Suitable patients for single-port laparoscopic adrenalectomy: optimal cut-off value of body mass index

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Abstract

Objectives
It is considered that single-port surgery should be performed by experienced surgeons because of the difficulties. In this study, we tried to identify the patients who were suitable for single-port laparoscopic adrenalectomy, focusing on the optimal cut-off values of the body mass index (BMI) and the visceral fat area / total fat area (VFA/TFA) ratio. It is hoped that the results will be useful for making decisions about the surgical access. In this study, we tried to identify the patients who were suitable for single-port laparoscopic adrenalectomy, focusing on the optimal cut-off values of the body mass index (BMI) and the visceral fat area / total fat area (VFA/TFA) ratio. It is hoped that the results will be useful for making decisions about the surgical access.

Methods
A retrospective study was conducted in 126 consecutive patients who underwent single-port adrenalectomy between 2009 and 2015. All operations were done via the transperitoneal approach, after a single access port was placed at the umbilicus with a 2.5 cm skin incision. The pneumoperitoneum time (PT) was employed as an objective index for the surgical difficulty.

Results
The statistical significant cut-off value for BMI is 24 kg/m². In 80 patients with a BMI less than 24 kg/m², PT was significantly shorter than in those whose BMI exceeded 24 kg/m² (78 vs. 94 minutes, \( p=0.038 \)). Mean PT was 71 minutes in 27 patients with a BMI less than 20 kg/m², while mean PT was 118 minutes in 10 patients with a BMI exceeding 28 kg/m². Regarding the VFA/TFA ratio, the clear cut-off value was 0.4. PT was shorter in 65 cases with a VFA/TFA ratio less than 0.4 than the counterparts (78 vs. 91 minutes, \( p=0.056 \)).

Conclusions
BMI is associated with the PT for single-port laparoscopic adrenalectomy. Patients with a BMI less than 20 kg/m² are thought to be suitable for novice surgeons. Conversely, even experienced surgeons should carefully consider performing single-port surgery in patients whose BMI exceeds 28 kg/m². The right figure shows the mean PT in each range of the VFA/TFA ratio, demonstrating a clear cut-off value of 0.4 for this ratio. PT was shorter in 65 cases with a VFA/TFA ratio less than 0.4 than in those with a ratio exceeding 0.4 (78 vs. 91 minutes, \( p=0.056 \)).

Laparoscopic adrenalectomy is the gold standard surgical technique for adrenal tumors. Recently, the single-port approach has attracted attention with evolution to less invasive surgery; the benefits include less postoperative pain, faster recovery, and better cosmetic results. It is considered that single-port surgery should be performed by experienced surgeons because of the difficulties associated with using specialized instruments through such limited access. In this study, we tried to identify the patients who were suitable for single-port laparoscopic adrenalectomy, focusing on the optimal cut-off values of the body mass index (BMI) and the visceral fat area / total fat area (VFA/TFA) ratio. It is hoped that the results will be useful for making decisions about the surgical approach to adrenal tumors and may increase the adoption of single-port surgery.

Conclusions
Our results suggested that BMI is associated with the PT for single-port laparoscopic adrenalectomy, and the optimal cut-off value is 24 kg/m². Patients with a BMI less than 20 kg/m² are thought to be suitable for novice surgeons. Conversely, even experienced surgeons should carefully consider performing single-port surgery in patients whose BMI exceeds 28 kg/m². The VFA/TFA ratio was also a predictor of the technical difficulty of single-port surgery, and its optimal cut-off value was 0.4.