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DEVELOPMENT OF A PRESSURE SENSOR INTEGRATED INTO A CATHETER FOR REAL-TIME INTRAVESICAL PRESSURE MONITORING

Hypothesis / aims of study
Monitoring physiologic intravesical pressure is important to prevent secondary renal functional impairment, especially in long-term indwelling urinary catheter users with voiding problems like neurogenic bladder. Catheter valves offer a number of advantages over drainage bags including improved privacy and dignity, and maintenance of normal detrusor muscle function. However, these are not suitable for everybody because of pressure-monitoring difficulty. In this study, we evaluate the efficacy of the prototype intravesical pressure sensor integrated into a catheter-like tube in the rabbit.

Study design, materials and methods
The catheter type wireless pressure sensor is manufactured by direct inserting the prototype sensor into the port split from the feeding tube between the sensor and the port so the tube could hold the bladder pressure. The tip of the tube is inserted into the rabbit bladder through the urethra and saline solution is infused using a disposable syringe into the bladder through the end cap. Conventional cystometry was performed and the intravesical pressure was measured by prototype intravesical pressure sensor at the same time.

Results
The measured resonance frequencies and the pressure data converted from those signals were compared to the reference pressure data obtained from a conventional cystometry. The scale factor of the sensor to correlate the prototype sensor resonance frequencies to the reference pressure data is -2.1 kPa/MHz(=-0.476 MHz/kPa), comparable to the result of its in-vitro measurement, a pressure responsivity of -0.418 MHz/kPa.

Interpretation of results
The feasibility of the developed sensor is investigated through an animal test and confirmed by comparing with the data of conventional cystometry.

Concluding message
We demonstrated the feasibility of the catheter type which is non-invasive method and easy to apply to patients in actual examination. Further investigation to overcome the limitation of the prototype intravesical pressure sensor is necessary for the application to the real life practice.

Disclosures
Funding: none **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Rabbit **Ethics Committee:** Institutional Animal Care and Use Committee in School of Medicine, The Catholic University of Korea