Primary cutaneous carcinosarcoma: report of a case with poroid and fibrohistiocytic differentiation

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Resumen

El carcinosarcoma primario cutáneo es un tumor infrecuente de la piel y corresponde a una neoplasia bifásica compuesta por un componente epitelial y otro mesenquimático, ambos con características de malignidad, de causa incierta. El componente epitelial frecuentemente presenta diferenciación escamoide o basaloide, pero puede adquirir otra diferenciación como anexial. El componente mesenquimático puede presentar diferenciación variada, como por ejemplo muscular lisa, nerviosa, osteoblástica, condroblástica, miofibroblastica, angiomatosa, fibrosarcomatosa entre otras. Se ha reportado que tiene recurrencia local con bajo potencial metastásico. Presentamos el caso de un paciente hombre de 89 años, con un tumor exofítico en la parte posterior de la pierna izquierda, cuyo examen histopatológico mostró un Carcinosarcoma cutáneo, con diferenciación anexial (porocarcinoma) y de Sarcoma pleomórfico con diferenciación fibrohistiocitaria.

Palabras claves: Carcinosarcoma cutáneo; porocarcinoma; fibrohistiocítico; tumor bifásico.

Abstract

Primary cutaneous carcinosarcoma is an infrequent cutaneous biphasic tumor composed of an epithelial and a mesenchymal component, both of which contain malignant features. The epithelial component frequently shows squamoid or basaloid differentiation but other differentiations, such as adnexal, have also been described. The mesenchymal component shows diverse cellular lineages including, but not limited to, smooth muscle, nervous, osteoblastic, chondroblastic, myofibroblastic, angiomatous, and fibrosarcomatous. Local recurrences with low metastatic potential are also reported. We present the case of an 89-year-old man with an exophytic tumor located in the back of the left leg. A biopsy of the tumor showed a cutaneous carcinosarcoma with adnexal differentiation (porocarcinoma) and pleomorphic sarcoma with fibrohistiocytic differentiation.

Key words: Cutaneous carcinosarcoma; porocarcinoma; fibrohistiocytic; biphasic tumor.

Carcinosarcoma is a biphasic neoplasm composed of malignant epithelial and mesenchymal elements that are intimately admixed[1]. It has been described in many different organs such as the uterus, bladder, lung, kidney, breast, oropharynx, and the gastrointestinal tract, but it very rarely develops in the skin[2].The prognosis is uncertain and depends on the epithelial component, but local recurrence and metastasis rates are lower when compared to similar tumors located elsewhere in the body.

Case report

An 89-year-old man presented with an ulcerated solitary exophytic nodule located on the back of the left leg that had steadily grown over the past year to a diameter of 2.6 cm. It was ulcerated and bled occasionally but lymph nodes were unaffected. An excisional biopsy and skin graft were performed, and no residual tumor was detected (figure1).

The pathologic findings showed an ulcerated invasive biphasic mass with a mesenchymal component

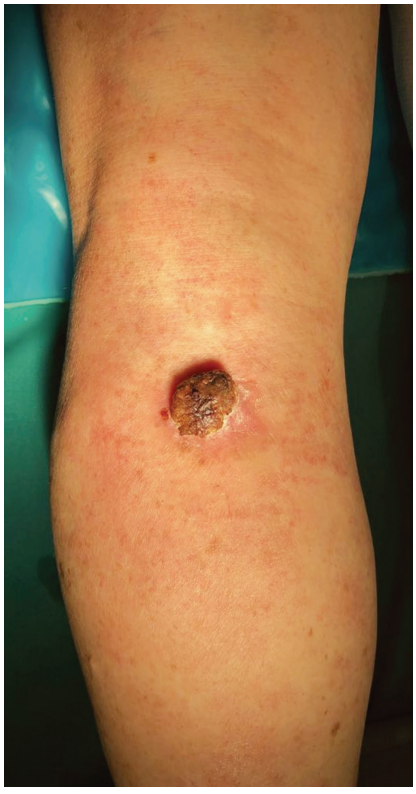

Figure 1
Exophytic ulcerated nodular lesion located on the back of the left leg.

formed by large irregular dyscohesive pleomorphic mono and multinucleated cells with wide eosinophilic cytoplasm, and some cells with eosinophilic intracytoplasmic globules. They also had irregular nuclei with vesicular and granular chromatin, and prominent nucleoli. Three atypical mitoses per high power field were identified. The epithelial component was circling its mesenchymal counterpart, and consisted of atypical cohesive cells with clear cytoplasm, round and oval-shaped nuclei with vesicular chromatin and prominent nucleoli, forming a trabecular pattern, nests, and some tubular structures (figure 2A-2D).

Immunohistochemical staining showed a positive reaction for EMA and it was negative for CD10, CD31 and MyoD1 in the epithelial component. In the mesenchymal component, there was a positive reaction for CD10, and negative for EMA, CD31 and MyoD1 (figure 3A-3D).

The histopathological findings were consistent with a cutaneous carcinosarcoma with adnexal differentiation (porocarcinoma), and pleomorphic sarcoma with fibrohistiocytic differentiation.

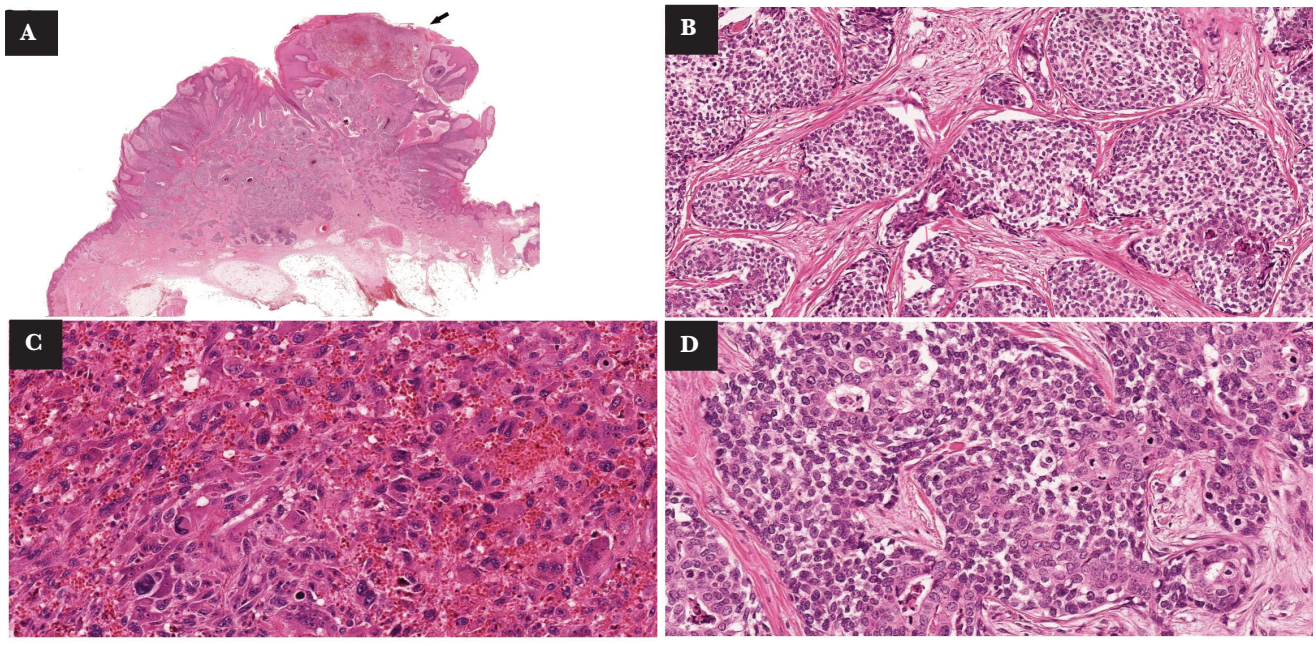

Figure 2
2A: Ulcerated malignant tumor with a predominant epithelial component. The sarcomatous component is superficial and ulcerated (arrow). HE2.5x.
2B: The epithelial component is formed by a nest of cells with tubular structures.
2C: The mesenchymal component is formed by large pleomorphic cells with enlarged and hyperchromatic nuclei in addition to some binucleated cells. HE20x.
2D: Several mitosis can be seen.

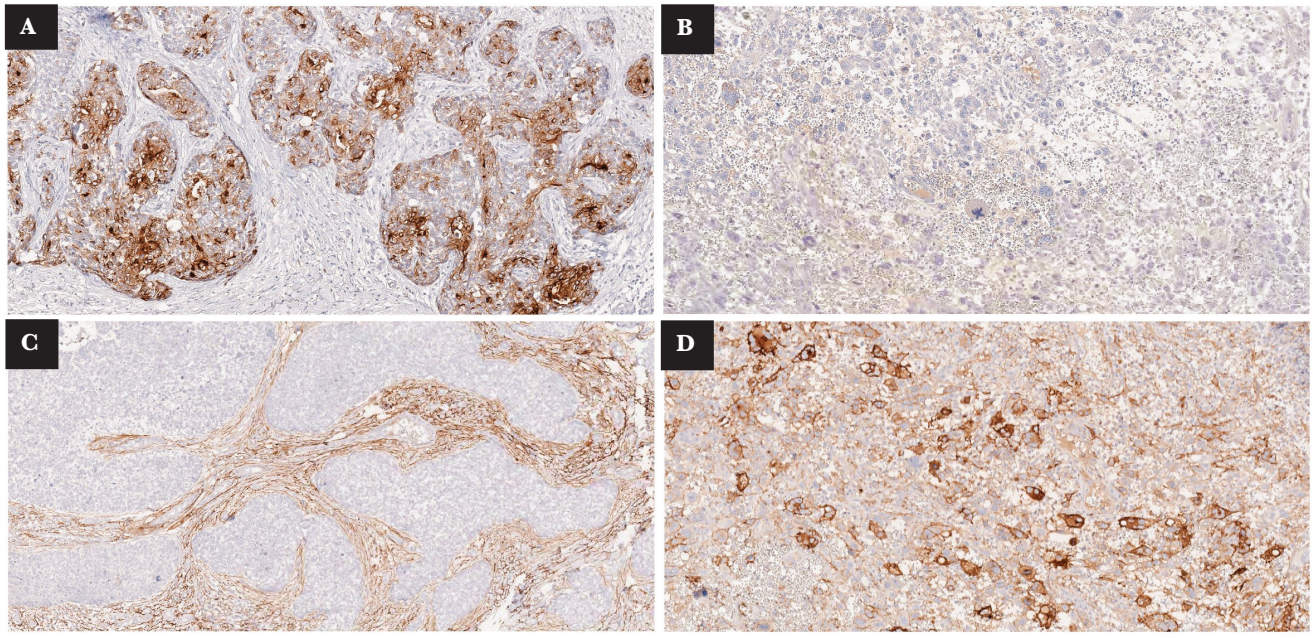

Figure 3
A. Stain with monoclonal antibodies against EMA was positive in the epithelial component
B. Stain with monoclonal antibodies against EMA was negative in the mesenchymal component
C. Stain with monoclonal antibody against CD10 was negative in the epithelial component
D. Stain with monoclonal antibody against CD10 was Positive in the mesenchymal component

Discussion

Carcinosarcoma is a malignant biphasic tumor described in different anatomical sites but infrequently develops in the skin. The first description of carcinosarcoma was made by Virchow in 1864[3] but a primary cutaneous carcinosarcoma was first described by Grime in 1948[4] in a biopsy showing squamous cell carcinoma with fibrosarcoma that had developed in a post-burn scar. Since then, we found 80 cases of cutaneous carcinosarcoma reported in the English literature (Table 1). According to these case reviews, the average age of clinic presentation is 76 years old, and ranges from 48 to 92 years old. It is more frequent in men (n: 57) than in women (n: 23), 71.2% compared to 28.7%. In the skin the most frequent locations are photoexposed areas, mainly in the face and ears although they have been described in places like the armpit and gluteus[1,2].

The prognosis is variable and depends directly on the epithelial carcinoma component differentiation. If it comes from the epidermis (basaloid or squamous), the disease-free survival rate at 5 years is 70%. However, if the epithelial component has adnexal differentiation (poroid or trichoblastic), the disease-free survival rate at 5 years is 25%[5]. The suggested treatment consists of a surgical resection through Mohs surgery[6].

The epithelial component can arise from the epidermis (basaloid or squamous) or derived from eccrine, apocrine, follicular, matrical, or trichilemmal skin appendages[5]. The sarcomatous component can be homologous, meaning it is made of the same tissue where the lesion develops, or heterologous and formed from a tissue elsewhere on the body. This component can have, but is not limited to, osteoblastic, chondroblastic, smooth muscle, skeletal muscle, or fibrohistiocytic differentiations.

Of all the cases we found in the literature, 67.9% had a basaloid epithelial differentiation, 32% had squamous differentiation, and only 8.6% showed adnexal differentiation. Among the mesenchymal components 16.25% had atypical fibroxanthoma (undifferentiated pleomorphic sarcoma), and 37.5% had a heterologous component with osseous being the most frequent (Table 1).

Tabla 1
Guímera-Martín and Paniz-Mondolfi. Modified from[3,10]

Case number	Reference	Age/ Years	Gender	Location	Clinical diagnosis	Epithelial component differentiation	Mesenchymal component differentiation
1	(17) 1948	48	M	Arm	NR	SCC	Fibrosarcoma
2	(3) 1972	75	M	Thorax	NR	Squamous/basal	Osteoid - chondroid
3	(21) 1981	74	M	Armpit	NR	BCC	Chondroid – osteoid-fibrosarcoma - synovial
4	(22) 1988	91	F	Forehead	NR	BCC	Osteosarcoma
5	(23) 1993	44	M	Back	NR	BCC	Cell fused sarcoma
6	(24) 1995	86	M	Tragus (Ear)	SCC	BCC	Osteosarcoma
7	(14) 1996	69	F	Arm	NR	Squamous	Pleomorphic sarcoma
8	(12) 1997	71	M	Eyelid	NR	Squamous	Osteoid
9		74	M	Scalp	Dermatofibrosarcoma protuberans	Squamous	Smooth and skeletal muscle
10		83	M	Scalp	NR	Squamous	Osteoid and chondroid
11		67	M	Nose	Pyogenic granuloma	Eccrine porocarcinoma	Osteoclast-like and osteoid-like giant cells
12	(25)1998	82	M	Supraclavicular region	NR	BCC	Malignant fibrous histiocytoma (Undifferentiated pleomorphic sarcoma)
13	(1)1999	72	M	Arm	Swollen epidermal cyst	BCC	Fibrosarcoma
14	(26) 2003	64	M	Ear	NR	BCC	Myxoid fibrous histiocytoma
15	(13) 2003	73	F	Arm	SCC	BCC	Atypical fibroxanthoma
16	(7) 2005	77	F	Forehead	NR	BCC	Pleomorphic sarcoma
17		70	M	Chin	NR	BCC	Pleomorphic sarcoma
18		83	M	Ear	NR	BCC	Pleomorphic sarcoma – osteoid – myofibroblast
19		86	M	Back	NR	BCC	Pleomorphic sarcoma - leiomiosarcoma
20	(4) 2005	78	M	Temporal bone	NR	BCC	Atypical fibroxanthoma
21		81	F	Chin	NR	BCC	Atypical fibroxanthoma with heterologous component - chondrosarcoma

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Case number	Reference	Age/ Years	Gender	Location	Clinical diagnosis	Epithelial component differentiation	Mesenchymal component differentiation
22		75	F	Hand	NR	BCC and SCC	Atypical fibroxanthoma
23		90	M	Ear	NR	BCC	Atypical fibroxanthoma
24	(27) 2005	61	M	Leg	NR	BCC	Cell fused sarcoma
25	(3) 2005	70	F	Scalp	NR	Adenocarcinoma	Rhabdomyosarcoma
26	(28) 2006	62	M	Leg	NR	BCC	Osteosarcoma
27		83	F	Leg	NR	BCC	Osteosarcoma
28		92	F	Forehead	NR	BCC	Osteosarcoma/ giant cell-rich
29		87	M	Preauricular	NR	BCC	Osteosarcoma
30		75	M	Olecranon	NR	BCC	Osteosarcoma
31		77	F	Periocular	Pyogenic granuloma/ BCC	BCC	Osteosarcoma
32		61	M	Arm	Pyogenic granuloma	BCC	Osteosarcoma/ giant cell-rich
33		68	M	Scalp	NR	BCC	Osteosarcoma
34		89	M	Forehead	NR	BCC	Osteosarcoma
35		75	F	Ear	NR	BCC	Osteosarcoma
36		65	F	Periocular	NR	BCC	Giant cell-rich estroma
37	(29) 2006	53	M	Abdominal	NR	BCC	Osteosarcoma
38	(15) 2006	93	M	Vertex	SCC	BCC	Cell fused sarcoma
39		80	F	Shin	SCC	BCC	Cell fused sarcoma
40		86	M	Forehead	NR	SCC	Cell fused sarcoma
42		90	M	Auricular pavilion	NR	SCC	Cell fused sarcoma
43	(18) 2007	62	M	Thorax	NR	BCC	Cell fused sarcoma
44		83	M	Ear	NR	BCC	Cell fused sarcoma
45		70	M	Ear	NR	Poorly differentiated SCC	Cell fused sarcoma/ Atypical fibroxanthoma
46	(30) 2007	78	M	Chin	NR	BCC	Fibrosarcoma/DFSP
47	(31) 2008	84	M	Temple	NR	BCC	Giant cells/ Atypical fibrous histiocytoma

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Case number	Reference	Age/ Years	Gender	Location	Clinical diagnosis differentiation	Epithelial component differentiation	Mesenchymal component
48		58	M	Chin	NR	BCC	Atypical fibrous histiocytoma
49		77	M	Shoulder	BCC	BCC	Osteosarcoma
50		79	M	Chin	NR	BCC	Osteosaroma
51		69	M	Inner canthus	BCC	BCC histiocytoma	Giant cells/ Atypical fibrous
52	(20) 2008	83	F	Face	NR	BCC	Myofibroblastic
53	(16) 2009	87	F	Helix	NR	BCC and SCC	Osteosarcoma
54	(32) 2009	85	F	Scalp	NR	BCC	Fibrosarcoma/ osteosarcoma
55	(33) 2009	87	M	Gluteal	NR	Myoepithelial (basaloid and Squamoid) with duct formation	Fused and giant cells with myxochondroid stroma
56	(2) 2010	58	F	Hand	NR	Squamous	Liposarcoma
57	(19) 2010	73	M	Temple	Amelanotic melanoma/ SCC / Merkel cell carcinoma	BCC	Atypical fibrous histiocytoma with osteoclast-like giant cells
58	(5) 2013	84	M	Shoulder	Dermatofibrosarcoma Protuberans/ liposarcoma	Squamous	Undifferentiated cell fused sarcoma
59	(9) 2013	86	M	Forehead	NR	Poorly differentiated SCC	Myogenic sarcoma
60		76	M	Back	NR	Dedifferentiated SCC	Neurogenic sarcoma
61		53	M	Ear	NR	Dedifferentiated SCC	Rhabdomyosarcoma
62		84	M	Eyelid	NR	Poorly differentiated SCC	Malignant fibrous histiocytoma
63		86	M	Forehead	NR	Poorly differentiated SCC	Myogenic sarcoma
64		74	F	Temple	NR	Poorly differentiated SCC	Myofibroblastic sarcoma
65	(10) 2014	92	F	Armpit	BCC	SCC	Sarcomatous - fused cells – Rhabdomiomatous
66		90	M	Scalp	SCC	SCC	Sarcomatous - fused cells

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Case number	Reference	Age/ Years	Gender	Location	Clinical diagnosis differentiation	Epithelial component differentiation	Mesenchymal component
67		83	M	Forehead	SCC	SCC	Sarcomatous - fused cells
68		54	M	Back	BCC	BCC	Sarcomatous - fused cells – Osteoid
69		73	M	Back	BCC	BCC	Sarcomatous - fused cells – Osteoid
70		59	M	Scalp	BCC	BCC	Sarcomatous - fused cells–Leiomiomatous
71	(34) 2015	71	M	Arm	Pyogenic granuloma or vascular neoplasm	BCC	Sarcomatous - fused cells
72	(8) 2016	77	M	Chin	NR	BCC/ pilomatrical	Undifferentiated Cell fused sarcoma
73		82	M	Scalp	NR	Basaloid SCC	Undifferentiated Cell fused sarcoma
74		81	M	Forehead	NR	Tricoblastic	Undifferentiated Cell fused sarcoma
75		85	M	Finger	NR	Tricoblastic	Undifferentiated Cell fused sarcoma
76		73	M	Ear	NR	BCC	Undifferentiated Cell fused sarcoma
77		90	M	Ear	NR	BCC	Undifferentiated Cell fused sarcoma
78	(6) 2017	88	F	Supraclavicular	SCC/ keratoacanthoma	BCC	Sarcomatous-Fused cells with chondroid component
79	(11)2018	85	F	Forehead	NR	BCC fused cells	Sarcomatous– pleomorphic
80	(35) 2018	80	F	Leg	Metastasis/ Merkel cell carcinoma/ /melanoma	Squamous	Sarcomatous – fused cells
81	Current	89	M	Leg	Melanoma/SCC	Poroid	Atypical fibroxanthoma

NR: not referred; BCC: Basal cell carcinoma; SCC: Squamous cell carcinoma, DFSP: dermatofibrosarcoma protuberans; M: Male; F: Female

Clinically the presentation is variable and often presents as an exophytic nodular lesion that can mimic a basal cell carcinoma, squamous cell carcinoma, keratoacanthoma, or Merkel-cell carcinoma[6].

There are several morphological criteria that define a carcinosarcoma. First, dual neoplasia with epithelial and mesenchymal components must be confirmed by histology and immunohistochemical reactions. Second, a collision tumor or metastasis must be excluded. Lastly, cells must be coherent and show solid pattern proliferation without stromal sarcomatous changes in the surrounding tissue[7,8].

The histogenesis of carcinosarcoma remains unknown, although four theories have been proposed[9–11]. First among them is the theory of collision or convergence, which posits that the tumor is composed of two different synchronic neoplasms originating from two or more undifferentiated progenitor cells. Second is the theory of conversion, in which a part of the carcinoma shows a metaplastic transformation into a sarcomatous component. Third is the theory of composition that hypothesizes that the mesenchymal component is not a tumor but reactive stroma with "pseudosarcomatous" changes. Finally there is the divergent or combination theory that both the epithelial and the mesenchymal components are originated from a common pluripotential progenitor cell[4].

Biernat *et al*[10] demonstrated the similar expression of p53 in both the epithelial and sarcomatous components which supports the theory that they have a common origin, favoring the divergence or conversion theories.

The diagnosis can be made by biopsy analysis, using Hematoxylin and Eosin staining in addition to complementary immunohistochemical analyses that allows the origin of the cell line to be more accurately classified. The treatment is surgical resection by Mohs surgery with strict clinical follow up.

The differential diagnosis includes cutaneous metastasis from sarcoma, squamous cell carcinoma, melanoma, or atypical fibroxanthoma.

Conclusion

We have presented the case of an 89-year-old man with an exophytic tumor histopathologically diagnosed as cutaneous carcinosarcoma with adnexal differentiation (porocarcinoma) and pleomorphic sarcoma with fibrohistiocytic differentiation. Primary cutaneous carcinosarcoma is an infrequent neoplasm of uncertain etiology, potentially locally recurrent and metastatic. The prognosis is primarily determined by the epithelial component (adnexal or epidermic), and the elected treatment is surgical excision by Mohs surgery with strict clinical follow up.

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