DERMATOFIBROSARCOMA PROTUBERANS: THE EXPERIENCES OF DIAGNOSIS AND TREATMENT THROUGH A RARE CASE REPORT

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ABSTRACT

Background: Dermatofibrosarcoma protuberans (DFSP) is classified as a soft tissue sarcoma, representing a rare form of skin cancer. Despite its rarity, DFSP is acknowledged as the most common skin sarcoma. The clinical features of DFSP are highly varied, making early-stage diagnosis challenging. Treatment initiated at an advanced stage significantly increases the risk of DFSP recurrence.

Case report: A 65-year-old female patient sought medical attention at our hospital due to a giant tumor on her central back. The lesion had initially appeared two years prior and had been initially misdiagnosed as keloids. Subsequently, the patient underwent intralesional steroid injections and surgery at a private clinic, but the lesion exhibited no improvement and relapsed within two months. Upon presenting to the National Hospital of Dermatology and Venereology, the patient displayed a brown-red raised tumor measuring approximately 8x4cm on her back. Given the suspicion of a cutaneous carcinoma, a biopsy was conducted. The histopathology and immunohistochemistry tests confirmed the diagnosis of DFSP. Consequently, the patient underwent wide excision of the lesion, including 3 cm of normal skin around it and deep into the fascia. No recurrence was recorded after one year of follow-up.

Conclusions: DFSP, a rare form of skin carcinoma, can be challenging to differentiate from various other conditions, including keloids. In cases where conventional treatments such as intralesional triamcinolone acetonide injection show poor improvement for suspected keloids, DFSP should be considered and confirmed through histopathology and immunohistochemistry tests.

Keywords: *Skin sarcoma, dermatofibrosarcoma protuberans, DFSP, keloids, recurrent keloids.*

1. INTRODUCTION

DFSP, initially described by Darier and Ferrand in 1924, was definitively termed Dermatofibrosarcoma protuberans (DFSP) in 1924 by Hoffman. It is a fibroblastic cutaneous sarcoma originating from dermal fibroblasts.

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Predominantly affecting middle-aged women, its annual incidence ranges from 0.8 to 5.3 cases per million, with a higher rate among African Americans.[1,2,3]

The underlying mechanism of DFSP is linked to the translocation mutation t(17;22) between chromosomes 17 and 22, resulting in the creation of COL1A1-PDGFB fusion transcripts.[4,5] Although approximately 92% of DFSP cases are associated with this mutation, about 8% exhibit other mutations. DFSP can manifest anywhere on the body, with the trunk (42 - 72%) and extremities (20-30%) being the most common locations, followed by the head and neck (10 - 16%). Notably, DFSP can arise on post-surgical scars, burn scars, injuries, radiation dermatitis, injection sites, and even insect bites.[6,7]

The progression of DFSP occurs through two main stages. In the initial stage, lasting an average of 7.6 years, the lesion slowly develops within the dermal skin with atypical features, often leading to missed early diagnoses. In the second stage, the lesion becomes more typical, presenting as a pink or brown-red plaque with an infiltrated and uneven surface.[8,9] In this stage, the tumor tends to penetrate deep into the skin, reaching underlying structures or surrounding tissues, exhibiting a "tentacle-like" appearance. Consequently, DFSP has a high recurrence rate after surgery without meticulous border control[10].

Clinical examinations require differentiation between DFSP and Basal cell carcinoma, especially in cases involving facial lesions, or keloids when the lesion appears on the trunk. A definitive diagnosis hinges on histopathological and immunohistochemical tests. The histopathological test typically reveals a "wheel-structure" with elongated spindle-shaped cells featuring elongated nuclei and thin cytoplasm. Immunohistochemistry tests often show CD34 positivity in 80 - 90% of cases. While CD34 positivity is strong and diffuse in DFSP, it is not exclusive to this condition. The classification of DFSP includes various types such as the classic type, Bednar type, Myxoid type, giant fibroblastoma type (found in children or adolescents), atrophy type, and fibrosarcomatous transformation type. Understanding these classifications is crucial for accurate diagnosis and subsequent treatment strategies.[11]

2. CASE REPORT

A 65-year-old woman was hospitalized due to a painless, giant raised tumor on her back that had developed over the course of 2 years. In a private clinic, the patient had been initially diagnosed with keloids and received three sessions of intralesional steroid injections two years ago. However, the "keloids" did not improve, prompting the decision to remove the entire lesion without a histopathology test. Within just one month, the lesion relapsed and exhibited accelerated growth. The patient reported experiencing mild pain and no pruritus.

Upon clinical examination, a giant, deep-red raised tumor measuring approximately 8x4cm was observed on her back. The lesion displayed an unclear and uneven border, uneven surface, central ulceration with crusting, telangiectasia, infiltration, and an immobile tumor (Figure 1a). The initial diagnosis suggested dermatofibroma, differentiating it from keloids. No similar lesions were found during the examination, and there was no familial history of keloids.

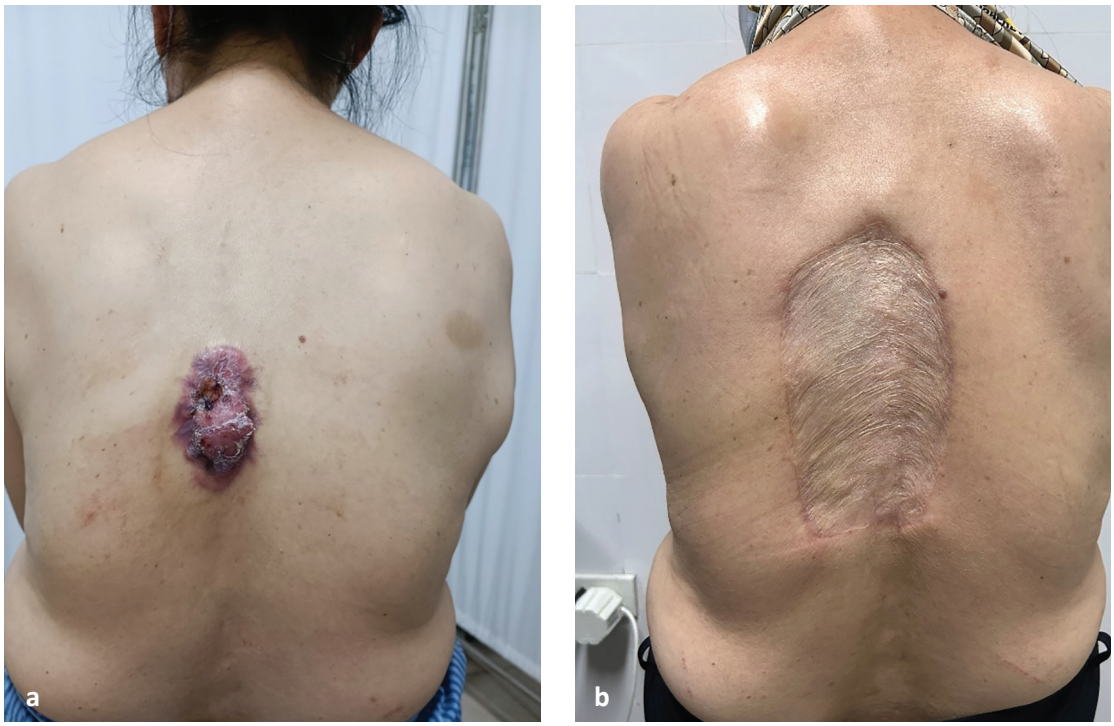

Figure 1. Our case of DFSP before operation (1a) and 1 year after operation (1b)

A biopsy was conducted to obtain a sample for histopathology and immunohistochemistry tests. Hematoxylin & eosin stains revealed dense spindle cells infiltrating the dermal layer in a storiform pattern. The spindle cells exhibited coarse basophilic nuclei, increased mitotic activity, and atypical mitosis. Immunohistochemistry stains indicated CD34 negativity and Ki67 positivity exceeding 30% (Figure 2). Both the histopathology and immunohistochemistry tests confirmed the presence of dermatofibrosarcoma protuberans (DFSP). An ultrasound was ordered to evaluate the depth of the tumor, revealing an indefinite border and a heterogeneous cutaneous tumor. Measuring the size of the tumor was challenging.

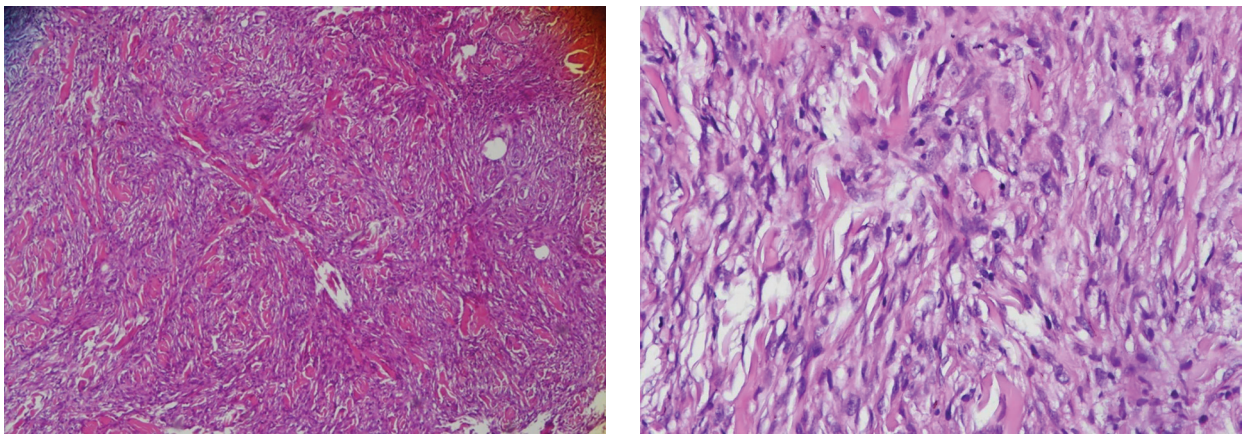

Figure 2. Histopathology of tumor showing storiform pattern and spindle cells

In this case, the lesion was removed with a 3cm margin, extending deep into the muscle. The resulting cavity after tumor removal was reconstructed using a thin skin graft. After a follow-up of one year, there have been no reports of recurrence (Figure 1b).

3. DISCUSSION

DFSP is a slowly malignant fibroblastoma sarcoma, occur only in 0,1% in skin cancer and about 1% in soft tissue sarcoma.[8,10] DFSP in differentiation with the other sarcoma such as angiosarcoma (more common), it normally onset earlier. Angiosarcoma often appear in over 80 years old patient, DFSP often appear in middle-age one. DFSP in most case have better prognosis than other sarcoma, rarely metastasize. Clinical features of DFSP are a pink or red-brown plaque develop slowly in cutaneous layer in early stage, after that, the tumor develops into the raised lumps on the cutaneous surface and tends to infiltrate to the deeper layer such us subcutaneous layer, muscle layer and even bone in late stage. In the first stage, DFSP was needed to differentiate with some skin diseases which have similar clinical features such as lipid tumor, epidermal cyst, keloids or basal cell carcinoma. In the second stage, DFSP may be mistaken with benign or malignant connective tissue tumors.

In our DFSP case, the patient was diagnosed with keloids in the early stage and was given treatment for a keloids. The patient was treated by intralesional steroids injection and followed by removing lesion surgery in over 1 year. However, the lesion relapsed after surgery quickly in size. After recurrence, the patient was given maintain intralesional steroids therapy, when the lesion was not improved with steroids, the patient presented to our hospital by herself. At our hospital, the patient was suspected for dermatofibroma or DFSP depended on her medical history. Her diagnose was confirmed by histopathology test and immunohistochemistry tests. As we know, keloids is a common of skin diseases, more common than DFSP, familiar with dermatologist than DFSP. In addition, keloids often appear in high-stress areas such as back, chest (also common in DDSP). In addition, DFSP may occur on keloids and keloids may appear after surgical DFSP. So some cases of DFSP can be misdiagnosed with keloids. However, DFSP was suspected in case of recalcitrant keloids and our case should have been suspected for DFSP when no improvement after intralesional steroids injection. Of course, histopathology and immunohistochemistry test are golden standard of DFSP diagnosis.

On HE stains, typical DFSP is a tumor with dermal and subdermal layer infiltration but epidermal layer typical spared and characterized by spindle cell with a storifrom pattern. Tumors may infiltrate to adipose tissue yields a so called “honey comb” pattern. The cytoplasm is generally abundant and eosinophilic, the nuclei are monomorphic and ovoid to elongated with variable mitotic activity. The poor prognosis factors in DFSP are mitotic rate, necrosis degree and histopathological types. Fibrosarcomatous transformation appears with cellular spindle cells fascicles or a “herringbone” pattern and with high mitotic rate, atypical mitotic or abnormal nuclei. In the histopathological test, DFSP needed to differentiate with dermatofibroma. On immunohistochemistry stains, DFSP positive strongly in focal or disseminated in 80 - 90% cases. CD34 positive in typical DFSP but it not specific for DFSP, CD34 is a marker for hematopoietic cells that is positive in other soft tissue sarcomas,

benign fibrohistiocytic lesions and vascular neoplasms.[9,10] In our case, histopathological test reveals a typical DFSP but CD34 negative, but Ki67 positive over 30%, Ki67 is a protein which relate to cell proliferation and is a poor prognostic factor. On the other hand, lost of CD34 positivity may appear in case of fibrosarcomatous DFSP but lack the histopathological typical structure and positive p53 immunohistopathological stain of fibrosarcomatous transfomation.[9,10] Because of actual conditions, we did not do the other immunohistopathological stain marker vimentin, p53 (normally positive in DFSP), factor XIIIa (normally negative in DFSP) to confirm the diagnosis clearly.

Other subclinical test such as ultrasound, MRI or CT are not playing role in diagnosis but was recommended for infiltrating assessment which is a factor to choose a suitable treatment. Because of COVID-19 pandemic, we did not order MRI for patient to assess the deeper of tumor and the tumor's infiltration into the surrounding tissues.

Surgery is an optimal choice for DFSP. However, DFSP have high rates of recurrence if it was found in late stage. Wide excision of the lesion including deep fascia even bone, with 3-5cm margin of normal skin and controlled-border. According to a series of DFSP cases, wide excision with 5cm margin of normal skin reported 5% recurrence rate. Mohs micrographic surgery, which is a special surgical technique to control tumor margins, is sometimes used to confirm that all the abnormal cells have been excised with cured rated reach 93 - 100%.[12,13] Imatinib mesylate - a tyrosine kinase inhibitor is used to treat in case of recurrent, inoperable or metastatic DFSP characterized by translocation mutation t(17;22). Radiotherapy is sometimes used in addition to surgery if a tumor cannot be removed completely or recurrent tumor.[12,13] Our patient was performed wide excision with 3cm margin of normal skin. Mohs surgery was not chosen caused by the actual conditions. The hole of removing tumor was reconstructed by skin graft, we did not choose skin flap for reconstruction caused by giant lesion and skin graft is better for following. Recently, the patient was examined clinically, there was no recurrent tumor.

4.CONCLUSION

DFSP is a rare skin cancer so it may be difficult in diagnosis in early stage. To diagnose DFSP, it must be considered. DFSP have a good prognosis with early diagnosis and proper treatment. It is usually treated by wide excision and Mohs surgery in most cases. However, DFSP have high risk of recurrence so restricted long-term follow-up is neccessary.

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