

AN EXCEPTIONAL CASE OF “ POLYOMAVIRUS-ASSOCIATED UROTHELIAL CARCINOMA WITH MULLERIAN DIFFERENTIATION” IN A RENAL TRANSPLANT PATIENT – a rare intersection of immunosuppression, infection and neoplasia

Dr.Swathy Narayanan, Dr.Renu Mariam Thomas, Dr.Abi.M.Abraham, Dr.Datson.P.George

VPS Lakeshore Hospital , Kochi , Kerala , India

BACKGROUND

In kidney transplant recipients, the incidence of cancer of the urinary tract is 4–10 times higher than that in the general population, which is associated with immunosuppressive states and carcinogenic viral infections. Polyoma virus is a ubiquitous, opportunistic, double stranded DNA virus with a seroprevalence rate that can reach > 90% in adults.

CASE PRESENTATION

46 F, post renal transplant recipient, 9 years back presented with hematuria.

INVESTIGATION

Cystoscopy- polypoid lesion posterosuperior bladder wall. **MRI abdomen + pelvis + Urography revealed-** polypoidal lesion along the dome and posterior wall of bladder, measuring 2 cm x 1.7 cm showing diffusion restriction and post contrast enhancement –features suspicious of urothelial carcinoma.

TURBT - HISTOPATHOLOGICAL ASSESSMENT

Figure A - Shows fragments of an invasive neoplasm composed of cells arranged in solid sheets , cords and glandular pattern(H&E,4x)

Figure B - The cells are markedly pleomorphic with high nuclear cytoplasmic ratio(H&E,40x)

Figure C - Glandular areas showing cells exhibiting marked cytological atypia with hobnailing and cytoplasmic clearing(H&E,40x)

Figure D - PAX8 – Showing diffuse staining in tumour cells indicating mullerian differentiation (IHC)

Figure E -Tumour cell nuclei showing amorphous appearance (H&E,40x) resembling viral cytopathic changes seen in renal transplant biopsies with polyoma virus nephropathy (**Figure F** – PAS,40x)

Figure G – SV40 T large antigen showing diffuse staining in tumour cells (IHC)

Figure H – Tumour cells showing p53 overexpression (IHC)

DISCUSSION

- Forty cases of polyomavirus-associated Urothelial carcinoma have been reported.
- The urinary bladder is the most common site but allograft kidney and ureter are also frequent sites.
- The average time of onset is 8.5 years after transplantation
- Cases are accompanied by preceding polyomavirus viremia and polyomavirus nephropathy.
- Mortality is as high as 33.3%.
- Pathogenesis: Viral reactivation due to immunosuppression followed by oncogenic transformation – Viral SV40 T large antigen binds to host genome , disrupts cell cycle by inactivating p53 and pRb.

REFERENCES1. Iwasaki S, Takahashi K, Katano H, Suzuki T, Sasaki H, Harada H, et al. BK Polyomavirus-Associated Urothelial Carcinoma of the Bladder with a Background of BK Polyomavirus Nephropathy in a Kidney Transplant Recipient. Nephron. 2023;147(Suppl. 1):53–60.

2. Duvuru Geetha, Tong BC, Racusen L, Markowitz JS, Westra WH. Bladder carcinoma in a transplant recipient: evidence to implicate the BK human polyomavirus as a causal transforming agent. Transplantation. 2002 Jun 1;73(12):1933–6.

Take home message : This rare case expands the spectrum of Polyoma virus related pathology in transplant patients and also reinforces a pathologist’s critical role in guiding optimal patient care.