

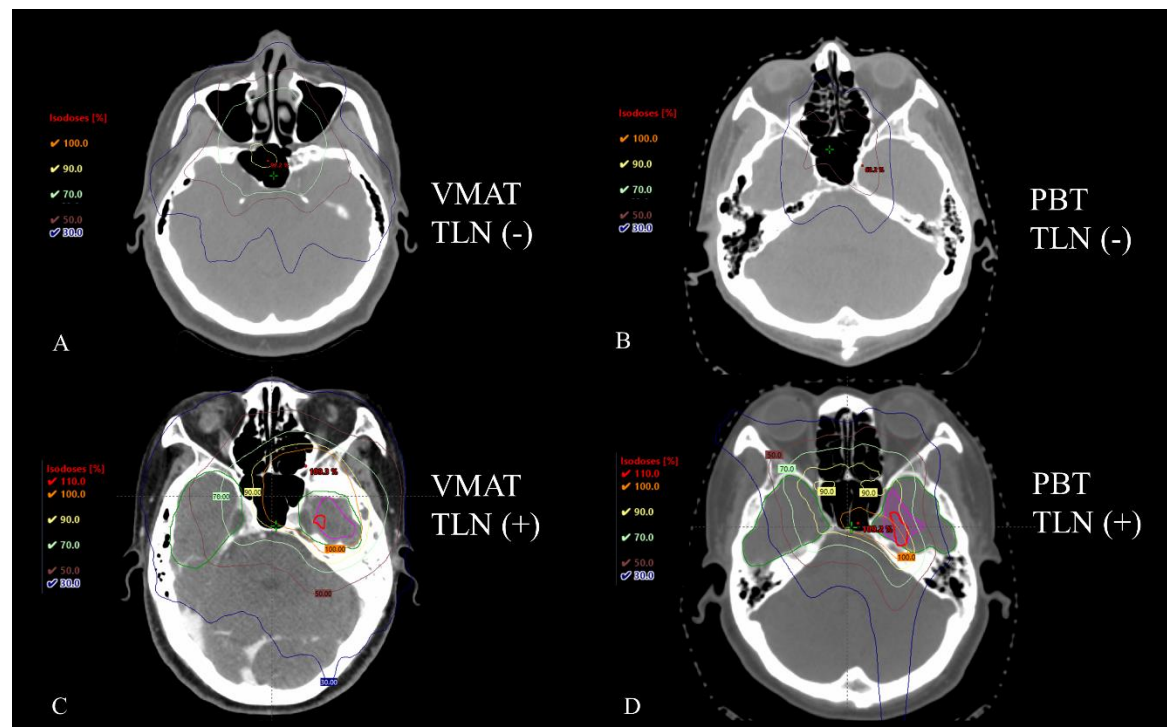
Supplementary materials

Supplementary Figure. Radiation dose distributions of select patients with nasopharyngeal carcinoma receiving RT.

Supplementary Figure A and B showing the radiation dose distributions in two selected patients who did not have TLN, while Supplementary Figure C and D showing the radiation dose distributions in the other two selected patients with TLN.

The red-lines circles the area with contrast enhancement on T1 weighted images, and the purple lines circles the hyperintensity area on T2 weighted images in the Figure C and D. The selected patients in the Supplementary Figure A and C received VMAT, whereas those in the Supplementary Figure B and D received PBT.

PBT, proton beam therapy; TLN, temporal lobe necrosis; VMAT, volumetric modulated arc therapy.



Supplementary Table 1. Risk of TLN and NPC, overall and by T stage category

	T stage				Total	
	T0-T2		T3-T4			
	NPC	non-NPC	NPC	non-NPC	NPC	non-NPC
TLN (n)	4	0	7	1	11	1
Total at risk (n)	86	111	109	165	195	276
Risk of TLN (%)	4.7%	0.0%	6.4%	0.6%	5.6%	0.4%
Odds ratio		NA	11.26 (1.37-92.82)		16.44 (2.11-128.42)	
<i>p</i> value (X ² test)		0.04		<0.01		<0.01

Mantel-Haenszel test, $p < 0.01$

NPC, nasopharyngeal carcinoma; TLN, temporal lobe necrosis

Odds ratio was interpreted as ratio (95% confidence interval)

Supplementary Table 2. Characteristics of patients with TLN in this study

Baseline characteristics					RT data			TLN type				SE	RT dose	Right temporal total						Left temporal total					
Age	Sex	Cancer	Staging	CCRT	re-RT	RT type	Edema	CE	NEC	Loc			(cGy)	Dmax	D0.5cc	D1cc	D2cc	V50Gy(c.c.)	V20Gy(c.c.)	Dmax	D0.5cc	D1cc	D2cc	V50Gy(c.c.)	V20Gy(c.c.)
1	70	F	NPC	T3N1M0	+	-	PBT	+	+	-	Lt	-	6996	7488	6876	6610	6495	7	19	7583	7215	7019	6651	8	19
2	52	F	NPC	T4N1M0	+	-	PBT	+	-	-	Lt	-	7000	6611	5979	5582	4949	2	10	7722	7424	7359	7260	12	23
3	57	F	NPC	T2N1M0	+	-	VMAT	+	-	-	Bil	-	7000	7167	6716	6404	5629	3	8	6713	6317	6003	5147	2	9
4	56	M	NPC	T4N0M0	+	+	VMAT	+	+	-	Bil	+	6996	7453	7329	7305	7208	9	60	7892	7812	7717	7513	18	51
5	74	F	NPC	T4N1M0	+	-	VMAT	+	-	-	Lt	-	6996	7471	6345	6073	5925	6	48	7708	7573	7524	7461	23	50
6	45	M	NPC	T2N2M0	+	-	VMAT	+	-	-	Bil	-	6996	7543	7519	7394	7355	12	53	7513	7378	7299	6884	7	56
7	72	M	Parotid	T4N2M0	+	-	VMAT	-	+	-	Rt	-	6996	7168	6915	6831	6607	9	25	3379	2952	2770	2524	0	17
8	56	M	NPC	T3N2M0	+	-	VMAT	+	-	-	Lt	-	6996	7453	7070	6873	6443	7	43	7598	7448	7409	7357	16	52
9	53	F	NPC	T4N1M0	+	-	VMAT	+	+	-	Rt	-	6996	7489	7373	7351	7324	22	54	5883	5620	5550	5345	3	40
10	48	M	NPC	T2N1M0	+	-	PBT	+	+	-	Lt	-	6996	6686	6178	6078	5854	5	19	8132	7300	6994	6508	9	28
11	50	M	NPC	T2N3M0	+	-	VMAT	+	-	-	Rt	-	6996	7307	7124	6920	6489	8	43	6528	6426	6360	6143	8	50
12	49	F	NPC	T4N1M0	+	-	PBT	+	+	-	Rt	-	6996	7556	7359	7270	6956	7	22	6797	6427	6250	5849	4	20

Bil, bilateral TLN; CCRT, concurrent chemoradiation therapy; CE, contrast-enhanced lesion; cGy, centigray; F, female; Loc, TLN location; Lt, Lt TLN; M, male; NEC, necrosis; NPC, nasopharyngeal carcinoma; PBT, proton beam therapy; RT, radiotherapy; Rt, right TLN; SE, seizure; TLN, temporal lobe necrosis; VMAT, volumetric modulated arc therapy.

Supplementary Table 3. Comparisons of dosimetry data of the TLN vs. non-TLN lobes in NPC patients with TLN

	Radiation dose to the TLN vs. non-TLN lobes in NPC patients with TLN					
	Dmax	D0.5cc	D1cc	D2cc	V50Gy (c.c.)	V20Gy (c.c.)
TLN lobe	7550(7417,7712)	7386(7192,7466)	7302(6976,7398)	7082(6503,7356)	9.00(7.00,16.50)	46.50(21.29,53.25)
Non-TLN lobe	6742(6549,7467)	6366(6029,6764)	6164(5705,6548)	5890(5471,6368)	5.50(3.25,6.91)	30.00(18.65,46.75)
p value	<0.01	<0.01	<0.01	<0.01	0.01	0.17

Gy, Grays; NPC, nasopharyngeal carcinoma; TLN, temporal lobe necrosis; The doses were presented as median (quartile 1, quartile 3).

The data were examined using Mann-Whitney test