CASE REPORT

# *A case of penile melanoma illustrating the low sensitivity of frozen sections in the assessment of sentinel lymph nodes*

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*A 75 year-old uncircumcised man presented with a 1.1 mm thick malignant melanoma on the ventral aspect of the glans penis. He underwent isosulfan blue and technetium 99m guided sentinel lymph node (SLN) biopsy and distal penectomy with 2 cm margins. This is the third reported case of penile melanoma using both markers for SLN mapping. While frozen sections and H & E stains were negative, S-100 and HMB-45 immunohistochemistry revealed micrometastasis in one of the sentinel nodes. This case illustrates that any discussion with the patient about management and prognosis should await immunohistochemistry results.*

**Key Words:** malignant melanoma, penile, sentinel node biopsy, immunohistochemistry, sensitivity

## Introduction

Penile melanoma represents 1.4% of penile cancers and 0.2% of all extraorbital malignant melanomas.[1] There are 70 cases of penile melanoma in the reported literature including the largest series of 11 patients accumulated over 66 years.[1-4] Stillwell and associates have recommended conservative penile surgery with appropriate margins of 1 cm-5 cm for thin (<1.5 mm thick) lesions and non-palpable lymph nodes. Prophylactic bilateral superficial inguinal node dissection has been recommended for lesions >1.5 mm because of a higher rate of nodal metastasis.[1] However, lymph node dissection results in significant complications including lymphedema, flap necrosis, phlebitis, chronic scrotal edema, and wound infection.[3] Therefore, in 1977 Cabanas proposed identification of the sentinel node in a patient with

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squamous cell carcinoma of the penis.[5] However, it is difficult to identify this sentinel node on gross inspection alone. In 1992, Morton et al. published the seminal article detailing the SLN mapping technique using isosulfan blue dye with a detection rate of 82%.[6] Later, technetium $99^m$ sulfur colloid was used in conjunction with the blue dye to increase the accuracy of sentinel node mapping from 92% with blue dye alone to 96% with both blue dye and technetium $99^m$.[7] There have been only two other case reports of penile melanoma and sentinel lymph node mapping using both markers.[3,4]

## Case report

A 75 year-old uncircumcised man presented with a 7-month history of bloody staining of his undergarments due to a dark blue lesion on his penis. He denied any loss of appetite or weight. His medical history includes hypothyroidism and muscular dystrophy with predominantly distal myopathy. On examination, there was a 2 cm x 1 cm blue asymmetrical lesion on the ventral aspect of the glans penis. Figure 1 In addition, a small clinically benign inguinal lymph node was palpated on the right side. A punch biopsy of the lesion at an outside institution showed a 1.1 mm thick mucosal melanoma. A decision was made to proceed with partial penectomy and SLN biopsy. At surgery, 0.5 cc of isosulfan blue dye was injected into the submucosa around the lesion. This was followed by injection of 0.5 cc of filtered technetium $99^m$ sulfur colloid (0.5 milliCurie). Using a gamma probe, both groins were examined and two hot spots were identified, one on each side. Exploration of the inguinal areas, at the site of the hot spots revealed one hot and blue node on the left side and one hot non-blue node on the right side. Figure 2 In addition, the clinically palpable non-sentinel node in the right groin was removed. Since there was a darker area on the surface of the blue sentinel node on the left side, it was sent for frozen section, which was negative for malignancy. The other nodes on the right side were not assessed intra-operatively. The inguinal incisions were then closed. Distal penectomy was performed with 2 cm margins. The post-operative period was uneventful except for hematoma involving the suprapubic area and mostly left groin, which resolved spontaneously within days.

Examination of the resected specimen revealed residual 2.3 mm thick mucosal melanoma focally invading the corpus spongiosum. Initially, there was no evidence of metastatic melanoma present in any of the three lymph nodes examined with H & E staining. Figure 3 However, immunohistochemistry with S-100 and HMB-45 antibodies showed a small number of positive cells in the marginal sinus of the sentinel node from the left groin. These cells were compared to those on adjacent sections stained with H & E. Together, they

**Figure 1.** A photograph of the 2 cm x 1 cm pigmented lesion on the ventral aspect of the glans penis.

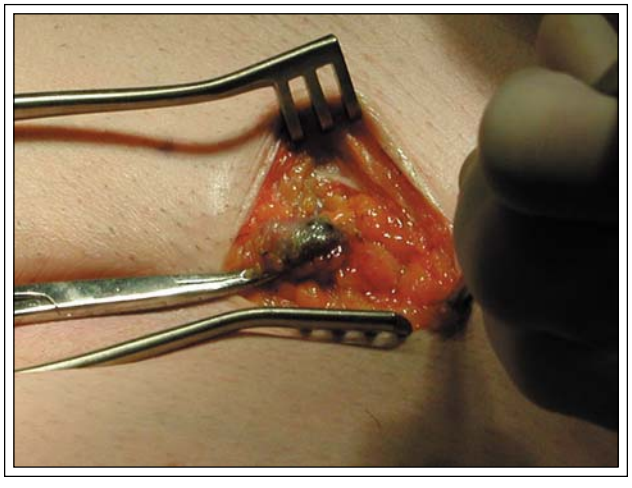

**Figure 2.** Intraoperative photograph showing the blue node.

were interpreted as focal lymph node involvement by metastatic melanoma. After taking into consideration his co-morbidities and discussing these pathology findings with the patient and his family, the patient elected not to proceed with left superficial groin dissection. At 6-month follow-up, he showed no evidence of disease clinically.

## Discussion

There have been only two other case reports of penile melanoma and SLN mapping using both markers.[3,4] The two sentinel nodes and the palpable non-sentinel node were initially reported to be negative on H&E staining. However, immunohistochemistry with S-100 and HMB-45 revealed a small number of positive cells in the left sentinel node. This is the node that was also negative on frozen section. This case demonstrates the shortcomings of frozen sections in the evaluation of SLNs. The low sensitivity of frozen sections in the evaluation of SLNs has been reported to be 38%-47% by two different investigators.[8,9] In addition, this case also demonstrates that immunohistochemistry improves the detection rate of lymph node metastasis.[10,11] In a review of 1273 nodes, Cochran et al. found melanoma tumor cell in 10% of the nodes by H&E alone compared to 29% of the nodes when S-100 immunohistochemistry was added to H&E.[10]

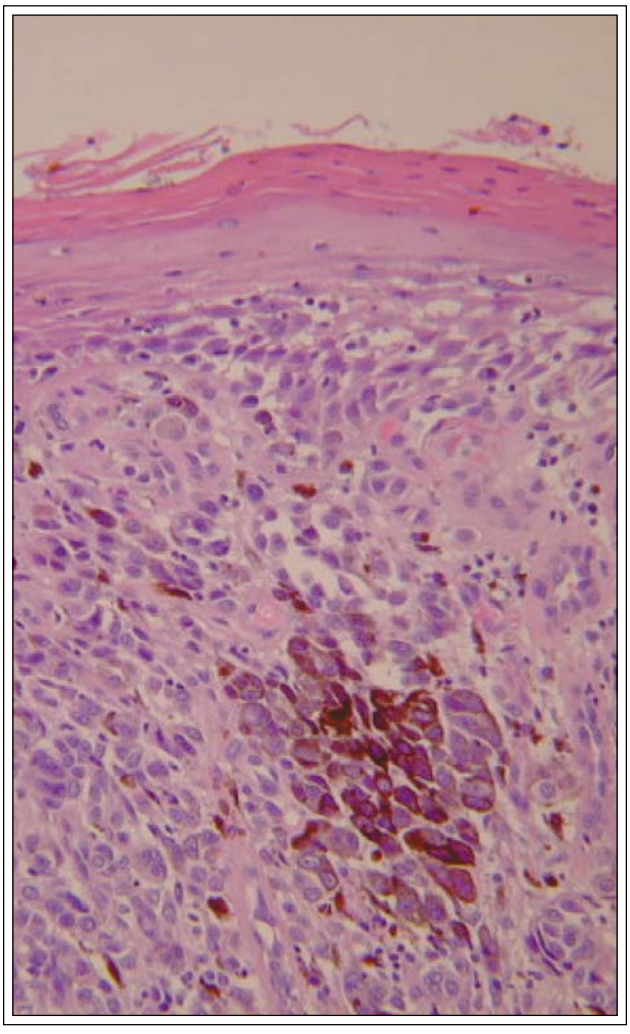

**Figure 3.** A photomicrograph of the glans penis stained with H&E showing an invasive mucosal melanoma. X400.

The low sensitivity of frozen sections during SLN biopsy should be taken into consideration when further management and prognosis are determined. In addition, immunohistochemistry results should be available before further decisions are taken. SLN mapping with over 95% detection rate of the sentinel node and a false negative rate of 5% can be used in the evaluation of nodal basins. Nodal dissection is done only for those patients with proven metastatic cells to the nodes, thus avoiding unnecessary dissection and associated morbidity. In conclusion, SLN biopsy using both isosulfan blue and technetium 99m can be helpful in identifying sentinel nodes in patients with penile melanoma as it has been shown in other sites of cutaneous melanomas. □

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