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Short Report

Examining the Utility of Performing Sentinel Node Biopsies for T1 Melanomas with Breslow Depths between 0.75 and 1.0 mm: A Review of a 20 Year Experience

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Abstract

This study evaluated a series of patient data with T1 melanoma to determine, in those cases where Breslow depth is between 0.75 mm and 1 mm, whether Sentinel Lymph Node Biopsy (SLNBx) is necessary or beneficial. This study represents a chart-review based retrospective analysis of over 1500 patients of Dr. William Jewell accrued over a period of 20 years (1986-2005) at the University of Kansas Medical Center. Of these 1500 patients, over 300 patients received wide excision and subsequent SLNBx. Thirty of these patients fell within the 0.75 to 1.0 mm Breslow depth and had the necessary SLNBx performed. 6% of those with Breslow depths between 0.75 and 1.0 mm had a positive SLNBx compared to 20% of those melanomas with depths between 1 and 2 mm. Furthermore, Clark's level of IV or greater suggested a greater likelihood of positivity at the SLN for T1 melanoma.

Introduction

Melanoma accounts for the vast majority of deaths from cutaneous neoplasms. Treatment involves wide surgical excision of individual lesions and removal of regional lymph node metastases. Important prognostic indicators in melanoma patients include tumor thickness, degree of ulceration, and presence of nodal metastases.

Historically, a formal Lymph Node Dissection (LND) was performed after wide local excision of the melanoma to prevent the dissemination of the tumor throughout the body. However, LND can be associated with significant morbidity, including nerve injury, seroma formation, and lymphedema. Sentinel Lymph Node (SLN) biopsy is a procedure that has been developed as a minimally invasive procedure not associated with any significant morbidity. In fact, Wrone et al., reported a less than 2% incidence of lymphedema after 235 procedures [1].

The SLN is defined as the first lymph node or nodes to receive lymphatic drainage from the primary, as such, are the nodes most likely to contain metastatic deposits. The SLN has been demonstrated in multiple studies to reflect the tumor status of the entire nodal basin in that region [2-6]. Typically, the SLN procedure begins with an intradermal injection of a Technetium sulfur colloid at the site of the primary several hours before the excision of the node or nodes is to be performed. A handheld gamma probe used by the surgeon will detect the radioactive tracer as it collects at the node. Additionally, many institutions use Isosulfan blue dye of approximately 1 ml injected subdermally to improve detection of the SLN by adding a visual component to the procedure.

A small incision is made over the radioactive SLN, and all blue-stained and/or radioactive lymph nodes are removed. Approximately 1 to 4 nodes are usually removed, and afterwards the gamma probe is used to determine that bed counts are less than 10% of the counts of the least radioactive SLN. This ensures that all radioactive SLNs have been removed.

Several studies have documented 95% success rate of this method in patients undergoing SLN mapping when both radiocolloid and blue dye localization are employed [7-9]. Additionally, the false negative rate of this procedure has been reported at less than 1% [7].

At present, there is a consensus view that sentinel lymph node biopsy should be performed on melanomas with a Breslow depth greater than 1.0 mm [10-14]. Balch et al., demonstrated a statistically significant survival advantage to SLN biopsy in over 5000 patients with melanomas >1 mm (68.5% reduction in mortality compared with patients staged to be N0 by clinical exam and ELND). The survival advantage of SLN biopsy was statistically significant for each T-stage category (T2, T3 and T4). There was no advantage to SLN biopsy in patients with melanomas <1 mm [14].

However, sentinel lymph node biopsy for T1 melanomas (those tumors of Breslow depths less than or equal to 1 mm) and, particularly, biopsy for those between 0.75 mm and 1.0 mm is controversial [4,15-18]. Arguments against SLNB include a low risk for regional metastases, minimal therapeutic and survival advantage, and potential morbidity such as lymphedema [19,20]. Additionally, survival rates for T1 patients generally range from 91 to 95%, and patients with melanomas less than 1.0 mm in depth have a relatively low risk (2% to 6%) of metastatic melanoma in the SLN node [8,10,21,22]. Compare this to when all patients with melanoma between 1 and 4 mm in depth are considered, the risk of SLN positivity ranges from 15% to 20% [23-25].

Arguments for SLNB for those melanomas of Breslow depth between 0.75 and 1.0 mm include identification of patients who are at an increased risk of early metastases and local recurrence. It is speculated that early identification may confer a therapeutic and

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survival advantage, although this has not been proven [26-29]. Nonetheless, most physicians offer SLN mapping to patients with thin melanoma (1 mm or less) if it is a Clark's level IV lesion or deeper [30]. This recommendation is based on data to suggest that in patients with otherwise favorable melanoma based on Breslow depth (0.76 mm or less), Clark's level IV, and severe histologic regression are independently predictive of mortality from recurrent disease [31]. Similarly, McKinnon et al., suggest SLN biopsy may be reasonable in patients with melanoma of 1 mm or less in the presence of one or more poor prognostic features. Those include ulceration, mitotic rate, and Breslow thickness between 0.76 and 1 mm [32].

Methods

Approximately 1500 pathology reports from the years 1987 through 2005 were evaluated. Approximately 300 of these reports contained information on sentinel lymph node biopsy status. From these 300 reports, Breslow depth, Clark staging, and sentinel lymph node biopsy status were recorded. In all, thirty patients fell within the 0.75 to 1.0 mm Breslow depth and had the necessary sentinel lymph node biopsies performed. In addition, 60 patients fell within Breslow depths between 1.0 and 2.0 mm. These two groups were compared for rates of lymph node positivity. In addition, an attempt was made to determine if Clark's level added any predictive value to lymph node status.

Note: As a consequence of being a chart-review based retrospective analysis, no IRB was required for this study.

Results and Discussion

Of the thirty patients who fell within the 0.75 to 1.0 mm Breslow depth, table 1 illustrates that 2 of these patients or 6% had positive sentinel lymph node biopsies, which, falls into the range of previous reports of 3 to 6% [8,10,21,22]. This study also revealed (not in table) a 20% (12/60) positive sentinel node percent for those melanomas with Breslow depths between 1 and 2 mm, which, also seems congruous with results of other authors [23-25]. Although the pathology reports did not uniformly provide Clark's level as well as Breslow depth, the two positive sentinel nodes were from melanomas with advanced Clark's levels of IV and V (Table 1), whereas only 35% of the negative node melanomas had levels of ulceration this advanced (Table 2). This finding further substantiates the recommendation that SLN biopsies be performed for thin melanomas with Clark's level of IV or greater [30-32].

2 Positive SLNBx	Breslow Depth	Clark's level
	0.80 mm	V
	0.79 mm	IV

Table 1: Breslow Depth and Clark's Level -Correlation with Positive SLNBx.

2 Positive SLNBx (17 with recorded Clark's level, 11 not recorded)	Breslow Depth	Clark's level
11/17 = 65%	0.75 mm - 1.00 mm	I, II, III
6/17 = 35%	0.75 mm - 1.00 mm	IV, V
11	0.75 mm - 1.00 mm	Not recorded

Table 2: Constant Breslow Depth with Increasing Clark's Level - Correlation with Positive SLNBx.

Conclusion

Though the data subset scrutinized in this study is small at thirty patients, the risk of lymph node positivity in thin melanomas as offered by this study is 6%, falling in line with previous reports of 3 to 6% [8,10,21,22]. The data from this study further suggests that sentinel lymph node biopsies should be performed for melanomas with Breslow depths between 0.75 and 1.0 mm, if a Clark's level IV or greater, confirming previous reports [30-32].

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