

## **A Study on Urine Flow Characteristics in Ureter with Fluid-Structure Interaction**

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**Abstract :** Ureteral stent insertion is being used as one of the clinical interventional treatments due to stenosis and/or obstruction in the ureter. For the development of the ureteral stents, we have to know the flow patterns with and without peristalsis in the ureter. The purpose of this study is to understand the flow characteristics and movement of the ureter for the ureter model according to the presence or absence of peristalsis and to use it as fundamental information to design the optimal ureteral stent. In this study, CFD (Computational Fluid Dynamics) and FSI (Fluid-Structure Interaction) approaches were applied and compared the flow characteristics in the ureter. The distribution of streamlines was different in the near ureteropelvic junction. As a result of analyzing the area change of the ureter, the area change was large at the frontal and posterior ends, and the frontal and posterior aspects of the area change were reversed. There was no significant difference in the flow rate at the ureter outlet, and the movement of the ureter was larger when peristalsis was considered. Finally, as an introductory stage for the development of ureteral stents, basic information about the ureters according to the presence or absence of peristalsis is acquired.

**Keywords :** computational fluid dynamics, fluid-structure interaction, peristalsis, urine flow

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