Prediction of the Role of Definitive Surgical or Chemoradiation Therapy in Laryngeal and Laryngopharyngeal Squamous Cell Carcinoma

Thesis

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ABSTRACT:

Introduction: Head and Neck squamous cell carcinoma is the sixth most common cancer worldwide. Laryngeal carcinoma is the second most common malignancy of the head and neck**.** Hypopharyngeal carcinoma is relatively uncommon, it accounts approximately 10 % of all proximal aerodigestive tract malignancies**.**

Aims: The present study was designed to monitor the treatment response, local recurrence or residual with definitive surgical or chemoradiation therapy in laryngeal and laryngopharyngeal squamous cell carcinoma by using a recent technique, the diffusion weighted magnetic resonance imaging (DW-MRI) which has been proposed as a valuable tool in characterization of tumors in the head & neck regions.Several imaging modalities have been proposed for monitoring treatment response to chemoradiation and surgery. One of them is DWI which is of value as an early non invasive and clinically applicable method ***(Koh et al., 2007)*.**

Methods: Sixty patients diagnosed as laryngeal or laryngopharyngeal squamous cell carcinoma. will be divided into two groups, 1st group (30) patients will receive chemoradiation therapy with diffusion weighted MR imaging parameters is done before, 2 weeks and 3 months after the start of the treatment.

Results: For the 1st group, the response to chemoradiotherapy was evaluated by the apparent diffusion coefficient (ADC) before and after treatment. The ADC value was correlated with the different types of response according to RECIST criteria.

Conclusion: DWI is proved to be a very good, non invasive and useful parameter for monitoring the treatment response to CRT or surgery in patients with laryngeal and/or hypopharyngeal SCC.

Keywords: Chemoradiation Therapy, Laryngeal and Laryngopharyngeal, Squamous Cell Carcinoma

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Contents

List of Abbreviations

3 D	: Three dimensional.
ADC	: Apparent diffusion coefficient.
AJCC	: American Joint Committee on Cancer.
CR	: Complete response.
CRT	: Chemradiotherapy.
CT	: Computed tomography.
DVT	: Deep venous thrombosis.
DW MRI	: Diffusion weighted magnetic resonance imaging.
DWI	: Diffusion weighted imaging.
FDG PET	: Fluoro deoxy glucose - positron emission tomography.
HN SCC	: Head and neck squamous cell carcinoma.
HPV	: Human papilloma virus.
ICT	: Induction chemotherapy.
IMRT	: Intensity-modulated radiation therapy.
MR	: Magnetic resonance.
PD	: Progressive disease.
PET CT	: Positron emission tomography with computed tomography.
PR	: Partial response.
RECIST	: Response evaluation criteria in solid tumors.
SCC	: Squamous cell carcinoma.
SD	: Stationary disease.
WHO	: World health organization.

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Introduction

Head and Neck squamous cell carcinoma (HNSCC) represents the sixth leading cancer by incidence ***(Kamangar et al., 2006).***

Multimodal treatment with radiotherapy, surgery, chemotherapy has been performed for early and advanced head and neck squamous cell carcinoma (HNSCC). Neoadjuvant induction chemotherapy has resulted in decline in the risk for distant metastasis and an upsurge in organ preservation ***(Pazdur et al., 2009)***.

In general, patients responsive to induction chemotherapy also demonstrate positive responses to subsequent radiotherapy. However, given the economic burden and toxic side effects associated with induction chemotherapy in patients with HNSCC, imaging biomarkers that can evaluate treatment and survival outcomes in assessing the efficacy of induction chemotherapy are desirable ***(Fury and Shah, 2010).***

An accurate pretreatment evaluation is required to determine the type and the extent of the therapy ***(Yun et al., 2013).***

Moreover, although chemoradiation of HNSCC has become an integral part of patient management, it can be challenging owing to locoregional failures, if no reliable markers are available to predict the success of therapy ***(Cooper et al., 2004)*.**

Diffusion weighted magnetic resonance imaging (DW-MRI) can provide micro structural and anatomical information about head and neck lesions, and has a value in diagnosis of head and neck cancer, assessment of the efficacy of chemoradiation therapy and prognosis of head and neck squamous cell carcinoma ***(Zhang et al., 2016)*.**

Aim of the Work

Many multidisciplinary approaches have been applied to the treatment of head and neck squamous cell carcinoma (HNSCC). To optimize HNSCC treatment, An accurate evaluation is required to determine the type and extent of the therapy.

The present study was designed to monitor the treatment response, local recurrence or residual with definitive surgical or chemoradiation therapy in laryngeal and laryngopharyngeal squamous cell carcinoma by using a recent technique, the diffusion weighted magnetic resonance imaging (DW-MRI) which has been proposed as a valuable tool in characterization of tumors in the head & neck regions.

Overview

Epidemiology:

Squamous cell carcinoma (SCC) is the most frequent malignant tumor of the head and neck region. It represents approximately 5% of all malignancies worldwide. There are more than 550000 new cases per year worldwide, with around 300000 deaths each year ***(Jemal et al., 2011).***

About Two thirds of the patients present with locally advanced disease (stage III or IV) ***(Fountzilas et al., 2009).***

The regions involved in such carcinomas (Fig.1) include:

1- The larynx ***(Vogel et al., 2013).***

2-The Pharynx whether nasopharynx, oropharynx or hypopharynx and Tonsils ***(Chaturvedi et al., 2011).***

3- The oral cavity as in lips, tongue, hard palate ***(Williams, 2000).***

4-The paranasal sinuses and nasal cavity (***Mendenhall et al., 2011).***