

“Deep” vertical Mohs and closure with a tumor-free flap for dermatofibrosarcoma protuberans: A case report

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Abstract

Dermatofibrosarcoma protuberans is an uncommon low-grade malignant tumor that can invade locally and rarely metastasize. Dermatofibrosarcoma protuberans has a high rate of local recurrence due to incomplete excision, especially in deep tissues. Morbidity is often related to multiple local recurrences and removal of excessive tissue with large, complex repairs. We present a case of incompletely excised dermatofibrosarcoma protuberans after initial wide local excision. We subsequently employed a “deep” vertical Mohs micrographic surgical technique to remove the remaining tumor while creating a flap with the tumor-free superficial portion to preserve tissue and avoid a complicated repair. The patient is tumor-free for 7 years.

Keywords

Dermatofibrosarcoma protuberans, Mohs micrographic surgery, flap, dermatologic surgery

Introduction

Dermatofibrosarcoma protuberans (DFSP) is an uncommon low-grade malignant tumor that rarely metastasizes but can cause local destruction and invasion. It originates in the dermis and extends to the subcutaneous tissue. DFSP tends to display infiltrative and asymmetrical growth, with tentacle-like projections extending through fascial planes to muscle. This contributes to its high recurrence rate, as removal of the gross tumor does not always correspond to microscopic clearance. The most important prognostic factor in recurrence of DFSP is involvement of histological margins, with wide local excision with 1–5 cm margins resulting in a recurrence rate of 6.32% versus Mohs micrographic surgery (MMS) with a recurrence rate of 1.11%.¹ Morbidity in DFSP is usually related to multiple local recurrences, removal of excess tissue with deforming scars, defective repairs, and increased chance for metastasis.

Case report

A 38-year-old man presented to our office after wide local excision of DFSP by an outside office. Per his records, he presented with a new pink, indurated nodule on the left mid back that measured approximately 2 cm in diameter to an outside dermatologist 2 months earlier. Initial biopsy revealed a

spindle cell proliferation in the deep dermis and subcutaneous tissue with a storiform pattern, consistent with DFSP. All surgical margins were involved, and wide local excision with 2 cm margins was performed by an outside dermatologist. The final defect measured 12.5 cm × 4 cm × 1.2 cm and was closed with a complex linear closure. Subsequent histopathological examination of the excised lesion revealed residual tumor in the deep subcutaneous tissue, extending to the base of the specimen at the center of the lesion. The epidermis, dermis, and lateral margins appeared clear of tumor involvement. The patient was scheduled for another excision with the outside dermatologist. However, he presented to our office to discuss an alternative procedure to minimize scarring. With only deep margins at the center of the excision involved on histology, the question arose of how to remove the residual tumor while minimizing the defect. We employed a vertical

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MMS technique to remove residual tumor exclusively in the deep dermis and subcutaneous tissue while preserving tumor-free tissue.

A “deep” vertical MMS procedure was devised to eliminate the need for a graft, complicated closure, and large unsightly scar in an incompletely resected DFSP. First, a C-shaped semicircular incision was made to fat at the previous excision site. The epidermis and superficial dermis were carefully retracted and separated to create a semicircular flap (see Figure 1). The residual tumor in the dermis and subcutaneous tissue was cleared in three Mohs stages (see Figure 2). Superficial (the undersurface of the flap), deep, and lateral margins were processed by frozen section and examined by the surgeon to ensure tumor clearance. Subsequently, the C-shaped flap of healthy, tumor-free tissue was placed to close the defect (see Figure 3). The lesion healed within 3 weeks with highly satisfactory cosmetic and functional results. Post-treatment clinical surveillance

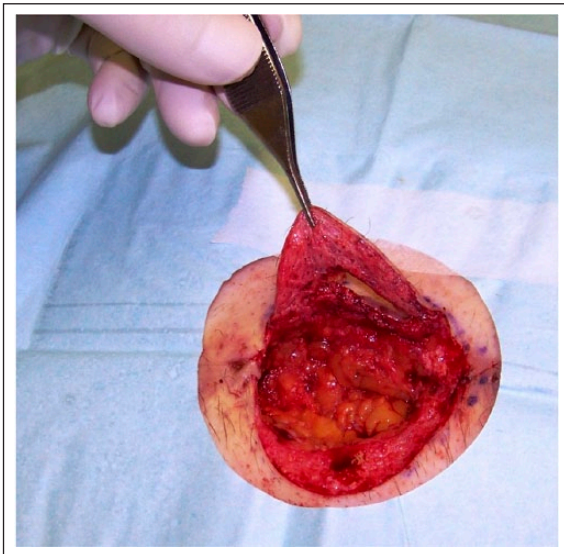


Figure 1. A C-shaped semicircular incision was performed. Retraction and separation of the epidermis and superficial dermis created a flap.

by physical exam including visual inspection and palpation every 6 months for 5 years plus once yearly for 2 years demonstrated no local clinical recurrence of the tumor for a total of 7 years.

Discussion

DFSP has a high rate of local recurrence due to incomplete excision, especially in deep tissues. This case presents the utility of a “deep” vertical MMS procedure for subcutaneous tumors or residual deep tumors with replacement of tumor-free tissue for closure. MMS for DFSP has been shown to have the lowest recurrence rate of 1.11%.¹ The modified “deep” Mohs procedure allows for precise marginal control and tissue sparing excision. Superficial, lateral, and deep aspects of the initial defect were examined to ensure tumor clearance. This “deep” Mohs procedure allowed access to the tumor-positive regions of the deep dermis and subcutaneous tissue. A limitation of this procedure is that the previous closure can make it difficult to identify the original area of tumor positivity. However, our surgeon had access to clinical images and final pathology reports from the previous excision. Therefore, the surgeon was aware of the post-operative defect as well as deep margin involvement on pathology and was subsequently able to identify the area of tumor positivity. This modified “deep” Mohs procedure ensured complete resection of the tumor and tissue-sparing closure of the surgical site with an aesthetically and functionally satisfactory result.

Other similar techniques have been previously described. Hersant et al.,² proposed a vertical modified technique, and Farma et al.³ described complete circumferential peripheral and deep margin assessment (CCPDMA). In both these techniques, peripheral and deep margins were examined and complex closures were delayed until negative margins were histologically established. However, both these techniques relied on excisions with pathology read separately and subsequent re-excisions if positive margins were found. Moreover, excess healthy tissue was excised in addition to tumor-infiltrated tissue in these techniques. Our technique allows for same-day establishment of tumor-clear margins

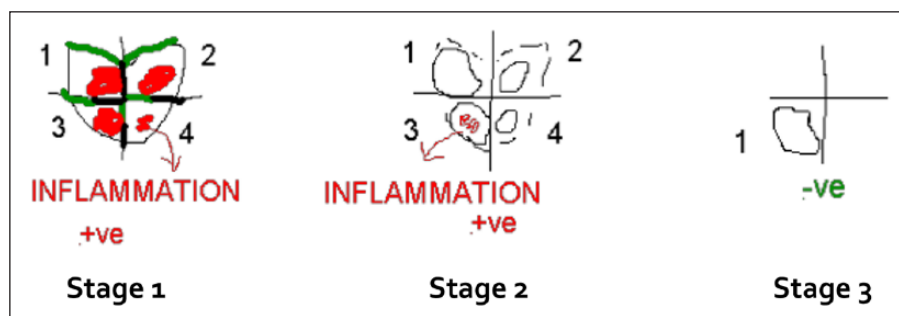


Figure 2. The tumor was cleared in three Mohs stages. All margins, superficial, deep, and lateral were processed and examined by the surgeon.



Figure 3. Closure was performed with replacement of the tumor-free flap, avoiding the need for a skin graft.

without the need for subsequent re-excision. In addition, by simplifying closure, our technique allows for preservation of tumor free and healthy tissue, tension-free closure without risk of rejection of a graft, and avoidance of surgery at a

different site with faster recovery rates. As the mean recurrence time after MMS for DFSP has been reported to be 68 months, our 7-year follow-up demonstrates an unlikely chance of recurrence.¹ Due to the tendency of DFSP to infiltrate deep and subcutaneous tissue, our approach to removal with a “deep” vertical MMS modification followed by replacement of tumor free tissue for closure should be considered in the treatment of DFSP and other deep subcutaneous tumors.

Declaration of conflicting interests

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Informed consent

Informed consent to perform this modified Mohs procedure and submit this case report was provided by the patient.

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