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Sequential development of dermatofibrosarcoma protuberans in the forehead and eyelid

Dermatofibrosarcoma protuberans (DFSP) is a rare cutaneous sarcoma that constitutes 1% of all soft tissue sarcomas and <0.1% of all malignancies.[1,2] The distinguishing features are slow growth, local aggressiveness, low metastatic potential, and elevated rates of local recurrences.[1,2] The tumour occurs on the trunk, particularly on the chest and shoulders, in 40%–50% of cases; on the proximal parts of the limbs in 30%–40% of cases; and on the scalp, cheeks, and supraclavicular area in 10%–15% of patients.[2] Eyelid DFSP is exceedingly rare with few well-documented cases in the literature.[3,4]

This report describes the clinical, imaging, and histopathological characteristics of 2 distinct DFSP developing on the forehead and lower eyelid in a middle-aged female.

This study adhered to the tenets of the Declaration of Helsinki. The patient subject to this study gave informed consent for the use of all medical information documented in the hospital chart and all imaging studies pertaining to the ocular disease, for scientific purposes including but not limited to presentations, journal articles and book chapters.

Case Report

A 58-year-old female presented with a painful left lower eyelid mass that gradually enlarged within 3 months. She had a similar lesion on her forehead for many years, for

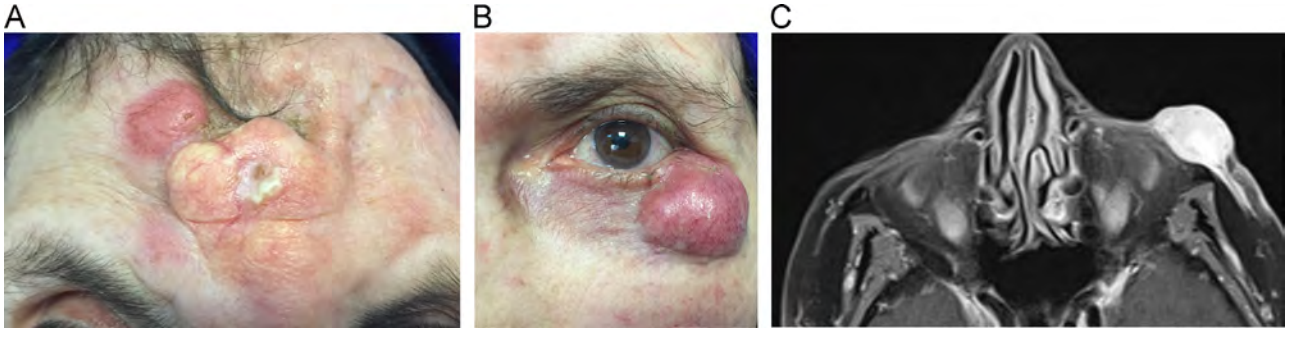

Fig. 1—(A) The forehead lesion at presentation, which was biopsied and then treated with radiotherapy a year earlier. (B) The eyelid tumour was densely vascular and hard on palpation.
(C) Orbital T1-weighted axial magnetic resonance imaging scan showed diffuse enhancement of the relatively well-delineated tumour after contrast agent administration.

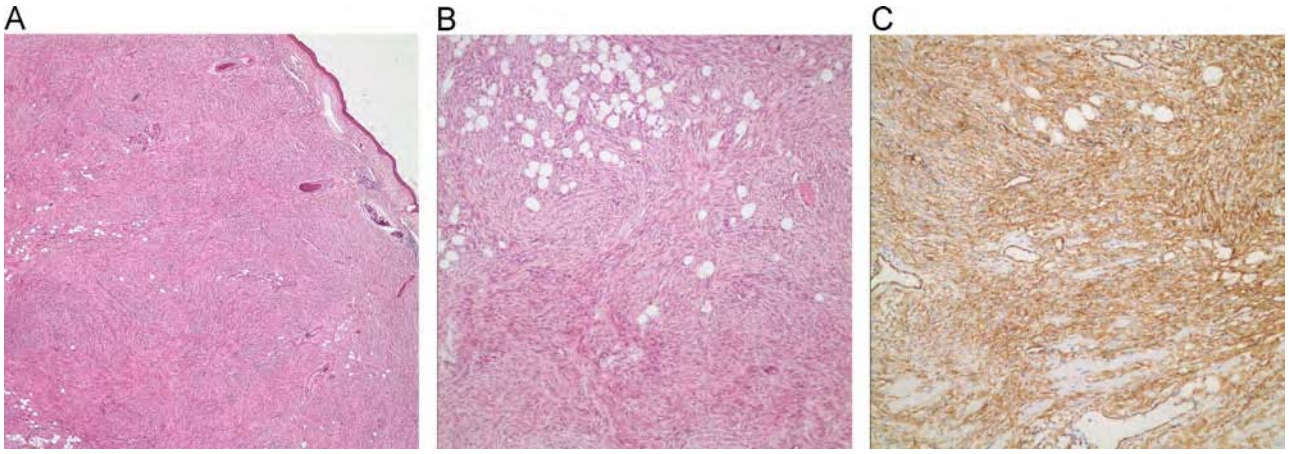

Fig. 2—(A) The cellular spindle cell neoplasm involved the whole dermis extending into the subcutaneous fat and sparing the skin appendages (H&E, ×40). (B) The monomorphic tumour cells formed prominent storiform patterns and had scant eosinophilic cytoplasm and hyperchromatic nuclei. The entrapped fat cells displayed honeycomb pattern (H&E, ×100). (C) Neoplastic cells were CD34 positive (CD34, ×100).

which she had undergone radiotherapy a year earlier at another institution (Fig. 1A). On ocular examination, her visual acuity was 20/30 in each eye. There was an immobile, indurated, and tender nodular lesion measuring approximately 3 cm × 2 cm × 2 cm on an erythematous base on her left lower eyelid (Fig. 1B). The rest of ocular examination was noncontributory. Orbital magnetic resonance imaging (MRI) study disclosed a cutaneous lesion on the left lower eyelid with heterogeneous signal intensity and diffuse contrast enhancement without orbital extension (Fig. 1C). Incisional biopsy was performed from both lesions and the diagnosis of DFSP was established. The patient gave consent for wide local excision only for the eyelid tumour. Histopathological evaluation of the whole-eyelid lesion showed a cellular dermal neoplasm with infiltrative borders into the muscle and fat, forming a "honeycomb" pattern (Fig. 2A). The tumour had a prominent storiform pattern at high magnification and was composed of spindle cells with scant pale cytoplasm and elongated nuclei with minimal pleomorphism (Fig. 2B). Mitotic activity was lower than 5 per 10 high-power fields. Immunohistochemically, the neoplastic cells stained positive for CD34 (Fig. 2C) and vimentin, and negative for factor XIIIA, EMA, S100, desmin, myogenin, HHV8, CD31, and bcl-2. The Ki-67 index was 5%. There were no areas of necrosis or fibrosarcomatous transformation. The surgical margins of the eyelid specimen were reported to be free of tumour cells.

The forehead tumour received adjunct radiotherapy at 60 Gy in fractionated doses, and at 20 months of follow-up, the eyelid remained recurrence-free and the forehead tumour was stable.

Discussion

DFSP is usually a slow-growing fibroblastic/myofibroblastic tumour with variable clinical presentations and growth patterns.[2,5] It most commonly starts as a violaceus red-blue plaque with small increments of growth over years and then multiple nodules develop over the plaque.[1,2] The tumour may even be present at birth, only to be recognized decades later.[6] On rare occasions, DFSP may rapidly arise as a firm, solitary cutaneous nodule.[2] Although the 2 lesions in our patient were histologically identical, their clinical courses were distinctly different; the forehead lesion developed over 20 years and the eyelid tumour emerged only in 3 months.

The MRI findings are not specific and demonstrate a well-delineated tumour that is isointense or mildly hyperintense on T1-weighted images and hyperintense on T2-weighted scans.[7] However, because DFSP is histologically poorly circumscribed and often extends into the dermis, subcutis, and muscles, it is advisable to resect deeper and wider from the margins that are appreciated clinically or on MRI studies.[1,2,5,8]

Documented predisposing factors favouring the development of DFSP include surgical scars, radiodermatitis, sites of multiple immunizations, old burns, and sites of central venous lines.[2,5] A history of trauma is present in up to 20% of patients.[2] The tumour may also be associated with acanthosis nigricans, arsenic intoxication, acrodermatitis enterohepatica, and pregnancy.[5] Our patient had none of these conditions.

The genetic background of DFSP has recently been elucidated. In more than 90% of patients, the t(17;22)(q22;q13) translocation is present, which leads to the fusion of *COL1A1* and *PDGFB* genes.[9,10] The gene product acts as an autocrine factor involved in Ras-MAPK, PI3K-AKT-mTOR signalling pathways and is a potent mitogen-stimulating proliferation, differentiation, and migration.[9] Imatinib mesylate, a tyrosine kinase inhibitor, has been shown to be effective in locally inoperable or metastatic DFSP, and identifying this genetic rearrangement may become mandatory in selected patients.[9,10] We did not determine the genetic status of the tumour in our patient.

Securing microscopically negative surgical margins is the cornerstone of treatment in DFSP because recurrence

rates after simple excisional biopsy varies between 20% and 70%.[5,10] Gayner et al.[11] showed that a margin of ≤ 2 cm was associated with a recurrence of 60%, whereas a margin of >2 cm was associated with a recurrence rate of 20%. A study on 29 patients suggested that the use of Mohs' micrographic surgery lowered the recurrence rate to 1% and this may become the treatment of choice in most cases.[8] Because most relapses occur within 2–3 years, it may be early to declare our patient recurrence-free after 20 months of follow-up.[5] Radiotherapy has re-emerged as a useful adjunct tool in large or incompletely resected tumours, and a recent study on 14 patients with a median follow-up of 10.5 years found that with 55.8–66 Gy radiation dose, 86% of patients became disease-free.[12]

Our patient is a rare example of DFSP developing consecutively as 2 separate tumours on the forehead and eyelid with identical histology but disparate clinical courses.

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A primary squamous cell carcinoma of the orbit

Secondary squamous cell carcinomas (SCCs) account for 6.8% of histologically proven orbital tumours. These most commonly derive from the paranasal sinuses followed by the periocular skin, the nasal cavity, the nasopharynx, the epibulbar structures, and the lacrimal sac.[1] Metastatic orbital SCC is less common with 1/28 and 0/32 cases of larger series of metastatic orbital tumours.[2,3]

Primary orbital SCCs are extremely rare, with 6 presumed cases reported in the literature.[4–7] We present a case of primary orbital SCC.

Case Presentation

A 78-year-old Caucasian male presented with an 18-month history of horizontal diplopia and a 1-month history of left-sided ptosis, periorbital paraesthesia, and increasingly severe orbital pain. The visual acuity was unaffected. He had had 7 facial basal cell carcinomas (BCC) (nose, left cheek, glabella, and right temple) in the preceding 15 years, one of which (right ear) had had areas of squamous differentiation and had recurred before complete excision. Immunohistochemistry of this lesion was positive for Ber-EP4m and negative for epithelial membrane antigen (EMA).

He had had 2 recent cerebrovascular events and was on warfarin.

On examination he had 2 mm of left proptosis relative to right, complete left ophthalmoplegia, and a dense left ptosis. He had paraesthesia in the distribution of the 1st and 2nd branch of his left trigeminal nerve and wasted muscles of mastication. The pupil reactions, remaining cranial nerves, and colour vision were all normal. There were no suspicious skin lesions anywhere on the face or body.