recurrence. Patients with continuing air leak remained in the community until admission for thoracic surgery. Complications included pain in two patients and allergic reaction to the dressing used in one patient. The patient with allergic reaction had accidental dislodgement of chest drain during dressing change necessitating reinsertion of chest drain.

Conclusion It is feasible for most patients with large PSP and many patients with SSP to be managed on an ambulatory care pathway with a Heimlich valve until their pneumothorax heals or is definitively treated.

REFERENCE

1 Fanny Voisin *et al*. Ambulatory management of spontaneous pneumothorax with pigtail catheters. http://dx.doi.org.10.1016/j.annemergmed.2013.12.017

P174 UTILITY OF NEEDLE ASPIRATION IN PATIENTS WITH PRIMARY SPONTANEOUS PNEUMOTHORAX WITH COMPLETE LUNG COLLAPSE: A RETROSPECTIVE 5-YEAR STUDY

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Introduction Primary spontaneous pneumothorax (PSP) is a common presentation. Despite being known for over 200 years, there is variation in definition criteria and treatment recommendations. Previous studies comparing needle aspiration (NA) with intercostal drain (ICD) for all primary spontaneous pneumothoraces requiring intervention including those with complete lung collapse have shown no difference in immediate success, early failure and recurrence rate. There is no separate treatment algorithm for PSP with complete lung collapse in the current British Thoracic Society pneumothorax guidelines. We aimed to compare NA with ICD as the first intervention in this subgroup.

Methods We conducted a retrospective observational study of 735 consecutive pneumothorax episodes between March 2008 and December 2013. Those with secondary spontaneous pneumothorax, history of trauma and iatrogenic pneumothorax were excluded. Pneumothorax with no visible aerated ipsilateral lung on plain chest radiograph was defined as 'PSP with complete lung collapse'. Patient case records and plain chest radiographs were reviewed. Values of $p < 0.05$ were considered statistically significant.

Results Of the 735 episodes, 233 (32%) were PSP. 61 PSP patients were identified to have complete lung collapse on chest radiograph. 32 patients had NA and 29 ICD as the first intervention. There was no statistically significant difference between the two groups in terms of age, sex, smoking history and symptoms. Compared to the NA group, patients with ICD had significantly better immediate success rate (66% vs. 10%; $p < 0.0001$) and lower rate of recurrence (3% vs. 31%; $p = 0.0064$). Median length of stay was similar in both groups. Almost a third of the patients in both groups required a definitive surgical intervention.

Conclusion Our results suggest significantly better success with ICD as the first intervention in the management of PSP with complete lung collapse and there was no added benefit of NA. We propose a further sub group of PSP with complete lung collapse in which NA should not be attempted.

Abstract P174 Table 1

	NA as first intervention (n = 32)	ICD as first intervention (n = 29)	P value
Median age, years (IQR)	31 (25–39)	32 (26–36)	0.66
Male, n (%)	21 (66%)	22 (76%)	0.41
Right sided, n (%)	19 (59%)	18 (62%)	>0.99
Previous pneumothorax, n (%)	4 (13%)	5 (17%)	0.72
Smoking history			
Current/Ex, n (%)	26 (82%)	21 (75%)	0.54
Never, n (%)	3 (9%)	6 (21%)	0.29
Mean pack years, n (IQR)	9 (5–20)	12.5 (8.5–20)	0.49
Symptoms			
Chest pain, n (%)	26 (81%)	24 (83%)	>0.99
Dyspnoea, n (%)	27 (84%)	28 (97%)	0.20
Cough, n (%)	4 (13%)	8 (28%)	0.20
Median LOS, days (IQR)	6 (4–10)	9 (4–13)	0.19
Successful lung re-expansion, n (%)	3 (10%)	19 (66%)	<0.0001
Need for surgical intervention, n (%)	10 (31%)	10 (34%)	>0.99
Recurrence, n (%)	10 (31%)	1 (3%)	0.0064

Categorical variables shown as n (%), comparisons made with Fisher's exact test; continuous variables shown as median (25th – 75th percentile), comparisons made with Wilcoxon signed rank test.

P175 MEASUREMENT OF AIR LEAK POST-THORACIC SURGERY: IMPLICATIONS FOR MEDICAL MANAGEMENT OF PNEUMOTHORAX

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Introduction Use of digital suction devices post-thoracic surgery is widespread, allowing patients to be more mobile and potentially reducing the time to chest drain removal post-op (in comparison with standard underwater seal).

Spontaneous pneumothorax (SP) is common (5,000/yr in the UK). However, there are no good predictors of outcome for patients with pneumothorax. Measurement of early air leak could potentially predict which patients who will not resolve spontaneously and will require surgery. Post-surgical data may provide an interesting analogy to ongoing air leak in spontaneous pneumothorax. The hypothesis is that reduction in air leak to <50 ml/min within 30 min of attachment can predict air leak over next 48 h and overall drain duration.

Methods Retrospective review of the use of digital suction device (Thopaz, Medela UK) post-op in the Thoracic Surgical department of a tertiary referral centre between May and December 2012. The detailed air leak measurements were assessed against duration of drainage.

Results Operations included 88 lung resections (wedge resections, lobectomies and metastasectomies via VATS and thoracotomy), 28 pleural procedures (VATS pleurodesis +/- bullectomy) and 12 empyema drainage/decortication. Average air leak over the entire duration was significantly different between the groups: 80.6 ml/min, 54.3 ml/min and 304.5 ml/min respectively ($p = 0.01$).

Patients with early reduction of air leak (i.e. reduced to <50 ml/min within the initial 30 mins) were compared to patients

Abstract P175 Table 1 Comparison of average air leak over 48 h and overall chest drain duration by initial air leak reduction (i.e. <50ml/min in 30mins), for each surgical procedure

Surgical procedure	Air leak reduced to <50ml/min in 30mins? (%)	N (%)	Average leak over next 48hrs (ml/min)	Significance of difference (p value)	Drain duration (days)	Significance of difference (p value)
Lung resection	Y	34 (38.6%)	34.4		5.0	
	N	55 (61.4%)	164.9	0.01	7.1	0.26
Total/Average		**88 (100%)**	**114.4**		**6.1**	
Pleural	Y	18 (64.3%)	9.1		3.00	
	N	10 (35.7%)	196.7	0.03	9.70*	0.19
Total/Average		**28 (100%)**	**76.4**		**5.4**	
Empyema	Y	7 (58.3%)	9.83		7.0	
	N	5 (41.7%)	1001.4	0.08	15.4	0.12
Total/Average		12 (100%)	423.0		10.5	

*However, sensitivity analysis shows no difference (3.0 days) once a single outlier of 70day duration was removed from ongoing air leak group

with >50 ml/min air leak (see Table). The mean air leak over the subsequent 48 h was significantly different between the groups for patients post-lung resection (34.4 vs 164.9 ml/min, p = 0.01), and post-pleural operation (9.1 vs 196.7 ml/min, p = 0.03); but not after empyema surgery (9.8 vs 1001.4 ml/min, p = 0.08). The duration of chest drain *in situ* post-op was lower in the group with early reduction in air leak (but did not reach statistical significance).

Conclusion This sample of post-surgical data suggests that early resolution of air leak is associated with ongoing low air leak (and early drain removal). Equivalent prospective studies are now required in the medical management of pneumothorax to determine whether early physiological measurements can predict outcome.

P176 IATROGENIC PNEUMOTHORAX POST CT-GUIDED LUNG BIOPSY – HOW DO WE MANAGE IT?

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Introduction Iatrogenic Pneumothoraces (IP) are a common complication of computerised tomography (CT)-guided lung biopsy. Management depends on size, underlying lung disease, and symptoms.

The British Thoracic Society (BTS) Guidelines comment that the majority of IPs do not require intervention. If needed aspiration is successful in 89%(1). Size of pneumothorax is assessed differently by the BTS and The American College of Chest Physicians (ACCP),(1, 2). This study reports the management of IP over a 15-month period.

Methods All IP over 15-months were analysed. Data extraction forms for each IP episode utilised electronic clinical, MDT notes and radiological images.

Results 160 day-case CT-guided lung biopsies were performed. There were 32 IPs, 20% of all biopsies.

Five IPs were >2 cm at hilar level, classified as large by BTS guidance. Fifteen were >3 cm apically, described as large by ACCP classification.

There was poor agreement between BTS and ACCP sizing of pneumothoraces, (kappa 0.26).

All BTS-classified large pneumothoraces, and 9(60%), of ACCP-classified large pneumothoraces required intervention.

Fifteen (47%) patients with IP, all asymptomatic with pneumothoraces

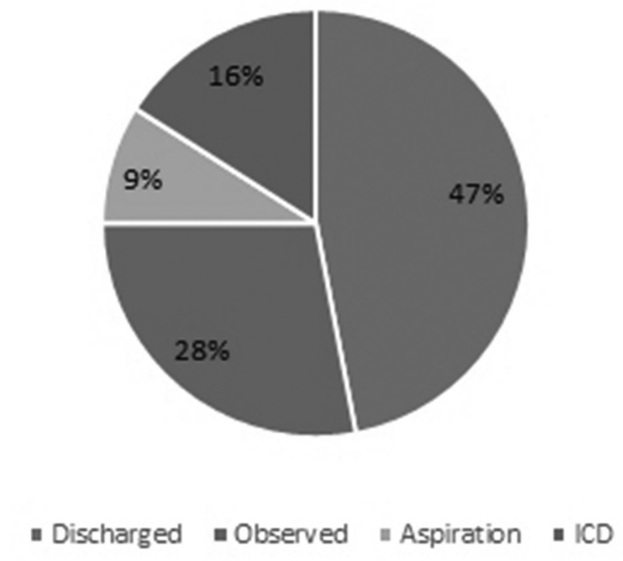
Nine (28%) IPs underwent inpatient observation. Three subsequently required intervention, all of which were small at hilar level but large apically, or symptomatic.

Aspiration was performed in 4 patients, one being >2 cm at hilar level and all >3 cm apically. Two required subsequent tube drainage.

Five (16%) IPs were treated initially with intercostal chest drainage. Four had pneumothoraces >2 cm at hilar level, and the other had a large apical pneumothorax. Only one was symptomatic.

Five patients were initially observed or had simple aspiration but subsequently required tube drainage.

Conclusions Two-thirds of the IPs were managed conservatively. Thirteen percent of patients had aspiration of which three-quarters needed subsequent intervention. Symptoms or FEV1 did not predict need for intervention. The BTS and ACCP criteria for size assessment had poor agreement and clinical judgement was used to decide on treatment.



Abstract P176 Figure 1 Initial management of pneumothoraces post CT-guided biopsy