INTRODUCTION:

Approximately 50,000 of head and neck cancers are diagnosed each year with an estimated 11,000 deaths. The majority of these tumors are squamous cell carcinoma, with human papilloma virus infection, tobacco and alcohol use regarded as risk factors. Due to the complexity of tumors arising from the head and neck region, it is not unusual for management to include an initial evaluation and development of a plan by a multidisciplinary team, including surgery, radiotherapy, medical oncology, and dental. Although single modality treatment with either surgery or radiotherapy is not uncommon with patients with early stage disease, combined modality therapy is appropriate for the majority of patients with locally or regionally advanced stage of disease. The primary sites for head and neck tumors include paranasal sinuses, the lip, oral cavity, salivary glands, oropharynx, hypopharynx, glottic larynx, supraglottic larynx, nasopharynx, and occult head and neck primary sites.

GOAL OF THE GUIDELINE:

This guideline outlines several methods suitable for delivering radiation therapy to the head and neck area. Various radiotherapy techniques may be used as appropriate, depending on the stage, location, and expertise of the radiation oncologist. Multidisciplinary management is recommended to best achieve tumor control while reducing toxicity.

Advances in the treatment of head and neck cancer with irradiation have been a direct result of improved diagnostic accuracy and integration of imaging with precise treatment delivery. Improvements in technology result in more favorable distributions of radiation dose, and thus enhanced tumor control due to dose escalation and altered fractionation and decreased complications by limiting dose to normal tissues. The goal of these guidelines is to guide diagnosis and treatment to the most efficient, comparatively effective treatment pathway. These are generally accepted practice guidelines, however, cannot incorporate all possible clinical variations, and thus are not intended to replace good clinical judgment or individualization of treatments.

GENERAL CONSIDERATIONS

- Treatment of head neck cancer requires a thorough understanding of patterns of disease spread. Expertise in head and neck imaging is required to best delineate radiation target and optimal dose distribution.
IMRT, 3D, 2D, and brachytherapy techniques may be used as appropriate, depending on the tumor location, stage of disease, and experience/availability of dosimetry/medical physics support.

Target definition, dose specifications/dose constraints, fractionation, and combined chemoradiation are still evolving.

IMRT has been shown to be beneficial in treating certain head and neck cancers by reducing dose to the salivary glands, brain, auditory apparatus, and optic structures.

There are many methods of delivering radiation therapy, including simultaneous, sequential, or concomitant boost.

Radiation delivery, radiation dose, treatment fields, fractionation, and the use of chemotherapy, with or without surgical resection, is based on specific patient clinical factors. In general, primary tumor and gross adenopathy require a dose of 66-74 Gy (2 Gy per fraction), and up to 81.6 Gy (1.2 Gy per fraction) in hyperfractionation. Doses exceeding 75 Gy at 2 Gy per fraction may lead to unacceptable rates of damage to normal surrounding tissue.

Elective nodal irradiation typically requires a dose of 44-64 Gy, depending on the estimated level of tumor burden and fraction size.

Higher doses of radiation (60-66 Gy) with or without chemotherapy are recommended for high risk disease (extracapsular extension and/or positive margins).

Post-operative radiation is typically within six weeks or less.

Intensely modulated radiation therapy (IMRT) has been shown to be useful in reducing long term side effects in oropharyngeal, paranasal sinus, and nasopharyngeal cancers by reducing dose to normal surrounding tissue, including the salivary gland and brain (including temporal lobes, auditory apparatus, and optic structures). The application of IMRT to other sites of the head and neck is evolving with the recommendation to use at the discretion of the treating physicians.

IMRT can be delivered with various dose fractionation schemes, including simultaneous integrated boost, sequential boost, and concomitant accelerated boost.

Post-operative radiation is indicated for adverse features such as positive margins, extracapsular spread, pT3-4 disease, N2-3 disease, level IV or V nodes, perineural or vascular embolism.

Low dose or high dose brachytherapy may be appropriate in certain cases.

MEDICALLY NECESSARY INDICATIONS FOR RADIATION THERAPY AND TREATMENT OPTIONS:

2D, 3D, IMRT and Brachytherapy techniques may be used as appropriate, depending on the tumor location and stage of disease. Brachytherapy, were appropriate, may be utilized as a boost for 2D, 3D or IMRT courses of radiation therapy.

- Pre-operative radiation therapy
  - 2D/3D/IMRT – 35 fx max
- Definitive radiation therapy
  - T1-2, N0
    - 2D/3D/IMRT – 42 fx max
  - T1N1, T2N0-1
    - Conventional and accelerated fractionation - 66-74 Gy (37 fx max)
- Hyperfractionation - 81.6 Gy, 1.2 Gy per fraction BID (68 fx max)
- Concomitant boost 72 Gy, 1.8 with 1.5 Gy boost delivered as a second daily fraction the last twelve treatments (41 fx max)
  - T2-4aN0-3
    - Concurrent chemoradiation - 42 fx max
- Post-operative radiation therapy
  - Presence of adverse factors
    - pT3 or pT4 primary tumors
    - N2-3
    - Perineural invasion
    - Vascular tumor embolism
    - Extracapsular spread
    - Positive surgical margin
  - +/- chemotherapy – 40 fx max
- Palliative radiation therapy
  - Symptomatic
- Re-treatment
  - No metastatic disease present

**TREATMENT OPTIONS REQUIRING ADDITIONAL CLINICAL REVIEW:**

**Stereotactic Body Radiation Therapy (SBRT)**
Stereotactic Body Radiation Therapy is not a standard treatment option for the treatment of head and neck cancer.

**Proton Beam Radiation Therapy**
Proton beam is not an approved treatment option for head and neck cancer.
REFERENCES


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