

# Surveillance of patients with conjunctival melanoma in German-speaking countries: A multinational survey of the German dermatologic cooperative oncology group

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Dear Editor,

Conjunctival melanoma (CM) represents about 5% of all ocular melanomas with an incidence of 0.2–0.8 per million [1]. It significantly differs from uveal melanoma (UM) and more closely resembles cutaneous melanoma. CM spreads via lymphogeneous and

hematogeneous dissemination [2] and shows a clear UV light signature and high mutational burden [3]. BRAF, NRAS and KIT mutations are detected in up to 50%, 20% and 7%, respectively [2,4]. Primary tumours are mostly treated by local excision [5–7], often combined with adjuvant interventions [5,7,8]. No standard recommendations for treatment of metastatic disease exist to date.

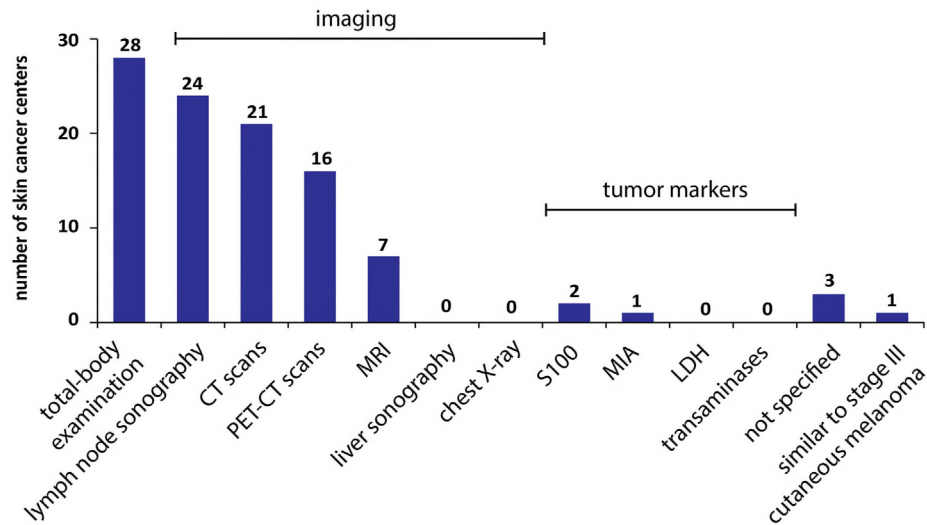
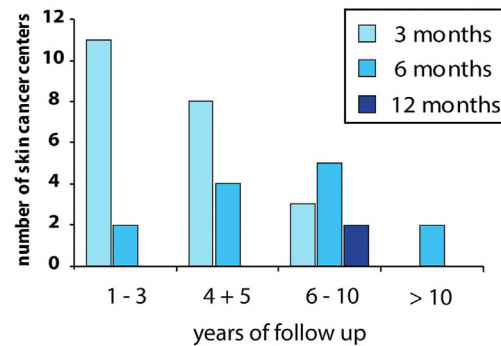
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Year of follow-up / Screening intervals	Total-body examination				Lymph node sonography				Imaging (MRI, CT, or PET-CT)				Tumor marker (S100)				Ophthalmologic inspection			
	1-3	4+5	6-10	>10	1-3	4+5	6-10	>10	1-3	4+5	6-10	>10	1-3	4+5	6-10	>10	1-3	4+5	6-10	>10
<b>3 months</b>	5	3	1	-	5	3	1	-	2	1	1	-	2	-	-	-	-	-	-	-
<b>6 months</b>	1	3	3	-	-	2	1	-	3	1	-	-	-	2	-	-	1	1	1	-
<b>12 months</b>	-	-	2	-	1	1	-	-	1	1	2	-	1	1	1	-	-	-	-	-
<b>Unclear (if necessary)</b>	2				2				2 (1)				1*				1			

\*: melanoma inhibitory antigen (MIA)

Fig. 1. The bar chart illustrating a) the deployed screening measures in the skin cancer centres (n = 37) for patients with conjunctival melanoma, b) applied screening intervals in different years of follow-up for conjunctival melanoma in the skin cancer centres (n = 16), c) reported follow-up strategies for conjunctival melanoma by the skin cancer centres in Austria, Germany, and Switzerland; every number indicates the response of a skin cancer center. CT: computed tomography, PET-CT: positron emission tomography–computed tomography, MRI: magnetic resonance imaging, MIA: melanoma inhibitory antigen, LDH: lactate dehydrogenase.

Here, we report the results of a tri-national cross-sectional study exploring current treatment and surveillance strategies in German-speaking skin cancer centres. A sub-questionnaire addressing the management of surveillance of patients with CM was

distributed to 70 skin cancer centres in Austria, Germany and Switzerland in August 2019. Frequency distributions were calculated, and subgroup differences were explored with Mood's median test. A p-value of <0.05 was considered as significant.

Statistical analyses were conducted with SPSS (version 25, IBM Corporation).

Forty four of 70 (62.9%) centres completed the questionnaire. Responding centres were mostly located in Germany (88.6%,  $n = 39$ ), followed by Switzerland ( $n = 3$ , 6.8%) and Austria ( $n = 2$ , 4.5%). 68.2% (30/44) represented university hospitals and one-third municipal or private hospitals (31.8%, 14/44). 77 patients with primary CM were estimated to be treated in 2018, 68 of them (88.3%) in Germany. The number of followed-up primary CM patients per center ranged from 0 to 10 (median 1). In addition, 28 patients with metastatic CM were estimated to be treated, 25 of them (89.3%) in Germany. The number of metastatic CM patients per center ranged from 0 to 4 (median = 0). 46.3% of the centres did not follow-up any CM patients. More patients were followed-up on in a university hospital setting (primary CM:  $p = 0.037$ , metastatic CM:  $p = 0.005$ ). Screening measures for follow-up care of primary CM patients are shown in Fig. 1a. Three centres did not perform any follow-up examinations. Three centres stated that ophthalmology departments were involved in the surveillance. 71.4% (25/35) indicated follow-up intervals of 3 months, followed by 6 months (51.4%, 18/35). Three centres reported follow-up intervals of 12 months, whereas two did not specify any intervals or reported intervals longer than 12 months (5.7% each). Sixteen centres provided information about the screening intervals in different years of follow-up (Fig. 1b), and 11 provided more details on distinct screening measurements and intervals (Fig. 1c). Responders could also raise general comments. Most desired clear follow-up schemes for the surveillance of tumour-free CM patients in a guideline. A central register for patients with ocular melanoma (both CM and UM) was also suggested.

This survey provides an overview of the current patterns of surveillance and treatment in German-speaking skin cancer centres. We focused on skin cancer centres as the treatment of metastatic disease is currently adopted from cutaneous melanoma. Our results demonstrate that the follow-up of CM patients is highly heterogeneous. Thus, a solid framework for the management and follow-up of CM is urgently needed. Today, consensus standard operating procedures for diagnosis, treatment, and follow-up care of CM for the 14 Centers of Excellence in Germany is available [9], but no consensus-based national guidelines exist. The low

number of affected patients and their exclusion from many trials makes it difficult to demonstrate effectiveness of therapies in clinical trials and to create evidence-based treatment guidelines. Thus, current CM management is rather based on case series than prospective trials.

Overall, the results of this survey provide the first and currently best overview on follow-up patterns for CM in German-speaking countries and represent the first step towards a standardised follow-up care.

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## Conflict of interest statement

The authors declare no conflict of interest.

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