

Synchronous melanosis of upper and lower urinary tract

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ABSTRACT

Urothelial melanosis is an exceptionally rare diagnosis, with less than 25 cases being reported in the literature. Melanosis of the urothelium is characterized by abnormal melanin deposition within tissues, producing a black, velvety appearance to the urothelial mucosa. We present a 67-year-old male undergoing cystoscopy during a routine percutaneous nephrolithotomy (PCNL), who was found to have diffuse bladder melanosis extending up the ureter and into the renal pelvis. To our knowledge, this is the first reported case of synchronous melanosis of upper and lower urinary tract.

1. Introduction

Melanosis is a deposition of melanin within the lamina propria, evident as dark granular pigment leading to a brown-black discoloration of the tissue. It is common in skin and mucocutaneous tissues. A well described version is melanosis of the colon (melanosis coli), considered to be a largely benign phenomenon commonly associated with the overuse of laxatives.¹ Urothelial melanosis is much rarer with only a few documented cases reported in the literature, primarily focusing on melanosis of the bladder. This condition is generally considered benign, but there are reported cases concurrent with malignant melanoma of the bladder,² as well as with high-grade primary urothelial cell carcinoma.³ We are currently unaware of any other bladder melanosis with concurrent upper tract melanosis.

2. Case report

A 67-year-old male with a history of uncomplicated nephrolithiasis was referred for urologic evaluation for intermittent hematuria. Urine cytology was negative, and culture revealed asymptomatic bacteriuria. CT urogram revealed bilateral renal calculi with the largest non-obstructive calculus in the left kidney measuring 1.8 cm. Mild left hydronephrosis was noted without any observed bladder abnormalities. The patient's risk factors for bladder cancer included a history of smoking about 2 packs of cigarettes per day for 45 years. Patient was

scheduled for percutaneous nephrolithotomy to treat his stone.

Inspection of the bladder during cystoscopy showed bladder mucosa that appeared blackish-brown with areas of tan that looked somewhat calcified (Fig. 1). These lesions were biopsied and histologic sections revealed benign bladder mucosa with mild reactive changes of the urothelium. There was abundant melanin present within the superficial urothelium, and the lamina propria contained macrophages with melanin deposits. The Prussian blue stain was negative for iron. Immunostains for Melan-A and SOX10 were negative for malignant melanoma (Fig. 2). No cells containing premelanosomes were identified. The stains to confirm melanosis were performed per hospital protocol and were reviewed by two surgical pathologists.

The patient's initial PCNL procedure was deferred until pathologic reports were available. He underwent PCNL one month later with similar brown-black granular pigment deposition in the renal pelvis (Fig. 3). Renal pelvis biopsy at the time of PCNL showed no definite dysplasia and granular pigment negative for iron stain, consistent with melanosis. Patient had no immediate complications. Plan to see in the outpatient setting to determine future care and follow up.

3. Discussion

Melanosis of the genitourinary tract is a rare phenomenon that has only recently seen increased documentation. This condition has been well-described in the gastrointestinal tract, as well as the oral cavity and

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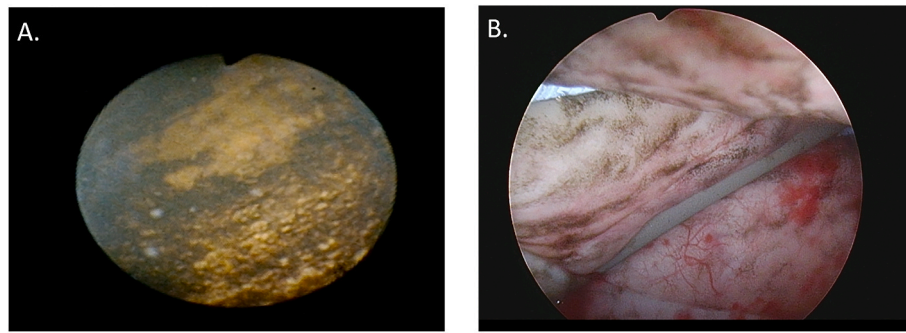


Fig. 1. Bladder Mucosa (Panel A): Pigmentation of bladder mucosa as seen on cystoscopy. Upper Tract Urothelium (Panel B): Upper tract urothelial pigmentation of mucosa as seen on nephoscopy.

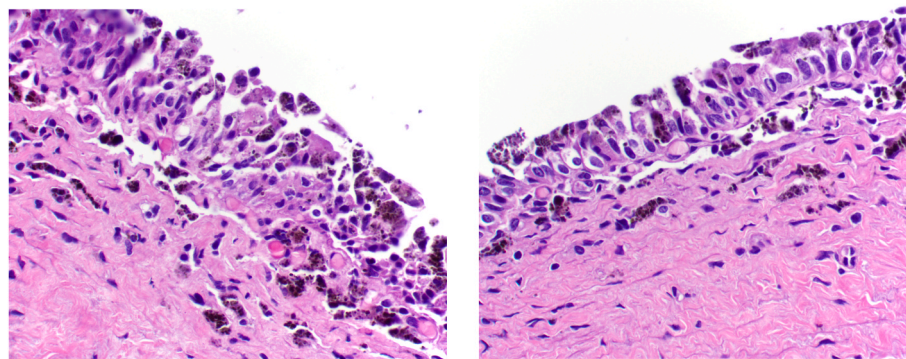


Fig. 2. Melan-A and SOX10 Immunohistochemistry Stain of Bladder Biopsy: Immunostains show background melanin pigment, but are negative for Melan-A (Panel A) and SOX10 (Panel B) expression, excluding a diagnosis of malignant melanoma.

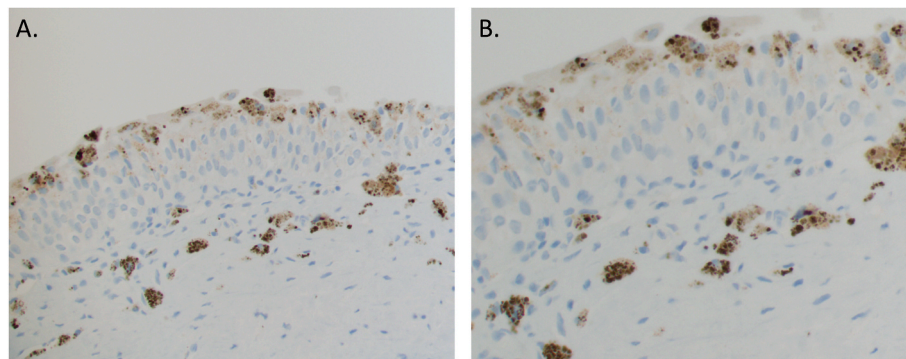


Fig. 3. H&E Stain of Bladder Biopsy: Abundant black-brown granular pigment consistent with melanin present within the superficial urothelium and in macrophages in the lamina propria as seen on histologic sections of benign bladder mucosa. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

conjunctiva.⁴ Despite the low number of recorded cases, there are some associations that have emerged. First, nearly all cases report the patient's age between 43 and 86 years of age, with an apparent male predominance.⁵ Symptoms that have been commonly associated with bladder melanosis include dysuria, urinary frequency, hematuria, incontinence, and retention; however this is unclear if melanosis is the cause of symptoms or if the symptoms are simply the instigating factor for endoscopic evaluation of the urinary tract.⁵ While our patient's primary complaint was hematuria, he did note some urinary frequency. We cannot determine the etiology of his frequency due to likelihood there could be some confounding effect between irritation from the calculi and mucosal changes.

Additionally, the natural history of melanosis of the bladder is not well defined. While the number of documented cases of bladder

melanosis continue to rise, the etiology continues to remain a mystery. No correlation between melanosis and malignant transformation has been established, but reports do note the two conditions occurring concurrently.^{2,3} There are other reports with spontaneous resolution of urothelial melanosis on surveillance cystoscopy. Given the uncertain course, it has been recommended that patients with melanosis are followed with surveillance cystoscopy. For patients with concurrent upper and lower tract melanosis, it is reasonable to undergo surveillance with cystoscopy and upper tract evaluation to evaluate for resolution and ensure no malignant transformation.

There are almost no reports of melanosis in conjunction with urolithiasis. Some case reports have noted incidental renal stones⁵ but none have linked melanosis with increased risk of developing calculi. Our patient was found to have melanosis in conjunction with nephrolithiasis

during endoscopic treatment of their stone. It is unlikely that the finding of melanosis increases the risk of stone formation above baseline risk, but given the paucity of data, no definite correlation can be made.

4. Conclusion

Urothelial melanosis is a rare phenomenon with an undetermined etiology and no correlation between malignant transformation or urolithiasis. This is the first reported presentation of urothelial melanosis in both the upper and lower urinary tracts.

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Declaration of competing interest

The authors declare that they have no known competing financial

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