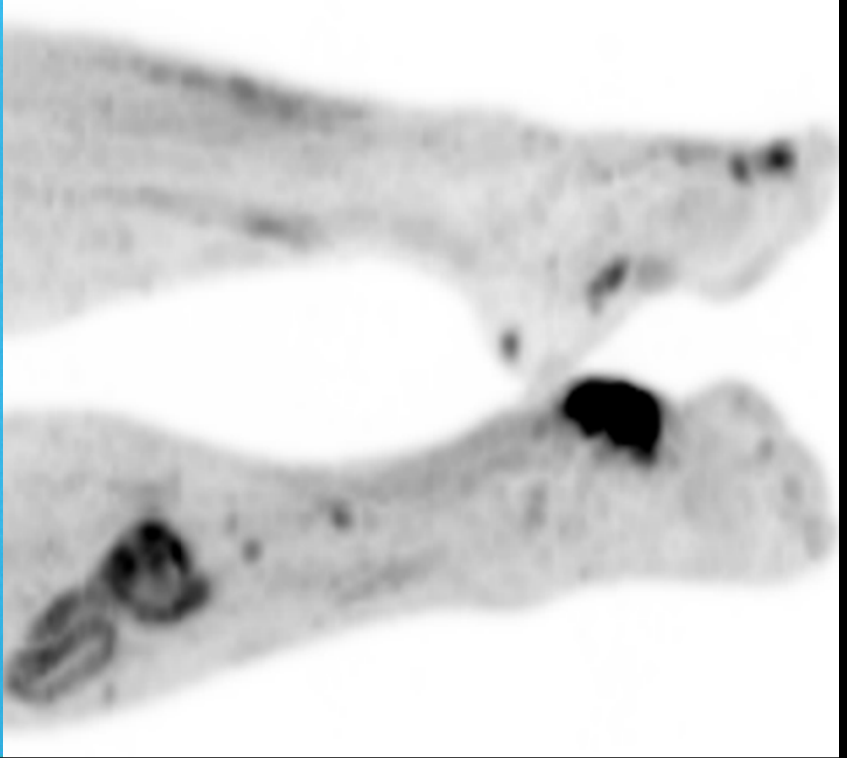
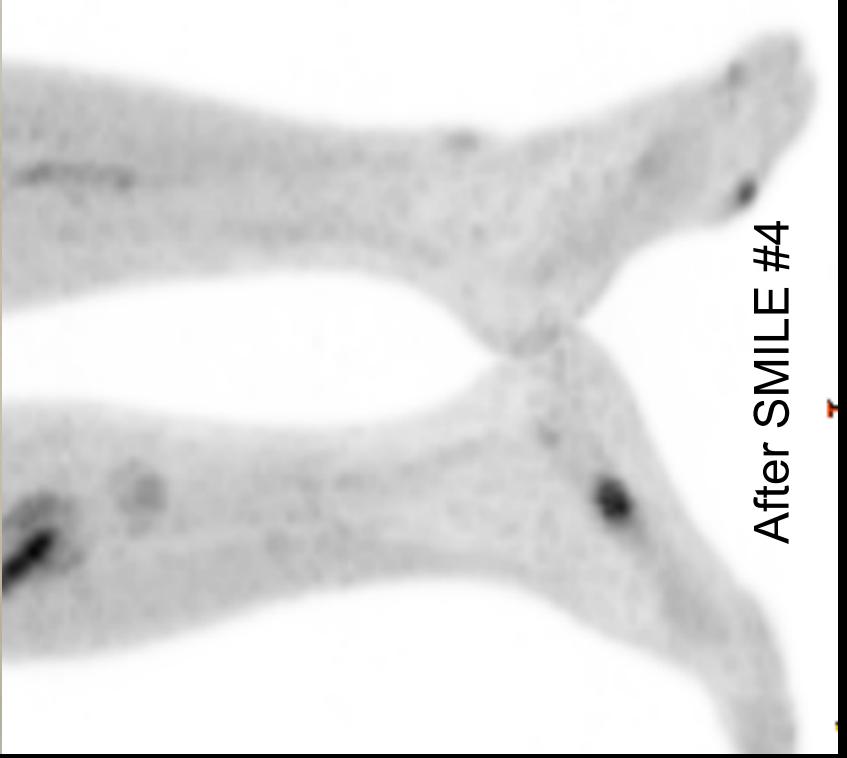
		Post-treatment Deauville score				
		1	2	3	4	5
Post-treatment Epstein-Barr virus	Negative		Observation after primary treatment		Additional treatment to achieve Deauville score 1-2	
	Positive		Additional treatment to achieve Epstein-Barr virus negativity		Salvage treatment or clinical trial	



Pitfalls of EOT PET/CT









PET in ENKL

Sensitive method to detect ENKL involving lesions.

- Essential for staging
- Helpful to plan radiation field



Mid
treatment
PET

- Valuable in case of chemotherapy only
- Limitation in the cases after radiation



EOP
PET

- Valuable to decide the final response
- Limitation in evaluation of ulcerative lesions under healing
- Limitations can be overcome with combining evaluation with circulation EBV DNA



Thank you

SAMSUNG MEDICAL CENTER





Down-hill course

