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# Epidemiology of genitourinary melanoma in the United States: 1992 through 2012



Ritva Vyas, MBChB, FRACP,<sup>a</sup> Cheryl L. Thompson, PhD,<sup>b</sup> Homayoun Zargar, MBChB, FRACS,<sup>c</sup> Jacqueline Selph, MD,<sup>a</sup> and Meg R. Gerstenblith, MD<sup>a,b</sup>  
Cleveland, Ohio

**Background:** Primary melanoma arising in the genitourinary tract is rare and poorly characterized.

**Objectives:** We sought to describe the epidemiology of genitourinary melanoma in the United States.

**Methods:** Incident case and population data were obtained for genitourinary melanoma from the Surveillance, Epidemiology, and End Results 13 Registries Database between 1992 and 2012.

**Results:** A total of 817 patients with genitourinary melanoma were identified; most cases occurred in the vulva. The incidence of genitourinary melanoma was much higher in women (1.74/1 million person-years) than men (0.17/1 million person-years). The highest rates occurred among non-Hispanic white women aged 85 years and older. Five-year melanoma-specific and overall survival were poor at 52.4% and 36.3%, respectively. Predictors of poor survival were increasing age, black race, and female sex.

**Limitations:** The study population is small, therefore some rates reported may be unstable. In addition, cutaneous, mucosal, and other extracutaneous surfaces of the genitourinary tract cannot be reliably distinguished in Surveillance, Epidemiology, and End Results. Furthermore, melanomas may be under-reported to cancer registries.

**Conclusion:** From 1992 to 2012, genitourinary melanoma was 10 times more common in women than men. Survival was poor in women compared with men, which is different from cutaneous melanoma where women have a survival advantage. (*J Am Acad Dermatol* 2016;75:144-50.)

**Key words:** epidemiology; genitourinary; incidence; melanoma; Surveillance, Epidemiology, and End Results; survival.

**M**elanoma occurs primarily on cutaneous surfaces but can also occur on noncutaneous surfaces such as ocular and mucosal tissue.<sup>1-3</sup> Genitourinary melanoma is melanoma that originates from the female genital tract, male genital tract, or the urinary tract. Most cases of genitourinary melanoma arise on mucosal surfaces; however, some arise on cutaneous genitourinary surfaces such as the labia majora, penile shaft, and scrotum and from

#### Abbreviations used:

CI: confidence interval  
EAPC: estimated annual percentage change  
SEER: Surveillance, Epidemiology, and End Results

noncutaneous, nonmucosal genitourinary surfaces such as the ovaries or kidneys. Genitourinary

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From the Department of Dermatology, University Hospitals Case Medical Center/Case Western Reserve University School of Medicine<sup>a</sup>; Case Comprehensive Cancer Center, Case Western Reserve University School of Medicine<sup>b</sup>; and Glickman Urological Institute, Cleveland Clinic Foundation.<sup>c</sup>

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Reprint requests: Meg R. Gerstenblith, MD, Department of Dermatology, University Hospitals Case Medical Center/Case Western Reserve University School of Medicine, 11100 Euclid Ave, Lakeside 3500, Cleveland, OH 44106-5028. E-mail: [Meg.Gerstenblith@uhhospitals.org](mailto:Meg.Gerstenblith@uhhospitals.org).

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melanoma accounts for only 0.53% of all melanomas; however, it accounts for almost half (44.8%) of all mucosal melanomas.<sup>4</sup> Genitourinary melanoma commonly presents with a mass, pain, bleeding, pruritus, ulceration, or urinary symptoms such as dysuria and decreased urinary stream.<sup>5</sup>

Although risk factors for cutaneous melanoma are well established, those for genitourinary melanoma remain unknown. Cutaneous melanoma can affect all ages, with a higher incidence in women than men younger than 40 years, but a higher incidence in men than women older than 40 years.<sup>6,7</sup> Compared with cutaneous melanomas, genitourinary melanomas have a poor prognosis with a 5-year relative survival of 15% for vaginal location, 18% for urinary tract location, 53% for female external genital location, and 69% for male genital tract location.<sup>4</sup> The reasons for poor survival remain to be determined, and predictors of poor survival have yet to be fully characterized.

Prior studies have noted a higher frequency of genitourinary melanoma in women compared with men.<sup>8-10</sup> However, population-based studies have not included all the sites within the genitourinary tract, making it difficult to draw conclusions on the epidemiology of genitourinary melanoma.<sup>3,4,9</sup> In addition, institutional studies focusing on genitourinary melanoma have been site-specific or reported only on a single sex, also limiting our understanding of the epidemiology.<sup>11-26</sup>

The aim of this study was to further describe the incidence rates, trends, and survival of genitourinary melanomas in the United States. The National Cancer Institute's large-scale and population-based Surveillance, Epidemiology, and End Results (SEER) 13 Registries Database, spanning 20 years (1992 through 2012) and comprising approximately 14% of the US population was used to obtain cases.

## METHODS

The Institutional Review Board of University Hospitals Case Medical Center, Cleveland, OH, approved this study. The SEER 13 Registries Database includes San Francisco-Oakland, CA; Connecticut; Detroit, MI; Hawaii; Iowa; New Mexico; Seattle (Puget Sound), WA; Utah; Atlanta, GA; Los Angeles, CA; San Jose-Monterey, CA; rural

Georgia; and the Alaska Native tumor registries. The SEER 13 database from 1992 through 2012 was used to obtain cases of genitourinary melanomas with malignant behavior and a primary tumor with one of the following primary site codes: C51.0 to C57.9 (female genital tract), C60.0 to C63.9 (male genital tract), and C64.9 to C68.9 (urinary tract)

along with the *International Classification of Diseases for Oncology, 3rd Edition* melanoma codes 8720 to 8790. In an effort to collect comprehensive information on all sites where genitourinary melanoma may arise, all the genitourinary primary site codes were included; therefore, cases included those melanomas arising from mucosal, cutaneous, and other surfaces. Age-standardized incidence rates of genitourinary melanoma (adjusted by the direct method to the 2000 US pop-

ulation) by age, sex, race, and stage of diagnosis were evaluated. Race (white, black, American Indian/Alaskan Native, Asian or Pacific Islander) and Hispanic vs non-Hispanic ethnicity of the study population were obtained from SEER. For all race analyses, the race and ethnicity fields were merged to the following 4 race/ethnicity groups: non-Hispanic white, Hispanic white, black, and other (American Indian/Alaskan Native and Asian or Pacific Islander). Relative risk was expressed as incidence rate ratios, where a given characteristic was compared with a referent characteristic. Secular trends were quantified with the estimated annual percentage change (EAPC) in the age-standardized incidence rate, computed with weighted least squares log-linear regression. The Kaplan-Meier method was used to assess overall and melanoma-specific survival with 95% confidence intervals (CI). SEER historic stage A was used for local, regional, and distant disease. "Treatment summary—surgery at primary site (1998+)" was used for extracting data on surgery at primary site. "Treatment summary—surgery at other regional or distant site (2003+)" was used to extract data on surgery at nonprimary site. "Treatment summary—scope regional lymph node surgery (2003+)" was used to extract data on lymph node surgery. Statistical tests were assessed at the 95% confidence level, and all *P* values were 2-sided. Multivariate analysis of predictors of outcomes was performed using Cox proportional hazard modeling.

## CAPSULE SUMMARY

- Primary melanoma arising in the genitourinary tract is rare.
- A total of 817 patients with genitourinary melanoma were identified in the Surveillance, Epidemiology, and End Results 13 database between 1992 and 2012.
- Genitourinary melanoma is 10 times more common in women compared with men and survival is worse in women, which is different from cutaneous melanoma.

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