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NASOPHARYNGEAL CARCINOMA: MODERN APPROACHES TO DIAGNOSIS AND TREATMENT

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Abstract

Nasopharyngeal carcinoma (NPC) is a malignant tumor of the head and neck region characterized by distinct epidemiological, morphological, and clinical features. The disease demonstrates high radiosensitivity, early lymphatic metastasis, and a strong association with Epstein–Barr virus (EBV) infection. This article reviews current concepts of etiology, pathogenesis, morphology, diagnosis, and treatment strategies for nasopharyngeal carcinoma. Particular attention is given to combined and personalized therapeutic approaches.

Keywords: nasopharyngeal carcinoma, head and neck cancer, radiotherapy, chemoradiotherapy, immunotherapy, Epstein–Barr virus.

Introduction

Nasopharyngeal carcinoma occupies a unique position among head and neck malignancies due to its anatomical location, biological behavior, and clinical course. Unlike other tumors of the upper aerodigestive tract, NPC is often diagnosed at advanced stages and is characterized by a high incidence of regional lymph node metastasis. Nevertheless, owing to its pronounced radiosensitivity, satisfactory treatment outcomes can be achieved with timely and appropriately selected therapy.

Epidemiology

The incidence of nasopharyngeal carcinoma demonstrates marked geographical variation. The highest rates are observed in Southeast Asia, Southern China, and North Africa. In Europe and the Russian Federation, NPC is relatively rare and accounts for less than 1% of all malignant neoplasms. The disease is two to three times more common in men than in women, with peak incidence occurring between 40 and 60 years of age.

Etiology and Risk Factors

The main etiological factors associated with nasopharyngeal carcinoma include:

- Epstein–Barr virus infection;
- genetic predisposition;
- consumption of salted and preserved foods;
- exposure to occupational and environmental carcinogens;
- tobacco smoking and alcohol consumption (to a lesser extent than in other head and neck cancers).

EBV association is a hallmark of undifferentiated nasopharyngeal carcinoma and serves as an important diagnostic and prognostic marker.

Pathomorphology

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According to the World Health Organization (WHO) classification, nasopharyngeal carcinoma is divided into the following histological types:

1. Keratinizing squamous cell carcinoma;
2. Non-keratinizing squamous cell carcinoma;
3. Undifferentiated carcinoma.

The undifferentiated type is the most common and is characterized by high radiosensitivity and a strong association with EBV infection.

Clinical Presentation

Early symptoms of nasopharyngeal carcinoma are often nonspecific and may include:

- nasal obstruction;
- hearing loss;
- serous otitis media;
- epistaxis.

As the disease progresses, patients may develop:

- cervical lymphadenopathy;
- persistent headaches;
- cranial nerve deficits due to skull base involvement.

Diagnosis

The diagnostic evaluation of nasopharyngeal carcinoma includes:

- endoscopic examination of the nasopharynx;
- biopsy with histopathological and immunohistochemical analysis;
- computed tomography (CT) and magnetic resonance imaging (MRI) of the head and neck;
- positron emission tomography combined with CT (PET-CT) for detection of distant metastases;
- plasma EBV DNA testing.

Tumor staging is performed according to the TNM classification system.

Selection of Treatment Methods

Radiotherapy

Radiotherapy is the cornerstone of treatment for nasopharyngeal carcinoma. Intensity-modulated radiotherapy (IMRT) is considered the current standard of care, allowing high rates of local tumor control while minimizing radiation exposure to surrounding critical structures.

Chemoradiotherapy

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For stage II–IV disease, concurrent chemoradiotherapy is the treatment of choice. Platinum-based chemotherapy, most commonly cisplatin, is used to enhance radiosensitivity. This approach significantly improves overall survival and reduces the risk of locoregional recurrence and distant metastasis.

Surgical Treatment

The role of surgery in nasopharyngeal carcinoma is limited. Surgical interventions are mainly reserved for cases of persistent or recurrent disease following radiotherapy, as well as for neck dissection in patients with residual nodal metastases.

Targeted Therapy and Immunotherapy

Targeted agents, particularly epidermal growth factor receptor (EGFR) inhibitors, and immune checkpoint inhibitors targeting PD-1/PD-L1 have shown promising results in patients with recurrent or metastatic nasopharyngeal carcinoma. Immunotherapy appears especially effective in EBV-associated tumors with high PD-L1 expression.

Rehabilitation and Quality of Life

Rehabilitation of patients with nasopharyngeal carcinoma focuses on the restoration of hearing, swallowing function, management of radiation-induced complications, and psychological support. Quality of life assessment has become an essential component of treatment outcome evaluation.

Conclusion

Nasopharyngeal carcinoma remains a complex multidisciplinary challenge in modern oncology. A comprehensive and personalized approach to diagnosis and treatment significantly improves disease control and patient survival. Advances in radiotherapy techniques and immunotherapy continue to expand therapeutic possibilities and offer new prospects for improving outcomes in patients with this disease.

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