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Original Article

Clinicopathological evaluation of Marjolin ulcers over two decades

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Abstract Malignant changes arising on the previously traumatized or chronically inflamed skin are defined as Marjolin ulcers. They can develop on many different lesions but frequently they are detected on burn scars. Histopathologically, Marjolin ulcers are mostly diagnosed as squamous cell carcinoma and they need special attention when especially located on the lower extremities. In this study, 63 patients treated for Marjolin ulcers between January 2000 and March 2015 were evaluated according to etiology, histological differentiation, primary tumor size, patient age and anatomical localization. Medical records of these patients were reviewed retrospectively. Mean age was 49.7 years. Average interval between the first injury and carcinoma development was 37.9 years. Most frequent etiologic factor was burn scars with 82.5%. Foot was the most frequently affected site with 28.6% and scalp was the second most frequent localization with 25.4%. Squamous cell carcinomas were detected in 88.9% of the patients and basal cell carcinomas were detected in 11.1% of the patients. For treatment, excision and grafting was performed for 48 patients (76.2%), excision and local flaps were used for 10 patients (15.9%) and excision and free flaps were used for five patients (7.9%). Regional lymph node dissection was performed for 12 patients (19%). Average follow up period was 46.5 months. Local recurrences were detected in nine patients (14.3%). In conclusion, Marjolin ulcers are aggressive tumors that require special care. In order to prevent life threatening

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sequelas of this entity, it is important to know basic aspects of clinical progress, prognostic factors and treatment modalities.
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Introduction

Marjolin ulcers can be defined as the malignant changes developed on the previously traumatized or chronically inflamed skin. Firstly, Jean Nicholas Marjolin defined the malignant changes developed on the basis of scar tissue in 1828 [1–5]. Then, in 1903, DaCosta introduced the term "Marjolin ulcer" to define the malignancies developed on burned tissue [3]. Recently, Marjolin ulcer definition is used synonymous with squamous cell carcinomas (SCC) detected on scar tissues. Although most frequent wound or scar type causing Marjolin ulcers is burns, cancer development on discoid lupus erythematosus lesions, osteomyelytic scars, amputation stumps, regions of chronic fistulas, regions of insect bites, vaccination sites, frostbites and other chronic wounds was previously defined in literature [6,7]. Burn scar carcinomas are frequently detected on extremities but approximately 20–30% develops on head and neck region [8].

Marjolin ulcers are mostly SCC and second most common diagnosis is basal cell carcinoma (BCC). Melanomas and sarcomas rarely develop. Marjolin ulcers are nearly 2% of all SCCs [1,9]. They can be seen in all age groups. Fleming et al. reported the average age to develop burn scar carcinomas as 58 years [9]. Nevertheless, it is a generally accepted truth that the age of the scar is more important than the age of the patient.

In this study, it was aimed to make a retrospective evaluation of 63 patients with Marjolin ulcers treated in Ankara Training and Research Hospital between January 2000 and March 2015. Patients were evaluated according to age at the time of diagnosis, sex, latent period, cause of the injury, tumor size, histologic differentiation of the tumor, anatomical localization, treatment modality and recurrence rates.

Material and method

Between January 2000 and March 2015, 721 consecutive melanoma and non melanoma skin tumor cases were treated in Ankara Training and Research Hospital in plastic and reconstructive surgery clinic. A retrospective analysis of these patients was performed after the approval of the ethics committee of the same hospital and 63 of these patients were confirmed to have Marjolin ulcers. Further analysis was done for these patients.

Informations were summarized from the patients' medical recordings. Age at the time of diagnosis, sex, cause of the first injury, latent period between the first damage and development of Marjolin ulcer, tumor size, histologic type of the tumor, anatomic localization, treatment modalities and complications were documented for these patients. Obtained data were analyzed by using SPSS 15.0 programme (SPSS Inc., Chicago, IL, USA).

Results

Totally 63 patients were evaluated with the diagnosis of Marjolin ulcers. 38 of these patients were female (60.3%) and 25 were male (39.7%). Female/male ratio was 1.5/1. Average age was found as 49.7 years (34–90 years). Most frequent etiologic factor was detected as burn injury with 82.5% in 52 patients. Chemical damage, cold injury and previous traumatic wounds were the other causes of Marjolin ulcers in our patient group. Microscopically, 37 patients were diagnosed as well differentiated SCC (58.8%), 13 patients were diagnosed as moderately differentiated SCC (20.6%), six of them were non differentiated SCC (9.5%) and seven of them were BCC (11.1%) (Table 1).

Tumor induction period was accepted as the period between the first injury and the time of diagnosis of Marjolin ulcer. This period was found as 37.9 years on average in our patient group (5–68 years). When the anatomical localizations were evaluated, it was found that foot was the most frequently affected site with 28.6% in 18 patients. Scalp was the second leading localization with 25.4% in 16 patients (Table 1). Tumor size was ranging in between 2 × 1 cm and 10 × 10 cm and it was 6 × 4 cm on average.

Principal treatment modality was surgery. Wide local excision with 2 cm clear margins was performed for all of the patients. After surgical excision, reconstruction with grafts was performed for 48 patients (76.2%), reconstruction with local flaps was performed for 10 patients (15.9%) and five patients (7.9%) were treated with free flaps (Table 1) (Fig. 1a,b). Radiologically positive or palpable lymph nodes were present in 12 patients (19%). Regional lympadenectomies were performed for these 12 patients. Four patients were treated with axillary lymphadenectomy and eight patients were treated with inguinal lymphadenectomy. Lymph node metastasis was detected in four of the lymphadenectomy cases. Follow up period was 46.5 months on average (13–66 months).

Local recurrence was detected in nine patients (14.3%). Eight of these patients presented with Marjolin ulcers on the lower extremity and after recurrence foot amputation was performed for four of them. Other patient presented with a Marjolin ulcer on the scalp (Fig. 2a–d). There was sagittal sinus invasion after recurrence and at the secondary operation, sagittal sinus was excised by neurosurgery team. Histopathological diagnosis was poorly differentiated SCC for six of the patients and moderately differentiated SCC for three of them. Local recurrences were detected on postoperative 15 month on average (12–23 months). Radiotherapy was applied for only these patients that develop recurrence.

Distant metastasis was present in three patients (4.8%) at the time of diagnosis. Two of these were metastasis to lungs and one of them was metastasis to liver. Time period

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