All patients were treated with radical intensity-modulated radiotherapy (IMRT) as a primary treatment, while immobilized in the supine position using a thermoplastic head and shoulder mask. Contrast-enhanced planning computed tomography (CT; 3 mm-slice thickness) images from the superior border of the frontal sinus to 2 cm below the sterno-clavicular joint were obtained and transferred to the Monaco treatment planning system (version 3.02; Elekta AB, Stockholm, Sweden).

Target volumes and organs at risk (OARs) were delineated on each slice of the CT images, as previously described [1], in agreement with International Commission on Radiation Units and Measurements Reports 62 [2] and 83 [3]. The gross tumor volume (GTV) including primary nasopharyngeal tumor (GTVp) and GTVnd was delineated on the basis of clinical, endoscopic and MRI findings. Gross disease at primary site together with enlarged retropharyngeal lymph nodes was designated GTVp; clinically-involved cervical lymph nodes was designated GTVnd. Two clinical target volumes (CTVs) were delineated according to the GTV: CTV1, high-risk regions encompassing GTVp plus 5-10 mm, including entire nasopharyngeal mucosa and 5 mm submucosal region; and CTV2, low-risk regions containing CTV1 plus 5-10 mm, encompassing sites of microscopic extension and lymphatic regions. The planning target volumes (PTVs), termed PTVp, PTV1, PTV2 and PTVnd, were constructed by expanding the GTVp, CTV1, CTV2 and CTVnd, respectively, by 3 mm; a 3 mm margin was added to the brainstem and spinal cord to generate planning organ at risk volume (PRV). The prescribed doses were 66–72 Gy/28–33 fractions to the planning target volume (PTV) of the primary gross tumour volume (GTVnx), 64–70 Gy/28–33

fractions to the PTV of the GTV of the involved lymph nodes (GTVnd), 60–63 Gy/28–33 fractions to the PTV of the high-risk clinical target volume (CTV1), and 54–56 Gy/28–33 fractions to the PTV of the low-risk clinical target volume (CTV2).

Institutional guidelines recommended IMRT for stage I NPC, platinum-based concurrent chemoradiotherapy ± induction chemotherapy/adjuvant chemotherapy for stage II to IVB NPC. Induction or adjuvant chemotherapy were cisplatin (80 mg/m^2) with 5-fluorouracil (800 mg/m^2/day over 120 h), or cisplatin (80 mg/m^2) with docetaxel (80 mg/m^2), or cisplatin (60 mg/m^2) with 5-fluorouracil (600 mg/m^2 over 120 h), and docetaxel (60 mg/m^2) administered at 3 week intervals for two or three cycles. Concurrent chemotherapy consisted of cisplatin (80 or 100 mg/m^2) given in weeks 1, 4, and 7 of radiotherapy, or cisplatin (40 mg/m^2) given weekly during radiotherapy, beginning on the first day of radiotherapy. Reasons for deviation from the guidelines included recruitment in clinical trials, individual patient's refusal, age, or organ dysfunction suggestive of intolerance to treatment. When possible, salvage treatments were provided for patients with relapse or persistent disease.

References

1. Lai SZ, Li WF, Chen L, Luo W, et al. How does intensity-modulated radiotherapy versus conventional two-dimensional radiotherapy influence the treatment results in nasopharyngeal carcinoma patients? Int J Radiat Oncol Biol Phys. 2011;80(3):661-8.
2. ICRU report. Vol. 62: Prescribing, recording, and reporting photon beam therapy. Maryland: International Commission on Radiation Units and Measurements; 1999.
3. ICRU Report. Vol. 83: Prescribing, Recording, and Reporting Photon-Beam Intensity-Modulated Radiation Therapy (IMRT). Maryland: International Commission on Radiation Units and Measurements; 2010.