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Original Research

Prognostic factors and treatment outcomes in 444 patients with mucosal melanoma

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Abstract ***Background:*** Mucosal melanoma (MM) is a rare but diverse cancer entity. Prognostic factors are not well established for Caucasians with MM.
Patients and methods: We analysed the disease course of 444 patients from 15 German skin cancer centres. Disease progression was determined with the cumulative incidence function. Survival times were estimated with the Kaplan–Meier method. Prognostic parameters were identified with multivariate Cox regression analysis.
Results: Common anatomic sites of primary tumours were head and neck (MMHN, 37.2%), female genital tract (MMFG, 30.4%) and anorectal region (MMAN, 21.8%). MMAN patients showed the highest vertical tumour thickness ($p = 0.001$), had a more advanced nodal status ($p = 0.014$) and a higher percentage of metastatic disease ($p = 0.001$) at diagnosis. Mutations of NRAS (13.8%), KIT (8.6%) and BRAF (6.4%) were evenly distributed across all tumour site groups. Local relapses were observed in 32.4% and most commonly occurred in the MMHN group ($p = 0.016$). Male gender ($p = 0.047$), advanced tumour stage ($p = 0.001$), nodal disease ($p = 0.001$) and incomplete resection status ($p = 0.001$) were independent risk factors for disease progression. Overall survival (OS) was highest in the MMFG group ($p = 0.030$) and in patients without ulceration ($p = 0.004$). Multivariate risk factors for OS were M stage at diagnosis ($p = 0.002$) and incomplete resection of the primary tumour ($p = 0.001$).
Conclusion: In this large series of MM patients in a European population, anorectal MM was associated with the poorest prognosis.

1. Introduction

Melanoma originating from mucous membranes encompasses a heterogeneous group of patients. According to anatomic site of the primary tumour, multiple disciplines are involved in the treatment and surveillance of patients with mucosal melanoma (MM) [1]. Primary tumours may arise in virtually any mucous membrane. Thus, uniform staging and classification systems are lacking [2,3].

MM shows biologic and clinical differences to cutaneous melanoma [4,5]. Asian and darker-skinned individuals show a higher percentage of MM opposed to Caucasians [1,6]. Due to the paucity of MM, data on the course of the disease and prognostic factors are sparse. Several retrospective studies focussed on a particular anatomic region, but analyses across all localisations are missing or deal with a limited sample size [7,8]. One large-scale study prospectively followed the natural history of MM in a large Chinese cohort and compared the patterns of metastasis according to the anatomic site [9]. However, this population may not be representative for Europeans or Northern Americans because of differences in genetic background, tanning behaviour and environmental factors. In this study, we investigated a large German population with MM of all anatomic sites for prognostic factors and treatment outcomes.

2. Patients and methods

2.1. Study design

This study was designed as retrospective explorative analysis. Inclusion criteria were a histologically confirmed diagnosis of MM and an observation period