



ACADEMIA ESPAÑOLA  
DE DERMATOLOGÍA  
Y VENEREOLOGÍA

# ACTAS Dermo-Sifiliográficas

Full English text available at  
[www.actasdermo.org](http://www.actasdermo.org)



## RESIDENT'S FORUM

### [Translated article] RF - Brigham and Women's Hospital Tumor Staging System for Basal Cell Carcinoma: Superior Specificity and Positive Predictive Value



### FR - Sistema de estadificación del carcinoma basocelular del Brigham and Women's Hospital: mayor especificidad y valor predictivo

M. Luque-Luna, D. Morgado-Carrasco\*

Servicio de Dermatología del Hospital Clínic de Barcelona, Universitat de Barcelona, Barcelona, Spain

#### KEYWORDS

Basal cell carcinoma;  
Tumor staging system;  
Brigham and Women's Hospital classification;  
Specificity

#### PALABRAS CLAVE

Carcinoma basocelular;  
Estadificación tumoral;  
Clasificación Brigham and Women's Hospital;  
Especificidad

Basal cell carcinoma (BCC) is the most common malignancy in humans. Most BCCs are low risk and portend excellent outcomes. It is important, however, to identify tumors associated with a poor prognosis and an increased risk of local recurrence, metastasis, and death.<sup>1</sup> The National Comprehensive Cancer Network classified BCC as low risk or high risk depending on the likelihood of local recurrence, but it did not consider events such as metastasis or death.<sup>2</sup> The eighth edition of the American Joint Committee on Cancer Staging Manual (AJCC-8) includes a staging system for cutaneous squamous cell carcinoma (SCC) and BCC of the head and neck, but it is based on SCC patient cohorts and has not been validated for BCC.

Morgan et al.<sup>2</sup> from the Brigham and Women's Hospital (BWH) recently published the results of a retrospective cohort study evaluating predictors of poor prognosis in BCC. They studied 488 tumors (244  $\geq$  2 cm and 244 < 2 cm) and observed 12 cases of metastasis or death. The larger BCCs were associated with higher rates of local recurrence (9% vs. 1% for tumors < 2 cm) and higher rates of metastasis or death (6.5% vs. 0%).<sup>2</sup> Additional factors associated with an increased risk of metastasis or death in tumors measuring  $\geq$  2 cm were a head/neck location, a diameter  $\geq$  4 cm, and invasion beyond the subcutaneous tissue. The authors' findings led them to propose a new staging system for BCC that distinguished between BWH T1 (tumors associated with a better prognosis) and BWH T2 (tumors associated with a

DOI of original article:

<https://doi.org/10.1016/j.ad.2021.07.022>

\* Corresponding author.

E-mail address: [morgadodaniel8@gmail.com](mailto:morgadodaniel8@gmail.com)

(D. Morgado-Carrasco).

<https://doi.org/10.1016/j.ad.2021.07.030>

0001-7310/© 2022 AEDV. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Table 1** Comparison of Staging Systems for Basal Cell Carcinoma: the American Joint Committee on Cancer Staging Manual for Head and Neck Cancers, Eighth Edition (AJCC-8) vs. the Brigham and Women's Hospital Tumor Classification System (BWH).

	AJCC-8		BWH	
Staging	T1	Tumor < 2 cm in greatest diameter	T1	Tumor diameter < 2 cm or ≥ 2 cm with 0–1 risk factors <sup>b</sup>
	T2	Tumor ≥ 2 cm but < 4 cm in greatest diameter	T2	Tumor diameter ≥ 2 cm with 2–3 risk factors
	T3	Tumor ≥ 4 cm in greatest diameter or minor bone invasion or perineural invasion or deep invasion <sup>a</sup>		
	T4a	Tumor with gross cortical bone and/or marrow invasion		
	T4b	Tumor with skull base invasion and/or skull base foramen involvement		
Sensitivity for the detection of metastasis or death	1.0		1.0	
Specificity for the detection of metastasis or death	0.80		0.92	
Positive predictive value	0.11		0.24	
Negative predictive value	1.0		1.0	

<sup>a</sup> Deep invasion defined as invasion beyond the subcutaneous tissue or > 6 mm (as measured from the granular layer of adjacent normal epidermis to the base of the tumor); perineural invasion for T3 defined as tumor cells within the nerve sheath of a nerve lying deeper than the dermis or measuring ≥ 0.1 mm or larger in caliber, or presenting with clinical or radiographic involvement.

<sup>b</sup> Risk factors include diameter ≥ 4 cm, head and neck location, and invasion beyond the subcutaneous tissue.

Source: Morgan et al.<sup>3</sup>

worse prognosis) (Table 1). They subsequently compared this system with the AJCC-8 system using the original cohort of patients.<sup>3</sup> The 10-year cumulative incidence of metastasis or death was calculated using both staging systems. Of the 488 BCCs studied, 439 (all the tumors measuring < 2 cm and 195 of the tumors measuring ≥ 2 cm) were classified as BWH T1, and none of these were associated with metastasis or death. The remaining 49 tumors were classified as BWH T2, and this is where the 12 cases of metastasis or death occurred. There were 23 local recurrences, with a cumulative 10-year incidence of 2.8% for BWH T1 BCCs and 47% for BWH T2 BCCs. On applying the AJCC-8 staging system, none of the T1 (n = 233) or T2 tumors (n = 149) were associated with metastasis or death. The 12 cases of metastasis or death all occurred in patients with T3 or T4a/T4b tumors (n = 106). The cumulative incidence of local recurrence for T1 and T2 tumors according to the AJCC-8 staging system was 2.2%. The corresponding rate for T3/T4 tumors was 25.7%, practically half of that observed for BWH T2 tumors.

The BWH system was superior to the AJCC-8 system for identifying BCCs associated with an increased risk of metastasis or death (0.96 vs. 0.90,  $P < .001$ ). It also had higher specificity (0.92 vs. 0.80,  $P < .001$ ) and a higher positive predictive value for these events (0.24 vs. 0.11,  $P < .001$ ). Sensitivity and negative predictive values were similar for both staging systems as the overall risk of metastasis and death was low.

The BWH staging system is simple to use and can identify patients with high-risk BCC who might benefit from additional tests and systemic treatments.

## Funding

No funding was received.

## References

1. Von Domarus H, Stevens PJ. Metastatic basal cell carcinoma. Report of five cases and review of 170 cases in the literature. *J Am Acad Dermatol.* 1984;10:1043–60.
2. Morgan FC, Ruiz ES, Karia PS, Besaw RJ, Neel VA, Schmults CD. Factors predictive of recurrence, metastasis, and death from primary basal cell carcinoma 2 cm or larger in diameter. *J Am Acad Dermatol.* 2020;83:832–8.
3. Morgan FC, Ruiz ES, Karia PS, Besaw RJ, Neel VA, Schmults CD. Brigham and Women's Hospital tumor classification system for basal cell carcinoma identifies patients with risk of metastasis and death. *J Am Acad Dermatol.* 2021, <http://dx.doi.org/10.1016/j.jaad.2021.01.052> [online ahead of print].