

# Surgical Treatment of Classic Kaposi's Sarcoma in the Lower Extremity

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## Abstract

**Objective:** Classic Kaposi's sarcoma is an indolent, angioproliferative tumor that is usually observed in the lower extremities of elderly men. Depending on their stages, skin lesions are maculonodular or vegetative ulcerated masses. Visceral organ or lymph node involvement may rarely occur. There is no gold standard treatment for local diseases. Surgical excision, radiotherapy, chemotherapy, and cryotherapy can be performed. This retrospective study aimed to evaluate the long-term results of surgical excision and skin graft repair of stage I and II classic Kaposi's sarcoma skin lesions around the foot and ankle.

**Material and Methods:** Eleven patients were included. The patients' age and gender, location of lesion, surgical treatment, follow-up period, and recurrence were evaluated by retrospectively examining patient records. For the surgical treatment, the lesion was excised with a 0.5-cm safe skin margin. The defect area was repaired with full-thickness skin grafts that were obtained from the inguinal region in all patients.

**Results:** Eight of the patients were male and three were female. The average age of the patients was 69 (54–84) years. All patients were completely cured. The average follow-up period was 1.8 (1–3) years. No recurrence was observed in any of the patients at the end of the follow-up period.

**Conclusion:** Classic Kaposi's sarcoma skin lesions in the lower extremity can be completely cured by surgical excision, with no recurrence risk. After surgical excision, using a full-thickness skin graft for repairing primary cutaneous defects, particularly those in the soles, is a simple and reliable method.

**Keywords:** Kaposi sarcoma, surgical excision, skin graft, lower extremity

## INTRODUCTION

Kaposi's sarcoma (KS) is a tumor of mesenchymal origin arising from vascular endothelial cells.<sup>1</sup> Viral oncogenesis, particularly the human herpesvirus-8 (HHV-8), has been reported to have a major role in its pathogenesis.<sup>2</sup> Clinically and epidemiologically, KS is classified under four categories: (1) epidemic (AIDS-associated); (2) endemic (African type); (3) post-transplant (immunosuppression-associated); and (4) classic (Mediterranean type).<sup>3</sup>

Of the four types, classical Kaposi's sarcoma (CKS) has the best prognosis and is mostly seen in elderly men. It is predominantly seen among people of Eastern European, Mediterranean, or Jewish descent.<sup>4</sup> CKS is a chronic and progressive but non-life-threatening disease. Risk factors include advanced age, diabetes, and use of steroids.<sup>5</sup>

Classical Kaposi's sarcoma lesions commonly uptake the skin and the subcutaneous tissue of the lower limbs. Involvement of a visceral organ or lymph node can rarely occur.<sup>6</sup> Lesions initially present as solitary asymptomatic macules or nodules. Their progress varies; while some lesions can remain unchanged for years, others can rapidly grow within weeks. Rapid growth of the lesion can cause local pain and

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bleeding. Differential diagnosis of the lesions includes pyogenic granuloma, melanocytic nevus, malignant melanoma, hemangioma, angiokeratoma, and bacillary angiokeratoma.<sup>7</sup>

Classification of CKS evaluates the localization of the skin lesions and the presence of complications such as visceral involvement, lymphedema, ulceration, and pain.<sup>8</sup> Depending on the character of the tumor, treatment choices include local treatment methods (surgical excision, laser, cryotherapy, radiotherapy, and intralesional chemotherapy) in stages I and II and systemic treatment methods (interferon- $\alpha$ , vinca alkaloids, bleomycin, and doxorubicin) in stages III and IV.<sup>9</sup>

While there is a number of treatment choices in localized stage I and II diseases, a gold standard has not yet been determined. The objective of this retrospective study is to evaluate the long-term outcomes of reconstruction treatment involving surgical excision and skin grafting in stage I–II CKS skin lesions associated with the foot region and particularly the plantar region.

## MATERIAL AND METHODS

This study included patients who were treated in the Pamukkale University Hospital, Plastic, Reconstructive, and Aesthetic Surgery Clinic in 2010–2015 for stage I or II CKS with surgical excision and skin grafting. Approval was obtained from the ethics committee for the study (Nr. 60116787-020/19898). Informed written consent was obtained from the patients included in the study. All patient files were reviewed and retrospectively evaluated with regards to their age, gender, location and histopathological features of the lesion, possible conditions leading to immunosuppression, the surgical treatment they received, follow-up period, and recurrence.

Maculo-nodular skin lesions were classified as stage I, and infiltrative and vegetative skin lesions were classified as stage II per Brambilla's staging system.<sup>8</sup> All lesions were excised with a skin safety margin of 0.5 cm. The resulting defect was recon-

structed with full-thickness grafting taken from the inguinal region in all patients. In the postoperative period, all patients were examined for recurrence in months three and six and at six-month intervals after the sixth month.

## Case Reports

**Case 1:** A 57-year-old male patient presented to our department with an ulcerous nodular exophytic lesion to the plantar region of his left foot (Figure 1a). The patient's history revealed that the lesion was about one year old and had been totally excised and diagnosed to be fibroma in an external clinic seven months ago. After performing incisional biopsy, histopathology reported for KS. Imaging of the internal organs showed no involvement. Magnetic resonance imaging showed involvement of the plantar fascia and the flexor muscles (Figure 1b). The lesion was excised (Figure 1c), and the defect area was closed with full-thickness skin grafting. Radiotherapy or chemotherapy was not given. Presently in his third follow-up year, no local recurrences or systemic involvement are observed (Figure 1d).

**Case 2:** A 79-year-old female patient applied to our department with complaints of a growing ulcerous vegetative wound that involved the plantar region and the pulp of the fourth digit of her right foot (Figure 2a). She had no systemic conditions that would suppress the immune system. Magnetic resonance imaging showed that the lesion was confined to the subcutaneous tissue (Figure 2b). With incisional biopsy results reporting consistent with KS, a total excision (Figure 2c) was performed, and the defect was closed with full-thickness skin grafting taken from the inguinal region. No additional treatments were deemed necessary. No recurrences were found in the first year of her follow-up (Figure 2d).

## RESULTS

Eleven patients were included in the study; of this total, eight (72%) patients were male and three (18%) were female. The

Tablo II. Demographic data of patients

Patient no	Age	Gender	Site of lesion	Diameter of lesion (cm)	Stage	Follow-up period (year)	Recurrence
1	57	M	Plantar of left foot	3	II	2	-
2	75	M	Dorsolateral of left foot	3.5	II	1.5	-
3	79	F	Plantar and fourth digital pulp of right foot	7 and 1.5	II	1	-
4	61	F	Plantar of right foot	2	I	2	-
5	72	M	Dorsal of right foot	4	II	2	-
6	67	M	First digital pulp of right foot	1	I	2.5	-
7	62	M	Plantar of left foot	2	I	2	-
8	69	M	Plantar of right foot	3	II	2	-
9	84	M	Plantar of left foot	2.5	I	3	-
10	79	M	Medial malleolus of right foot	3	II	1	-
11	54	F	Plantar and ankle of right foot	4.5 and 2	II	2	-

F: female; M: male



**Figure 1. a-d.** (a) Ulcerous nodular exophytic lesion in the plantar region of the left foot; (b) view of defect after excision; (c) magnetic resonance imaging view of tumor invading the plantar fascia and the flexor muscles; (d) postoperative view in year two

median age of patients was 69 (from 54 to 84) (Table I). None of the patients had a disease or drug use history that could lead to immunosuppression. HIV serologic test results were negative in all patients. Immunohistochemical pathology examination identified HHV-8 positive in eight patients and negative in three patients.

In eight (72%) of the patients, the lesion was in the plantar region. Two patients had two lesions each. In 10 patients, reconstruction by grafting was performed in the same session immediately after the excision; only in one patient was grafting performed after eight days to allow for the granulation of the donor site. Full-thickness grafts were taken from the inguinal region, and donor sites were primarily sutured. No postoperative wound or donor site complications were encountered in any of the patients.

All patients were completely cured. Recurrence was not observed in any of the patients during the follow-up period. The median follow-up period was 1.8 (1–3) years.

## DISCUSSION

Depending on the stage of the disease and the site and size of the lesions, local or systemic treatments can be combined for treating KS. The subtype of the disease and immune condition also play a decisive role in the treatment plan. Yet a complete cure cannot be always achieved, and recurrences

are often encountered.<sup>9,10</sup> Excision of the lesion, radiotherapy, cryotherapy, and intralesional chemotherapeutic injection can be chosen in locally applied treatments. In the presence of systemic diseases and rapid, progressive diseases, systemic chemotherapy can be used in addition to local treatment methods.<sup>9,10</sup> There is no standard treatment for KS because it is a rare disease. In this retrospective study, we have demonstrated that patients with stage I and II nodular or vegetative lesions in the foot region without visceral involvement and diagnosed with KS can be successfully treated with surgical excision and skin grafting.

Classical Kaposi's sarcoma lesions are mostly seen to occur in the lower limbs, particularly the plantar region of the foot. Considering the advanced ages of the patients, nodular or vegetative lesions can adversely affect their life quality. Complaints of pain and bleeding due to pressure while walking are frequently encountered. In our cases, the lesion was located on the sole of the foot in nine out of 11 patients (81%). The lesions were excised within a skin safety margin and reconstructed with full-thickness skin grafting from the inguinal region. None of the patients experienced any graft loss or donor site complications.

There are studies in the literature reporting frequent relapses following the local treatment of KS;<sup>9</sup> however, studies reported on the surgical treatment of CKS lesions are rare. Tourluki et al.<sup>11</sup> report to have treated 90 patients with curettage of

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**Figure 2. a-d.** (a) Ulcerous vegetative lesion in the plantar region and the pulp of the fourth digit of the right foot; (b) view of defect after excision; (c) magnetic resonance imaging view of lesion confined to the subcutaneous tissue; (d) postoperative view in year one

KS nodules followed by the application of H<sub>2</sub>O<sub>2</sub> and healing by secondary intention. Since the lesions in this series range from 7 mm to 20 mm in size (average of 11 mm)-in other words, since they are smaller lesions-healing by secondary intention can be considered as an option. Healing of wounds in the lower limbs can be problematic in elderly patients. To be able to reconstruct larger defects that cannot be closed by primary intention, as were the cases of our patients, skin grafting, which is the next rung on the reconstructive ladder, should be used.<sup>12</sup> Choosing the inguinal region as the graft donor site minimizes donor site morbidity. Furthermore, reconstruction of tumor defects with skin grafting facilitates tracking of any recurrences. The patients were advised to wear shoes with silicone soles after full recovery to avoid any possible late graft complications.

There are also other treatment possibilities for cutaneous CKS lesions. Di Monta et al.<sup>13</sup> describe an electrochemotherapy regimen by applying electric pulses inside and around the tumor tissue with intravenous bleomycin injection. Brambilla et al.<sup>14</sup> report to have achieved successful outcomes in treating lesions of 0.3–0.8 cm with intralesional vincristine injection. Apart from vincristine, chemotherapeutics such as bleomycin and vinblastine, interferon, and doxorubicin can be administered intralesionally.<sup>15,16</sup> Imiquimod and alitretinoin are topical treatment choices.<sup>17,18</sup> While none of these treatment options offer 100% success, they can add to the duration and cost of the treatment. In our case series, complete cure was achieved three weeks after the surgical excision and grafting procedure was performed. No local recurrence was observed in any of the cases during follow-up.

Classical Kaposi's sarcoma lesions are radiosensitive, and therefore radiotherapy can also be used; however, radiotherapy is more often preferred in cases with plaque lesions and lymph node involvement. Moreover, occurrence of acute and chronic side effects associated with radiotherapy given to the lower extremities is probable.<sup>14</sup>

## CONCLUSION

Classical Kaposi's sarcoma stage I and II skin lesions in the foot region can be completely cured with surgical excision without recurrence risk. Using full-thickness skin grafting following the excision in skin defects that cannot be closed by primary intention is a simple and reliable technique.

**Ethics Committee Approval:** Ethics committee approval was obtained for this study from the ethics committee of Pamukkale University School of Medicine (Number: 60116787-020/198989).

**Informed Consent:** Written informed consent was obtained from the patients who participated in this study.

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