

Coaxial drain is more effective in air leak evacuation after lung lobectomy

Salama M, MD, PhD, Akan A, MD, Holbik J, MD, Mueller MR, MD, PhD

Department of Thoracic Surgery, Otto-Wagner Hospital,
Sigmund Freud University, Medical Faculty, Vienna, Austria

Objectives

Chest tube are mandatory after lung surgery to evacuate air and fluid. The Coaxial drain (CD) was recently presented as an alternative to conventional chest tubes (CT).

CD are designed to evacuate air through an internal lumen with distal bores and simultaneously collect liquids through an external fluted profile.

Few data are available regarding the clinical efficacy of CD. The current study intended to examine this issue.

Patients & Methods

One hundred thirty six patients who underwent lung lobectomy were prospectively randomized and received either one single 24-F CD or 24-F CT connected to a digital chest drainage system. Air flow, fluid amount, subcutaneous emphysema, tube occlusion and drain duration were documented and compared between both groups.

Furthermore, patients were stratified in 2 subgroups according to air leak. Air leak was defined as persistent air flow of more than 100 ml/min.

Results

Repeated measures ANOVA revealed no significant difference between both groups regarding the amount of evacuated fluid over the postoperative course ($p=0.46$). Likewise, there was no significant difference regarding postoperative air leakage when both groups were compared ($p=0.48$).

There was a significant reduction observed in the amount of air leakage ($p=0.04$, Fig.2) and drainage volumes ($p<0.0001$, Fig.1) over time independent of the type of drain used. This effect was observed in patients with and without air leakage and there was no statistically significant difference between groups in this regard.

In patients with evidence of air leakage >100 ml/min (group 2) similar results regarding air flow ($p=0.01$, Fig 3) and drainage volumes ($p<0.001$, Fig. 4) were found.

In this cohort of patients tube occlusion occurred in 30% of patients with CT as compared to 5% with CD ($p=0.02$). Subcutaneous emphysema was observed in 50% of patients with CT as compared to 40% with CD. The use of CD was associated with shorter chest tube duration (6 ± 3 days) as compared to CT group (7 ± 4 days).

Conclusions

CD is efficient in evacuating leaking air through its inner air lumen. Its use is associated with lower incidence of subcutaneous emphysema and drain occlusion as compared to CT. Moreover, CD was associated with shorter chest tube duration and related shorter hospitalization.

References

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