



Micropapillary Variant Urothelial Carcinoma with Underlying Kartagener Syndrome and PALB2 Mutation

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Abstract

Urothelial carcinoma is the most common bladder cancer that can sometimes appear with rare features. Micropapillary variant is the most uncommon subtype of urothelial carcinoma and is associated with a poorer prognosis. In this case report, a female patient presented with gross hematuria and dysuria, after further imaging it was revealed she had an anterior and posterior bladder wall mass. A cystectomy was performed and was sent to pathology for analysis. The mass was confirmed micropapillary variant urothelial carcinoma in the setting of Kartagener Syndrome and PALB2 mutation. This case study discusses how an unlikely aggressive cancer can be correlated with a syndrome and mutation even after prophylactics have been performed.

Clinical Presentation

66-year-old female with Kartagener syndrome and PALB2 mutation presented with gross hematuria and dysuria. She had a double lung transplant in January 2019, a total abdominal hysterectomy with bilateral salpingo-oophorectomy (TAHBSO) and bilateral mastectomies in October 2024 and a cystectomy in 2026. She was referred from her gynecologist stating that she may have a bladder blockage in 2024. Further testing revealed an anterior and posterior bladder wall lesion, shortly after discovery she had a transurethral resection of bladder tumor (TURBT) with a diagnosis of proven malignancy. A cystectomy was performed and the specimen was sent to pathology for histologic evaluation and staging. Co-morbidities include former smoker, asthma, deafness, type II diabetes, gastroesophageal reflux, hypertension, stage IV kidney failure, chronic sinusitis, double lung transplant and PALB2 mutation.

Final Diagnosis

Histologically, there was proof of high-grade urothelial carcinoma with micropapillary features. High grade features contain dyscohesive cells with large hyperchromatic nuclei, irregular nuclear chromatin and prominent nucleoli¹. The micropapillary features display lacunae of nested cells throughout the mass⁵ (Figure 2B). The greatest dimension of the mass was 4.5 cm with extension into the perivesicular fat (Figure 1) and the anterior portion of the vagina (Figure 2A). Since the vagina was involved that automatically brought the staging to a pT4a⁶.

The ureteral and urethral margins were free of the mass. Out of 5 lymph nodes, 1 was positive. Overall, this patient was staged with pT4a N1.



Figure 1
Cross section of the right lateral wall to include an ill-defined, calcified, and rubbery mass that displays extra vesicular extension, from cassette 2D.

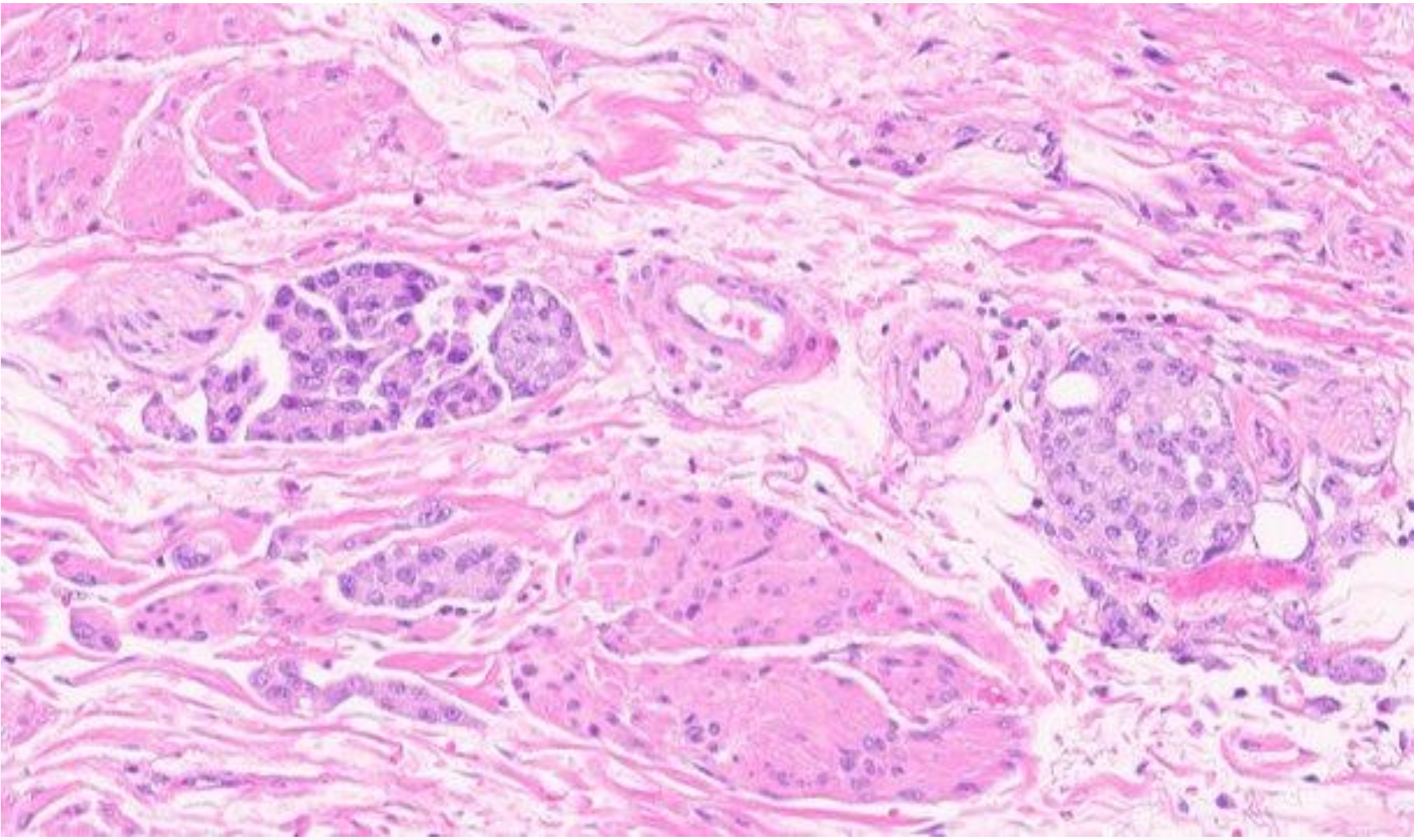


Figure 2A
Micropapillary features microscopically invading the anterior portion of the vagina.

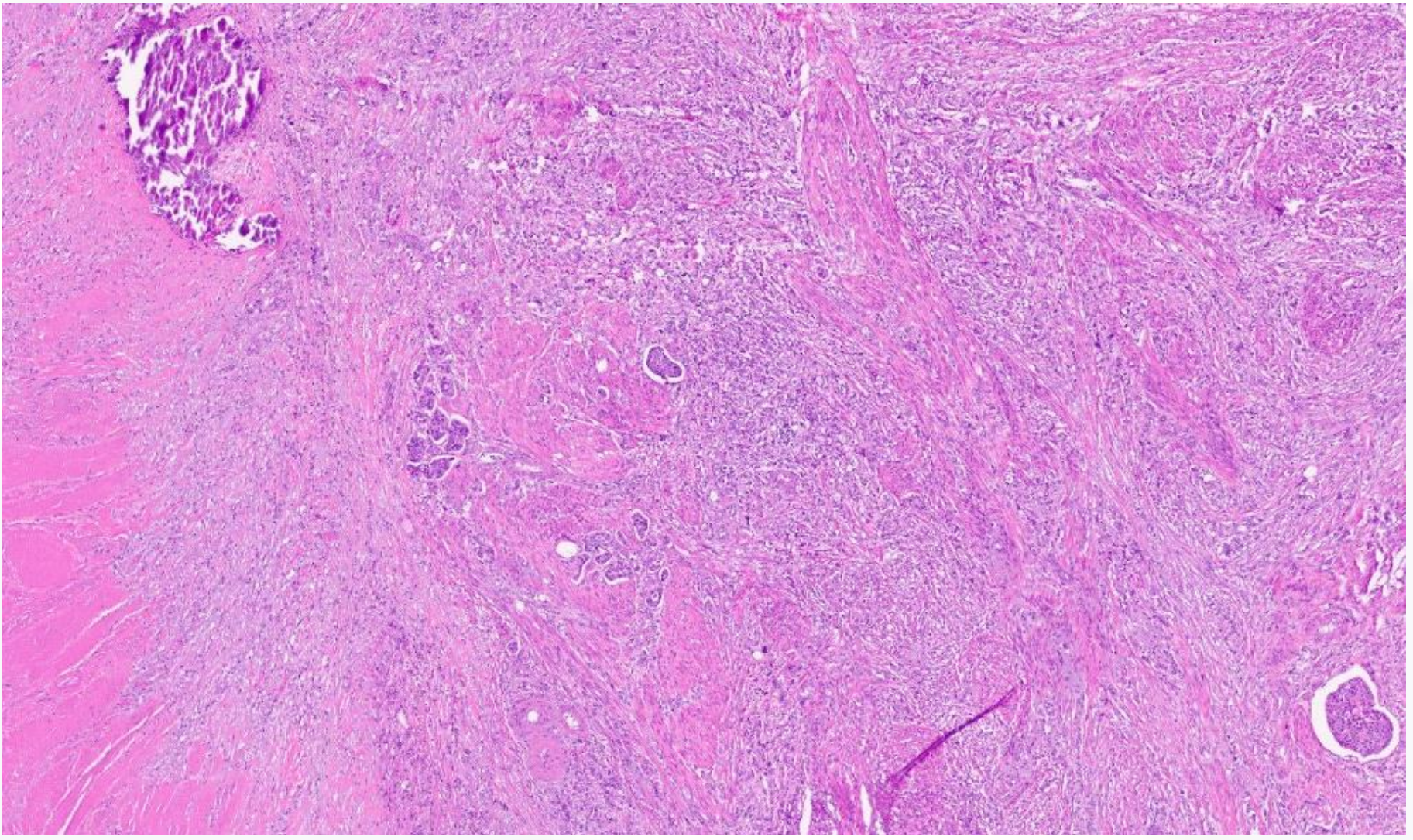


Figure 2B
This microscopic slide shows mass invading the detrusor muscle and extending into the perivesicular fat with micropapillary lacunae and an area of calcification.

Gross description

The specimen consisted of an intact bladder with anterior portion of vaginal wall. The bladder measures 8.4 cm from right to left, 11.9 cm from superior to inferior and 4.3 cm from anterior to posterior. The right ureter measures 3.2 cm in length and 0.4 cm in diameter and is probe patent. The left ureter measures 3.6 cm in length and 0.4 cm in diameter and is probe patent. The vaginal wall measures 3.6 x 4.6 cm. The bladder is opened along the anterior midline with a Y-shaped incision. The mucosal surfaces are tan-pink, focally hemorrhagic, edematous, with flattened areas. There is an ill-defined 4.5 x 3.3 cm tan-gray to tan-brown, calcified, flat granular mass with a 0.5 cm thickness involving the dome, anterior, right and left lateral, and posterior walls. The mass displays extravascular extension in the right lateral wall. Representative sections are submitted as follows:
2A: Urethral resection margin, enface
2B: Anterior wall with mass
2C: Dome with mass
2D: Right lateral wall to include mass with extension into fat (Figure 1)
2E: Left lateral wall to include mass
2F: Posterior wall to include lesion
2G: Uninvolved bladder
2H: Representative section of vagina

Discussion

Micropapillary variant urothelial carcinoma is an uncommon aggressive cancer, with an occurrence of 0.01-2.2% of all urothelial carcinomas²; it is also associated with advanced stage at diagnosis and has a poor prognosis. Margins and depth of invasion are the most important prognostic factor for this patient. This case highlights an unusual clinical scenario in which malignancy developed in the setting of both Kartagener syndrome and a PALB2 mutation. Kartagener syndrome is a triad of situs inversus, chronic sinusitis and bronchiectasis which can lead to systemic inflammation³. PALB2 mutation works with both BRCA1/BRCA2 mutations which cause impaired DNA repair⁴. The combination of both Kartagener syndrome and PALB2 mutation this can lead to potential dual contribution to tumorigenesis and aggressiveness.

Despite prior prophylactic surgical interventions, this patient developed a high-grade carcinoma, emphasizing the importance of continued surveillance in high-risk individuals. This case highlights the further investigation between the relationships of chronic inflammatory syndromes and genetic mutations in the setting of rare and aggressive variants of urothelial carcinoma.

References

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