Incidence and Prognostic Implications of Perineural Invasion with Urothelial Carcinoma Following Radical Cystectomy

Introduction and Objectives: The incidence and prognostic implications of perineural invasion (PNI) in a cohort of patients undergoing radical cystectomy for primary urothelial bladder cancer was studied.
Materials and Methods: There were 440 patients who underwent radical cystectomy for urothelial bladder cancer with curative intent. The presence of PNI in the cystectomy specimens were evaluated in addition to other histopathologic variables (grade, stage, surgical margin, lymphovascular invasion, concomitant variant secondary histologic subtypes, and presence of carcinoma-in-situ).
Results: PNI was identified in 101 patients (23%). Patients with extravesical primary tumors, ≥T3 (61/128, 48%) and node-positive disease (34/86, 40%) were more likely to have PNI than those with organ-confined tumors (<pT2; 10/183, 5%) (p<0.001). Median follow-up was 2 years (range: 0.1 to 12.5 years). Recurrence-free survival was worse in the PNI-positive extravesical (p=0.01) and node-positive (p=0.02) tumors compared to those with no evidence of PNI. Overall survival was also worse for PNI-positive patients (p<0.001). On multivariate analysis, PNI was an independent risk factor for recurrence after radical cystectomy (p=0.01, RR=2.8: 95% CI 2.0-10.0). Improved survival after adjuvant chemotherapy was also seen in PNI positive patients (p=0.01).
Conclusions: PNI with urothelial carcinoma is associated with a worse prognosis, especially for extravesical and node-positive disease following radical cystectomy. Adjuvant chemotherapy may benefit those patients who have PNI.