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PROLONGED AIR LEAK AFTER LUNG RESECTION CAN BE PREDICTED BY AIR LEAK FLOW RATES MEASURED IN THE EARLY POST-OPERATIVE PERIOD USING A DIGITAL CHEST DRAIN SYSTEM

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Objectives
Air leaks frequently complicate lung resection surgery, but predicting which resolve spontaneously and which progress to Prolonged Air Leakage (PAL) has hitherto been difficult.

Methods
Clinical data for 124 consecutive patients who received curative major lung resection by a single surgeon and who had complete chest drainage records were reviewed. All patients had one chest tube connected to either a conventional water seal chest drain system (group WS: n=69, 56%) or a digital chest drain system (group D: n=55, 44%) depending on availability of the latter at the time of operation.

Results
Patients in the two study groups were comparable in all demographic and clinical variables (see Table). Air leak was documented using the integral digital air flow monitor in group D, and a modification of a previously reported air leak severity score in group WS. Overall, 43 patients (34.6%) had some air leak on the morning after surgery, and 27 (21.8%) had PAL persisting >5 days. Considering only patients with an air leak in group D, an air leak rate of >200ml/min on the first post-operative day was associated with a higher rate of PAL (80% vs 20%, p=0.015); while a rate of >200ml/min on the second day was associated with higher rates of both PAL (75% vs 0%, p=0.001) and chest drain duration >7 days (63% vs 11%, p=0.026). A rate of <50ml/min on the second day was predictive of spontaneous resolution before the fifth day (100% vs 45%, p=0.025). Considering only patients with an air leak in group WS, air leak severity scores on all post-operative days failed to correlate with PAL or prolonged chest drain durations.

Conclusions
Using a digital monitor, the air leak rates measured in the first 2 days after lung resection can predict the risk of PAL, potentially allowing pre-emptive intervention in the early post-operative period.

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