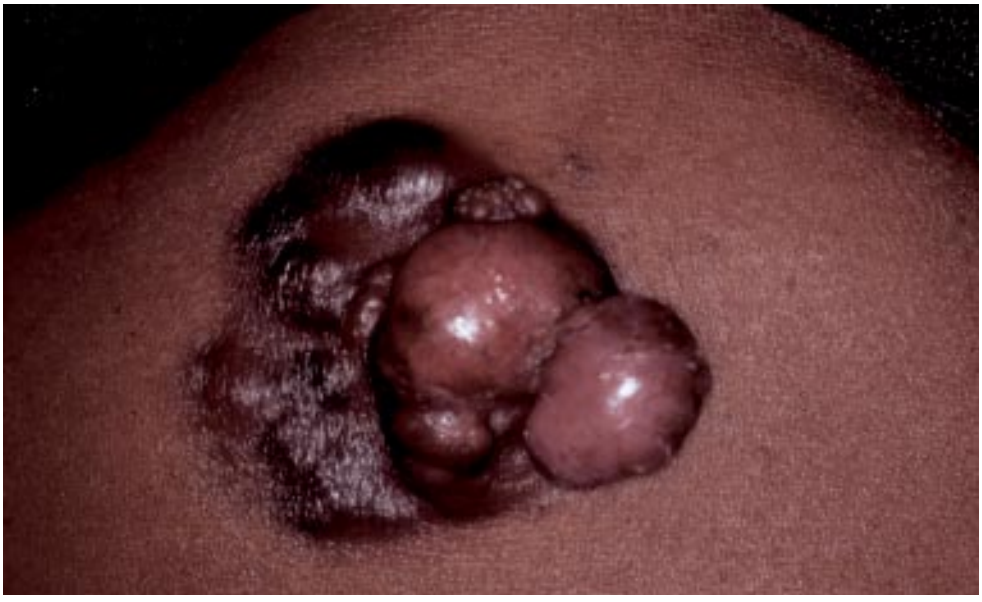
What Is Your Diagnosis?



A 33-year-old man presented with a 6-month history of a progressively enlarging asymptomatic lesion on his mid chest. The patient's medical history was unremarkable and he occasionally took a daily vitamin supplement. Physical examination revealed a flesh-colored, 5×5-cm, nodular, exophytic plaque on the mid chest. There were multiple smaller 1- to 2-cm coalescing flesh-colored nodules within the plaque. The nodules were firm and no pain was elicited from palpation. Similar lesions did not appear elsewhere on the body. In addition, lymph nodes were not palpable.

PLEASE TURN TO PAGE 343 FOR DISCUSSION

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The authors report no conflict of interest.

The opinions herein are the private views of the authors and not the official position of the US Department of the Army or the US Department of Defense.

The Diagnosis: Dermatofibrosarcoma Protuberans

Dermatofibrosarcoma protuberans (DFSP) is a rare, low-grade but locally invasive tumor of dermal origin. It occurs because of a translocation of chromosomes 17 and 22, t(17;22), which results in the fusion of the platelet-derived growth factor β polypeptide gene, *PDGFB*, with the collagen I alpha-1 gene, *COL1A1*. This fusion causes an overactive receptor protein tyrosine kinase for *PDGFB* and an uncontrolled growth of DFSP cells.[1,2] Clinically, DFSP presents as a red to violet nodule or plaque, usually less than 5 cm in diameter, with surrounding telangiectases.[1] The most frequent sites of occurrence are the trunk (47%–72%), the extremities (16.5%–20%), and the head and neck (11.5%–14%).[1,2] Dermatofibrosarcoma protuberans is slightly more common in males than females and usually presents in the fourth decade of life.

Microscopic examination of the nodules contained within the plaque on our patient's mid chest (Figure 1) revealed multiple irregular proliferating spindle cells that penetrated deep into the subcutaneous adipose tissue. The spindle cells were arranged in a storiform pattern with sparing of the adnexal structures. There also was some evidence of fat trapping (Figure 2). A stain for CD34 was grossly positive while factor XIIIa was negative. Dermatofibrosarcoma protuberans was diagnosed.

The patient was sent for Mohs micrographic surgery and a 3-cm margin was removed around the lesion. Follow-up pathology from the excision revealed no residual tumor in the deep and lateral margins. Because the patient was not amenable to skin grafting, the defect was left to heal by secondary intention. Healthy granulation tissue developed and the defect completely healed within 6 weeks.

The histologic pattern for DFSP is monomorphic spindle cells in a storiform pattern that extends deep into the subcutaneous adipose tissue, as seen in our patient. The adnexal structures typically are spared in DFSP and there may be some evidence of fat trapping. There also may be a grenz zone, or tumor-free area, between the superficial lesion and the epidermis.[1] The differential diagnosis of DFSP includes dermatofibroma, which may be distinguished by immunostaining. Specifically, DFSP stains positive for CD34, negative for factor XIIIa, negative for stromelysin-3, and negative for CD44, while dermatofibroma is negative for CD34, positive for factor XIIIa, positive for stromelysin-3, and positive for CD44. Furthermore, DFSP generally stains positive for the protein p75 while benign fibrous histiocytoma (dermatofibroma) does not.[1]

Tumors with a high-grade fibrosarcoma component, which occurs in 10% to 15% of all DFSPs, are more aggressive and more likely to metastasize. The site of metastasis usually is the lungs through hematogenous spread. Patients with DFSP with a fibrosarcoma component show higher proliferative activity and protein p53 overexpression compared to patients with DFSP without a fibrosarcoma component. Other uncommon variants are the

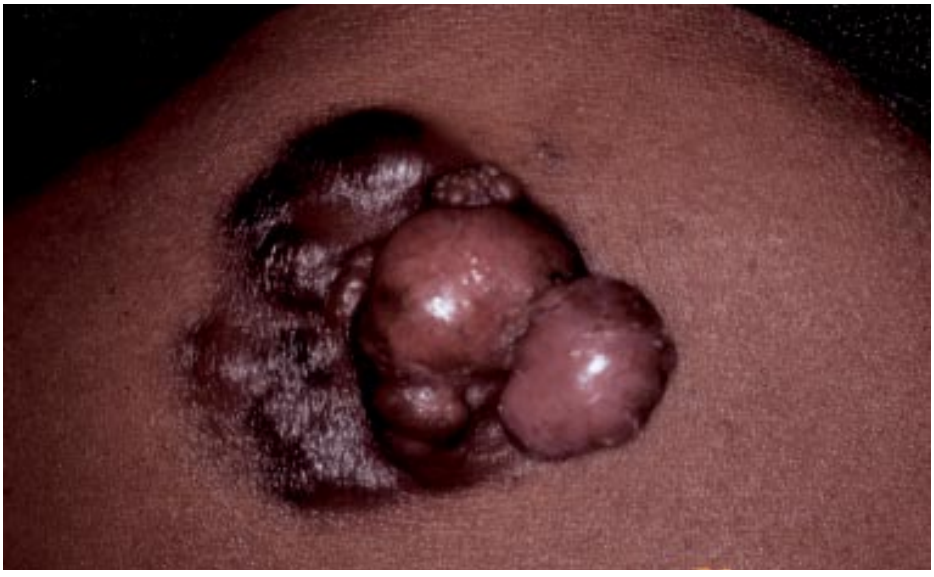

Figure 1. A multinodular plaque on the patient's mid chest.

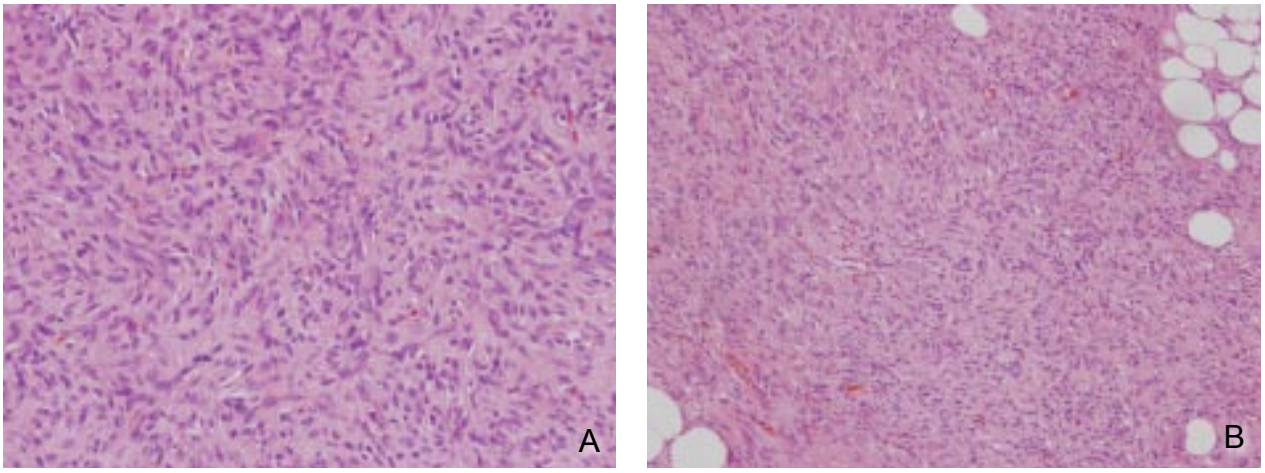

Figure 2. Cellular proliferation of dermal fibroblasts in a storiform pattern (A and B)(H&E, original magnifications ×5 and ×10, respectively).

Bednar tumor, dendritic cells with melanin scattered among spindle cells, and myxoid DFSPs.[1]

Despite the indolent nature of DFSPs, they can grow deeply into underlying tissues. Therefore, the standard treatment is removal by wide local excision down to the fascia with at least 3-cm margins. The rate of recurrence 3 years after primary excision is approximately 10% to 60%.[1,2] Excision margins are frequently positive after resection of the primary growth; therefore, removal by Mohs micrographic surgery is considered a more prudent course of action.[3,4] Adjuvant radiation therapy is recommended in addition to excision when positive margins are present. The use of chemotherapy, especially imatinib mesylate, a protein tyrosine kinase inhibitor, to control metastatic or unresectable disease is undergoing clinical trials, but it does show potential for inducing regression of DFSP in these inoperable conditions.[5]

Overall, DFSP has an excellent prognosis, with a 10-year survival rate of more than 97%.[2] Additionally, the 10-year local control rate with surgery and adjuvant radiation therapy is 84%.[1]

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