Table S1: Baseline characteristics of the patients with IPI scores ≥ 3

	CAR-T group (N=20)	ASCT group (N=11)	P Value
Age, median	62 (range,27-69)	52 (range 30-64)	
Female sex	6(30%)	4(36.4%)	0.717
Male sex	14(70%)	7(63.6%)	0.717
ECOG PS ≥2	4(20%)	1(9.1%)	0.429
Disease type			
DLBCL	16(80%)	9(81.8%)	0.902
MCL	1(5%)	2(18.2%)	0.235
Transformed DLBCL	1(5%)	0	0.451
BL	2(10%)	0	0.278
Elevated LDH lever	11(55%)	10(90.9%)	0.041
Advanced Stage (III-IV)	20(100%)	11(100%)	
≥3 prior lines of therapies	13(65%)	6(54.5)	0.567
Prior disease status			
CR/PR	3(15%)	4(36.4%)	0.173
SD/PD	17(85%)	7(63.6%)	0.173

Table S2: Multivariate analysis of overall survival risk factors with no statistical significance

Variable	Relative Risk of Overall survival (95% Confidence interval)	P value
Age ≥60	0.848 (0.150-4.747)	0.848
Prior therapies		
≥3 prior lines of therapies	0.560 (0.198-1.586)	0.275
No Response to salvage chemotherapy before enrolled	1.234 (0.384-3.969)	0.724
IPI score ≥3	1.930 (0.534-6.979)	0.316
Disease stage ≥3	0 (0-)	0.982

Table S3: All adverse events in the CAR-T group

Adverse Events(n)	Grade					Total
	1	2	3	4	5	
Blood and lymphatic system disorders Total	6	5	19			30
Anemia	6	5	16			27
Febrile neutropenia			3			3
Cardiac disorders Total	6				1	7
Sinus tachycardia	6					6
Heart failure					1	1
Gastrointestinal disorders Total	10	9				19

Abdominal distention	1	1				2
Abdominal pain	1	2				3
Constipation	3	4				7
Diarrhea	2					2
Nausea	2					2
Vomiting	1	2				3
General disorders and administration site conditions Total	17	8	4	2		31
Chill	4					4
Edema	2					2
Fatigue		8				2
Fever	10	6	4	2		22
Pain	1					1
Immune system disorder Total	10	8	4	1	1	24
Allergic reaction		1				1
Cytokine release syndrome	10	7	4	1	1	23
Infection and infestation Total			4			4
Lung infection			4			4
Investigations Total	11	1	10	19		44
Alanine aminotransferase increased	1		1			2
Aspartate aminotransferase increased	1		1			2
Alkaline phosphatase increased	2					2
Blood bilirubin increased	1					1
Creatinine increased	5		2			7
Neutrophil count decreased	1	1	6	19		27
Thrombocytopenia	3	7	3	9		
Nervous system disorder Total	1	1	3			5
Aphasia			1			1
Dysphonic disorder			1			1
Cognitive disturbance			1			1
Headache	1					1
Epilepsy		1				1
Psychiatric disorder Total			4			4
Confusion			3			3
Delirium			1			1
Respiratory, thoracic and mediastinal disorders Total	3	1	3			7
Cough	3					3
Dyspnea		1				1
Hypoxia			3			3
Skin and subcutaneous tissue disorders Total		1				1
Rash		1				1
Vascular disorders Total		1	4			5
Hypotension		1	4			5

Table S4: All adverse events in the ASCT group

Adverse Events(n)	**Grade**					**Total**
	1	2	3	4	5	
Blood and lymphatic system disorders Total			38			38
Anemia			27			27
Febrile neutropenia			11			11
Cardiac disorders Total	8			2	2	12
Sinus tachycardia	8					8
Heart failure				1	1	2
Myocardial infarction					1	1
Toxic myocarditis				1		1
Gastrointestinal disorders Total	1	13	40			54
Abdominal pain		2	5			7
Constipation		2				2
Diarrhea	1	3	9			13
Nausea			9			9
Vomiting		2	5			7
Mucositis		2	12			14
Gastrointestinal bleeding		2				2
General disorders and administration site conditions Total	19	8	2			29
Chill	8					8
Edema	3					3
Fatigue		4				4
Fever	5	4	2			11
Pain	3					3
Infection and infestation Total			11		1	12
Lung infection			4			4
Abdominal infection			4			4
Urinary tract infection			1			1
Sepsis					1	1
Upper respiratory infection			1			1
Skin infection			1			1
Investigations Total	22	4		54		80
Alanine aminotransferase increased	6	2				8
Aspartate aminotransferase increased	4	1				5
Alkaline phosphatase increased	2					2
Blood bilirubin increased	3					3
Creatinine increased	3	1				4
Neutrophil count decreased				27		27
Thrombocytopenia				27		27
Wight gain	4					4

Nervous system disorder Total			1	1
Epilepsy			1	1
Respiratory, thoracic and mediastinal disorders Total	5	2	4	11
Cough	5			5
Dyspnea		2		2
Hypoxia			3	3
Hemoptysis			1	1
Vascular disorders Total			3	3
Hypotension			3	3

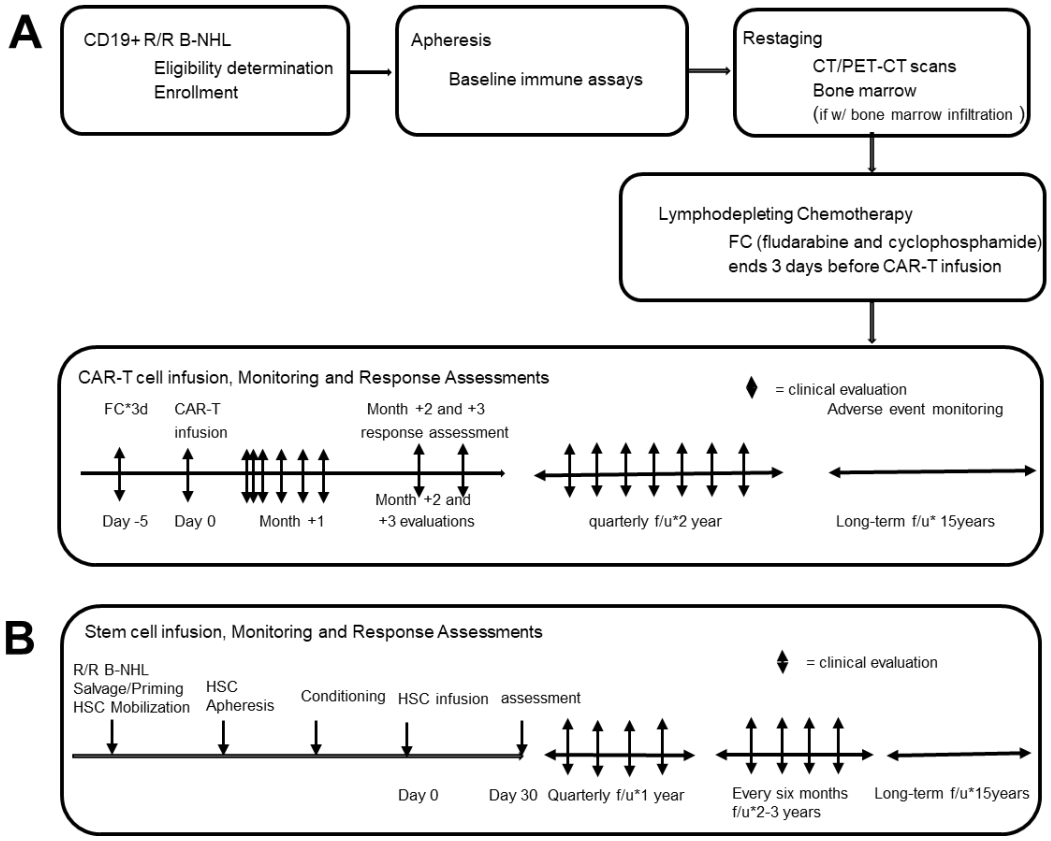


Figure S1. Protocol schema of CAR-T (A) and ASCT (B)

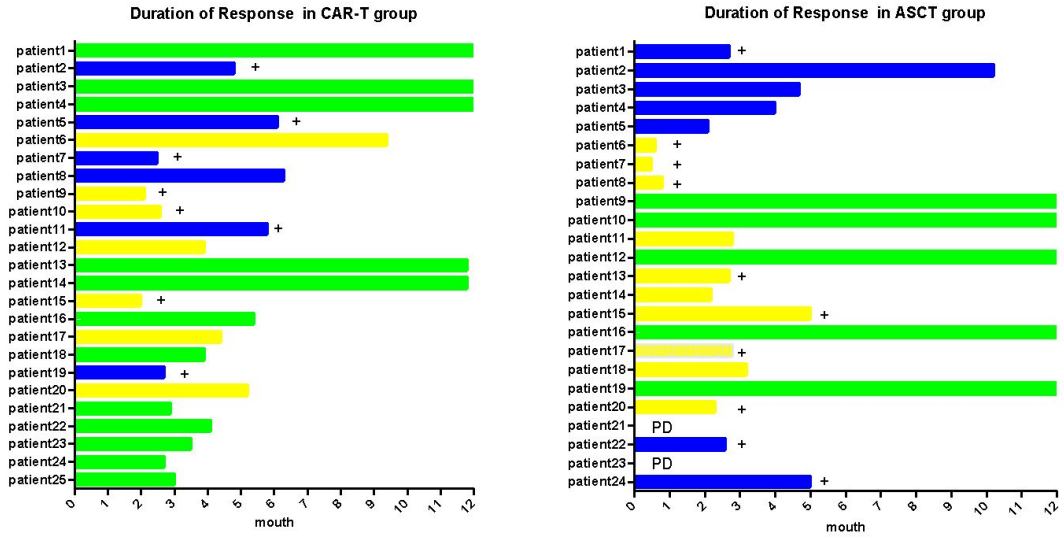
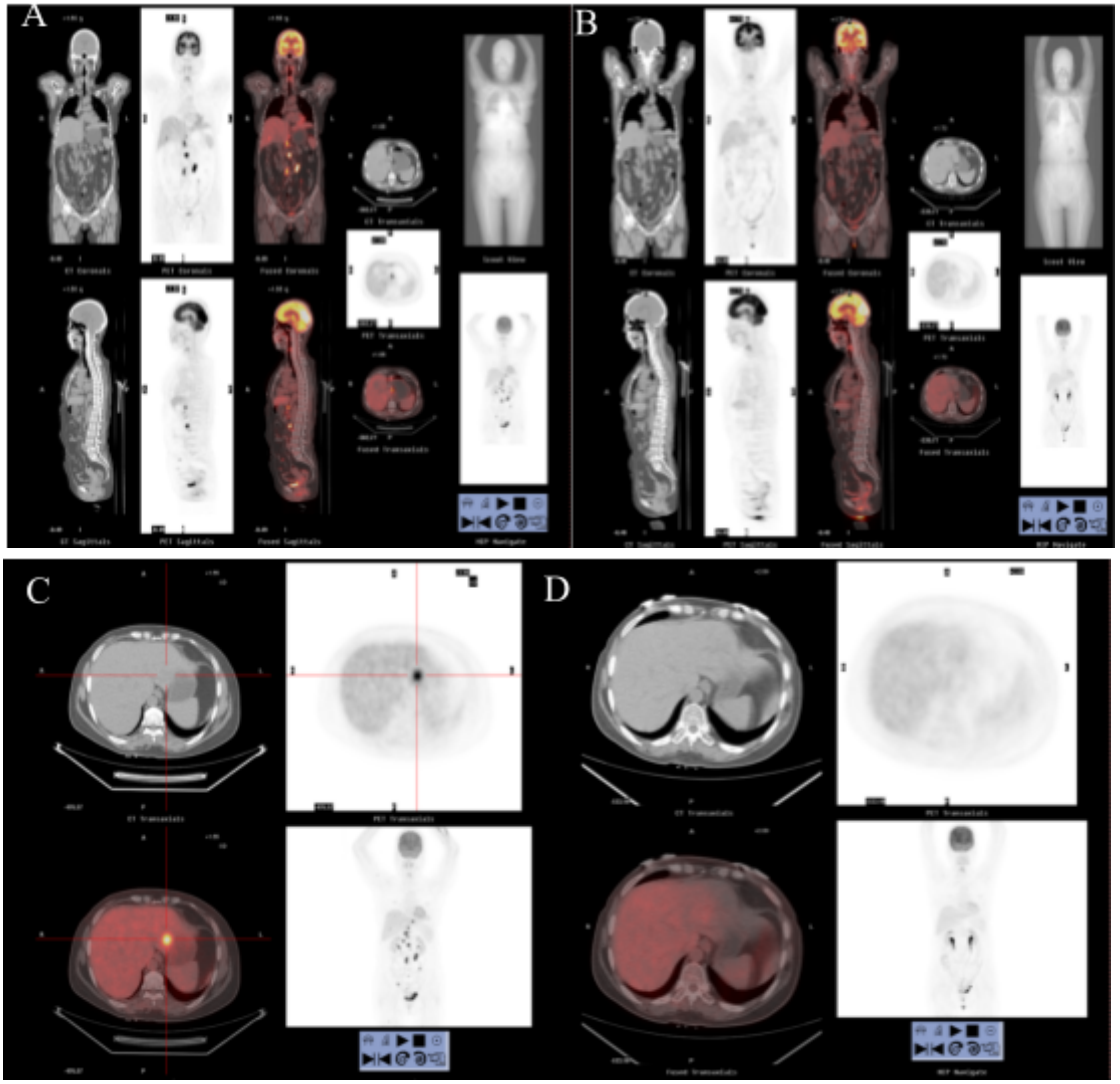


Figure S2. Individual duration of remission patients of the two groups. Individual duration of remission patients of the two groups. Green bars represent CR; Blue bars represent PR; Yellow bars represent SD; "+" means patients have experienced progression or death.



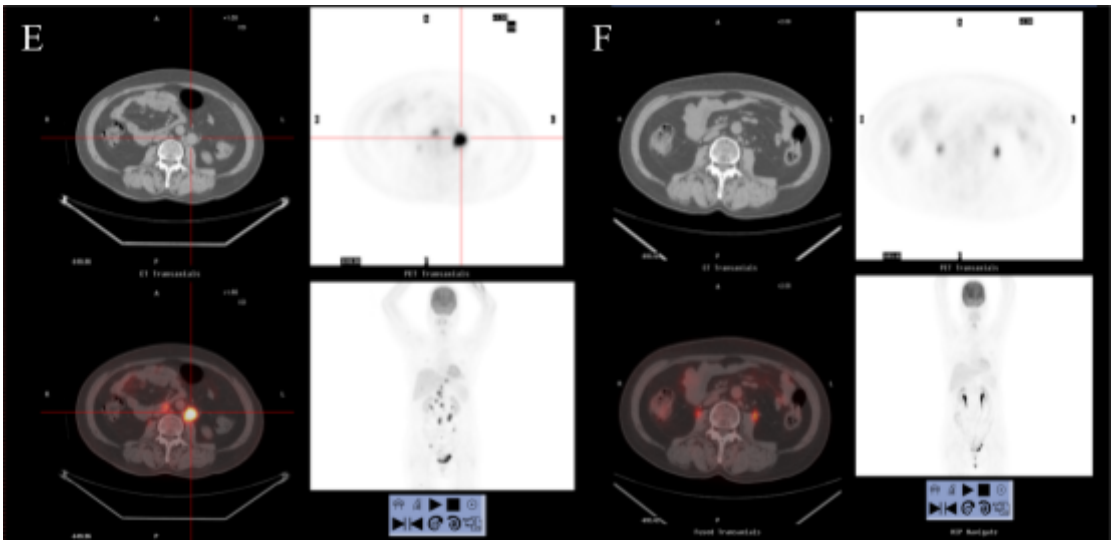


Figure S3. Pretreatment and post-treatment PET/CT of patient 14 in CAR-T group. Pretreatment and post-treatment PET/CT of patient 14 in CAR-T group. An axial PET-CT images prior to CAR-T cell treatment (**A**, **C** and **E**) shows liver and abdominal lesions associated with strong uptake of 18F-fluorodeoxyglucose. An axial PET-CT images post CAR-T cell treatment (**B**, **D** and **F**) shows all lesions had disappeared.