

## Omitting chest tube drainage after thoracoscopic major lung resection

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### Background

We previously reported the excellent effect of fibrin glue

when it was used in combination with a bioabsorbable mesh: the chest tube could be removed the day after the operation in 90% of patients undergoing lung lobectomy for cancer [1,2]. In addition, compared with the conventional procedure using fibrin glue alone, our technique led to a reduction in the rate of postoperative pulmonary complications and the length of the postoperative hospital stay [2], which in turn accelerated the postoperative physiological rehabilitation [3]. Considering these favorable results, our next goal was



to omit postoperative chest tube placement in selected patients undergoing thoracoscopic major lung resection. To identify the patients who did not need postoperative chest tube drainage, we defined original criteria to confirm pneumostasis during the intraoperative air leak test based on our previous observational study. By referring to the intraoperative air leak test results, we were able to remove the chest tube in the operating room in eligible patients. This study was conducted to clarify the feasibility of omitting chest tube placement after thoracoscopic major lung resection.

### Methods

Intraoperative air leaks were sealed with fibrin glue and absorbable mesh in patients undergoing thoracoscopic major lung resection. The chest tube was removed just after tracheal extubation if no air leaks were detected in a suction-induced air leak test, which is an original technique to confirm pneumostasis. Patients with bleeding

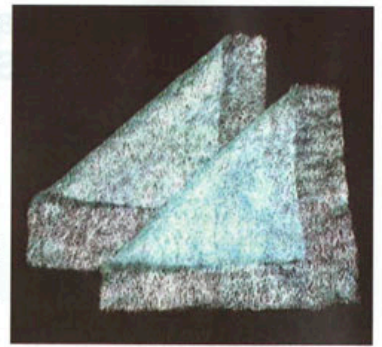
tendency or extensive thoracic adhesions were excluded.

### Results

Chest tube drainage was omitted in 29 (58%) of 50 eligible patients, and was used in 21 (42%) patients, based on the suction-induced air leak test results. Male gender and compromised pulmonary function were significantly associated with the failure to omit chest tube drainage (both,  $P < 0.05$ ). Regardless of omitting the chest tube drainage, there were no adverse events during hospitalization, such as subcutaneous emphysema, pneumothorax, pleural effusion, or hemothorax, requiring subsequent drainage. Furthermore, there was no prolonged air leakage in any patients: The mean length of chest tube drainage was only 0.9 days. Omitting the chest tube drainage was associated with reduced pain on the day of the operation ( $P < 0.05$ ).

### Conclusion

The refined strategy for pneumostasis allowed the omission of chest tube drainage in the majority of patients undergoing thoracoscopic major lung resection without increasing the risk of adverse events, which may contribute to a fast-track surgery.



Bioabsorbable mesh, used in the study, is exhibited at booth No: 23 (GUNZE LIMITED).

### References

1. Ueda K, et al. Sutureless pneumostasis using polyglycolic acid mesh as artificial pleura during video-assisted major pulmonary resection. *Ann Thorac Surg* 2007; 84: 1855-61.
2. Ueda K, et al. Sutureless pneumostasis using bioabsorbable mesh and glue during major lung resection for cancer: Who are the best candidate? *J Thorac Cardiovasc Surg* 2010; 139: 600-5.
3. Ueda K, et al. Mesh-based pneumostasis contributes to preserving gas exchange capacity and promoting rehabilitation after lung resection. *J Surg Res* 2011; 167: e71-e75.