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Review

Transformed dermatofibrosarcoma protuberans: A series of nine cases and literature review

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Abstract

The fibrosarcomatous variant of dermatofibrosarcoma protuberans (DFSP) represents an uncommon form of DFSP which has a higher risk of local recurrence and distant metastases than ordinary DFSP.

The aim of our study is to investigate clinicopathologic characteristics, treatment modalities and prognostic factors of nine cases of transformed DFSP admitted in Salah Azaiez Institute between 2002 and 2009.

They were five men and four women. Median age at diagnosis was 52 years (35–87 years). The lesions were located on the abdominal wall (three cases), the upper limb (two cases), the back (two cases), the lower limb (one case) and the chest wall (one case). Tumor size ranged from 25 mm to 150 mm. After diagnosis, six patients were treated by wide local excision with margins $\geqslant$2 cm, two patients had local excision without defined margins and one patient had incomplete local excision. Three patients underwent radiotherapy because of either cramped or unknown limits. Local recurrence was diagnosed in 5 cases and distant metastasis occurred in one patient.

Fibrosarcomatous DFSP exhibits more aggressive behavior than DFSP. Their similar clinical presentation requires histopathological differentiation for prognosis. Treatment is based on wide local excision, radiation and targeted therapy.

Keywords: Dermatofibrosarcoma protuberans; Fibrosarcoma; Surgery

Contents

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1. Introduction

Dermatofibrosarcoma protuberans (DFSP) is a locally aggressive fibrohistiocytic tumor of intermediate malignancy with a great potential of recurrences and a small risk of distant metastasis. The fibrosarcomatous variant of DFSP represents an uncommon form of DFSP in which the prognosis is closely linked to the fibrosarcomatous component.

The aim of our study is to investigate clinicopathologic characteristics, treatment modalities and prognostic factors of 9 cases of transformed DFSP.

2. Methods

We have compiled nine patients from Salah Azaiez Institut of Tunisia during the period from 2002 to 2009. Those patients had histologically proven fibrosarcomatous dermatofibrosarcoma protuberans (FS-DFSP).

Treatment modalities and outcomes were analyzed retrospectively.

3. Results

We analyzed the clinicopathologic features of a series of nine patients presenting FS-DFSP (Table 1). Six patients have been treated initially in other hospitals and three were seen first in our department.

They were five men and four women, and their age at diagnosis ranged from 35 to 87 years (mean, 52). All patients had a history of a slowly growing painless mass.

The lesions were located on the abdominal wall (three cases), the upper limb (two cases), the back (two cases), the lower limb (one case) and the chest wall (one case). Tumor size ranged from 25 mm to 150 mm (mean, 86 mm).

In five patients FS-DFSP occurred as a recurrence of classic dermatofibrosarcoma, and the number of recurrences varies from 1 to 6. The remaining patients presented this type of lesion for the first time.

After diagnosis, six patients were treated by wide local excision with margins $\geqslant$2 cm, two patients had local excision without defined margins and one patient had incomplete local excision. Three patients underwent radiotherapy because of either cramped or unknown limits.

Follow-up ranged from one to 144 months. Recurrences occurred in five cases at a median of 2.4 years. All these patients were treated by wide local excision, and one of them had local radiotherapy. In one case, lung metastasis was diagnosed and treated by chemotherapy. The patient was lost of view in poor condition.

4. Discussion

The DFSP affects predominately adults between 20 and 50 years. A slight male predominance has been reported (Rutgers et al., 1992), as shown in our study; 5 men and 4 women. There is no difference in anatomic location between DFSP and fibrosarcomatous DFSP. Similar to our series, it is seen mainly on the trunk (42–72%) and the proximal extremities (16–30%) (Lemm et al., 2009).

The fibrosarcomatous transformation of DFSP is exceptional. In 1951, Penner reported a case of metastasizing DFSP containing areas that were histologically indistinguishable from fibrosarcoma (Penner, 1951).

As FS-DFSP is clinically indistinguishable from ordinary DFSP, its diagnosis is established histologically. It is characterized by more spindle cells, greater number of nuclei and increased mitotic rate. Immunohistochemically, a strong CD34 positivity is an important feature for the diagnosis of DFSP. However, in the sarcomatous cases, the CD34 reactivity can be weak and this can be explained by the loss of expression of CD34 during the tumor differentiation (Weiss and Goldblum, 2001).

The standard therapeutic approach used for the treatment of the DFSP is wide and deep local excision including the underlying fascia with margins $\geqslant$2 cm (Voth et al., 2011). These margins have been respected in 6 patients in our series. Some authors suggest the use of Moh's micrographic surgery in order to achieve negative resection margins and simultaneously preserve the uninvolved tissue from resection (Llombart et al., 2011).

The extent of the initial resection is the most significant prognostic factor for relapse. In our study, five patients presented local recurrence. In four cases, margins were $\geqslant$2 cm in anatomopathologic examination. Ding and al suggested a high recurrence rate (89%) in cases of fibrosarcomatous transformation, but the adequacy of surgical excisions was not made clear (Ding et al., 1989). Mentzel et al. and Pizarro et al. documented a recurrence rate of 59%, but a minority of the patients received wide local excision and treatment details were not provided (Mentzel et al., 1998). One of the largest studies by Goldblun et al. found no prognostic differences between conventional DFSP and DFSP containing sarcoma treated by wide local excision (Goldblum et al., 2000). These desperate results are due to small sample sizes and inadequate treated patients included. In a retrospective review of 122 patients with DFSPat the University of Texas MD Anderson Cancer Center in Houston, fibrosarcomatous change was significantly associated with local recurrence and patients with a higher percentage of FS change (25%) carried a

Table 1
Clinicopathologic features of nine patients with FS-DFSP.

	Age (years)	Sex	Site	Tumor size (mm)	Type of sarcoma	Occurrence of sarcoma	Surgical margins	Treatment	Recurrences	Metastases	Follow-up (months)
Case 1	41	M	Right upper limb	85*60	Fibrosarcoma	After DFS	Negative	WLE	–	–	24
Case 2	62	F	Abdominal wall	100*70	Fibrosarcoma	After DFS	Negative	WLE	–	–	144
Case 3	67	M	Abdominal wall	40*40	Fibrosarcoma	De novo	Unknown	LE + irradiation	1	Lung	48
Case 4	35	F	Back	25*20	Fibrosarcoma	After DFS	Unknown	LE + irradiation	–	–	24
Case 5	38	M	Back	70*45	Fibrosarcoma	De novo	Negative	WLE	1	–	72
Case 6	39	F	Left lower limb	90*70	Fibrosarcoma	After 3 occurrences of DFS	Negative	WLE	2	–	138
Case 7	53	M	Left upper limb	150*100	Fibrosarcoma	After 6 occurrences of DFS	Positive	–			
						WLE + irradiation	3		24		
Case 8	87	F	Abdominal wall	115*110	Fibrosarcoma	De novo	Positive	ILE	–	–	1
Case 9	52	M	Chest wall	100*60	Fibrosarcoma	De novo	Negative	WLE	1	–	24

M: male; F: female; WLE: wide local excision; LE: local excision without defined margins; ILE: incomplete local excision.

greater risk of recurrence and metastasis (Llombart et al., 2011).

DFSP has been proposed to be a relatively radiosensitive tumor and radiation should be considered as an adjuvant to resection if margins are positive, and wider excision is not feasible due to anatomic limitations. Some authors also recommended the use of radiotherapy after wide resection in the fibrosarcomatous subtype, even with negative margins, to improve local control and reduce the risk of recurrence postoperatively (Farma et al., 2010 and Williams et al., 2014). We indicated radiotherapy in patients who had local excision without defined margins (2 patients). Recently, targeted therapy (Imatinib) has shown very good results. It is accepted that the use of this drug is indicated in patients with unresectable, locally advanced, recurrent or metastatic disease (Han et al., 2009). It can also be used in tumor shrinkage prior to surgery, avoiding loss of functions and cosmetic defects. The clinical efficacy of Imatinib crucially depends on the presence of $t(17,22)$ in the individual tumor and/or its metastases with objective response rates in classic DFSP and FS-DFSP harboring $t(17,22)$ approaching 50% (Rutkowski et al., 2010).

The metastatic capacity makes DFSP a true sarcoma, although the rate of metastases is less than 5% (McPeak et al., 1967). Distant metastases usually occur only after multiple local recurrences, mostly in the lungs or bones. The distant metastasis reported in our study was in the lung and occurred after only one recurrence, 3 years after surgery.

5. Conclusion

Fibrosarcomatous DFSP exhibits more aggressive behavior than DFSP. Their similar clinical presentation requires histopathological differentiation for prognosis which appears to be worse in DFSP with FS change with higher risks of local recurrence, metastasis, and death. Additional studies are needed to define optimal management but will be challenging given the rarity of this entity.

Conflict of interest

None declared.

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