

Supplementary Table 1 The details of the primary disease

Primary disease		<i>n</i>
Congenital	Hemivertebra	2
	Block vertebra	1
	Undiagnosed skeletal dysplasia	1
Neuromuscular	Cerebral palsy	14
	Lennox-Gastaut syndrome	2
	Chiari malformation type I	2
	Spinal muscular atrophy type II	1
	Duchenne muscular dystrophy	1
Syndromic	Rett syndrome	1
	Turner syndrome	1
	Growth hormone deficiency	1
	Undiagnosed syndromic disorder (collagen-related disease suspected)	1

Supplementary Table 2 Comparison of clinical characteristics, spinal thoracic deformity parameters, and computed tomography-derived respiratory function parameters between idiopathic and neuromuscular scoliosis

		Idiopathic (N=25)	Neuromuscular (N=20)	P value
Age (years)	Median (range)	15 (12-30)	17 (11-26)	0.50
Gender	Male, n (%)	2 (10.5 %)	14 (70 %)	<0.001
Height (cm)		157 (154, 162)	144 (138, 153)	<0.001
Cobb angle (°)		47 (38, 65)	88 (74, 113)	<0.001
AVT (mm)		38 (24, 47)	85 (69, 96)	<0.001
AVB-R		0.67 (0.51, 0.78)	0.36 (0.14, 3.0)	0.12
RAml (°)		30 (21, 39)	64 (49, 103)	<0.001
RA sag (°)		14 (11, 22)	38 (30, 74)	<0.001
TLC% (%)		64 (59, 75)	35 (24, 45)	<0.001
Lung volume (ml)	Total	2865 (2548, 3421)	1174 (763, 1629)	<0.001
	Right	1560 (1376, 1888)	652 (417, 1022)	<0.001
	Right upper	496 (428, 603)	228 (159, 341)	<0.001
	Right middle	243 (192, 311)	124 (97, 171)	<0.001
	Right lower	778 (682, 1002)	252 (148, 518)	<0.001
	Left	1293 (1142, 1542)	498 (327, 776)	<0.001
	Left upper	714 (591, 815)	291 (187, 430)	<0.001
	Left lower	630 (512, 790)	230 (143, 362)	<0.001
Tracheal bifurcation	Min diameter (mm)	12.2 (10.9, 13.7)	11.1 (9.1, 13.1)	0.11
	Max diameter (mm)	18.5 (16.9, 19.9)	15.4 (13.5, 17.4)	0.003
	Area (mm ²)	190 (160, 213)	147 (105, 178)	0.006

Narrowest tracheal segment	Min diameter (mm)	12.1 (11.8, 13.1)	9.5 (5.6, 11.5)	<0.001
	Max diameter (mm)	14.1 (13.4, 15.6)	12.9 (9.4, 15.2)	0.06
	Area (mm ²)	140 (128, 166)	83 (47, 157)	0.02
Narrowest left bronchi	Min diameter (mm)	6.3 (5.1, 7.3)	5.0 (3.7, 5.6)	0.02
	Max diameter (mm)	8.6 (6.9, 10.3)	6.8 (5.2, 8.7)	0.03
	Area (mm ²)	45 (30, 64)	29 (16, 40)	0.02
Narrowest right bronchi	Min diameter (mm)	9.7 (7.8, 11.0)	7.7 (6.9, 8.9)	0.02
	Max diameter (mm)	13.1 (10.2, 15.3)	10.8 (8.9, 12.9)	0.02
	Area (mm ²)	97 (71, 142)	73 (52, 89)	0.01
Right-to-left bronchial length ratio		0.84 (0.80, 0.86)	0.85 (0.78, 0.87)	0.88

Abbreviations: apical vertebral translation (AVT), apical vertebral body-rib ratio (AVB-R), apical vertebral rotation relative to the midline (RAml), apical vertebral rotation relative to the sagittal plane (RASag), predicted total lung capacity (TLC%). Data are presented as median values with interquartile ranges.

Supplementary Table 3 Spearman's rank correlations between spinal thoracic deformity parameters and computed tomography-derived respiratory function parameters in the entire cohort

		Cobb angle		AVT		AVB-R		RAml		RASag	
		ρ	<i>P</i>	ρ	<i>P</i>	ρ	<i>P</i>	ρ	<i>P</i>	ρ	<i>P</i>
TLC%		-0.63	<0.001	-0.62	<0.001	0.36	0.008	-0.65	<0.001	-0.64	<0.001
Lung volume	Total	-0.61	<0.001	-0.59	<0.001	0.35	0.009	-0.65	<0.001	-0.64	<0.001
	Right	-0.60	<0.001	-0.60	<0.001	0.37	0.005	-0.66	<0.001	-0.67	<0.001
	Right upper	-0.57	<0.001	-0.56	<0.001	0.37	0.005	-0.63	<0.001	-0.68	<0.001
	Right middle	-0.45	0.006	-0.50	0.001	0.41	0.001	-0.55	<0.001	-0.55	<0.001

	Right lower	-0.58	<0.001	-0.58	<0.001	0.32	0.01	-0.62	<0.001	-0.64	<0.001
	Left	-0.62	<0.001	-0.56	<0.001	0.31	0.02	-0.62	<0.001	-0.60	<0.001
	Left upper	-0.59	<0.001	-0.59	<0.001	0.31	0.01	-0.63	<0.001	-0.63	<0.001
	Left lower	-0.64	<0.001	-0.55	<0.001	0.32	0.01	-0.62	<0.001	-0.57	<0.001
Tracheal bifurcation	Min diameter	-0.21	0.12	-0.27	0.047	0.21	0.12	-0.28	0.03	-0.27	0.04
	Max diameter	-0.52	<0.001	-0.45	<0.001	0.35	0.008	-0.46	0.004	-0.40	<0.001
	Area	-0.44	<0.001	-0.41	0.001	0.31	0.02	-0.44	0.008	-0.38	<0.001
Narrowest tracheal segment	Min diameter	-0.46	<0.001	-0.55	<0.001	0.38	0.003	-0.54	<0.001	-0.51	<0.001
	Max diameter	-0.29	0.03	-0.33	0.01	0.38	0.004	-0.40	0.002	-0.36	0.008
	Area	-0.34	0.01	-0.40	0.002	0.44	<0.001	-0.46	<0.001	-0.43	0.001
Narrowest left bronchi	Min diameter	-0.37	0.005	-0.38	0.004	0.24	0.07	-0.39	0.003	-0.33	0.01
	Max diameter	-0.39	0.003	-0.40	0.002	0.27	0.04	-0.42	0.001	-0.34	0.01
	Area	-0.38	0.004	-0.39	0.003	0.24	0.07	-0.41	0.001	-0.35	0.008
Narrowest right bronchi	Min diameter	-0.29	0.03	-0.35	0.009	0.10	0.44	-0.29	0.03	-0.24	0.08
	Max diameter	-0.31	0.02	-0.35	0.008	0.17	0.21	-0.33	0.01	-0.27	0.046
	Area	-0.34	0.01	-0.40	0.002	0.16	0.22	-0.36	0.006	-0.30	0.02
Right-to-left bronchial length ratio		0.16	0.23	0.18	0.19	-0.29	0.03	0.21	0.12	0.18	0.18

Abbreviations: apical vertebral translation (AVT), apical vertebral body-rib ratio (AVB-R), apical vertebral rotation relative to the midline (RAml), apical vertebral rotation relative to the sagittal plane (RASag), predicted total lung capacity (TLC%)

Supplementary Table 4 Spearman's rank correlations between spinal thoracic deformity parameters and computed tomography-derived respiratory function parameters in patients with neuromuscular scoliosis

		Cobb angle		AVT		AVB-R		RAml		RAsag	
		ρ	P	ρ	P	ρ	P	ρ	P	ρ	P
TLC%		-0.19	0.41	0.006	0.97	0.52	0.01	-0.14	0.54	-0.22	0.34
Lung volume	Total	-0.35	0.12	-0.07	0.77	0.51	0.02	-0.25	0.27	-0.24	0.31
	Right	-0.21	0.36	-0.01	0.95	0.47	0.04	-0.18	0.42	-0.21	0.35
	Right upper	-0.35	0.13	-0.03	0.91	0.52	0.02	-0.16	0.48	-0.18	0.43
	Right middle	-0.07	0.75	-0.02	0.91	0.28	0.22	-0.20	0.38	-0.25	0.27
	Right lower	-0.12	0.60	0.06	0.80	0.37	0.11	-0.09	0.69	-0.12	0.60
	Left	-0.48	0.03	-0.13	0.56	0.49	0.03	-0.29	0.20	-0.21	0.37
	Left upper	-0.44	0.053	-0.26	0.25	0.55	0.01	-0.37	0.10	-0.30	0.19
	Left lower	-0.50	0.02	-0.07	0.76	0.30	0.20	-0.29	0.20	-0.23	0.30
Tracheal bifurcation	Min diameter	-0.37	0.10	-0.32	0.15	0.28	0.22	-0.21	0.35	-0.17	0.46
	Max diameter	-0.43	0.055	-0.22	0.33	0.45	0.048	-0.27	0.23	-0.18	0.42
	Area	-0.47	0.04	-0.32	0.15	0.38	0.09	-0.27	0.24	-0.18	0.42
Narrowest tracheal segment	Min diameter	-0.05	0.82	-0.25	0.28	0.34	0.14	-0.26	0.26	-0.12	0.59
	Max diameter	-0.10	0.68	-0.26	0.26	0.36	0.12	-0.23	0.32	-0.09	0.68
	Area	-0.19	0.41	-0.32	0.16	0.49	0.03	-0.36	0.11	-0.25	0.28
Narrowest left bronchi	Min diameter	-0.20	0.39	-0.23	0.31	0.17	0.45	-0.16	0.48	-0.21	0.35
	Max diameter	-0.22	0.33	-0.22	0.33	0.26	0.26	-0.13	0.56	-0.20	0.38
	Area	-0.21	0.36	-0.27	0.23	0.15	0.51	-0.20	0.38	-0.27	0.23

Narrowest right bronchi	Min diameter	-0.27	0.24	-0.11	0.63	-0.02	0.93	-0.05	0.81	-0.07	0.75
	Max diameter	-0.22	0.33	-0.13	0.56	-0.13	0.56	-0.10	0.65	-0.04	0.84
	Area	-0.25	0.27	-0.15	0.52	-0.06	0.79	-0.10	0.64	-0.06	0.80
Right-to-left bronchial length ratio		0.15	0.51	0.12	0.61	-0.20	0.39	0.40	0.08	0.38	0.09

Abbreviations: apical vertebral translation (AVT), apical vertebral body-rib ratio (AVB-R), apical vertebral rotation relative to the midline (RAml), apical vertebral rotation relative to sagittal plane (RASag), predicted total lung capacity (TLC%)