

Neglected basal cell carcinoma presenting with diffuse skeletal metastases



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Metastatic basal cell carcinoma (mBCC) is exceedingly rare, with an estimated incidence of 0.0028% to 0.55%.¹ Although the behavior of mBCC is poorly understood, the primary tumor typically exhibits aggressive histopathology, such as morpheaform, infiltrating, or basosquamous features. Basal cell carcinoma (BCC) usually metastasizes to regional lymph nodes (53%), lungs (33%), and bone (20%). Until a few years ago, the median survival after diagnosis was only 8 to 10 months. After the demonstration that more than 90% of BCC expressed abnormal Hedgehog signaling, 2 Hedgehog pathway inhibitors, vismodegib and sonidegib, were approved for advanced BCC.²⁻⁴ We describe a patient with a chronic burn in whom mBCC with diffuse skeletal and possibly lung metastases developed. The patient was started on vismodegib but ultimately died of his disease.

REPORT OF A CASE

A 65-year-old man lost to medical care for more than 3 decades presented with a nonhealing ulcer on the posterior neck, tachycardia, and left hip pain. The lesion, present for at least 15 years, was the site of a fireplace burn during childhood. The patient reported a 20-pound weight loss over a few months but denied other constitutional symptoms. On examination, he appeared cachectic. On the posterior neck was an 8- x 10-centimeter pearly ulcer with raised borders (Fig 1, A). He had no

Abbreviations used:

BCC:	basal cell carcinoma
mBCC:	metastatic basal cell carcinoma
SCC:	squamous cell carcinoma

lymphadenopathy. Biopsy of the ulcer border found infiltrating BCC (Fig 1, B). Given his tachycardia and hip pain, chest computed tomography angiogram and abdominal computed tomography found multiple sub 4-mm pulmonary nodules as well as numerous lytic and osteoblastic lesions throughout the ribs, the lumbar spine, and pelvis (Fig 1, C). A core biopsy from the iliac crest showed an infiltrative basaloid neoplasm, consistent with mBCC (Fig 1, D). After ulcer debulking and skin grafting, he was started on vismodegib, 150 mg/d, and received 2 doses of radiation therapy for the left hip, with improvement in symptoms. He suffered from severe nausea, vomiting, and malaise on vismodegib, and, ultimately, given lack of tumor response, he was switched to comfort care and died only 2 months after his diagnosis.

DISCUSSION

This case adds to the sparse literature on metastatic BCC. Intriguingly, the history of prior fireplace burn in our patient may have represented a contributing factor. Trauma has long been proposed to be an inciting factor for the development of

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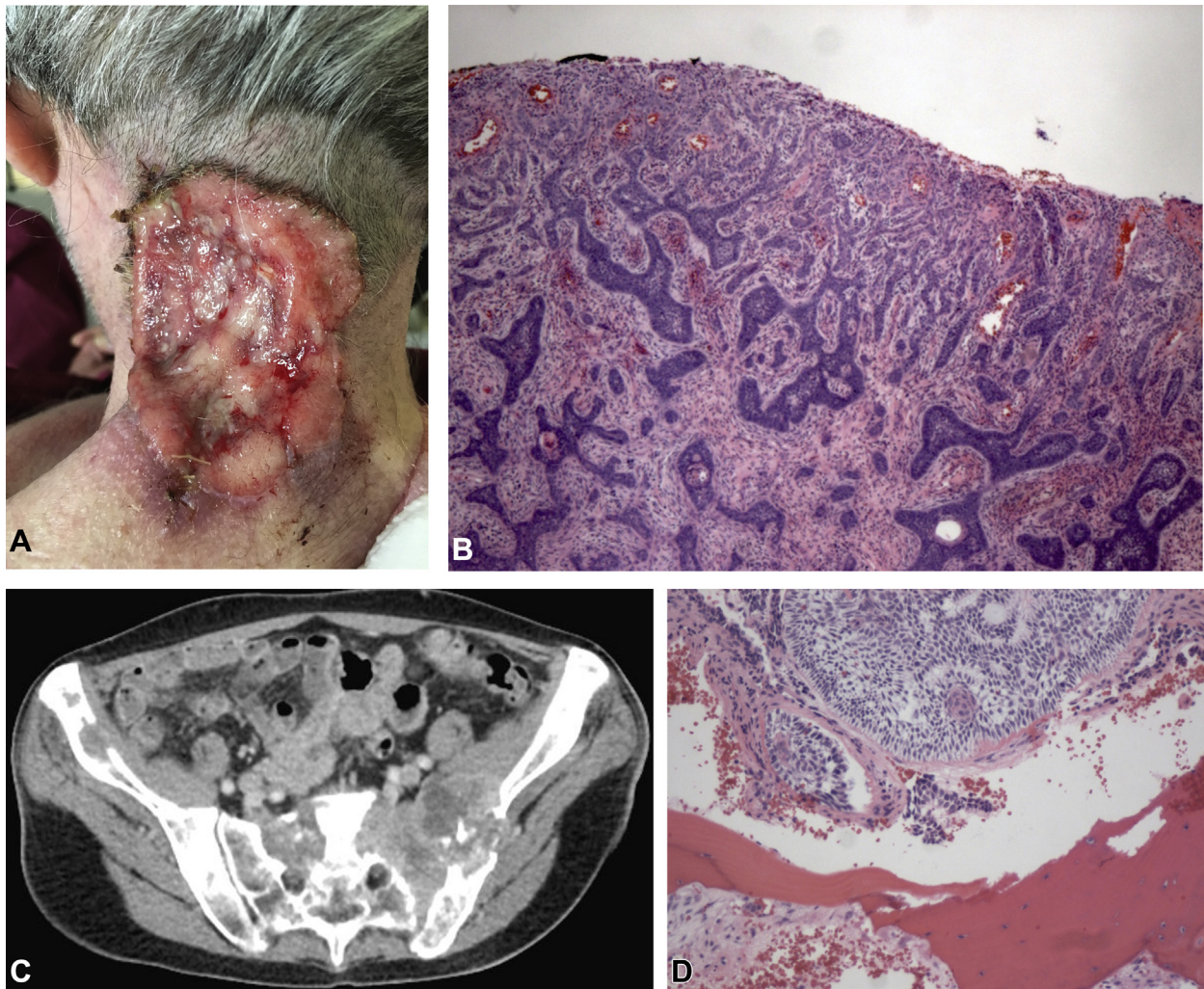


Fig 1. **A**, Examination of the posterior neck found an 8- x 10-cm-deep, rectangular ulcer with heaped borders. **B**, Biopsy of the ulcer border found nests and cords of atypical basaloid with prominent peripheral palisading, characteristic of BCC. **C**, Abdominal computed tomography scan shows diffuse lytic lesions of the skeletal system. Pictured here are multiple, soft tissue masses with extensive destruction of bone, including the left iliac bone, the site of the patient's presenting pain. **D**, Fine-needle aspirate from the iliac bone shows nests of malignant basaloid cells with prominent peripheral palisading, confirming mBCC. Note. Results are shown for the mBCC subgroup.

BCC.^{5,6} Most frequently, such carcinomas have reportedly been encountered in men; their histology is not particularly aggressive, and although they may be deceptive clinically, surgical excision is often curative.⁶ Various different types of trauma have been reported, including sharp or blunt injury,⁷ surgical incisions,⁸ vaccination sites,⁹ piercings,¹⁰ abscesses,¹¹ or fistulas.¹² Thermal or chemical burns are a common type of trauma associated with carcinoma. In fact, certain cultural practices of using thermal injury to the skin lead to burn scars with subsequent carcinomas that have been given eponyms such as Kangri and Kang cancers.^{13,14}

A meta-analysis in 2005 by Kowal-Vern and Criswell¹⁵ reviewed more than 1000 cases of skin cancers arising from chronic burns. Twelve percent of cases were BCC, whereas 71% were squamous cell carcinoma (SCC). Surprisingly, they found that BCC had a shorter latency period to malignancy (from the time of burn injury) compared with SCC, although that period ranged widely. To try to get at the association between burns and carcinoma, a recent Danish populationwide registry study examined 16,903 patients who were admitted from 1973 to 1993 for a thermal or chemical burn. The cohort was followed up for the development of cancer through

Table I. Three phase II clinical trials showing the response to vismodegib and sonidegib in locally advanced and metastatic BCC

Intervention	ERIVANCE, 2015 ²	BOLT, 2016 ⁴		STEVIE, 2017 ³
	Vismodegib 150 mg/d	Sonidegib 1:2 randomization		Vismodegib 150 mg/d
		200 mg/d	800 mg/d	
Median follow up (mo)	22.4	20.0	17.9	17.9
No. mBCC from total	33/104	13/79	23/151	96/1119
Overall response rate (% IA), (% CR, % PR)	48.5 (0, 48.5)	23.1 (0, 23.1)	34.8 (8.7, 26.1)	36.9 (4.8, 32.1)
Median duration of treatment, mo (95% CI)	13.3 (0.7-24.8)	8.9 (1.3-21.4)	11.0 (1.3-27.8)	8.6 (0-44)*
Median duration of response, mo (95% CI)	14.7 (5.6-NE)	17.7 (NE)	10.2 (NE)	13.9 (9.2-NE)
Median PFS (mo)	9.3 (7.4-16.16)	13.1 (9.2-18.6)	14.3 (11.1-20.2)	13.1 (12.0-17.7)
Survival rate	Median OS: 24.1 mo (14.3-NE)	31.6%, 12 mo	23.8%, 12 mo	Unknown
Adverse events, % (% ≥ grade 3)	100 (51.9)	97.5 (38)	100 (59.3)	97 (10)*

Note. Results are shown for the mBCC subgroup.

CI, Confidence interval; CR, complete response; IA, investigator-assessed; NE, not estimable; OS, overall survival; PFS, progression-free survival; PR, partial response.

*Responses for the entire population of locally advanced and metastatic BCC.

the Danish Cancer Registry until 2002.¹⁶ This study failed to show an increased incidence of skin cancer (BCC, SCC, and melanoma) arising within burns compared with that of the general population. However, it did not include information on tumor size, histology, locoregional spread, or distant metastasis, factors that may have been significantly different in burn carcinomas. That said, Kowal-Vern and Criswell,¹⁵ meta-analysis did not have any cases of locoregional or metastatic spread. Moreover, in our review of the 6 most recent cases (since 2005) of BCC arising within burn scars, none had locoregional or metastatic spread,¹⁷⁻²¹ and among the 4 cases that reported histology of the tumor, only 2 had an aggressive histology (infiltrative pattern).^{17,21} All were reportedly cured. To our knowledge, our case is the first to describe metastatic BCC arising within a chronic burn.

One issue with the current literature is that case reports and retrospective studies, by nature of design, are replete with recall bias. Moreover, ascertaining that BCC evolved from a traumatic ulcer is difficult in these cases without a prior biopsy showing the absence of preexisting carcinoma. A prospective cross-sectional study of 154 chronic, mostly venous, leg ulcers tried to address that issue.²² After obtaining baseline biopsies to rule out carcinoma, the ulcers were followed up for 1 year and evaluated for the development of carcinoma. Of the 16 carcinomas that developed, 5 were BCC; the rest were SCC. Although the relationship between chronic ulcers and carcinoma is better characterized in SCC as Marjolin ulcer, there is likely an unrecognized relation with BCC.

Our patient's overall poor response to vismodegib highlights the unfortunate gap that remains in treatment options for mBCC, with hedgehog signaling inhibitors constituting the main therapeutic class. The 3 pivotal phase II trials of vismodegib^{2,3} and sonidegib⁴ are described in Table I. Response rates in the mBCC subgroups ranged widely from 23% to 48%, with complete responses seen in only 3.8% to 8.7%. These responses, albeit low, are promising, and longer follow-up periods are needed to ensure that they are sustained. Unfortunately, grade 3 to 4 adverse event rates were reported as high as 59% and were typically worse in the first year of treatment and in some cases warranted treatment discontinuation, as with our patient.

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