Supplementary

Table S1. Demographic and clinical features (*Responders: PaO$_2$/FiO$_2$ S2>S1 more than 10%). Data are reported as mean (standard deviation) or median [interquartile] according to their distribution. SP1: supine position before postural change; PP: prone position; SP2: supine position after resupination. Significant difference in bold.

	All patients (*n* = 45)	Responders* (*n* = 22)	Non responders* (*n* = 23)	*p*-value
Male gender, *n* (%)	33 (73)	15 (68)	18 (78)	0.45
Age, *years*	63 (12)	63 (10)	65 (14)	0.67
BMI, Kg/m^2	27.3 (3.7)	28.1 (3.0)	26.6 (4.2)	0.17
Interval Symptoms-Hospital Admission, *days*	6 [4;8]	7 [4;9]	6 [4;7]	0.44
Interval Hospital Admission-SubICU, *days*	1 [1;4]	3 [1;4]	1 [0;2]	**0.02**
NIV Duration, *days*	6 [4;9]	8 [4;11]	5 [2;8]	0.14
PEEP, *cmH$_2$O*	8 [6;9]	8 [6;8]	8 [7;9]	0.32
Pressure Support, *cmH$_2$O*	8 [6;10]	8 [6;9]	8 [6;10]	0.78
Charlson Index	4 [3;5]	4 [2;5]	4 [3;6]	0.44
Hemoglobin, *g/dL*	14.0 [12.5;14.8]	13.9 [12.9;14.5]	14.1 [12.4;15.4]	0.59
Platelets, *10^9/L*	206 [159;272]	198 [156;253]	227 [159;289]	0.30
LDH, *U/L*	399 [311;468]	378 [293;466]	407 [314;480]	0.37
C-Reactive Protein, *mg/dL*	8.1 [4.5;15.8]	8.1 [5.1;16.1]	8.1 [4.4;15.8]	0.77
D-Dimer, *ng/mL*	682 [506;1099]	608 [504;865]	695 [507;1333]	0.41
Pulmunary trombo-embolysm, *n* (%)	2 (4)	1 (5)	1 (4)	0.97
Supine position before prone position				
Respiratory rate, *acts/min*	20 [18;25]	20 [18;22]	20 [18;25]	0.47
pH	7.45 [7.43;7.47]	7.45 [7.43;7.47]	7.45 [7.42;7.47]	0.77
PaCO$_2$, *mmHg*	35.0 (3.8)	35.0 (3.9)	35.0 (3.8)	0.98
HCO$_3^-$, *mmol/L*	25.0 [24.0;27.1]	25.1 [24.5;27.1]	24.6 [23.9;29.0]	0.87
PaO$_2$/FiO$_2$	140 [108;169]	134 [114;158]	141 [107;181]	0.59
Prone position				
Respiratory rate, *acts/min*	19 (4)	19 (5)	19 (4)	0.80
PaO$_2$/FiO$_2$	246 (105)	278 (80)	216 (119)	**0.05**
Supine position after prone position				
Respiratory rate, *acts/min*	20 [18;25]	20 [16;23]	20 [18;25]	0.30
PaO$_2$/FiO$_2$, *mmHg/%*	157 [111;198]	188 [149;245]	112 [102;165]	**<0.01**
Delta				
PaO$_2$/FiO$_2$ PP-SP1	98 (84)	140 (74)	57 (73)	**<0.01**
PaO$_2$/FiO$_2$ PP1-SP1, %	67 [21;113]	105 [42;137]	23 [−5;77]	**<0.01**
PaO$_2$/FiO$_2$ SP2-SP1	13 [−9;44]	44 [28;67]	−8 [−22;2]	**<0.01**
PaO$_2$/FiO$_2$ SP2-SP1, %	9 [−6 ;36]	36 [19;64]	−4 [−16;2]	**<0.01**

Table S2. Chest CT parenchymal abnormalities and distribution (*Responders: PaO_2/FiO_2 S2>S1 more than 10%). Data indicates the percentage, if not otherwise specified, and are expressed as mean (standard deviation) or median [interquartile] according to their distribution. Significant difference in bold.

	All patients (*n* = 45)	Responders* (*n* = 22)	Non responders* (*n* = 23)	*p*-value
OVERALL				
Healthy parenchyma	50 (17)	52 (15)	48 (18)	0.36
Emphysema	0.02 [0.00;0.08]	0.00 [0.00;0.07]	0.03 [0.00;0.15]	0.14
Ground glass	44 (14)	42 (12)	47 (15)	0.23
Consolidation	4 [2;9]	4 [2;9]	5 [2;8]	0.63
Groung glass + consolidation	51 (16)	48 (15)	54 (17)	0.23
ANTERIOR				
Healthy parenchyma	61 (15)	63 (14)	58 (16)	0.25
Emphysema	0.01 [0.00;0.09]	0.01 [0.00;0.04]	0.02 [0.00;0.13]	0.33
Ground glass	37 (14)	34 (13)	39 (15)	0.29
Consolidation	1 [0;2]	1 [1;3]	1 [1;2]	0.98
Groung glass + consolidation	39 (15)	36 (14)	41 (16)	0.29
POSTERIOR				
Healthy parenchyma	38 (18)	42 (18)	34 (18)	0.14
Emphysema	0.00 [0.00;0.05]	0.00 [0.00;0.01]	0.02 [0.00;0.06]	**0.02**
Ground glass	51 (16)	48 (13)	54 (17)	0.21
Consolidation	7 [3;15]	7 [3;15]	8 [4;17]	0.60
Groung glass + consolidation	62 (18)	58 (18)	66 (18)	0.16
POSTERIOR/ANTERIOR RATIO				
Healthy parenchyma	0.6 (0.2)	0.6 (0.2)	0.6 (0.2)	0.21
Ground glass	1.5 (0.4)	1.5 (0.4)	1.5 (0.4)	0.80
Consolidation	4.4 [2.5;6.4]	4.3 [2.9;6.1]	4.5 [2.4;8.1]	0.62
Groung glass + consolidation	1.7 (0.4)	1.7 (0.4)	1.7 (0.4)	0.90

Table S3. Demographic and clinical features (*Responders: PaO$_2$/FiO$_2$ S2>S1 more than 20%). Data are reported as mean (standard deviation) or median [interquartile] according to their distribution. SP1: supine position before postural change; PP: prone position; SP2: supine position after resupination. Significant difference in bold.

	All patients (*n* = 45)	Responders* (*n* = 16)	Non responders* (*n* = 29)	*p*-value
Male gender, *n* (%)	33 (73)	11 (69)	22 (76)	0.61
Age, *years*	63 (12)	64 (11)	64 (13)	0.34
BMI, Kg/m^2	27.3 (3.7)	28.0 (3.0)	27.0 (4.1)	0.70
Interval Symptoms-Hospital Admission, *days*	6 [4;8]	6 [3;7]	7 [4;9]	0.25
Interval Hospital Admission-SubICU, *days*	1 [1;4]	2 [1;4]	1 [0;4]	0.12
NIV Duration, *days*	6 [4;9]	8 [4;12]	5 [4;8]	0.17
PEEP, *cmH$_2$O*	8 [6;9]	7 [6;8]	8 [7;10]	0.07
Pressure Support, *cmH$_2$O*	8 [6;10]	8 [6;10]	8 [6;9]	0.34
Charlson Index	4 [3;5]	4 [3;5]	4 [3;6]	0.66
Hemoglobin, *g/dL*	14.0 [12.5;14.8]	13.9 [12.9;14.4]	14.1 [12.5;15.2]	0.60
Platelets, *10^9/L*	206 [159;272]	182 [128;239]	241 [168;290]	**0.02**
LDH, *U/L*	399 [311;468]	398 [324;470]	405 [302;469]	0.90
C-Reactive Protein, *mg/dL*	8.1 [4.5;15.8]	6.3 [4.6;14.3]	11.4 [4.5;16.2]	0.36
D-Dimer, *ng/mL*	682 [506;1099]	582 [499;843]	695 [507;1431]	0.33
Pulmunary trombo-embolysm, *n (%)*	2 (4)	1 (6)	1 (3)	0.66
Supine position before prone position				
Respiratory rate, *acts/min*	20 [18;25]	21 [18;24]	19 [17;25]	0.59
pH	7.45 [7.43;7.47]	7.46 [7.43;7.49]	7.44 [7.42;7.47]	0.48
PaCO$_2$, *mmHg*	35.0 (3.8)	35.0 (3.9)	35.0 (3.8)	0.94
HCO$_3$$^-$, *mmol/L*	25.0 [24.0;27.1]	25.3 [23.4;27.0]	25.0 [24.0;27.8]	0.90
PaO$_2$/FiO$_2$	140 [108;169]	127 [98;151]	145 [108;195]	0.13
Prone position				
Respiratory rate, *acts/min*	19 (4)	21 (5)	19 (4)	0.19
PaO$_2$/FiO$_2$	246 (105)	287 (76)	224 (113)	**0.03**
Supine position after prone position				
Respiratory rate, *acts/min*	20 [18;25]	21 [18;24]	20 [16;25]	0.46
PaO$_2$/FiO$_2$, *mmHg/%*	157 [111;198]	188 [142;238]	128 [104;182]	**0.02**
Delta				
PaO$_2$/FiO$_2$ PP-SP1	98 (84)	161 (70)	63 (70)	**<0.01**
PaO$_2$/FiO$_2$ PP1-SP1, %	67 [21;113]	118 [93;165]	31 [10;73]	**<0.01**
PaO$_2$/FiO$_2$ SP2-SP1	13 [−9;44]	53 [31;92]	−4 [−21;13]	**<0.01**
PaO$_2$/FiO$_2$ SP2-SP1, %	9 [−6 ;36]	47 [32;69]	−2 [−13;9]	**<0.01**

Table S4. Chest CT parenchymal abnormalities and distribution (*Responders: PaO_2/FiO_2 S2>S1 more than 20%). Data indicates the percentage, if not otherwise specified, and are expressed as mean (standard deviation) or median [interquartile] according to their distribution. Significant difference in bold.

	All patients (*n* = 45)	Responders* (*n* = 16)	Non responders* (*n* = 29)	*p*-value
OVERALL				
Healthy parenchyma	50 (17)	53 (15)	48 (18)	0.38
Emphysema	0.02 [0.00;0.08]	0.00 [0.00;0.07]	0.03 [0.00;0.09]	0.20
Ground glass	44 (14)	41 (11)	46 (15)	0.22
Consolidation	4 [2;9]	4 [2;9]	4 [2;9]	0.94
Groung glass + consolidation	51 (16)	47 (15)	53 (17)	0.27
ANTERIOR				
Healthy parenchyma	61 (15)	63 (14)	59 (16)	0.43
Emphysema	0.01 [0.00;0.09]	0.01 [0.00;0.03]	0.02 [0.00;0.10]	0.34
Ground glass	37 (14)	35 (13)	38 (15)	0.50
Consolidation	1 [0;2]	1 [1;2]	1 [1;2]	0.87
Groung glass + consolidation	39 (15)	37 (14)	40 (16)	0.48
POSTERIOR				
Healthy parenchyma	38 (18)	43 (17)	35 (19)	0.16
Emphysema	0.00 [0.00;0.05]	0.00 [0.00;0.00]	0.01 [0.00;0.06]	**0.04**
Ground glass	51 (16)	47 (11)	54 (17)	0.14
Consolidation	7 [3;15]	7 [4;14]	7 [3;17]	0.96
Groung glass + consolidation	62 (18)	57 (17)	64 (19)	0.18
POSTERIOR/ANTERIOR RATIO				
Healthy parenchyma	0.6 (0.2)	0.7 (0.2)	0.6 (0.2)	0.11
Ground glass	1.5 (0.4)	1.5 (0.4)	1.5 (0.4)	0.76
Consolidation	4.4 [2.5;6.4]	4.8 [3.3;6.5]	4 [2;7]	0.75
Groung glass + consolidation	1.7 (0.4)	1.6 (0.4)	1.7 (0.4)	0.63