

## **Supplementary Material 1 Magnetic resonance imaging imaging protocol**

All patients underwent MRI with a 1.5-T system (Signa CV/i; General Electric Healthcare, Chalfont St. Giles, United Kingdom) or 3.0-T system (Siemens Magnetom Tim Trio, Erlangen, Germany). The scan area ranged from the suprasellar cistern to the inferior margin of the sternal end of the clavicle.

MR sequences included T1-weighted fast spin-echo images in the axial, coronal, and sagittal planes and T2-weighted fast spin-echo images in the axial plane before injection of the contrast material. After intravenously administering gadolinium-based contrast material (0.1 mmol/kg of body weight), spin-echo T1-weighted axial, sagittal, and fat-suppressed coronal sequences were acquired sequentially using the same parameters.

The scanning parameters for the T1WI scan were FSE, TR=540 ms, and TE=11.8 ms and for T2WI scan were FSE, TR=4000 ms, and TE=99 ms. The section thickness was 5 mm with a 1 mm interslice gap.

## Supplementary Material 2

Detailed MRI report in NPC

Name of patient:\_\_\_\_\_ Sex:\_\_\_\_\_ Age:\_\_\_\_\_ Hospitalization number:\_\_\_\_\_

MRI check-up number:\_\_\_\_\_ Check-up date:\_\_\_\_\_

Scan range(1=nasopharynx, 2=nasopharynx + neck)

### 1. Primary tumor

(1)Nasopharynx( Description of main body of the lesion; Location: left right bilateral; Maximum diameter of the lesion: axial\_\_\_\_ coronal\_\_\_\_ sagittal\_\_\_\_mm);

(2)Extra-cavitary extension

A. Oropharynx (Lower boundary exceeds the first and second intervertebral space): (Anterior wall Posterior wall left wall right wall);

B. Nasopharynx (The front boundary exceeds the line between the bilateral pterygopalatina fossa): (Posterior half of nasal canal: left right bilateral; Anterior half of nasal canal: left right bilateral);

C. Hypopharynx (Lower boundary exceeds the lower margin of the third vertebral body or the hyoid body level): (Anterior wall Posterior wall left wall right wall);

(3)Muscles and mandible

Muscles (Prevertebral muscles[longus capitis]: left right bilateral; Tensor veli palatini muscles: left right bilateral; Levator veli palatini muscles: left right bilateral; Internal pterygoid muscle: left right bilateral; External pterygoid muscle: left right bilateral; Temporal muscle: left right bilateral; Masseter muscle: left right bilateral; )

Mandible ramus: left right bilateral.

(4)Fascial space and fossae (Anterolateral space of tensor veli palatini muscles is defined as pre-styloid process space; Posteromedial space of tensor veli palatini muscles is defined as posterior styloid process space; The posterior styloid space was separated to carotid sheath area and retro-pharyngeal space by inside edge of bilateral internal carotid artery. The carotid sheath area is outside and the retro-pharyngeal space is inside).

A. Pre-styloid process space (Tensor veli palatini muscles: left  right  bilateral ; Levator veli palatini muscles: left  right  bilateral ; Internal pterygoid muscle: left  right  bilateral ; External pterygoid muscle: left  right  bilateral ; Temporal muscle: left  right  bilateral ; Masseter muscle: left  right  bilateral ; Mandible ramus: left  right  bilateral .)

B. The carotid sheath area (Non-invasion of carotid sheath: left  right  bilateral ; The lesion does not invade carotid sheath but push and press it: left  right  bilateral ; The lesion invades carotid sheath without exceeding the posterior margin of the jugular vein: left  right  bilateral ; The lesion invades carotid sheath with exceeding the posterior margin of the jugular vein: left  right  bilateral .)

C. Retro-pharyngeal space ( left  right  bilateral );

D. Pre-vertebral space ( left  right  bilateral );

E. Parotid space ( left  right  bilateral );

F. Para-oropharyngeal space ( left  right  bilateral );

G. Pterygopalatina fossa ( left  right  bilateral );

H. Infratemporal fossa ( left  right  bilateral );

(5)Skull base and intracalvarium

A. Medial plate of anterior part of pterygoid process ( left  right  bilateral ); Lateral plate of pterygoid process ( left  right  bilateral ); Basal part of pterygus ( left  right  bilateral );

B. Basal part of sphenoid bone ( left  right  bilateral ); Greater wing of sphenoid ( left  right  bilateral ); Cavernous Sinus ( left  right  bilateral ); Meninges ( left  right  bilateral ); Intracal ( left  right  bilateral );

C. Petrous portion of temple bone ( left  right  bilateral ); Clivus ( left  right  bilateral ); Lacerated Foramen ( left  right  bilateral ); Anterior pon cistern ( left  right  bilateral ); Brainstem ( left  right  bilateral );

D. Occipital condyle ( left  right  bilateral ); Massa lateralis atlantis ( left  right  bilateral ); Axis ( left  right  bilateral );

E. Foramen rotundum ( left  right  bilateral ); Anterior condyloid foramen ( left  right  bilateral ); Jugular foramen ( left  right  bilateral ); Great occipital foramen ( left  right  bilateral ); Foramen rotundum ( left  right  bilateral ); Pterygoid canal ( left  right  bilateral );

(6)Paranasal sinuses, mastoid air cell, aural region, orbital part

Ethmoid sinus: (tumor invasion: left  right  bilateral ); Maxillary sinus: (tumor invasion: left  right  bilateral ); Sphenoid sinus: (tumor invasion: left  right  bilateral ); Frontal sinus: (tumor invasion: left  right  bilateral );

Mastoid air cell: (tumor invasion: left  right  bilateral ; Inflammation: left  right  bilateral );

Middle ear(Middle ear cavity): (tumor invasion: left  right  bilateral ); Inner ear(Cochlea): (tumor invasion: left  right  bilateral );

Orbital apex: (tumor invasion: left  right  bilateral ); Inferior orbital fissure: (tumor invasion: left  right  bilateral ); Anterior lacerate foramen: (tumor invasion: left  right  bilateral );

(7)Cranial nerve

Cribriform plate of ethmoid bone: (tumor invasion: left  right  bilateral );

Chiasma opticum: (tumor invasion: left  right  bilateral );

Optic nerve: (tumor invasion: left  right  bilateral );

The third cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

The fourth cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

The fifth-first cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

The fifth-second cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

The fifth-third cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

The fifth-third cranial nerve in extracranial section: (tumor invasion: left  right  bilateral );

Trigeminal ganglia: (tumor invasion: left  right  bilateral );

The cisternal segment of trigeminal nerve: (tumor invasion: left  right  bilateral );

The sixth-third cranial nerve in cavernous sinus: (tumor invasion: left  right  bilateral );

Aquaeductus fallopii: (tumor invasion: left  right  bilateral );

Internal auditory meatus: (tumor invasion: left  right  bilateral );

The cisternal segment of the ninth, tenth, eleventh cranial nerve: (tumor invasion: left  right  bilateral );

The cisternal segment of the hypoglossal nerve: (tumor invasion: left  right  bilateral );

