**Supplementary Figures**

**Figure S1**. Flow chart of patient inclusion. NPC, nasopharyngeal carcinoma; PET/CT, positron emission tomography with computed tomography; CCRT, concurrent chemoradiotherapy; IC, induction chemotherapy; IMRT, intensity-modulated radiotherapy.

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**Figure S2.** The manual segmentation of (A) a patient with disease progression and (B) a patient without disease progression. Red region, the segmented tumors; green region, the segmented lymph nodes.

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**Figure S3.** DCNN architectures used in the study. (A) DCNN for CT image in training step; (B) DCNN for CT image in feature extraction step; (C) DCNN for PET image in training step; (D) DCNN for PET image in feature extraction step.

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**Figure S4**. Time-dependent ROC curves of radiomics nomogram in the training (A) and test (B) sets. ROC, receiver operating characteristic; AUC, area under the curve.

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**Figure S5**. Radiomics nomogram score for each patients in the training (A) and test (B) sets.

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**Figure S6**. Kaplan-Meier survival curves of disease-free survival between high-risk and low-risk groups stratified by age, gender, overall stage, and pre-DNA.

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**Figure S7**. Kaplan-Meier survival curves of overall survival between high-risk and low-risk groups stratified by age, gender, overall stage and pre-DNA.

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**Figure S8.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for the whole 707 patients. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy; DFS, disease-free survival; OS, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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**Figure S9.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for the 521 patients with low risk. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy. DFS, disease-free survival; OS, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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**Figure S10.** An example of the feature maps generated from the DCNNs.

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**Figure S11.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for nomogram A-defined low-risk group. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy; DFS, disease-free survival; S, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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**Figure S12.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for nomogram A-defined high-risk group. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy; DFS, disease-free survival; S, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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**Figure S13.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for nomogram B-defined low-risk group. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy; DFS, disease-free survival; S, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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**Figure S14.** Kaplan-Meier survival curves of DFS (A), OS (B), DMFS (C) and LRRFS (D) between IC+CCRT and CCRT alone for nomogram B-defined high-risk group. IC, induction chemotherapy; CCRT, concurrent chemoradiotherapy; DFS, disease-free survival; S, overall survival; DMFS, distant metastasis-free survival; LRRFS, locoregional relapse-free survival.

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