Predictive Factors for Intra Operative Hypertension During Laparoscopic Adrenalectomy for Pheochromocytoma

Introduction and Objective: Laparoscopic adrenalectomy (LA) has become the gold standard procedure to small adrenal tumors. However, there are still some debates for the role of LA for pheochromocytoma because of the difficult techniques and the possibility of uncontrollable hypertensive crises, hemorrhage, and malignancy. Some authors reported longer operating time and the high cardiovascular risk for LAs than for open surgery. The aim of this study was to evaluate the validity of LA for pheochromocytoma and to investigate the predictive factors that affect the intra-operative hypertension.
Materials and Methods: From April 1997 to March 2011, 229 LAs were performed in this department and 54 of them were for pheochromocytoma. Clinical data were retrospectively collected and analyzed. The operating data of LAs for pheochromocytoma were compared with those of LAs for other adrenal tumors. The operative data and characteristics such as gender, age, laterality, tumor size, operating time, blood loss and preoperative catecholamine level in plasma and urine were compared to the intra-operative systolic blood pressure (SBP) variations.
Results: The comparison of the operative data between pheochromocytoma and other adrenal tumors, the tumor was larger (4.0 vs. 2.3 cm) than for other adrenal tumors. However, there was no statistically significant difference in operating time and blood loss among these two groups. In LA for pheochromocytoma, tumor size was significantly associated with operative time (P=0.017) or the blood loss (P=0.032). The intra-operative SBP rose to 180 mmHg or more in 29 cases (53.7%) and 200 mmHg or more in 16 cases (29.6%). No patient experienced a hypertensive crisis with uncontrollable high blood pressure. The comparison of SBP (<180 vs. >180 mmHg) showed that the tumor size was significant predictor for intra-operative hypertension (P=0.014). In addition, patients who had high preoperative epinephrine level in urine greater than 5 fold of upper normal limit frequently showed intra-operative hypertension (P=0.009).
Conclusions: Although the procedure seems to be influenced by the size and state of tumor, LA is not contraindicated for pheochromocytoma and can be performed safely. The tumor size and high pre-operative urine epinephrine level might be predictive factors for the intra-operative high SBP.