IS-7  Bladder Auto-augmentation Using Biodegradable Polymer Seeded With Autologous Smooth Muscle Cells In A Rabbit Model

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Background/Purpose: The protruded mucosa after bladder auto-augmentation surgery usually collapses and the volume increment is often limited. This study is aimed at an innovative bladder auto-augmentation covered with cell-seeded polyglycolic acid (PGA) mesh in a rabbit model.

Methods: One month after an initial 70% partial cystectomy auto-augmentation surgery was conducted. The surgery included traditional autoaugmentation (TA, n=6), autoaugmentation covered with PGA mesh without cells (PGA-N, n=6), and PGA seeded with autologous bladder smooth muscle cells (PGA-C, n=6). All were followed up by urodynamic study and retrieved on 1, 2, 3 and 6 months. Statistical analysis was by analysis of variance (ANOVA). Results: PGA-C group showed significant bladder capacity increment as compared to the other groups in all time points. Normal urothelial layer was maintained in all groups. The PGA-C group showed grossly normal bladder wall with scattered smooth muscle bundles. The other groups had marked grafts shrinkage with only unorganized muscle fibers. Conclusion: Cell-seeded PGA polymer could facilitate smooth muscle regeneration. It offers good structural support and significant volume increment for the auto-augmentation. Index Words: Urinary bladder; Polyglycolic acid; Cell Culture; Bladder augmentation