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Surgical treatment of advanced palmoplantar melanoma

İlerlemiş palmoplantar melanomun cerrahi tedavisi

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ABSTRACT

Aim: Palmoplantar melanoma is a rare and aggressive subtype of malignant melanoma. Not like other subtypes, sunlight is not the primary etiologic factor. We aim to expand the knowledge on this rare and neglected malignant melanoma subtype and add our findings to the literature.

Materials and Methods: Malignant Melanoma patients admitted to our hospital between 2008 and 2020 were retrospectively analyzed. Twenty-seven patients with plantar and one with palmar melanoma were identified and included in our study. Data about gender, age at the diagnosis, histopathological features, sentinel lymph node localization, performed surgeries, sentinel lymph node biopsy (SLNB) and regional lymph node dissection results, recurrence, survival time, primary tumor localization, and systemic metastases were collected.

Results: 26 plantar and one palmar melanoma patients were operated on in this period. Six patients died during follow-up. Twenty-three patients were treated with wide excisions, and four were treated with amputations. The defect was reconstructed with a skin graft in all cases with excisions. In 6 patients with suspicious lymph nodes in the preoperative imaging, lymph node dissection was added to the treatment. Other patients had sentinel lymph node biopsies and continued with dissection if a metastatic node was encountered.

Conclusion: Our findings are congruent with the current literature. Skin grafting may enhance the success of palmoplantar melanoma follow-up and demands attention.

Keywords: Foot, hand, heel, melanoma, trauma.

ÖZ

Amaç: *Palmoplantar melanom, malign melanomun nadir ve agresif bir alt tipidir. Diğer alt tiplerin aksine, güneş ışığı birincil etiyolojik faktör değildir. Nadir görülen ve ihmal edilen bu malign melanom alt tipi ile ilgili bilgileri genişletmeyi ve bulgularımızı literatüre eklemeyi amaçlıyoruz.*

Gereç ve Yöntem: *2008-2020 yılları arasında hastanemize başvuran Malign Melanomlu hastalar retrospektif olarak incelendi. Yirmi yedi plantar ve bir palmar melanomlu hasta belirlenerek çalışmamıza dahil edildi. Cinsiyet, tanı yaşı, histopatolojik özellikler, sentinel lenf nodu lokalizasyonu, yapılan cerrahiler, sentinel lenf nodu biyopsisi (SLNB) ve bölgesel lenf nodu diseksiyon sonuçları, nüks, sağkalım süresi, primer tümör lokalizasyonu ve sistemik metastazlar ile ilgili veriler toplandı.*

Bulgular: *Bulgularımız güncel literatür ile uyumludur. Deri grefti, palmoplantar melanom takibinin başarısını artırabilir ve yakın takip gerektirir.*

Sonuç: *Bu dönemde 26 plantar ve 1 palmar melanom hastası ameliyat edilmiştir. Takip sırasında altı hasta kaybedilmiştir. Yirmi üç hasta geniş eksizyonla, dördü amputasyonla tedavi edilmiştir. Eksizyon sonucu oluşan defekt, tüm olgularda deri grefti ile rekonstrükte edilmiştir.*

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Preoperatif görüntülemede lenf nodu şüphesi olan 6 hastada tedaviye lenf nodu diseksiyonu eklenmiştir. Diğer hastalara sentinel lenf düğümü biyopsileri yapılmış ve metastatik bir lenf noduyla karşılaşılırsa tedaviye diseksiyonla devam edilmiştir.

Anahtar Sözcükler: *Ayak, el, melanom, travma.*

INTRODUCTION

Palmoplantar melanoma is an aggressive subtype of malignant melanoma in which sunlight does not play a significant role in etiology. Unlike common melanomas, trauma is thought to play an essential role in its etiology (2, 14). Palmoplantar melanomas occur in localizations that are not exposed to excessive sunlight and can be misdiagnosed with other skin lesions (13, 14). Most patients have advanced disease at diagnosis (1, 5, 19).

The prevalence of palmoplantar melanomas varies in various populations (5). It is rare in Caucasians when compared to other melanomas (18). Due to the low count of published patient series, there is insufficient information to be satisfactory in the literature on topics such as age and gender distribution, treatment modalities or reconstruction methods after wide excision, etc.

Demographical data and meta-analyses are the main approaches to discovering the best oncological intervention. Therefore, most of the literature depends on meta-analyses to conduct an algorithm for such therapies. On these grounds, it is always better for the medicinal society to share their patient populations to add knowledge and material for future analyses to achieve this aim. This study aims to share data of such patients to contribute to future studies.

MATERIALS and METHODS

The local ethical committee approved this study on 29/01/2021 with approval number 21-1.1T/17. Six hundred thirty-two malignant melanoma patients admitted to our facility and operated on between 2008 and 2020 were retrospectively analyzed. Twenty-seven patients with plantar and one with palmar melanoma were identified and included in our study. Patient records were evaluated retrospectively. Data about gender, age at the diagnosis, histopathological features, sentinel lymph node localization, performed surgeries, sentinel lymph node biopsy (SLNB) and regional lymph node dissection results, recurrence, survival time, primary tumor localization, and systemic metastases were collected.

RESULTS

Fourteen of 27 plantar melanoma patients were male (51%), and thirteen were female (49%). The mean age at diagnosis was 57.9 years (min. 29, max. 78). The most commonly encountered primary type was acral lentiginous melanoma (ALM), with a total of sixteen patients (59%). (Figure-1) Nine of the patients (33%) were reported to have the “Not Otherwise Specified (NOS)” type, and two patients (7%) had in situ form disease. According to the weight-bearing capability of the skin, plantar melanoma patients were grouped as follows: sixteen melanomas (61%) were on the heel, three melanomas (12%) were on the lateral base, five melanomas (19%) were on the metatarsal heads, and two melanomas (8%) were on the medial plantar area. Two patients (7%) whose lymphatic stations were found to have pathological lymph nodes on preoperative imaging studies (such as ultrasonography or MRI) had gone through regional lymph node dissection without a sentinel lymph node biopsy, with wide excision of the tumor. Twenty-five patients (93%) had tumor resection and sentinel lymph node biopsy surgery. Nineteen of these 25 patients (76%) had wide excision with 2 cm clear surgical margins and were reconstructed with skin grafts, while six patients (22%) had an amputation at the mid-metatarsal level. Five patients (18%) were diagnosed with metastasis on SLNB and had completed lymph node dissection surgery in another operation. A total of seven patients (26%) had regional lymph node dissection surgery. One patient (3%) with sentinel metastasis in the popliteal fossa simultaneously had both inguinal and popliteal lymph node dissections. The mean tumor diameter was 38.5 mm (min. 3 mm-max. 55 mm). The mean Breslow thickness was 6.94 mm (min. 0.4 mm – max.65 mm). Thirteen patients (48%) had shown ulceration in the wide excision material pathological evaluation. The follow-up period of patients varied from 28 months to 12 years. Three patients presented with local recurrence, all at the primary sites, and were treated with WLE. 6 patients were lost to complications of systemic melanoma metastases.

The patient with palmar melanoma was a male patient aged 35 years. (Figure-2) He was treated with WLE and SLNB, which revealed 1.33 mm Breslow thickness and six reactive SLNs. His follow-up has been continuing without any events. Descriptives are shown in (Table-1).

Figure-1. Patient #2 with ALMM at heel. WLE of this patient involved most of the heel skin. The wound bed was grafted, and SLNB was done simultaneously.

Figure-2. The case of palmar melanoma, which was treated with wide excision and SLNB.

Table-1. Demographics of the patients. Recur: Recurrence, RecSurg: Surgery Performed for Recurrence, L: Left, R: Right, WLE: Wide Local Excision, AMP: Amputation, SLNB: Sentinel Lymph Node Biopsy, TLND: Therapeutic Lymph Node Dissection, LND: Lymph Node Dissection Site, ALMM: Acral Lentiginous Malignant Melanoma, NOS: Non-Specified Subtype, ALMMis: ALMM Insitu, ING: Inguinal, POP: Popliteal, RLN: Reactive Lymph Nodes, MLN: Metastatic Lymph Nodes, SG: Skin Graft

Patient	TM Side	Age at diagnosis	Age at death	Surgery	LND	Pathology	Breslow	TNM& Stage	Recur	RecSurg
#1	L	66		WLE+SLNB	-	ALMM+RLN	1,04	T2aN0M0,IB	-	-
#2	R	58		AMP+SLNB	-	ALMM+RLN	1.79	T2bN0M0,IIA	-	-
#3	L	75		WLE+SLNB	-	ALMMis+RLN	-	TisN0M0,IA	-	-
#4	L	61		WLE+SLNB	ING	ALMM+RLN	3.2	T3N1M0,IIIB	-	-
#5	L	39		WLE+SLNB	-	ALMM+RLN	5.2	T4bN0M0,IIC	-	-
#6	L	73		WLE+SLNB	-	ALMM+RLN	9.0	T4bN0M0,IIC	-	-
#7	L	40		WLE+SLNB	-	ALMM+RLN	2.5	T3aN0M0,IIA	-	-
#8	R	29	31	WLE+SLNB	-	ALMM+RLN	6.5	T4bN5M0,IIID	-	-
#9	R	35		WLE+SLNB	-	ALMM+RLN	0.4	T1N0M0,IA	-	-
#10	L	72	73	WLE+SLNB	-	ALMM+RLN	1.66	T2bN0M0,IIA	-	-
#11	R	52		WLE+SLNB	-	ALMM+RLN	1.43	T2bN0M0,IIA	-	-
#12	R	59		AMP+SLNB	ING	ALMM+MLN	8.0	T4bN1M0,IIIC	-	-
#13	R	68		AMP+SLNB	ING	ALMM+MLN	5.76	T4bN1M0,IIIC	+	WLE+SG
#14	R	57	62	AMP+SLNB	ING	ALMM+MLN	6.5	T4bN1M0,IIIC	+	WLE+SG
#15	R	69		WLE+SLNB	ING+POP	NOS+MLN	5.7	T4bN2M0,IIIC	-	-
#16	L	48		WLE+SLNB	-	ALMM+RLN	0.77	T1N0M0,IA	-	-
#17	L	57		WLE+SLNB	-	ALMM+RLN	3.66	T3a,N0M0,IIA	-	-
#18	L	76		WLE+SLNB	-	ALMM+RLN	2.3	T3aN0M0,IIA	-	-
#19	L	72		WLE+SLNB	ING	ALMM+MLN	3.7	T3bN2M0,IIIC	-	-
#20	L	76		WLE+TLND	ING	NOS+MLN	6.9	T4bN2M0,IIIC	-	-
#21	L	74		WLE+TLND	ING+POP	ALMM+RLN	0.93	T1N0M0,IA	-	-
#22	L	64	65	WLE+TLND	ING	ALMM+MLN	5.3	T4b,N1M0,IIIC	-	-
#23	L	64	70	WLE+TLND	ING	ALMMis+MLN	-	TisN1M0,III	-	-
#24	L	55	57	WLE+TLND	ING	ALMM+RLN	6.0	T4b,N0M0,IIC	-	-
#25	R	64		WLE+TLND	ING	ALMM+MLN	2.0	T2bN3M0,IIIC	-	-
#26	L	64		WLE+SLNB	ING	ALMM+MLN	4.5	T4bN3M0,IIID	-	-
#27 (Hand)	L	35		WLE+SLNB	-	ALMM+RLN	1.33	T2N0M0,II	-	-

DISCUSSION

This study examined patients with palmoplantar melanoma as a rare entity. Twenty-six patients had plantar melanoma, and one had palmar melanoma. Palmar melanoma is shown to be less common than plantar melanoma. In this context, our distribution of malignant melanoma patients in palmar and plantar localizations is compatible with previous publications with a low prevalence (11, 13).

Acral melanomas are known to be a more aggressive subtype of malignant melanoma. It is more common in the Black and Asian populations and has a poorer prognosis than other subtypes (16). It has been reported that the most common involvement site of acral melanoma in the Chinese population is the plantar region (13). Palmoplantar melanomas are relatively less common in Caucasian people due to the higher prevalence of melanomas in other body parts (12). In addition to the acral lentiginous subtype, the nodular and superficial spreading subtype has been reported as a histopathological subtype in the literature (13). But, only acral lentiginous and NOS subtypes were detected in this study. Although the prevalence of women was reported to be higher than men in previous publications in the literature, no such difference was found in this study (12). We think more studies on gender orientation in palmar and plantar melanomas are needed due to the low counts of published case series.

Considering that UV rays are a primary etiological factor in malignant melanoma pathogenesis, it is thought that trauma plays a significant role in the etiology of palmoplantar variants (2, 6, 12). Considering that the sole is exposed to more trauma stress than the volar face of the hand, the distribution of our patients supports this hypothesis (11). In publications that classify plantar melanomas according to their localization, it has been shown that less melanoma occurs on the medial side of the foot, which is the non-load-bearing part (11, 14). In another publication, half of the patients with melanoma on the medial plantar side were obese. Therefore, it was hypothesized that the traumas to the non-load bearing part, caused by increased load on the foot's arch, is the etiological reason (3). Our results are also congruent with these findings.

The literature has reported that palmoplantar melanoma patients refer to advanced stage at the time of diagnosis, have poor histopathological subtypes, and have a poor prognosis. The main reasons for these are atypical localization, delay in diagnosis, and misdiagnoses such as callus, nevus, wart, diabetic foot ulcers, traumatic ulcers, and other lesions (4, 7, 13, 15, 19). In developing countries, advanced age, negligence, and other reasons were reported (17). In our experience, all of these factors contribute to advanced palmoplantar melanoma diagnoses, as in our cases.

Tumor excision with safe margins leads the surgeon to a relatively large defect. It was reported in previous publications that methods such as skin grafts, dermal matrices, and local or free flaps can be used for defect reconstruction (9, 20). SLNB was performed for all patients diagnosed with malignant melanoma due to the initial biopsy in this study

The predictive value of SLNB and the effect of axillary and inguinal lymph node dissection on the survival of palmoplantar melanoma patients are neglected issues in the literature. Although there is a report about performing inguinal lymph node dissection routinely in all patients in the literature, our algorithm suggests lymph node dissection of the relevant region if the SLNB result is positive (20). It is known from previous research that frozen examinations during malignant melanoma excision are not reliable (15). Therefore, frozen sectioning is not preferred in our facility. Somé et al. have suggested that inguinal lymph node dissection in advanced-stage plantar melanomas in low-income countries may increase overall survival (17).

Glabrous skin on palmoplantar areas is a very delicate tissue subjected to chronic stress, and the reconstruction of this structure is known to be challenging. High rates of local wound complications have been reported in weight-bearing areas after skin graft reconstruction (15). Moreover, publications about local flap reconstruction in the literature lead the reader to consider flap choices (8, 10). Controversially, we reconstruct all our defects with skin grafts in the same operation. A thin split-thickness skin graft does the job from the opposite thigh for the possibility of subsequent completion of lymph node dissection. Flap surgery is not recommended in our algorithm because we encounter advanced diseases at the time of diagnosis. The disease's aggressive course, poor prognosis, and the possibility of in-transit metastases without a regional lymph node involvement are high possibilities (10, 20). Relapses can be discerned easier if the resultant defect is reconstructed with a thin skin graft

rather than a flap containing several layers such as fascia, subcutaneous tissue, and full-thickness dermis.

Consequently, our study has similar restrictions already described in the literature. Our facility is a tertiary center, so we may have more frequently encountered advanced diseases. The retrospective nature of our study hinders its strength. Finally, our population is restricted from reaching a definitive conclusion on a relatively rare disease. Yet, it may still add value to the literature and future studies.

CONCLUSION

Recent literature suggests that trauma is the primary etiologic factor underlying palmoplantar melanoma. Our findings are also congruent with that. Palmoplantar melanoma is a rare subtype of malignant melanoma with a poor prognosis and varies distribution in different races. It is usually diagnosed at an advanced stage. Considering the rarity of the disease and varying prevalence by ethnicity in diverse populations, various publications about different people will shed light on the dark areas in this subject.

Conflict of interest: No conflict of interest was declared by the authors.

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