Correlation between histologic findings on punch biopsy specimens and subsequent excision specimens in recurrent basal cell carcinoma

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Background: The type of treatment for a basal cell carcinoma (BCC) depends on the histologic subtype. Histologic examination is usually performed on incisional biopsy specimens. In primary BCC, the histologic subtype is correctly identified with a punch biopsy in 80.7% of cases. In recurrent BCC, correct identification is more difficult because of discontinuous growth caused by scar formation. Because an aggressive histologic subtype has a significantly higher risk for recurrence in these tumors, the histologic subtype is at least as important in recurrent BCC as it is in primary BCC.

Objective: To investigate the correlation between histologic findings on punch biopsy specimens and subsequent excision specimens in recurrent BCC. Furthermore, we sought to clarify how often an aggressive histologic subtype was missed, based on the punch biopsy specimen.

Methods: We compared the histologic subtype in a punch biopsy specimen with the subsequent excision specimen in recurrent BCC. All BCCs were coded and judged randomly by the same dermatopathologist.

Results: In 24 of 73 investigated BCCs (32.9%), the histologic subtype of the initial biopsy did not match with the histologic subtype of the subsequent excision. Of the 37 excised BCCs with an aggressive histologic subtype, 7 (19%) were missed by the initial punch biopsy.

Limitations: Intraobserver variation may have affected the results of this study.

Conclusions: Discriminating tumors with any aggressive growth is relevant for treatment. However, in recurrent BCC, the histology of the biopsy specimen does not always correlate with the histology of the definitive excision. This may have important therapeutic implications. (J Am Acad Dermatol 2011;64:323-7.)

Key words: biopsy; carcinoma, basal cell; dermatopathology; histology; recurrent; skin neoplasms; skin surgery.

INTRODUCTION

Currently, most basal cell carcinomas (BCCs) are treated with conventional surgical excision.[1] Other treatments may be preferred, based on specific tumor characteristics. For example, recurrent BCC (high-risk) is more effectively treated with Mohs micrographic surgery (MMS) than with surgical excision.[2] Furthermore, noninvasive therapies, such as photodynamic therapy, 5-fluorouracil, and imiquimod 5% cream may be

Abbreviations used:

BCC:	basal cell carcinoma
MMC:	Mohs micrographic surgery
MUMC:	Maastricht University Medical Centre

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preferred in selected low-risk BCCs because of the excellent cosmetic results seen after these therapies.[1] The choice for a treatment is usually based on the localization of the tumor, whether it is a primary or a recurrent BCC and what histologic subtype it constitutes.[3] The histologic subtype is established by an incision biopsy of a tumor, either a punch or a shave biopsy. In the past, 26 histologic subtypes of BCCs have been discriminated, but for practical use, those subtypes were combined.[4] Rippey[5] classified BCCs into 4 subtypes: nodular, infiltrative, superficial, or mixed BCC. More recently Crowson[6] classified BCC as belonging to indolent-growth or aggressive-growth subsets, the former including superficial and nodular BCCs and the latter infiltrative, metatypical, and morpheaform or sclerosing BCCs. Three subtypes are relevant to come to an appropriate treatment choice. Superficial BCC and nodular BCC are both indolent-growth subtypes and have a low risk for incomplete treatment and recurrence.[3] The third, a high-risk subtype, includes all BCCs that exhibit aggressive growth, such as infiltrative/morpheaform BCC, micronodular BCC, and BCC with squamous differentiation.[6,7]

CAPSULE SUMMARY

- Discriminating recurrent BCC with any aggressive growth is relevant for treatment.
- In recurrent BCC, the histology of the biopsy does not always correlate with the histology of the definitive excision.
- This finding may have important therapeutic implications.

It is known from the literature that histologic findings of a punch biopsy are accurate in predicting the final subset of primary BCCs in 80.7% of cases .[8] Inaccurate prediction may occur because in almost 40% of all BCCs there is a mixture of different histologic subtypes.[6] To our knowledge, it is unknown how often the histologic subtype in the initial punch biopsy matches with the histologic findings in the final excision specimens in recurrent BCC. Because of discontinuous growth caused by scar tissue following previous treatment, we expect that not all histologic subtypes of one tumor will be recognized by a punch biopsy in recurrent BCCs. The knowledge of the histologic subtype is relevant because an aggressive histologic subtype has a significant higher risk for recurrence in recurrent BCCs.[2] Identification of high-risk tumors may underline the preference for treatment with MMS to benefit the prognosis.

We investigated the correlation between histologic findings on punch biopsy specimens and the subsequent excision specimens in recurrent BCC. Furthermore, we investigated how often an aggressive histologic subtype was missed by a 3-mm skin biopsy specimen obtained in recurrent BCC.

METHODS

A retrospective analysis was conducted on histologic slides of both the punch biopsy specimen and the following excision specimen obtained from recurrent BCCs treated with surgical excision. Patients were selected from an existing database of participants of a randomized, controlled, multicenter trial performed at the Maastricht University Medical Centre (MUMC), The Netherlands, from October 1999 until February 2002.[2] The selected group had facial recurrent BCC that recurred for the first or second time. Only tumors that had randomized for treatment with surgical excision were included. Pathology slides were obtained from the archives of the Department of Pathology of the MUMC, VieCuri Medical Centre, Venlo; Atrium Medical Centre Heerlen, Laurentius Hospital Roermond, and the Laboratory of Pathologic Anatomy and Medical Microbiology (PAMM) Eindhoven, which were the centers that participated in the trial. All sections of 3-mm punch biopsy specimens and excision specimens were hematoxylin-eosin stained. Documentation of the histologic subtype of all biopsy and excision specimens was randomly performed by one experienced dermatopathologist who was blinded as to patient identification, making association between the punch biopsy and the following excision specimen impossible. The subtypes of all BCCs were identified by standard histopathologic characteristics found in Table I and subsequently classified into BCCs with a superficial, nodular, or aggressive subtype according to a practical treatment-based classification.[3,6] The group of BCCs with aggressive growth included micronodular BCC, infiltrative/morpheaform BCC and metatypical BCC (BCC with squamous differentiation).[6,7] All subtypes that were detected were registered, independent of the size or proportion. If specimens obtained from BCCs contained a mix of histologic growth patterns, the most aggressive variant was recorded as the definite histologic subtype. If either the punch biopsy specimen or the following excision specimen of a BCC revealed an aggressive histologic subtype, the BCC was considered to be of an aggressive histologic subtype. A random selection of all specimens was reexamined by the same dermatopathologist to test for intraobserver variation.