

presence of local or regional metastatic disease and a chest radiograph to detect distant metastatic disease. Evaluations should be performed quarterly for the first 2 years and then every 6 months for up to 5 years.<sup>4</sup> Greater than 90% local control is achieved in patients who undergo excision and RT.<sup>5</sup>

## Conclusion

This case is the first reported in the literature of an AMFS treated using Mohs micrographic surgery instead of wide local excision. RT as an adjuvant to excision should also be considered. Because of the propensity of this tumor to involve acral sites, where tissue conservation is important, Mohs micrographic surgery may be an alternative treatment modality for this rare entity.

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## Infiltrative Recurrent Eccrine Spiradenoma of the Anterior Neck Treated Using Mohs Micrographic Surgery

Eccrine spiradenoma (ES) is a rare, usually benign adnexal tumour that may be sporadic or familial. The cell of origin has been debated and is thought to arise from the hair follicle.<sup>1</sup> We describe a patient with Fitzpatrick skin type V who developed recurrent ES of the anterior neck treated using Mohs micrographic surgery (MMS).

A 57-year-old woman with Fitzpatrick skin type V presented with a 5-month history of tender enlarg-

ing lesions on the anterior neck. She reported excision of a lesion at this site 14 years before.

Examination revealed an 85-mm scar on the anterior neck. Firm tender subcutaneous papules and nodules were noted at two sites adjacent to the scar measuring 29 by 17 mm and 30 by 13 mm (Figure 1). Skin biopsy showed a well-circumscribed tumor composed of small basaloid cells with interspersed vascular spaces and duct-like structures, typical of ES.



**Figure 1.** Recurrent eccrine spiradenoma. Firm tender papules adjacent to scar from previous excision (central neck and left lateral neck sites).

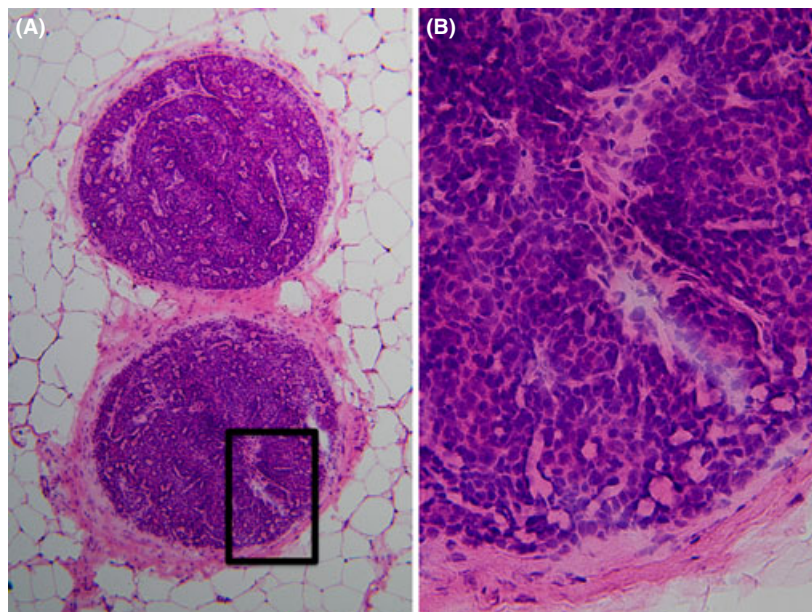
Ultrasound of the neck confirmed that the lesions were confined to the skin and subcutaneous tissue, with no apparent penetration of deep fascia and no lymphadenopathy. She underwent MMS of the two clinically apparent areas of recurrence. MMS histology confirmed tumor extension into the subcutaneous tissue (Figure 2). At the left lateral neck site, tumor-negative MMS margins were achieved after four stages and eight blocks, with a defect size

of 47 by 26 mm. At the central neck site, tumor-negative MMS margins were also achieved after four stages and eight blocks, with a defect size of 42 by 28 mm (Figure 3). Both defects were repaired using primary direct closure. The intervening scar between the defects was also excised at closure. The histologic appearance of the debulked tissue from MMS at both sites confirmed appearances in keeping with ES, with cystic change noted at the left lateral site. No malignant changes were seen.

There was no evidence of recurrence 15 months after MMS.

### Discussion

Our case is notable because sporadic ES is rarely described in patients with Fitzpatrick Skin type V. Kersting and Helwig first described ES in 1956.<sup>2</sup> It is an uncommon benign adnexal tumor that presents as a slow-growing, often painful intradermal or subcutaneous isolated nodule on the ventral upper body. Lesions may be small but



**Figure 2.** (A) Photomicrograph of spiradenoma extending into fat, shown at  $\times 10$  magnification (hematoxylin and eosin staining). (B) The black rectangle, shown at  $\times 40$  magnification, illustrating the cellular morphology of spiradenoma.



**Figure 3.** Final defects on anterior and left lateral neck.

can grow to several centimeters. Adults are mainly affected, with the highest incidence in the fourth decade and roughly equal incidence in both sexes.

ES usually presents as a solitary lesion, although cases of multiple ES have been reported, as have linear, zosteriform, nevoid, and blaschkoid distributions. Multiple ES in association with cylindromas and trichoepithelioma, may suggest Brooke-Spiegler syndrome, an autosomal dominant disorder characterized by multiple adnexal neoplasms and associated with mutations in the tumor suppressor *CYLD* gene on chromosome 16q. In cases of multiple ES, histology consistent with ES and cylindroma may be found within the same sample, showing overlapping features. We have recently shown that ES may arise from existing cylindromas in Brooke-Spiegler syndrome.<sup>3</sup>

Although rare, there is a risk of malignant transformation and metastasis with ES. As with cylindroma, malignant transformation usually occurs as rapid growth and ulceration of a longstanding lesion, although de novo malignant ES has also been reported. Malignant transformation may occur more often in cases of multiple ES.

Histologically, ES displays a well-circumscribed basophilic nodule (or nodules) with epithelial cells arranged in sheets and cords or in a trabecular pattern. Basaloid cells may be composed of large cells with pale nuclei arranged in the center and small cells with hyperchromatic nuclei at the periphery. Malignant ES may show atypical cells, increased mitoses, focal areas of necrosis, loss of the typical lobular pattern, and loss of the dual cell population.

Surgical excision is the treatment of choice for tumor clearance. There are no clear recommendations on margins for standard excision and, to our knowledge, no published data on recurrence rates. Staged surgical excision and carbon dioxide laser ablation may be used for multiple ES. MMS has been used to treat cylindromas and malignant ES,<sup>4,5</sup> but we are not aware of any reports of it being used to treat nonmalignant ES. Our patient had recurrent disease at multiple sites and hence had a significant risk of subclinical disease extension, as demonstrated on MMS histology. Excision with a 1 cm margin or less would have resulted in incomplete excision and further recurrence. MMS was chosen because it offered the benefit of optimal tumor clearance. Tumor was readily identifiable on hematoxylin and eosin-stained frozen sections (Figure 2). For ES that may have significant subclinical extension and potential for malignant transformation or recurrent disease, MMS provides optimal tumor clearance, as well as tissue sparing benefits at critical sites.

### Summary

ES is a rare benign tumor for which surgical excision is the treatment of choice. Tumor can be clearly identified on Mohs sections. MMS should be considered in recurrent ES, large ES, or ES at critical sites to ensure complete excision and tissue sparing.

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## The Racket Graft

Full-thickness skin grafting is a common repair method for surgical skin defects. It provides cosmesis superior to that of split-thickness skin grafts. Nevertheless, full-thickness skin grafts have greater metabolic requirements than split-thickness grafts. Large donor site defects represent a major limitation when planning the use of a full-thickness graft. New formulas have been designed to reduce the size of the donor site.<sup>1–3</sup> The racket graft is a novel technique that allows the surgeon to use a smaller full-thickness skin graft while providing a constant tensionless recipient site for optimal survival and regrowth of the graft. In the racket graft technique, the size of the graft is measured after having obtained the maximum advancement of the surrounding tissues of the surgical defect. To study the utility of the racket graft, we designed a prospective analysis of 30 patients treated using this technique. For each patient we compared the size of a normal full-thickness graft normally required to cover the primary defect with the size of the graft using this technique, and the cosmetic outcome of the racket graft. Patients and a derma-

tologist who was not present in the operating theater evaluated cosmetic results on a scale of 1 to 3 (1 = unsatisfactory, 2 = satisfactory, 3 = very satisfactory).

## Technique

The cutaneous lesion to be removed was marked according to the design of the excision limits. We used full-thickness skin grafts harvested from usual donor sites in all patients. The defect size should be reduced to estimate the final graft size by stretching the surrounding tissues with hooks and measuring the remaining defect or by placing and tightening temporary sutures to approach the boundaries of the defect in an attempt to obtain direct closure of the defect.

In preparing for the suture, the graft is placed in the center of the defect (Figure 1), and the number of sutures needed to create the racket graft is planned depending on the tension of the skin and the size and shape of the defect. A circular defect