

Minimizing morbidity in the treatment of penile melanoma: Mohs micrographic surgery and sentinel lymph node biopsy

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The combination of Mohs micrographic surgery and sentinel lymph node biopsy in the treatment of penile melanoma is novel. Mohs surgery allows the removal of penile malignancies with microscopically controlled

tumor-free borders, while maintaining cosmetic and functional demands through the maximal preservation of normal tissue. Sentinel lymph node biopsy minimizes the morbidity associated with inguinal node dissection. At 30 months follow-up, these two modalities together have achieved local control and regional nodal staging while minimizing functional morbidity.

Key Words: penile melanoma, Mohs micrographic surgery, sentinel node biopsy

Introduction

A previously healthy 44-year old male presented with a 1-year history of a slowly growing erythematous macule on the glans penis. Excisional biopsy revealed

a melanoma with a Breslow thickness of 2.2 mm, perineural invasion and positive peripheral and deep margins.

Current treatment recommendation for melanoma limited to the penis ranges from wide excision with 3 cm margins to total penectomy.¹ Recommendations for nodal therapy range from "watchful waiting" to bilateral ilioinguinal lymphadenectomy.^{1,2} In an effort to minimize morbidity, Moh's micrographic surgery and sentinel lymph node biopsy was employed.

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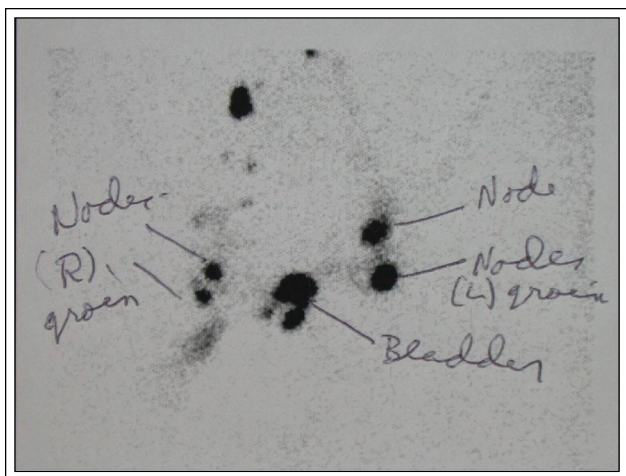


Figure 1. Pre-operative lymphoscintigraphy shows uptake in bilateral inguinal and left iliac nodes.

Materials and methods

The patient was referred for Mohs micrographic surgery with a well-healed 5 mm incision on the glans penis, ventral to the urethral meatus. There was no palpable lymphadenopathy and staging investigations, including CT of the chest/abdomen/pelvis, bone scan and liver function tests, were negative.

The patient was injected with 40 MBq Tc-99 sulphur colloid in the nuclear medicine department, mapping to bilateral inguinal nodes, Figure 1. The patient was taken to the operating room and

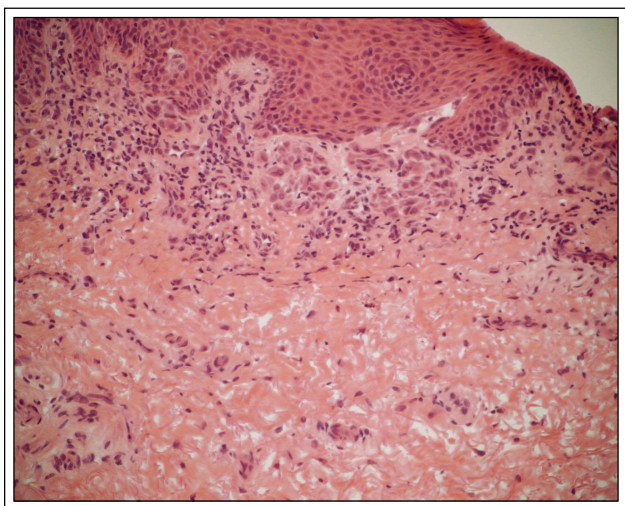


Figure 2. A frozen section of the first Mohs level demonstrates focal junctional nests of melanoma. This was cleared by a second level in this area of positivity.



Figure 3. The penile defect following two Mohs levels measures 1.5 cm by 1.1 cm.

sentinel node biopsy was carried out. Patent blue dye was not used to avoid blue-tissue staining of the Mohs sections. Sentinel node biopsy resulted in removal of one left inguinal, one left pelvic and one right inguinal lymph node. Two palpable non-sentinel nodes were also removed.

The primary site was then addressed by debulking the initial scar with a 1 mm margin. Using standard Mohs fresh-frozen technique,³ a first rim of tissue was harvested with a 3 mm margin. A single focus of positivity was found, Figure 2, and cleared by one additional level with a 3 mm margin.

The final defect size was 1.5 cm by 1.1 cm, Figure 3. Reconstruction was completed with a local advancement flap and urethral repair, Figure 4. Total procedural time was 2.5 hours.

Results

Permanent sections confirmed clear margins on the final Mohs levels and negative sentinel nodes on routine and immunohistochemical stains (S-100, Hmb-45, Melan-A).

Healing was uneventful with full functional recovery, including urinary and sexual restoration. Interferon alpha-2B therapy was discussed and not



Figure 4. The glans is reconstructed by a local flap and urethral repair. The sentinel node incisions are well hidden in the inguinal creases.

administered based on the lack of evidence for its application in penile melanoma. He remains disease-free 30 months after surgery, Figure 5.



Figure 5. Eighteen months follow-up shows a stable reconstruction with no evidence of local recurrence.

Discussion

Penile melanoma is exceedingly rare, accounting for less than 0.2% of all cutaneous melanomas in men.⁴ This usually presents in the 5th to 7th decades with metastatic disease in 50% of patients at the time of diagnosis.² The reported 5-year survival rate is low at 15%.^{5,6}

Current treatment recommendation for melanoma limited to the penis ranges from wide excision with 3 cm margins to total penectomy.¹ The treatment of penile carcinomas with Mohs micrographic surgery has been presented in several case series. Mohs et al performed a series of 29 consecutive cases of squamous cell carcinoma of the penis with a 5-year cure rate of 68%.⁷ The primary carcinoma was eradicated in 92% of the lesions. Location of the cancer on the penis and presence of metastases strongly affected the prognosis. Mohs also recommended excision of melanoma of the penis using total microscopic control.⁸ Brown et al reports on 20 patients with penile cancer utilizing the fresh tissue technique of Mohs micrographic surgery.⁹ Four patients developed metastatic disease and one patient developed local recurrence. They conclude that micrographic surgery offers comparable survival rates with a less radical procedure and may often be curative. These series demonstrates that penile malignancies can be removed with microscopically controlled tumor-free borders, while maintaining cosmetic and functional demands through the maximal preservation of normal tissue.

Mohs micrographic surgery has been extensively evaluated in the treatment of melanoma. There has been some controversy over the diagnostic accuracy and sensitivity of frozen sections to detect melanocytes.¹⁰ However, a landmark study by Zitelli et al compared 535 patients with primary cutaneous melanoma treated with Mohs micrographic surgery to historical controls treated with wide local excision.¹¹ They found that Mohs micrographic surgery provided 5-year survival and metastatic rates equivalent to controls treated with wide local excision. As well, satellite metastases and local recurrence were not more common. Snow et al reviewed 179 cases from the Mohs' melanoma registry and also found concordant 5-year survival data regardless of treatment.¹² In 202 cases of melanoma treated with Mohs surgery, Temple et al showed no local recurrences at 30 months follow-up.¹³

Recommendations for nodal therapy range from "watchful waiting" to bilateral ilioinguinal lymphadenectomy.^{1,2} In an effort to minimize the significant morbidities associated with inguinal node dissection, sentinel node biopsy was originally described in 1977 by Cabanas for the treatment of penile squamous

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cell carcinoma.¹⁴ The use of sentinel lymph node mapping for penile melanoma has only been recently described, though well established for cutaneous melanoma.¹⁵ There are currently three case reports in the existing literature of sentinel lymph node biopsy with partial penectomy to treat penile melanoma.¹⁶⁻¹⁸

This unique combination of Mohs microsurgery and sentinel node biopsy offers local control and nodal staging with a minimally invasive approach, minimizing morbidity in this patient population with this aggressive tumor.

Conclusion

This report is the first to combine Mohs excision of penile melanoma with sentinel lymph node biopsy. This procedure provided complete tumor clearance and nodal staging information while maintaining function and cosmesis in this sensitive area. □

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