

Artificial Urinary Sphincter: Our 20 Year Single Center, Single Surgeon Experience

Introduction and Objectives: The artificial urinary sphincter is considered the gold standard treatment for severe stress urinary incontinence. Long-term success with the artificial urinary sphincter (AUS) is common but device revision and replacement is a reality encountered by the surgeon. We present our long-term data on sphincter revision from a single center, single surgeon experience.

Materials and Methods: The medical records of all patients undergoing AUS implantation by a single surgeon at the University of Montreal Hospital Center were reviewed between 1992 and 2012. Patient information related to age, history of diabetes, clean intermittent catheterization, overactive bladder or radiotherapy were included in this analysis. Urodynamic studies were also obtained and analyzed for the majority of patients. Preoperative clinical variables included aetiology of incontinence. The date of AUS implantation, presence of a urethral wall stent, reason for revision, date of sphincter revision, volume within the reservoir, use of electrical continuity testing (ECT) and type of revision performed were also included in the analysis. Early complications were defined as a revision within 6 months of implantation and late complications were defined as revisions performed after 6 months of sphincter implantation. Chi square analysis was used to determine significant factors that were associated with sphincter revision.

Results: There were 144 patients who underwent a 2 incision bulbar urethral AUS implantation between 1986 and 2010. Primary sphincter revision and secondary revision (>1 revision) were performed in 35 (24.3%) and 25 (17.4%) patients respectively. 8 (23.9%) compared to 25 (71.4%) patients had early and late primary revision respectively. The proportion of patients undergoing early or late revision was statistically significantly related to the clinical indications for revision and the type of procedure performed. Specifically, early revisions were more often performed due to infection and/or erosion ($X^2=0.017$) and due to difficulty manipulating the pump ($X^2=0.009$). Within the entire cohort, 4 (2.8%), 9 (6.3%), 29 (20.1%), 34 (23.6%), and 67 (46.5%) patients had their sphincter implantation in 1985-1989, 1990-1994, 1995-2000, 2001-2005, >2005, respectively. Median time to primary revision was 2.83 years. Our analysis showed decreasing trends in revision rates according to year of AUS implantation. Specifically patients treated in the most contemporary year quartile had a lower revision rate (13.4%) than patients treated in the most historical year quartile of 1985-1990 (50%, $X^2=0.008$).

Conclusion: Managing complications after AUS implantation poses a significant obstacle for the neuro-urologist. Our 20 year experience has revealed important determinants and trends in AUS revision. A large proportion of revisions within the first 6 months of implantation were due to infection and/or erosion. Moreover, early revisions were performed in the context of difficulty with pump manipulation. We report decreasing trends in the proportion of sphincter revision according to year of AUS implantation. These results can be due to increased surgeon experience and increased annual case load as well as technological advancements in the design and construction of the AMS 800.