**Table 1** Baseline characteristics of the study patients and treatments for IPF before the first admission for pneumothorax

Characteristics N=36

Age, yr 75.5 ± 5.4

Gender

Male/Female 29/7

Body mass index a, kg/m2 18.5 ± 4.1

Preadmission of PFT

FVC b, L 1.6 ± 0.6

FVC b, % predicted 55.8 ± 16.5

FEV1 b, L 1.5 ± 0.5

FEV1 b, % predicted 66.2 ± 18.4

FEV1/FVC b, % 91.7 ± 10.6

DLco c, mL/min/mmHg 8.3 ± 2.2

DLco c, % predicted 62.4 ± 14.9

Smoking status

current/former/never 1/25/10

Treatment for IPF at baseline

pirfenidone 4

nintedanib 3

corticosteroid 7

cyclosporine 4

None 22

Long-term oxygen therapy

 yes/no 　　　　　　　　　　　　　　　　 9/27

Values are shown as actual numbers or means±standard deviation.

N = 36 (a: n = 35, b: n = 27, c: n = 12)

DLco diffusing capacity for carbon monoxide; FEV1 forced expiratory volume in 1 second; FVC forced vital capacity; IPF idiopathic pulmonary fibrosis; PFT pulmonary function tests

**Table 2** Clinical data at the first admission for pneumothorax

Variable N=36

KL-6 a, U/mL 972 ± 744

Arterial blood gas

 pH b 7.39 ± 0.06

 PaO2/FiO2 ratio b 295 ± 100

 PaCO2 b, mmHg 46.8 ± 9.8

Values are shown as actual numbers or means±standard deviation.

N = 36 (a: n = 28, b: n = 33)

KL-6 Krebs von der Lungen-6; PaCO2 partial pressure of arterial carbon dioxide; PaO2/FiO2 partial pressure of arterial oxygen/fraction of inspiratory oxygen

**Table 3** Rates of successful treatment for pneumothorax without surgical intervention

First admission Total admission

Treatment Number of Number of patients Number of Number of patients

 patients successfully patients successfully

 treated (%) treated (%)

All patients 36 27 (75.0) 58 49 (84.4)

Observation only 15 13 (86.6) 29 26 (89.6)

Chest tube 21 14 (66.7) 29 17 (58.6)

Chest tube only 13 9 (69.2) 15 10 (66.6)

Chest tube plus additional therapy 8\* 5 (62.5) 12\* 7 (58.3)

EWS placement 7 4 (57.1) 10 5 (50.0)

Pleurodesis with

 fibrin glue and/or blood patch 2 1 (50.0) 3 2 (66.6)

\*One patient underwent EWS followed by pleurodesis.

Two patients during the first admission and 4 during all admissions combined underwent surgery after chest tube placement and some additional therapies resulting in chest tube removal.

EWS endoscopic Watanabe spigot

**Table 4** Hospital mortality according to treatments for pneumothorax and success of chest tube removal

First admission Total admission

 Number of Hospital death (%) Number of Hospital death (%)

 patients patients

All patients 36 10 (27.7) 58 14 (24.1)

Observation only 15 2 (13.3) 29 3 (10.3)

Chest tube 21 8 (38.0) 29 11 (37.9)

Successful chest tube removal 14 3 (21.4) 17 3 (17.6)

Failure of chest tube removal 5 5 (100) 8 8 (100)

Removed with surgery 2 0 (0) 4 0 (0)

**Table 5** Relationships betweentreatment for pneumothorax and recurrence in patients who discharged alive

First admission Total admission

 Treatment for the first The number of The number of patients The number of The number of patients

pneumothorax patients who recur (%) patients who recur (%)

All patients 26 14 (53.8) 44 20 (45.4)

Observation only 13 7 (53.8) 26 12 (46.1)

Chest tube 13 7 (53.8) 18 8 (44.4)

Chest tube only 7 3 (42.8) 9 3 (33.3)

Chest tube plus additional therapy \*4 3 (75.0) †5 4 (80.0)

Surgery‡ 2 1 (50.0%) 4 1 (25.0%)

The last treatments in the first admission were listed.

EWS, endoscopic Watanabe spigot

\*Three patients underwent EWS after chest tube drainage. One patient underwent blood patch pleurodesis and fibrin glue pleurodesis after chest tube drainage.

†Four patients underwent EWS after chest tube drainage. One patient underwent blood patch pleurodesis and fibrin glue pleurodesis after chest tube drainage.

‡One patient (50%) recurred in ones who underwent surgery for the first admission. One patient recurred (25.0%) in ones who underwent surgery for the total admission.