STUDY: IS BIOPSY EFFECTIVE FOR BASAL CELL CARCINOMA ON THE HEAD AND NECK?

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Basal cell carcinoma (BCC) is the most frequent skin cancer in the US, accounting for an estimated 2.8 million cases each year. Numerous treatment modalities have been utilized, including (but not limited to) surgical excision, Mohs micrographic surgery, electrodessication with curettage, photodynamic therapy (PDT), cryosurgery, radiotherapy, imiquimod, 5-fluorouracil, and vismodegib. The clinical decision of which treatment is most appropriate for the individual patient relies on patient input and a number of factors. They include size of the lesion, location on the body, aggressiveness of the tumor, overall health/age of the patient, accessibility to treatment/follow-up care, cost to the patient, convenience, and cosmetic outcome. The subtype of basal cell carcinoma is paramount in the decision to use a surgical type of treatment versus more conservative approach. Nonsurgical modalities of treatment, such as topical immunomodulators, PDT, and curettage are utilized in less aggressive or superficial types of BCC. Accurate histologic subtyping of basal cell carcinoma is therefore very important in determining the best treatment. Furthermore, head and neck locations of basal cell carcinoma may favor more aggressive subtypes. This retrospective study evaluated the frequency of aggressive basal cell carcinoma subtypes on Mohs excisions when the initial biopsy was interpreted as a non-aggressive subtype.

Study Methods and Results. After obtaining institutional review board approval, a database search was conducted to review Mohs cases that had residual basal cell carcinoma and correlate the subtype with the initial biopsy. Cases included solely head and neck locations and only cases with slides available for review. The timeframe included all Mohs cases from January 1, 2012 to September 1, 2014. The 2012 start correlates with a new electronic medical record.
that is more amenable to a database search versus the prior system. Only cases initially diagnosed with nodular, superficial, or mixed nodular and superficial BCC were included. In addition, only cases that had residual tumor (multiple Mohs stages) were included, as no correlation is possible with cases that did not have residual basal cell carcinoma. Aggressive subtypes were lumped together, but include: infiltrative, morpheaform, metatypical, and micronodular. The initial biopsies were also re-reviewed for accuracy.

A total of 316 multiple stage cases were found from patients initially diagnosed with a non-aggressive BCC on the head or neck. In 131 of those patients (41.5 percent), the residual tumor did show some component of an aggressive subtype of BCC. In 21 of these cases that were initially diagnosed with superficial BCC only, 14 that had residual tumor had an aggressive form (66.7 percent). Figures 1 and 2 highlight an example of a case initially diagnosed as a superficial BCC that had an aggressive subtype on Mohs excision. On re-review of the initial biopsies, we found that while the majority of non-aggressive BCCs were of the nodular subtype, focal subtle features were present to suggest an infiltrative type in a minority of cases. This included a focal area where the discreet nodules of carcinoma had an edge with a transected slight “projection” of the basaloid nest. Stromal change, more commonly seen in aggressive subtypes, was noticed in several cases as well. Overall, the initial biopsies were still considered to be diagnostic of their initial subtype, however.

Discussion. This study demonstrates that for BCCs from the head or neck, the initial diagnosis of a non-aggressive subtype may not reliably predict that an aggressive subtype does not exist. In fact, in our current study, 41.5 percent of the time, histologic evidence suggests otherwise. The implications of these findings are important in choosing the treatment modality for the optimal cure of these carcinomas. Numerous studies have shown the unreliability of biopsies to completely and accurately diagnose all cutaneous carcinomas and melanomas.16-28 Ro and colleagues went as far to say that “when planning surgery, dermatologists should not place too much confidence in the pathologic subtypes identified by biopsy.”18 It has been shown that the more aggressive subtypes of basal cell carcinoma infiltrate deeper and generally require more Mohs stages to achieve clearance, which not only adds cost but time to each procedure.19, 29-31 Aggressive subtypes of BCC are also more commonly found on the head and neck region versus other parts of the body.13-16 Some clinicians rely on scoring systems to attempt to predict the difficulty of the Mohs procedure, and plan their schedules accordingly.32 One key component to this scoring assessment is the histologic subtype, and these studies disprove the assumption that the biopsy reflects the entire malignancy. Cohen et al determined that more than 40 percent of BCCs in their study were of mixed histology.20 They added that the initial biopsy only identified 10 percent of the mixed histology tumors. Roozeboom and colleagues discovered that 74 percent of their primary BCCs were of a mixed histology subtype.22 This discrepancy holds true for recurrent basal cell carcinoma, with approximately 33 percent of punch biopsies not correlating with the subsequent excision.21 The biopsy technique does not affect the uncertainty of the subtype of BCC, as one study showed an 80 percent correlation with either shave or punch biopsy, and concluded that either technique was adequate.23

Mohs micrographic surgery is generally thought to be a treatment for BCC that results in the highest cure rate, especially for “high risk” areas on the face.33-34 It is also recommended for incompletely excised BCCs, as residual tumor was discovered in 69 percent of specimens in one study.35 While the economic impact of this surgical technique is great, several studies have shown the cost effectiveness in the treatment of this cancer.36-37 As health care dollars get tighter, the selection of Mohs surgery will become under increasing scrutiny as the most appropriate therapy for these carcinomas. The Mohs appropriate use criteria from 2012 includes the aggressive versus non-aggressive subtypes of BCC in the determination of advocating Mohs micrographic surgery as acceptable treatment.38 This current study, among others we have cited, calls into question whether that criteria should be revised, as the initial biopsy quite frequently underestimates the aggressiveness of the entire tumor. This underestimation undoubtedly accounts for treatment failures utilizing other techniques, especially nonsurgical modalities. Our recommendation is that if Mohs micrographic surgery is a consideration for treatment of a BCC on the head or neck, the subtype not be a critical factor, especially if the initial biopsy reflects a non-aggressive variant. This likely will result in less treatment failures and recurrences. Additionally, Mohs surgery has a significantly
better cure rate for a primary basal cell carcinoma versus recurrence, especially the aggressive subtypes. Better cure rate may also be related to a greater degree of tumor removal by Mohs micrographic surgery, which is a distinct technique that is not performed by shave biopsy.

Our study was limited. Because this is a retrospective review, cases could only be selected if residual tumor was present for comparison. There were numerous cases of nonaggressive basal cell carcinoma that were cleared in one stage, and those cases quite likely corresponded to the initial impression. The fact that residual tumor was present in the cases studied is biased toward tumors with a more infiltrative and aggressive histology. These numbers are therefore likely an overestimation of the true percentage of cases with aggressive BCC.

Conclusions. This study definitively demonstrates that aggressive BCCs are frequently present in patients initially diagnosed with nonaggressive subtypes on the head and neck. Many considerations are involved in deciding the most appropriate treatment for these common malignancies. Our recommendation is that surgical removal, especially Mohs micrographic surgery, is the best option to provide the highest cure rate, as more aggressive subtypes can be identified with histologic assessment of tissue. While topical therapies, PDT, curettage, and cryosurgery have their advantages, they will not allow identification of cases with aggressive BCCs that are more likely to recur and will be less likely to be cured upon recurrence. We also advocate for dermatopathologists to diagnose infiltrative BCCs based on focal features of an infiltrative pattern, even if the majority of the tumor has the classic “nodular” appearance.

Sampling error will always exist despite our best efforts. Our responsibility to patients is to provide them with the most appropriate advice to cure their skin malignancies. While these cancers are not often life-threatening, they can be problematic when undertreated. Surgical/Mohs excision remains the therapy of choice when dealing with basal cell carcinomas of the head and neck, even if the initial biopsy diagnoses a nonaggressive type.