**Effectiveness of Three-Dimensional (3D) Imaging Systems in Laparoscopic Radical Prostatectomy: Randomized Comparative Study with 2D Systems**

**Introduction and Objectives**: There is only limited data evaluating the effectiveness of 3D imaging systems compared to two-dimensional (2D) imaging systems. We conducted randomized controlled trials to evaluate whether 3D images are useful in performing laparoscopic radical prostatectomy compared to 2D imaging systems.
**Materials and Methods:** Nine experienced surgeons of four institutions participated in this study. One hundred and twenty laparoscopic radical prostatectomies (LRP) were randomly allocated according to several variables to each surgeon from March 2011 to November 2011. Primary endpoints are the time of urethrovesical anastomosis and the 3D to 2D conversion rate. Secondary endpoints are the total operation time, number of sutures of urethrovesical anastomosis, scope position from the working site during urethrovesical anastomosis, urine leakage from anastomosis, and the fatigues of operators and scopists evaluated by the Fricker test and Subjective Symptoms Index (SSI), and questionnaires about the feasibility of various procedures. In this study, we used Olympus 3D laparo-thoraco videoscope systems provided to us by Olympus Medical Systems Corp (Tokyo, Japan).
**Results:** The baseline characteristics were similar in the two groups. Time of urethrovesical anastomosis and time of operation of each group were 29.9 min and 162 min in 2D, and 26.8 min and 158 min in 3D imaging system, and hence no significant difference was observed. However, the number of sutures of urethrovesical anastomosis was significantly less in 3D imaging system, 11.5 sutures versus 10.4 sutures ($p=0.04$). No conversion from 3D to 2D imaging system during LRP was observed. The fatigues of the operators and scopists evaluated by Fricker test and SSI were not significantly different between 2D and 3D imaging systems. The feasibility which was evaluated by eight questionnaires about typical procedures during LRP was significantly better in 3D imaging system.
**Conclusion:** Although 3D imaging systems do not shorten time of urethrovesical anastomosis and the operation time of LRP in the case of experienced surgeons, it increased the feasibility of various procedures without increasing fatigue. Especially in urethrovesical anastomosis, 3D imaging systems were useful for surgeons in performing precise suturing, when aiming to decrease the number of sutures.