Paediatric Nasopharyngeal Carcinoma:
Pre- and Post-Treatment Imaging Features

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Nasopharyngeal carcinoma (NPC) is a rare but important entity in paediatric patient as it is mostly diagnosed late. Mainstay of treatment is radiotherapy (RT) with radiation dose similar to that of adult. To our knowledge, there is no literature describing imaging features for diagnosis for Chinese population and the post treatment imaging features of NPC in paediatrics. The objective of this report is to investigate the key pre- and post-treatment imaging features in paediatric nasopharyngeal carcinoma.

Methods

This study included 9 patients aged from 11 to 18 years old (median 16), who were investigated in our institute from April 2005 to March 2018 with histologically proven nasopharyngeal carcinoma. Pre-treatment scans (including 5CT, 8MRI and 3PET/CT) and post treatment scans (including 3CT, 31MRI and 7PET/CT) are retrospectively assessed by two radiologists. Extent of local disease, lymph node status and other associated features were reviewed in the pre-treatment imaging. Post RT complications and local recurrence were evaluated in the post-treatment imaging.

Results

Table 1. Pre–treatment changes

Pre-treatment changes	No of patient (%)
Nasopharyngeal mass	9/9(100%)
Abnormal bone marrow signal at skull base	9/9(100%)
Invasion to deep neck spaces	9/9(100%)
Engorged venous plexuses	7/8(88%)
Enlarged (>1cm) lateral retropharyngeal lymph nodes	7/9(78%)
Retention changes in paranasal sinuses	7/9(78%)
Extensive retropharyngeal edema	6/8(75%)
Lymph node with extracapsular spread	3/9(33%)
Intracranial extension	0/8(0%)

Table 2. Post treatment changes in follow up scans ranging from 5 months to 11 years after RT.

Post treatment changes	No of patient (%)
Post treatment changes at skull base	7/7(100%)
Atrophy of salivary gland	7/7(100%)
Lung fibrosis	3/4(75%)
Local recurrence	0/7(0%)
Temporal lobe necrosis	0/7(0%)
cervical spine osteonecrosis/ myelopathy	0/7(0%)

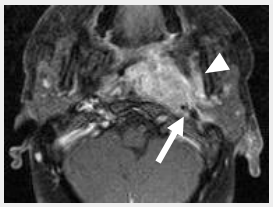

Fig 1. Axial T1 weighted contrast enhanced MRI image with fat saturation shows NPC invasion into left masticator space (arrowhead) and left carotid space (arrow).

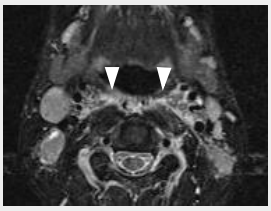

Fig 2. Axial T2 weighted STIR MRI image shows extensive retro-pharyngeal edema (arrowheads).

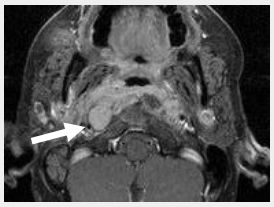

Fig 3. Axial T1 weighted contrast enhanced MRI image with fat saturation shows enlarged lateral retropharyngeal lymph node (arrow).

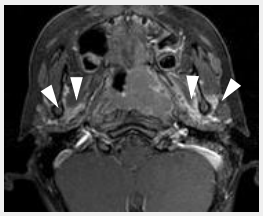

Fig 4. Axial T1 weighted contrast enhanced MRI image with fat saturation shows engorged venous plexuses in bilateral deep neck spaces (arrowheads).

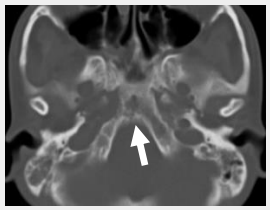

Fig 5. Axial bone window CT image shows osteolytic bone changes at clivus 2 years after RT(arrowhead).

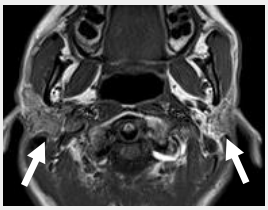

Fig 6. Axial T1 weighted MRI image shows atrophy of bilateral parotid glands 11 years after RT (arrows).

Conclusion:

Engorged venous plexuses and extensive retropharyngeal edema are features commonly observed in paediatric NPC other than in adults.