Case Study

Treatment of Melanoma with Human Acellular Dermal Matrix (ADM)

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Melanoma originates in the majority of cases from the melanocytes found in the epidermis. Melanocytes are located in the deepest layer of the epidermis and produce melanin, the pigment responsible for skin coloration. Over the last 10 years, new cases of melanoma in the Caucasian population have increased by approximately 5% per year. Melanoma can appear at any age, and it is one of the most frequently occuring cancers in adults aged between 30 and 40 years.

Those most at risk of developing melanoma have one or more of the following characteristics:
– Fair complexion, blue eyes and blond or red hair
– Often clinically atypical
– History of repeated sunburn, especially in adolescence and young age
– Personal history of melanoma
– Nearest relatives suffering from melanoma
– Alterations of immune defenses (for example subject undergoing organ transplant or in immunosuppressive therapy)

Early diagnosis provides the most effective instrument for reducing death associated with melanoma. The prognosis is often considered excellent if the melanoma can be recognized at the intial phase. Surgery is the principal therapeutic modality in the treatment of primary melanomas and metastases to lymph nodes. Surgery also plays an important role in the treatment of locally recurrent tumors and distant metastases in select cases. Wide excision of the primary tumor in stage I malignant melanoma results in a recurrence rate of about 2%. Surgical techniques for lymph node dissection are the same for melanoma as those performed for other malignancies. There is little question that dissection is necessary in obviously involved nodal areas, but controversy remains regarding the value of lymph node dissection of clinically uninvolved regional nodes. A prospective, randomized study by the World Health Organization has shown no improvement in survival for patients who underwent elective regional node dissection.

The following case presentation involves the treatment of a melanoma tumor excision site with a human acellular dermal matrix (ADM), DermACELL AWM®.

Patient

- An 83 year old woman diagnosed with local relapse of a stage IIIB melanoma on the left arm.

Treatment

- The primary tumor was excised with a safety margin 5 years prior, but further staging and further treatment were declined. As the tumor bulk became bothersome due to the size and pain, the patient requested a local excision in an ambulant setting **(Fig. 1)**. Besides dementia of a mixed vascular Alzheimer type and an arterial hypertonia, the patient was otherwise healthy.
- The tumor bulk was excised with a safety margin of 1 cm in a lazy-S-shape and directly closed after undermining. The patient was referred to us three days postoperative due to an extensive postoperative hematoma with tension bullae **(Fig 2)**. After wound revision, the wound was partly adapted and bandaged with silver-coated alginate wound dressing.
- As the patient refused donation for a large split skin graft or an extensive flap, we opted for the application of a decellularized matrix, DermACELL, for wound closure. Therefore, we freshened the wound edges 5 days after wound revision **(Fig. 3)**, and applied the meshed (1:1.5) decellularized matrix on the wound. The matrix was fixed with non-absorbable sutures at the edges and the center **(Fig. 4)**. Non-adhesive gauze was applied below a vacuum-assisted wound closure dressing for negative pressure wound therapy with a continuous pressure of 80 mmHg. Postoperatively, cefuroxime was taken for 3 days.
- Four days after application of the decellularized matrix, the first changes of the wound dressing took place **(Fig. 5)**. The wound was clean, bleeding had stopped, and the matrix was white in appearance as expected. The wound dressing was changed into a non-adhesive gauze containing nanocrystalline silver ions.

Results

- Postoperatively at eight and eleven days **(Fig. 6)**, the wound still revealed the whitish mesh scaffold, but an increase in remodeling was evident. The crusted overlaying edges were removed.
- Fifteen days postoperatively **(Fig. 7)**, the whitish scaffold was barely visible, as it was almost completely remodeled. Additionally, the wound showed granulation from the base.
- The wound size continuously decreased until fully closing at the final 8 weeks postoperative wound vist **(Fig. 8)**. The wound was completely healed, and remarkably, the scar was thin and much lower in diameter than the original wound. Six months afterwards, the wound was still stable and comparable to the clinical presentation at the eight weeks postoperative visit.

Conclusion

- DermACELL AWM was able to successfully heal the excision site of a melanoma tumor.

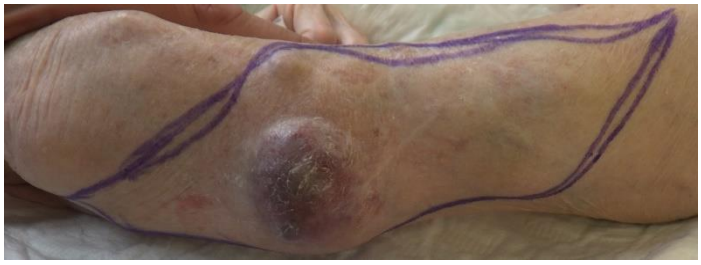

Figure1. Tumor bulk before excision

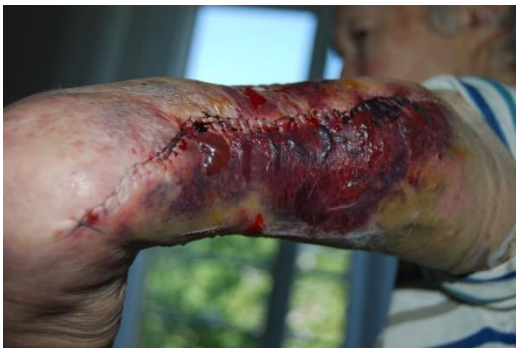

Figure 2. 3 days postoperative with extensive hematoma

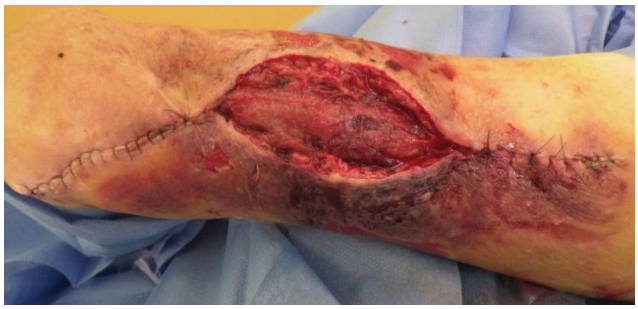

Figure 3. Wound before DermACELL application

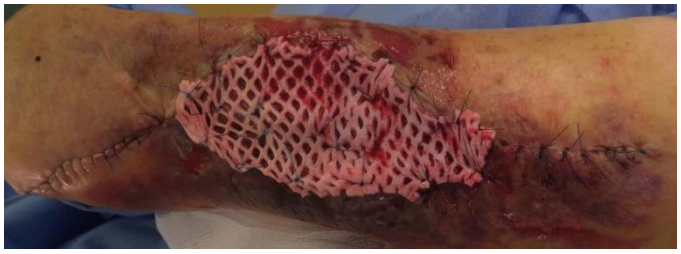

Figure 4. DermACELL graft application

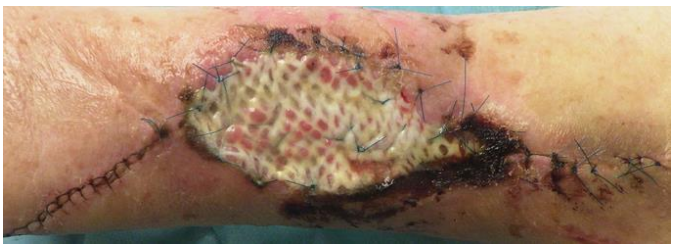

Figure 5. 4 days postoperative

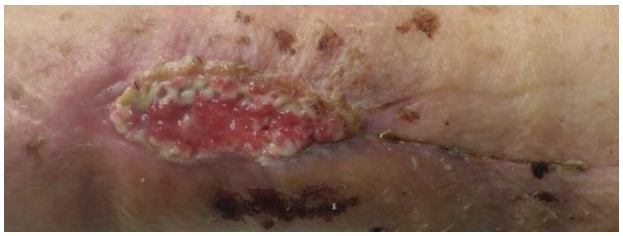

Figure 6. 8-11 days postoperative

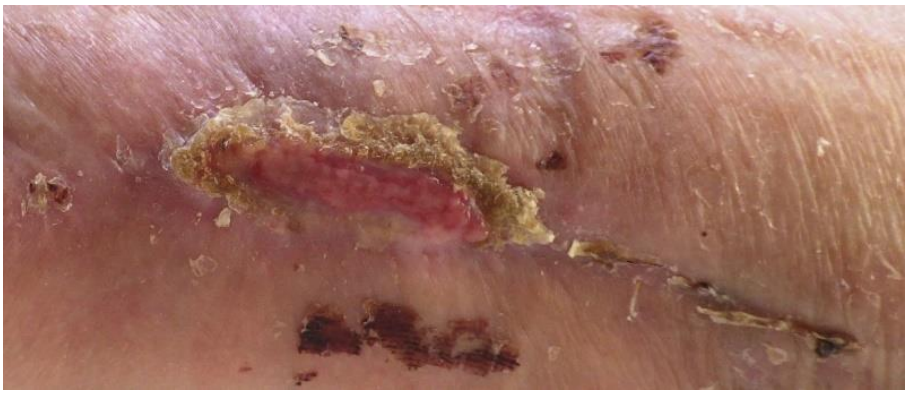

Figure 7. 15 days postoperative

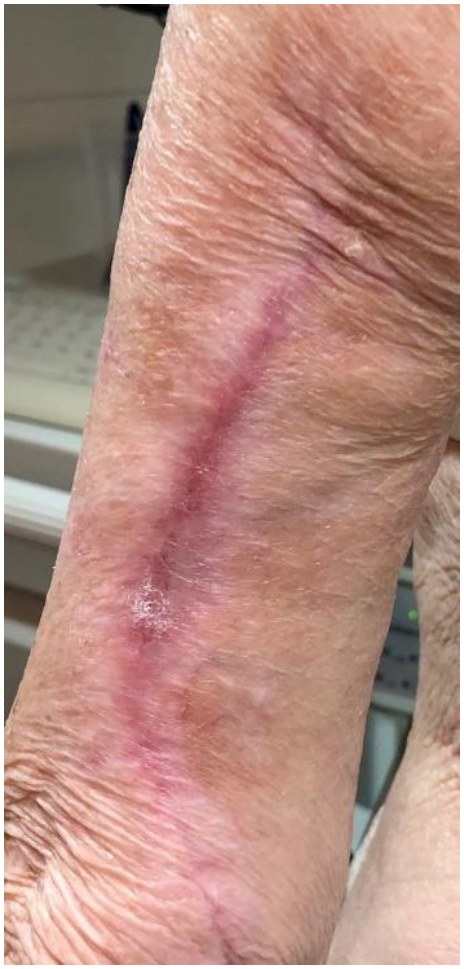

Figure 8. 8 weeks postoperative

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