



Multidisciplinary team in head and neck cancer: a management model

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Abstract

Nowadays, the multidisciplinary team (MDT) is an essential component for oncologic disease management. Its benefit is also extensively recognized in head and neck cancer (HNC) community, due to tumor rarity and complex treatment. A well-defined MDT management serves as a stable point to define the better strategy and offers a chance to optimize HNC clinical outcomes and patient's quality of life. We explored both mandatory and additional requirements for establishing a high-quality MDT. Then we proposed an example of HNC MDT organization. The aim is to contribute to the best way to systematize HNC care.

Keywords Head and neck cancer · Multidisciplinary team · Quality of life · Management · Requirements · Organization

Introduction

Head and neck cancer (HNC) is a heterogeneous group of malignancies, accounting for approximately 5% of all cancers cases [1]. In Italy, 9300 new HNC cases and 2820 deaths from HNC are projected to occur annually [2]. Due to its rarity, the delivery of HNC services should be centralized at centers with expertise and should be in any case considered responsibility of the public sector [3]. In fact HNC requires complex treatment and a multidisciplinary team (MDT) approach involving different professional figures from all relevant specialties is paramount.

HNC risk, as well as HNC prognosis, mainly depends on bad habits, including tobacco and alcohol abuse, and virus infections, such as human papilloma virus (HPV) and Epstein–Barr virus (EBV) [4, 5]. Each HNC patient needs an individualized medical decision process in order to receive the more appropriate counseling, treatment, and supportive

care options. This decisional process should be based on a well-established care setting mechanism.

In this work, we provided a comprehensive description of the essential requirements in the effort to bridge the daily MDT clinical practice to the necessary organizational skills at all levels in the management of HNC patients. Based on the statement “doing the right thing, at the right time, in the right way, for the right person” [6], we highlighted the gap between what we have and what we know to be effective and beneficial. The aim is to improve quality of care and the hope is to plan changes effectively.

Head and neck cancer: current situation

In general, HNC management is complex and includes surgery (S), radiation therapy (RT), chemotherapy (C), or a combination of these modalities [7]. Proper approach mainly depends on stage of disease at diagnosis and primary tumor location. Primary S is performed in oral cavity cancer and, in case of pathological T3-4, N2-3 nodal disease, positive surgical margins, extracapsular nodal spread, perineural invasion, and lymphovascular invasion, an adjuvant treatment is required [8]. Primary definitive RT is usually considered in the remainder HNC cancer sites, especially in locally advanced stage disease in order to propose an organ preservation strategy [8].

For sure, significant expertise is required from different health care professionals not only due to proximity to diverse

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anatomic structures—variety of glands and organs, soft tissue, bone, skin—but even due to vital functions that can be affected by both primary lesion and treatment—chewing, swallowing, speech, and breathing. Therefore, it is important to establish a plan to distribute health care resources and guarantee health care services. The European Head and Neck Society (EHNS) defined and validated the criteria for excellence in HNC patient care: first treatment must be commenced within 30 days from date of definitive pathological diagnosis; treatment decisions should be made and implemented according to evidence-based recommendations/guidelines (including radiotherapy, surgery, adjuvant (C) RT, plus ensuring full, and accurate pathological reporting) and/or trial participation; adjuvant treatment must be commenced within 6 weeks; patients should be encouraged via awareness raising activities to present to a health care provider within the early stages of the disease to optimize potential for curative options (persistent white/red lesions in the oral cavity mucosa should be biopsied at the earliest opportunity); a MDT approach should be applied to ensure optimal standards of care for patients [9].

Patients work-up

A rigorous pre-treatment multidisciplinary work-up is required to plan the more appropriate therapy. The minimum work-up needed by a HNC patient is summarized in Table 1. In general, it should include a complete head and neck exam and diagnostic imaging exams, as well as specific tests depending on primary location. It is critical that patients have an accurate dental-oral evaluation, a complete

Table 1 Work-up in patients with head and neck carcinoma

<i>Complete head and neck examination</i>
Macroscopic inspection
Neck palpation
Fiberoptic nasopharyngoscopy
<i>Imaging evaluation (as appropriate)</i>
MRI with contrast of primary and neck
CT of chest +/- of primary and neck
PET-CT (consider in advanced stage or in case of an uncertain staging)
<i>Dental/oral evaluation</i>
<i>Nutrition, speech and swallowing evaluation</i>
<i>Audiology evaluation</i>
<i>Virus testing</i>
HPV test for oropharyngeal cancer
EBV-DNA test for nasopharyngeal cancer
<i>Preanesthesia evaluation (as appropriate)</i>
MRI magnetic resonance imaging, CT computed tomography, PET positron emission tomography, HPV human papillomavirus, EBV Epstein-Barr virus, DNA deoxyribonucleic acid

hearing test, and a nutrition/speech/swallowing evaluation in order to optimize treatment and minimize side effects.

Basic multidisciplinary team requirements

All HNC patients should be discussed by the MDT, including patients with new diagnosis, recurrence during follow-up, or for whom change to treatment program is indicated (*note: recommendations refer to more than 18 years of age patients with HNC; different principles might be appropriate for pediatric patients*). MDT becomes responsible for patient assessment, treatment planning, delivery of services, rehabilitation, and survivorship. Therefore, the decision process should include physicians and other health care professionals with expertise in HNC management and prevention of treatment sequelae. Table 2 lists MDT members. At least one of each of the reported specialists should be included in the MDT. The team members should ideally have specialized training in HNC and should spend an agreed amount of annually time with HNC patients to maintain proficiency. At present, minimum recommended volumes required to care for HNC patients are defined for surgeon (50 patients/year), medical oncologist (25 patients/year), radiation oncologist (50 patients/year), maxillofacial prosthodontist (50 patients/year), and dentist with expertise in dental oncology (25 patients/year) [10]. However, no minimum volume has been currently established for the remainder figures [10].

Table 2 Multidisciplinary team for head and neck carcinoma management

<i>Physicians</i>
Oral and maxillofacial surgeon
Otolaryngeal surgeon
Medical oncologist
Radiation oncologist
Histopathologist
Diagnostic radiologist
Anesthetist
Endocrinologists
Palliative care physician
<i>Health care professionals</i>
Maxillofacial prosthodontist
Dentist with expertise in dental oncology
Clinical nurse specialist
Physiotherapist
Speech-language pathologist
Swallowing therapist
Dietitian
Audiologist
Psychologist
Social worker
<i>Data manager</i>

MDT decisions should be summarized and made accessible to all health care professionals involved. The document should become an integral part of patient records. MDT reports should include (i) demographics and the results of investigations; (ii) precise summary of clinical history; (iii) treatment plan, potential related side effects, and their management; (iv) whether the MDT made a unanimous or a majority decision; (v) a clear indication of the likely prognosis and follow-up strategy [11]. Moreover, the list of committee participants should be recorded. Adherence to practice guidelines should be guaranteed. For sure, clinical decisions should be tailored on each single patient and case discussion should be attended by all involved professional figures. MDT represents an opportunity to revise treatment recommendation, and eventually modify it, especially after treatment-related severe complications up to death.

Multidisciplinary team optimization

At the European level, several societies drive accreditation programs to improve MDT quality. Based on the Organization of European Cancer Institutes (OECI) policy, the Italian Head and Neck Oncologic Society (IHNS) has started a voluntary certification process for HNC centers to establish minimum standards and improve clinical performance [12, 13]. Certification is based on a schedule of structural and quality criteria that must be fulfilled by the single center to obtain the certificate. However, it is not possible to propose a standard system for all countries, but surely a MDT discussion must be guaranteed for all HNC cases. To gauge MDT effectiveness, particular attention should be paid to several quality and performance measures in routine clinical practice:

- Leadership
- Attendance
- Research
- Availability of technology
- Electronic database
- Performance indicators
- Education and training
- Patient needs
- Patient navigator
- Open data
- Hub-and-spoke model
- Fast-track.

These topics are outlined in the following sections.

Leadership

A good leadership, identified from any specialty of the team, is essential to coordinate and drive meeting.

Attendance

Realisation of reimbursement and financial incentives should encourage members to regularly attend and participate to MDT. Patient data, including case notes and images, should be available at the time of the MDT meeting to facilitate final recommendation. Case discussion without complete patient information may result in inappropriate management plan, increase delay to treatment, and necessitate repeated discussions at a later date.

Research

Development of specific protocols for the screening, management, and follow-up of HNC patients is one of the major goals. Different protocols should be proposed, discussed, and agreed by the multidisciplinary members and then shared across centers in order to support development of best practice. Significant evidence can be easily reached through large-scale clinical studies. Research and clinical activity need to be impeccably integrated.

Availability of technology

For an effective MDT meeting, technological equipment, including computer systems and videoconferencing equipment, are necessary. It is important to define dedicated meeting rooms with adequate facilities, in order to display radiological images and pathology slides.

Electronic database

Data on patient-related parameters (age, sex, habits, comorbidities, general health), tumor characteristics (primary location, stage at diagnosis, histology), treatment details, and outcomes should be routinely collected for each patient. An adequate database is paramount. It allows data extraction for regular audit (number of patients discussed, % of curative and palliative treatment, complications, survival rates, adherence to MDT recommendations), feedback, and benchmarking.

Performance indicators

Regular internal audit meetings should be held to review performance, establish/change procedures, and implement/

revise protocols as necessary. A constant monitoring and feedback of the performance should allow MDT to attempt to the highest level of care.

Education and training

Professional figures should be prepared to HNC patients' management because often patients require specialized approaches. Specific courses in post-graduate training should be proposed to increase awareness of head and neck issues and prepare specialists in this field. The educational program should cover basic HNC contents, such as specific symptoms, assessment, treatment, and care. Moreover, a better understanding of HNC biology and emerging therapies is essential for the team and it is mandatory to offer the best possible care. Strategic priorities should include participation in national and international HNC initiatives.

Patient needs

A patient-centered care should be supported. Treatment should be personalized in the respect of patient's preferences and needs. Surely clinical outcomes represent the primary endpoint, but also patient satisfaction and quality of life are extremely important. To promote and increase patient satisfaction, several strategies should be proposed and offered, including (i) different types of facilities, such as family lounge spaces, television, computer access, wireless internet connection, window views, access to food and drink; (ii) easy access to outside landscaped spaces; (iii) different types of treatment areas such as private, semi-open, and open station; (iv) patients toilets; (v) distances reduction between places; (vi) reception area and information desks.

Patient navigator

A dedicated case manager should be assigned to HNC patient during his oncologic journey. Case manager is a professional figure and should be responsible for each step in patient multidisciplinary treatment and able to manage problems and needs.

Open data

Data on information services, clinical outcomes, adverse events, clinical trials, numbers of patients and treatments, waiting times to first appointment, and patient experience feedback should be published on a website or at least make available on request.

Hub-and-spoke model

The hub-and-spoke model should optimally be applied to HNC unit. The goal of the hub-and-spoke model is to position a specialized MDT unit as a central hub and build a network with neighboring hospitals to deliver appropriate HNC treatment and care. This system generates learning curve benefits at the hub, as well as supports optimization of resources and patient well-being. Web-based consultations could potentially replace physical visits in the case of logistical issues, bringing complex cases to the central hub, where they can be managed at the highest level of competence.

Fast-track

For aggressive and rare histologies, a "fast-track" should be identified in order to deliver opportune care by reducing even more wait times and delays.

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Current state

Sapienza University of Rome is one of the top Italian universities and ranks competitively among the best universities worldwide [14]. The medical faculty is embedded within Policlinico Umberto I hospital. We are a reference point HNC center with well-trained and experienced experts, volume-based quality, and competitive technologies. Our MDT service includes primary assessment and diagnosis, specialist review, treatment, and follow-up. MDT meets weekly and includes oral and maxillofacial surgeons, otolaryngology head and neck surgeons, radiation oncologists, clinical oncologists, radiologist, pathologists, and dentistry, all with subspecialty experience in tumors of the nasopharynx, paranasal sinus and nasal cavity, oral cavity, oropharynx, hypopharynx, larynx, and occult primary. To ensure specialist multidisciplinary care, anesthetist, speech and language therapists, psychological therapists, dieticians, specialist nurses, physiotherapist, endocrinologists, palliative care physician, and social workers are available for consult when necessary. We developed internal guidelines and examples that explained our medical treatments are available online [15, 16].

Proposals

Our MDT is not completely accompanied by proper development strategies and, in the long term, it might result in

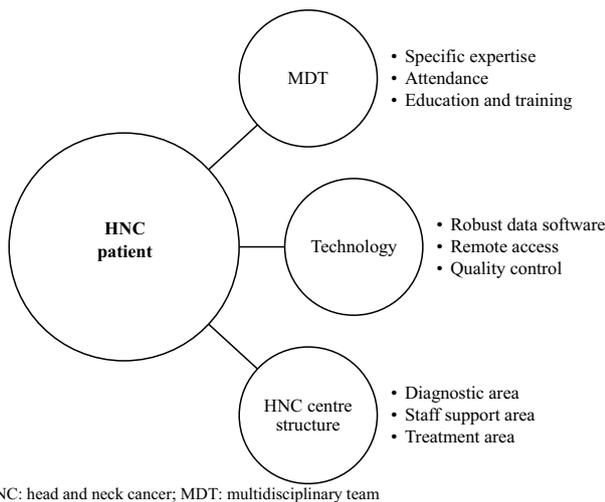


Fig. 1 Head and neck cancer multidisciplinary team: a conceptual framework. *HNC* head and neck cancer, *MDT* multidisciplinary team

limiting access to HNC clinic. Appropriate countermeasures to implement clinical innovation and support improvement of organization should be taken.

The promotion of clinical research should be prioritized. A dedicated data manager and an electronic data support could greatly facilitate the coordination tasks, as well as represent an effective approach to promote data sharing. A core facility is required to analyze MDT activities, supervise multicenter studies and clinical research projects, and strive for standardization of HNC care. In this process, MDT serves as a platform to accumulate clinical data and as a facility to educate practitioners. Our main limit is closely linked to public structures, including the health care system. To solve this problem, an interdisciplinary approach is needed, involving medical science, social science, engineering, and economics.

Figure 1 shows the skeleton of a conceptual framework to offer coordinated state-of-the-art care to HNC patients. Thanks to a cancer center concept based on Guy's Cancer Centre experience [17, 18], we provided a feedback on how improvements of our HNC MDT working could be made. The focus is on patient care. Specific expertise is essential and robust dataset is critical for sustainable decision-making process. This is the starting point. For sure, smooth organization and efficient logistic are necessary to ameliorate personalized HNC care approaches. MDT should respond to current requirements but also build solid bases for future needs and strategies. Ideally, the HNC center should be planned in three distinct areas: the diagnostic zone, the treatment zone, and the staff support zone located in between to provide opportunities for interdisciplinary collaboration between professional teams.

Conclusion

MDT should be considered the core of HNC patient management. Its quality mainly depends on careful coordination between multiple specialists involved in treatment and health system.

In order to optimize operational efficiency, address clinical priorities, and support patient well-being, MDT should promote a simple organizational structure. Several patterns of coordination with managerial staff should be consolidated in order to (i) regulate, coordinate, and promote weigh and quality of MDT work; (ii) improve current service levels; (iii) support research, as well as education and training program. MDT development should be built on the willingness of specialist clinicians and dedicated care professional figures, recognizing their essential role in HNC patients' support. The aim is to streamline decision-making process and management, in order to save time, reduce errors, and guarantee the same access to care for all HNC patients.

Compliance with ethical standards

Conflict of interest Authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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