Novel Electromechanic Artificial Urinary Sphincter

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Abstract:
Implantation of an artificial urinary sphincter (AUS) is the treatment of choice for managing severe stress urinary incontinence. This hydromechanical implant mimics a healthy sphincter by exerting a constant circumferential pressure around the urethra to close it and keep urine in the bladder. Common complications experienced with this device are urethral atrophy, erosion, and mechanical breakdown. Furthermore, AUS operation requires some dexterity resulting in difficulty and discomfort of use, and limiting the implantation in some patients. We present in this study a novel remote-controlled electromechanic AUS allowing rapid and effortless sphincter operation. Its design eliminates the classic manual pump, enhancing reliability, easing implantation in men and women, and achieving compatibility with already-implanted AUS. The device has been tested in vitro and ex vivo on fresh pig bladders. Different occlusive cuff pressure (OCP) ranges were employed and expected performance was obtained. Experimentation results and design challenges are reported and discussed here in.

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