

Supplementary Table 1. Characteristics of the study population according to chest pain at one-month post-surgery.

	Total (n=119)	W/o Chest Pain (n=69)	With Chest Pain (n=50)	P-value Total vs. w/o CP	P- value Total vs. w/CP	P-value w/o vs. w/CP
Demographics						
Age (years), mean \pm SD	40.7 \pm 14.6 ^{ps}	41.5 \pm	39.5 \pm 14.6 ^{ps}	0.710		
median	39.0	14.6 ^{ps}	38.0			
range	18 - 78	40.0	18 - 78			
		18 - 70				
Sex: female; n, (%)/male; n, (%)	70 (59) / 49 (41)	39 (56) / 30 (43)	31 (62) / 19 (38)	NS	NS	NS
Ratio F/M	1.43	1.30	1.63			
Clinical variables						
BMI (Kg/m ²), mean \pm SD	23.7 \pm 4.8	23.6 \pm 4.9	23.9 \pm 4.6	0.950		
median	23.1	23.5	22.2			
range	15.4 - 39.2	15.4 - 39.2	17.4 - 38.0			
Overweight; n, (%)	26 (22) ^{ps}	16 (23) ^{ps}	10 (20) ^{ps}	NS	NS	NS
Obesity; n, (%)	10 (8) ^{ps}	8 (12) ^{ps}	2 (4) ^{ps}	NS	NS	NS
Autoimmune disease; n, (%)	14 (12) ^{ps}	6 (9) ^{ps}	8 (16) ^{ps}	NS	NS	NS
Inflammatory diseases; n, (%)	20 (17) ^{ps}	10 (15) ^{ps}	10 (20) ^{ps}	NS	NS	NS
Type of Achalasia						
I; n, (%)	41 (34)	23 (33)	18 (36)	NS	NS	NS
II; n, (%)	76 (64)	44 (64)	32 (64)	NS	NS	NS
III; n, (%)	2 (2)	2 (3)	0 (0)	NS	NS	NS
Disease evolution (Months)						
mean \pm SD	26.0 \pm 26.8 ^{ps}	25.5 \pm 27.0	26.7 \pm 26.9 ^{ps}	1.0		
median	16.0	^{ps}	18.0			
range	1 - 144	14.0	2 - 115			
		1 - 144				
Symptoms						
Chest pain; n, (%)	50 (42)	0 (0)	50 (100)	<.00001	NS	<0.00001
Dysphagia; n, (%)	49 (41)	17 (25)	32 (64)	0.0265	0.0074	<0.00001
Regurgitation; n, (%)	23 (19)	9 (13)	14 (28)	NS	NS	NS
Questionnaires						
Eckart (score), mean \pm SD	1.9 \pm 2.0	1.2 \pm 1.3	3.0 \pm 2.3	0.007	0.001	<0.001
median	1.5	1.0	3.0			
range	0 - 12	0 - 6	0 - 12			
GERD-HRQL (score), mean \pm SD	4.3 \pm 5.1 3.0	3.1 \pm 4.5 2.0	5.9 \pm 5.4 4.5	NS	NS	0.001
median	0 - 24	0 - 22	0 - 24			

	range						
EAT-10 (score), mean ± SD	3.6 ± 5.6	2.1 ± 1.3	5.6 ± 7.1	NS	NS	0.004	
	median	2.0	1.0	3.0			
	range	0 - 35	0 - 6	0 - 35			
Viral exanthemata's childhood disease							
Chickenpox; n, (%)	83 (70) ^{ps}	49 (71) ^{ps}	34 (68)	NS	NS	NS	
Measles; n, (%)	39 (33) ^{ps}	26 (38) ^{ps}	13 (26)	NS	NS	NS	
Rubella; n, (%)	11 (9) ^{ps}	7 (10) ^{ps}	4 (8)	NS	NS	NS	
Hepatitis; n, (%)	3 (3) ^{ps}	3 (4) ^{ps}	0 (0)	NS	NS	NS	
Mumps; n, (%)	11 (9) ^{ps}	8 (12) ^{ps}	3 (6)	NS	NS	NS	
Environmental exposure							
Tobacco exposure; n, (%)	37 (31) ^{ps}	23 (33) ^{ps}	14 (28)	NS	NS	NS	
Biomass exposure; n, (%)	30 (25) ^{ps}	12 (17) ^{ps}	18 (36)	NS	NS	0.0316	
Laboratory Data							
Anti-nuclear antibodies; (%)	37/103 (36) _{ps}	20/59 (34) _{ps}	17/44 (39)	NS	NS	NS	
Neutrophil to lymphocyte ratio mean±SD	2.2 ± 1.3 ^{ps}	2.0 ± 1.1 ^{ps}	2.4 ± 1.5 ^{ps}	0.244			
	median	1.9	1.8	2.0			
	range	0.6 - 7.7	0.6 - 5.2	1.0 - 7.7			
Previous Treatments							
Pneumatic dilation; n, (%)	66 (56) ^{ps}	40 (58) ^{ps}	16 (32)	NS	NS	NS	
Pneumatic dilation sessions, mean ± SD	1.3 ± 0.7 ^{ps}	1.3 ± 0.7 ^{ps}	1.3 ± 0.5 ^{ps}	NS	NS	NS	
	median	1 - 3	1 - 3	1 - 2			
	range						
Diagnostic studies							
Barium swallow							
Esophageal dilatation (cm), mean ± SD	4.8 ± 1.6 ^{ps}	4.8 ± 1.7 ^{ps}	4.6 ± 1.5 ^{ps}	0.843			
	median	4.6	4.6	4.8			
	range	0.0 - 10.5	0.0 - 10.5	0.0 - 7.5			
Esophageal shape, n (%)							
Flask	81 (68) ^{ps}	47 (68) ^{ps}	34 (68) ^{ps}	NS	NS	NS	
Spindle	27 (23) ^{ps}	15 (22) ^{ps}	12 (24) ^{ps}	NS	NS	NS	
Sigmoid	11 (9) ^{ps}	7 (10) ^{ps}	4 (8) ^{ps}	NS	NS	NS	
Degree esophageal dilatation							
First degree [†] ; n, (%)	23 (19) ^{ps}	12(17) ^{ps}	11(22) ^{ps}	NS	NS	NS	
Second degree [†] ; n, (%)	59 (50) ^{ps}	33 (48) ^{ps}	26 (52) ^{ps}	NS	NS	NS	
Third degree [†] ; n, (%)	29 (24) ^{ps}	18 (26) ^{ps}	11 (22) ^{ps}	NS	NS	NS	
High-Resolution Manometry							

Basal LES pressure (mmHg), mean \pm SD	11.7 \pm 10.1 10.4	11.1 \pm 8.3 10.1	12.5 \pm 12.2 11.7	0.934		
median range	0.0 - 77.0	0.0 - 51.2	0.1 - 77.0			
Integrated relaxation pressure (IRP) (mmHg), mean \pm SD	7.9 \pm 5.0 7.7	8.2 \pm 5.7 7.8	7.5 \pm 4.0 7.4	0.992		
median range	0.0 - 33.2	0.0 - 33.2	1.5 - 17.0			
IRP > 15 mmHg; n, (%)	6 (5)	5 (7)	1 (2)	NS	NS	NS
Amplitude distal contractions, mean \pm SD	11.7 \pm 20.7 0.0	11.8 \pm 18.6 0.0	11.6 \pm 23.8 0.0	0.860		
median range	0.0 - 126	0 - 84.1	0.0 - 126.0			
Distal contractile integral (mmHg/s/cm), mean \pm SD	141.6 \pm	158.7 \pm	116.6 \pm 557.8	0.112		
median range	470.1 0.0 - 3528.0	404.3 0.0 -	0.0 0.0 - 3528.0			
		2809.0				

Surgical data

Fundoplication technique

Dor; n, (%)	69 (63)	36 (52)	33 (66)	NS	NS	NS
Toupet; n, (%)	56 (47)	33 (48)	23 (46)			

Intraoperative data

Esophageal myotomy (cm), mean \pm SD	6.0 \pm 0.7 6.0	6.0 \pm 0.7 6.0	6.0 \pm 0.7 6.0	NS	NS	NS
median range	4.0 - 7.0	4.0 - 7.0	4.0 - 7.0			
Gastric myotomy (cm), mean \pm SD	3.2 \pm 0.5 3.0	3.2 \pm 0.6 3.0	3.1 \pm 0.3 3.0			
median range	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0			
Full myotomy length (cm), mean \pm SD	9.2 \pm 0.8 9.0	9.1 \pm 0.8 9.0	9.1 \pm 0.7 9.0	NS	NS	NS
median range	7.0 - 12.0	7.0 - 12.0	7.0 - 11.0			
Dor Fundoplication length (cm), mean \pm SD	4.5 \pm 0.6 4.0	4.5 \pm 0.6 4.0	4.5 \pm 0.6 4.5			
median range	3.0 - 6.0	3.0 - 6.0	3.0 - 6.0			
Toupet Fundoplication length (cm), mean \pm SD	4.2 \pm 0.5 4.0	4.2 \pm 0.5 4.0	4.2 \pm 0.5 4.0	NS	NS	NS

median	3.0 - 6.0	3.0 - 6.0	3.0 - 5.0
range			

Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.

BMI: body mass index; cm: centimeter; DCI: distal; contractile integral; HRM: High-resolution manometry; IRP: Integrated relaxation pressure; Kg: kilogram; LES: Lower; esophageal sphincter; min: minute; mmHg: millimeters of mercury; NS: Not significant; ps: pre-surgery; s: second; SD: standard deviation; w/o: without, w/o CP: without chest pain; w/CP: with chest pain. †: First degree of dilatation (< 3.5 cm), second degree ($\geq 3.5 < 6$ cm), third-degree (≥ 6).

Supplementary Table 2. Characteristics of the study population according to chest pain at six-month post-surgery.

	Total (n=91)	W/O Chest Pain (n=50)	With Chest Pain (n=41)	P-value Total vs. w/o CP	P-value Total vs. w/CP	P-value w/o vs. w/CP
Demographics						
Age (years), mean ± SD	40.7 ±	39.0 ±	43.0 ±	0.551		
median	14.6 ^{ps}	14.4 ^{ps}	15.1 ^{ps}			
range	39.0 18 - 78	39.0 18 - 68	40.0 19 - 78			
Sex: female; n, (%)/male; n, (%)	59 (65) / 32 (35)	29 (58) / 21 (42)	30 (73) / 11 (27)			
Ratio F/M	1.84	1.38	2.72			
Clinical variables						
BMI (Kg/m ²), mean ± SD	25.5 ± 4.8	25.8 ± 5.4	25.3 ± 4.1	0.997		
median	25.3	24.6	25.5			
range	17.6 - 43.5	19.0 - 43.5	17.6 - 34.5			
Overweight; n, (%)	20 (22)	9 (18)	11 (27)	NS	NS	NS
Obesity; n, (%)	8 (9)	5 (10)	3 (7)	NS	NS	NS
Autoimmune disease; n, (%)	7 (8) ^{ps}	2 (4) ^{ps}	5 (12) ^{ps}	NS	NS	NS
Inflammatory diseases; n, (%)	16 (18) ^{ps}	6 (12) ^{ps}	10 (24) ^{ps}	NS	NS	NS
Type of Achalasia						
I; n, (%)	23 (25)	11 (22)	12 (29)	NS	NS	NS
II; n, (%)	66 (73)	37 (74)	29 (71)	NS	NS	NS
III; n, (%)	2 (2)	2 (4)	0 (0)	NS	NS	NS
Disease evolution (Months)						
mean ± SD	24.7 ± 24.1	23.9 ±	25.7 ± 23.7	0.806		
median	^{ps}	24.6 ^{ps}	^{ps}			
range	15.5 1 - 108	13.5 1 - 108	17.0 2 - 91			
Symptoms						
Chest pain; n, (%)	41 (45)	0 (0)	41 (100)	<0.00001	<0.00001	<0.00001
Dysphagia; n, (%)	50 (55)	23 (46)	27 (66)	0.3789	0.2587	0.0897
Questionnaires						
Eckart (score), mean ± SD	1.8 ± 1.8	1.1 ± 1.5	2.8 ± 1.8	<0.050	<0.050	<0.001
median	1.0	1.0	2.0			
range	0 - 9	0 - 8	0 - 9			
GERD-HRQL (score), mean ± SD	5.0 ± 6.0	3.3 ± 3.1	7.1 ± 7.9	0.071		
median	3.0	2.5	4.0			
range	0.0 - 33.0	0.0 - 13.0	0.0 - 33.0			
EAT-10 (score), mean ± SD	3.2 ± 5.5	1.3 ± 2.2	5.6 ± 7.2	NS	NS	0.002
median	1.0	1.0	4.0			

	range	0.0 - 36.0	0.0 - 11.0	0.0 - 36.0			
Viral exanthemata's childhood disease							
Chickenpox; n, (%)	69 (76) ^{ps}	39 (78) ^{ps}	30 (73) ^{ps}	NS	NS	NS	
Measles; n, (%)	33 (36) ^{ps}	16 (32) ^{ps}	17 (41) ^{ps}	NS	NS	NS	
Rubella; n, (%)	8 (9) ^{ps}	3 (6) ^{ps}	5 (12) ^{ps}	NS	NS	NS	
Hepatitis; n, (%)	2 (2) ^{ps}	1 (2) ^{ps}	1 (2) ^{ps}	NS	NS	NS	
Mumps; n, (%)	10 (1) ^{ps}	7 (14) ^{ps}	3 (7) ^{ps}	NS	NS	NS	
Environmental exposure							
Tobacco exposure; n, (%)	30 (33) ^{ps}	21 (42) ^{ps}	11 (27) ^{ps}	NS	NS	NS	
Biomass exposure; n, (%)	23 (25) ^{ps}	12 (24) ^{ps}	11 (27) ^{ps}	NS	NS	NS	
Laboratory Data							
Anti-nuclear antibodies; (%)	31/83 (37) ^{ps}	19/43 (44) ^{ps}	12/39 (31) ^{ps}	NS	NS	NS	
Neutrophil to lymphocyte ratio	2.3 ± 1.3 ^{ps}	2.2 ± 1.4 ^{ps}	2.3 ± 1.3 ^{ps}	0.995			
mean ± SD	2.0	2.0	2.0				
median	0.6 - 7.7	0.6 - 7.7	0.6 - 7.1				
range							
Previous Treatments							
Pneumatic dilation; n, (%)	56 (62) ^{ps}	29 (58) ^{ps}	27 (67) ^{ps}	NS	NS	NS	
Pneumatic dilation sessions,	1.2 ± 0.5 ^{ps}	1.3 ± 0.6 ^{ps}	1.0 ± 0.0 ^{ps}	NS	NS	NS	
mean ± SD	1.0	1.0	1.0				
median	1 - 3	1 - 3	1 - 1				
range							
Diagnostic studies							
Barium swallow							
Esophageal dilatation (cm), mean	4.6 ± 1.6 ^{ps}	4.8 ± 1.6 ^{ps}	4.3 ± 1.5 ^{ps}	0.707			
± SD	4.5	4.4	4.6				
median	0.0 - 10.5	2.0 - 10.5	0.0 - 6.5				
range							
Esophageal shape, n (%)							
Flask	61 (67) ^{ps}	34 (68) ^{ps}	27 (66) ^{ps}	NS	NS	NS	
Spindle	19 (21) ^{ps}	9 (18) ^{ps}	10 (24) ^{ps}	NS	NS	NS	
Sigmoid	11 (12) ^{ps}	7 (14) ^{ps}	4 (10) ^{ps}	NS	NS	NS	
Degree esophageal dilatation							
First degree [†] ; n, (%)	23 (25) ^{ps}	13 (26) ^{ps}	10 (24)	NS	NS	NS	
Second degree [†] ; n, (%)	48 (53) ^{ps}	27 (54) ^{ps}	21 (51)	NS	NS	NS	
Third degree [†] ; n, (%)	17 (19) ^{ps}	11 (22) ^{ps}	6 (15)	NS	NS	NS	
High-Resolution Manometry							
Basal LES pressure (mmHg),	12.8 ± 7.7	14.8 ± 8.8	10.5 ± 5.3	0.123			
mean ± SD	11.3	13.0	11.1				
median	0 - 39.2	0.1 - 39.2	0.0 - 20.8				
range							
Integrated relaxation pressure (IRP) (mmHg), mean ± SD	7.9 ± 4.5	8.6 ± 4.9	7.0 ± 3.9	0.664			

	median	7.8	7.6	7.8			
	range	0.0 - 23.3	1.2 - 23.3	0.0 - 13.6			
IRP > 15 mmHg; n, (%)		4 (4)	4 (8)	0 (0)	NS	NS	NS
Amplitude distal contractions,							
	mean ± SD	16.6 ± 32.7	19.0 ±	13.9 ± 27.3	0.931		
	median	0.0	36.9	0.0			
	range	0.0 - 201.5	0.0	0.0 - 130.7			
			0.0 - 201.0				
Distal contractile integral		235.3 ±	308.9 ±	152.0 ±	0.995		
(mmHg/s/cm), mean ± SD		923.5	1197.7	450.0			
	median	0.0	0.0	0.0			
	range	0.0 - 7750	0.0 - 7750	0.0 - 2188.7			
DeMeester score > 14.72; n,		13 (14)	7 (14)	6 (15)	NS	NS	NS
(%)							
DeMeester score > 14.72, mean		34.3 ± 24.6	21.8 ± 4.3	45.5 ± 29.6	NS	NS	0.044
± SD		23.7	21.7	34.1			
	median	16.1 - 109.0	16.1 - 28.9	22.0 - 109.0			
	range						

Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.

BMI: body mass index; cm: centimeter; DCI: distal; contractile integral; HRM: High-resolution manometry; IRP: Integrated relaxation pressure; Kg: kilogram; LES: Lower; esophageal sphincter; min: minute; mmHg: millimeters of mercury; NS: Not significant; ps: pre-surgery; s: second; SD: standard deviation; w/o: without, w/o CP: without chest pain; w/CP: with chest pain. †: First degree of dilatation (< 3.5 cm), second degree (≥ 3.5 < 6 cm), third-degree (≥ 6).

Supplementary Table 3. Characteristics of the study population according to chest pain at twelve-months post-surgery.

	Total (n=66)	W/O Chest Pain (n=37)	With Chest Pain (n=29)	P-value Total vs. w/o CP	P-value Total vs. w/CP	P-value w/o vs. w/CP
Demographics						
Age (years), mean ± SD	40.7 ±	40.7 ±	42.4 ±	0.915		
median	14.6 ^{ps}	14.9 ^{ps}	14.9 ^{ps}			
range	39.0	40.0	41.0			
	18 - 78	18 - 68	19 - 78			
Sex: female; n, (%)/male; n, (%)	37 (56) / 29 (44)	18 (49) / 19 (51)	19 (66) / 10 (34)			
Ratio F/M	1.28	0.95	1.94			
Clinical variables						
BMI (Kg/m ²), mean ± SD	26.8 ± 6.1	28.0 ± 6.7	25.0 ± 4.8	0.349		
median	26.4	28.0	24.8			
range	19.0 - 46.8	19.0 - 46.8	20.2 - 35.5			
Overweight; n, (%)	10 (15)	7 (19)	3 (10)	NS	NS	NS
Obesity; n, (%)	6 (9)	4 (11)	2 (7)	NS	NS	NS
Autoimmune disease; n, (%)	6 (9) ^{ps}	3 (8) ^{ps}	3 (10) ^{ps}	NS	NS	NS
Inflammatory diseases; n, (%)	6 (9) ^{ps}	2 (5) ^{ps}	4 (19) ^{ps}	NS	NS	NS
Type of Achalasia						
I; n, (%)	16 (24)	8 (22)	8 (28)	NS	NS	NS
II; n, (%)	48 (73)	27 (73)	21 (72)	NS	NS	NS
III; n, (%)	2 (3)	2 (5)	0 (0)	NS	NS	NS
Disease evolution (Months)						
mean ± SD	25.2 ±	24.6 ± 22.6	25.9 ± 16.0	NS	NS	0.004
median	24.4 ^{ps}	^{ps}	^{ps}			
range	1 - 108	2 - 108	1 - 96			
Symptoms						
Chest pain; n, (%)	29 (44)	0 (0)	29 (100)	<0.00001	<0.00001	<0.00001
Dysphagia; n, (%)	36 (55)	14 (38)	19 (66)	0.15	0.3717	0.0464
Questionnaires						
Eckart (score), mean ± SD	1.5 ± 1.6	0.8 ± 1.3	2.3 ± 1.7	<0.050	<0.050	<0.001
median	1.0	1.0	2.0			
range	0 - 7	0 - 6	0 - 7			
GERD-HRQL (score), mean ± SD	4.8 ± 6.2	3.9 ± 5.2	6.0 ± 7.2	0.150		
median	3.0	2.0	4.0			
range	0.0 - 35.0	0.0 - 25.0	0.0 - 35.0			

EAT-10 (score), mean ± SD	2.8 ± 4.9	2.2 ± 4.1	3.7 ± 5.6	0.072		
median	1.0	0.0	2.0			
range	0.0 - 29.0	0.0 - 21.0	0.0 - 29.0			
Viral exanthemata's childhood disease						
Chickenpox; n, (%)	52 (79) ^{ps}	31 (84) ^{ps}	21 (72) ^{ps}	NS	NS	NS
Measles; n, (%)	25 (38) ^{ps}	12 (38) ^{ps}	13 (45) ^{ps}	NS	NS	NS
Rubella; n, (%)	6 (9) ^{ps}	0 (0) ^{ps}	6 (21) ^{ps}	0.0853	0.1771	0.0052
Hepatitis; n, (%)	1 (2) ^{ps}	0 (0) ^{ps}	1 (3) ^{ps}	NS	NS	NS
Mumps; n, (%)	9 (14) ^{ps}	6 (16) ^{ps}	3 (10) ^{ps}	NS	NS	NS
Environmental exposure						
Tobacco exposure; n, (%)	22 (33) ^{ps}	14 (38) ^{ps}	8 (28) ^{ps}	NS	NS	NS
Biomass exposure; n, (%)	18 (27) ^{ps}	9 (27) ^{ps}	9 (31) ^{ps}	NS	NS	NS
Laboratory Data						
Anti-nuclear antibodies; n, (%)	25/61 (41) ^{ps}	15/34 (44) ^{ps}	10/26 (38) ^{ps}	NS	NS	NS
Neutrophil to lymphocyte ratio mean±SD	2.0 ± 0.9 ^{ps}	2.0 ± 0.9 ^{ps}	2.0 ± 0.9 ^{ps}	0.975		
median	1.9	1.9	1.8			
range	0.6 - 4.8	0.6 - 4.8	1.1 - 4.5			
Previous Treatments						
Pneumatic dilation; n, (%)	44 (67) ^{ps}	26 (70) ^{ps}	18 (62) ^{ps}	NS	NS	NS
Pneumatic dilation sessions, mean±SD	1.2 ± 0.6 ^{ps}	1.3 ± 0.7 ^{ps}	1.0 ± 0.0 ^{ps}	NS	NS	NS
median	1 - 3	1 - 3	1 - 1			
range						
Diagnostic studies						
 Barium swallow						
Esophageal dilatation (cm), mean ± SD	4.4 ± 1.7 ^{ps}	4.6 ± 1.8 ^{ps}	4.2 ± 1.5 ^{ps}	0.776		
median	4.3	4.4	4.1			
range	0.0 - 10.5	0.0 - 10.5	0.0 - 7.5			
Esophageal shape, n (%)	48 (73) ^{ps}	25 (67) ^{ps}	23 (79) ^{ps}	NS	NS	NS
Flask	10 (15) ^{ps}	5 (14) ^{ps}	5 (17) ^{ps}	NS	NS	NS
Spindle	8 (12) ^{ps}	7 (19) ^{ps}	1 (4) ^{ps}	NS	NS	NS
Sigmoid						
Degree esophageal dilatation						
First degree [†] ; n, (%)	13 (21) ^{ps}	7 (21) ^{ps}	6 (21)	NS	NS	NS
Second degree [†] ; n, (%)	39 (64) ^{ps}	21 (62) ^{ps}	18 (62)	NS	NS	NS
Third degree [†] ; n, (%)	9 (15) ^{ps}	6 (18) ^{ps}	3 (10)	NS	NS	NS
 High-Resolution Manometry						

Basal LES pressure (mmHg), mean ± SD	8.0 ± 5.4	9.8 ± 6.2	5.6 ± 3.7	0.606		
median	5.8	9.3	4.2			
range	2.8 - 17.1	3.6 - 17.1	2.8 - 9.8			
Integrated relaxation pressure (IRP) (mmHg), mean ± SD	5.2 ± 3.0	4.9 ± 3.5	5.7 ± 2.8	0.883		
median	6.5	4.8	6.5			
range	1.8 - 8.0	1.8 - 8.0	2.5 - 8.0			
IRP > 15 mmHg; n, (%)	0 (0)	0 (0)	0 (0)	NS	NS	NS
DeMeester score > 14.72; n, (%)	3 (5)	1 (3)	2 (7)	NS	NS	NS
DeMeester score > 14.72, mean ± SD	36.3 ± 25.0	15.8	46.6 ± 24.8	0.388		
median	29.1		29.1 - 64.1			
range	15.8 - 64.1					

Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.

BMI: body mass index; cm: centimeter; DCI: distal; contractile integral; HRM: High-resolution manometry; IRP: Integrated relaxation pressure; Kg: kilogram; LES: Lower; esophageal sphincter; min: minute; mmHg: millimeters of mercury; NS: Not significant; ps: pre-surgery; s: second; SD: standard deviation; w/o: without, w/o CP: without chest pain; w/CP: with chest pain. †: First degree of dilatation (< 3.5 cm), second degree (≥ 3.5 < 6 cm), third-degree (≥ 6).

Supplementary Table 4. Characteristics of the study population according to chest pain at twenty-four months post-surgery.

	Total (n=60)	W/O Chest Pain (n=32)	With Chest Pain (n=28)	P-value Total vs. w/o CP	P-value Total vs. w/CP	P-value w/o vs. w/CP
Demographics						
Age (years), mean ± SD	42.4 ±	42.4 ±	42.3 ±	0.970		
median	14.6 ^{ps}	14.0 ^{ps}	15.4 ^{ps}			
range	41.0	41.5	39.5			
	18 - 78	18 - 68	18 - 78			
Sex: female; n,	38 (63) /	20 (63) / 12	18 (64) / 10	NS	NS	NS
(%)/male; n, (%)	22 (37)	(37)	(36)			
Ratio F/M	1.73	1.67	1.80			
Clinical variables						
BMI (Kg/m ²), mean ± SD	27.3 ± 6.0	27.8 ± 6.6	26.7 ± 5.6	0.987		
median	26.0	26.0	26.3			
range	16.7 - 48.2	18.9 - 48.2	16.7 - 39.1			
Overweight; n, (%)	13 (22)	7 (22)	6 (21)	NS	NS	NS
Obesity; n, (%)	7 (11)	3 (9)	4 (14)	NS	NS	NS
Autoimmune disease; n, (%)	6 (10) ^{ps}	4 (12) ^{ps}	2 (7) ^{ps}	NS	NS	NS
Inflammatory diseases; n, (%)	12 (20) ^{ps}	7 (22) ^{ps}	5 (18) ^{ps}	NS	NS	NS
Type of Achalasia						
I; n, (%)	17 (28)	11 (35)	6 (21)	NS	NS	NS
II; n, (%)	41 (69)	19 (59)	22 (79)	NS	NS	NS
III; n, (%)	2 (3)	2 (6)	0 (0)	NS	NS	NS
Disease evolution (Months)						
mean ± SD	25.4 ±	24.1 ± 20.2	26.9 ± 28.6	0.959		
median	24.2 ^{ps}	^{ps}	^{ps}			
range	15.0	18.0	13.0			
	2 - 108	3 - 82	2 - 108			
Symptoms						
Chest pain; n, (%)	28 (47)	0 (0)	28 (100)	<.000001	<.000001	<.000001
Dysphagia; n, (%)	28 (47)	11 (34)	17 (61)	NS	NS	NS
Questionnaires						
Eckart (score), mean ± SD	1.9 ± 1.8	0.9 ± 1.2	3.0 ± 1.8	0.002	<0.001	<0.001
median	1.5	1.0	3.0			
range	0 - 9	0 - 6	1 - 9			
GERD-HRQL (score), mean ±	5.8 ± 6.0	4.5 ± 6.9	7.2 ± 4.3	NS	NS	0.003
SD	4.0	2.0	6.0			
median	0.0 - 30.0	0.0 - 30.0	2.0 - 16.0			
range						
EAT-10 (score), mean ± SD	3.8 ± 5.0	2.6 ± 4.9	5.1 ± 4.7	NS	NS	0.011
median	1.5	1.0	3.0			

	range	0.0 - 23.0	0.0 - 23.0	0.0 - 16.0			
Viral exanthemata's childhood disease							
Chickenpox; n, (%)		47 (78) ^{ps}	26 (81) ^{ps}	21 (75) ^{ps}	NS	NS	NS
Measles; n, (%)		26 (43) ^{ps}	12 (38) ^{ps}	14 (50) ^{ps}	NS	NS	NS
Rubella; n, (%)		7 (12) ^{ps}	2 (6) ^{ps}	5 (18) ^{ps}	NS	NS	NS
Hepatitis; n, (%)		1 (2) ^{ps}	0 (0) ^{ps}	1 (4) ^{ps}	NS	NS	NS
Mumps; n, (%)		8 (13) ^{ps}	6 (19) ^{ps}	2 (7) ^{ps}	NS	NS	NS
Environmental exposure							
Tobacco exposure; n, (%)		19 (32) ^{ps}	10 (31) ^{ps}	9 (32) ^{ps}	NS	NS	NS
Biomass exposure; n, (%)		16 (27) ^{ps}	9 (28) ^{ps}	7 (25) ^{ps}	NS	NS	NS
Laboratory Data							
Anti-nuclear antibodies; (%)		21/57 (37) ^{ps}	12/31 (39) ^{ps}	9/27 (33) ^{ps}	NS	NS	NS
Neutrophil to lymphocyte ratio mean±SD		2.3 ± 1.4 ^{ps}	2.0 ± 0.9 ^{ps}	2.7 ± 1.7 ^{ps}	0.391		
median		2.0	1.9	2.2			
range		0.6 - 7.7	0.6 - 4.8	1.1 - 7.7			
Previous Treatments							
Pneumatic dilation; n, (%)		44 (73) ^{ps}	23 (72) ^{ps}	21 (75) ^{ps}	NS	NS	NS
Pneumatic dilation sessions, mean ± SD		1.2 ± 0.6 ^{ps}	1.2 ± 0.7 ^{ps}	1.3 ± 0.5 ^{ps}	NS	NS	NS
median		1.0	1.0	1.0			
range		1 - 3	1 - 3	1 - 2			
Diagnostic studies							
Barium swallow							
Esophageal dilatation (cm), mean ± SD		4.5 ± 1.7 ^{ps}	4.4 ± 1.9 ^{ps}	4.5 ± 1.4 ^{ps}	0.780		
median		4.4	4.1	4.5			
range		0.0 - 10.5	0.0 - 10.5	0.0 - 7.5			
Esophageal shape, n (%)							
Flask		42 (70) ^{ps}	20 (63) ^{ps}	22 (79) ^{ps}	NS	NS	NS
Spindle		12 (17) ^{ps}	8 (24) ^{ps}	4 (17) ^{ps}	NS	NS	NS
Sigmoid		6 (13) ^{ps}	4 (13) ^{ps}	2 (4) ^{ps}	NS	NS	NS
Degree esophageal dilatation							
First degree [†] ; n, (%)		11 (21) ^{ps}	7 (26) ^{ps}	4 (14)	NS	NS	NS
Second degree [†] ; n, (%)		33 (63) ^{ps}	16 (59) ^{ps}	17 (61)	NS	NS	NS
Third degree [†] ; n, (%)		8 (15) ^{ps}	4 (15) ^{ps}	4 (14)	NS	NS	NS
High-Resolution Manometry							
Basal LES pressure (mmHg), mean ± SD		12.1 ± 6.1	13.5 ± 6.4	10.7 ± 5.5	0.968		
median		10.8	13.3	9.8			
range		2.2 - 24.7	2.6 - 24.7	2.2 - 21.0			

Integrated relaxation pressure (IRP) (mmHg), mean	7.6 ± 3.8	7.9 ± 3.6	7.4 ± 4.1	0.999		
± SD	7.2	8.4	6.2			
median	1.0 - 14.00	1.0 - 13.6	1.4 - 14.0			
range						
IRP > 15 mmHg; n, (%)	0 (0)	0 (0)	0 (0)	NS	NS	NS
Amplitude distal contractions, mean ± SD	9.7 ± 18.5	13.6 ± 22.3	5.7 ± 12.8	0.905		
median	0.0	0.0	0.0			
range	0.0 - 82.0	0.0 - 82.0	0.0 - 36.7			
Distal contractile integral (mmHg/s/cm), mean ± SD	128.4 ±	190.8 ±	63.3 ±	0.337		
median	346.1	441.3	195.6			
range	0.0	0.0	0.0			
	0 - 1993.0	0.0 - 1993.0	0.0 - 910			
DeMeester score > 14.72; n, (%)	11 (18)	6 (19)	5 (18)	NS	NS	NS
DeMeester score > 14.72, mean ± SD	32.7 ±	37.8 ± 20.8	26.7 ± 9.8	0.571		
median	17.0	34.4	23.5			
range	28.2	15.5 - 68.6	18.0 - 42.9			
	15.5 - 68.6					

Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.

BMI: body mass index; cm: centimeter; DCI: distal; contractile integral; HRM: High-resolution manometry; IRP: Integrated relaxation pressure; Kg: kilogram; LES: Lower; esophageal sphincter; min: minute; mmHg: millimeters of mercury; NS: Not significant; ps: pre-surgery; s: second; SD: standard deviation; w/o: without, w/o CP: without chest pain; w/CP: with chest pain. †: First degree of dilatation (< 3.5 cm), second degree (≥ 3.5 < 6 cm), third-degree (≥ 6).

Supplementary Table 5. A multiple linear regression analysis

R	R ²	Adjusted R ²	Standard error of the estimate
0.95	0.89	0.79	0.3

Supplementary Table 6. ANOVA

Model	df	F	p
Regression	12	8.36	<.001

Supplementary Table 7. Coefficients of the multiple linear regression analysis

Model	not standardized Coefficients		Standard error	t	p
	B	Beta			
(Constant)	1.2		0.53	2.25	0.044
Aye (years)	-0.02	-0.41	0.01	-3.31	0.006
Disease evolution (months)	0.01	0.22	0	1.33	0.21
BMI (kg/m ²)	0	0.04	0.01	0.36	0.722
GERD-HRQL	0.12	0.9	0.05	2.48	0.029
GERD pyrosis	-0.18	-0.84	0.06	-2.95	0.012
EAT-10	-0.06	-0.43	0.03	-2.22	0.046
ECKARDT	0.52	1.6	0.09	5.66	<0.001
Dysphagia	-0.72	-0.95	0.2	-3.64	0.003
Basal LES pressure (mmHg)	-0.03	-0.22	0.02	-1.48	0.164
IRP (mmHg)	-0.01	-0.08	0.03	-0.46	0.652
Amplitude distal contractions	-0.01	-0.21	0.01	-0.72	0.483
DCI (mmHg/s/cm)	-0	-0.22	0	-0.83	0.425

BMI: body mass index; cm: centimeter; DCI: distal; contractile integral; HRM: High-resolution manometry; IRP: Integrated relaxation pressure; Kg: kilogram; LES: Lower; esophageal sphincter; min: minute; mmHg: millimeters of mercury; w/o: without, w/o CP: without chest pain; w/CP: with chest pain.