

CHANGES OF COSTOCLAVICULAR SPACE AFTER MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM

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Objective

Thoracic outlet syndrome, which occurs due to compression of the neurovascular bundle, has been recently reported after minimally invasive repair of pectus excavatum (MIRPE). The aim of the study is to analyze the postoperative changes of the costoclavicular space after MIRPE.

Methods

We performed a retrospective review of 203 patients who had undergone MIRPE in our hospital. The costoclavicular space was measured as the shortest distance between the first rib and the clavicle on a sagittal view of the 3D chest CT. The differences of the costoclavicular spaces by defect types, number of bars, and patient age were also investigated. The Wilcoxon signed-rank test was used to compare differences between

preoperative and postoperative parameters. Kruskal-Wallis tests were performed to compare differences among groups in, type of PE, and number of inserted bars and patient age.

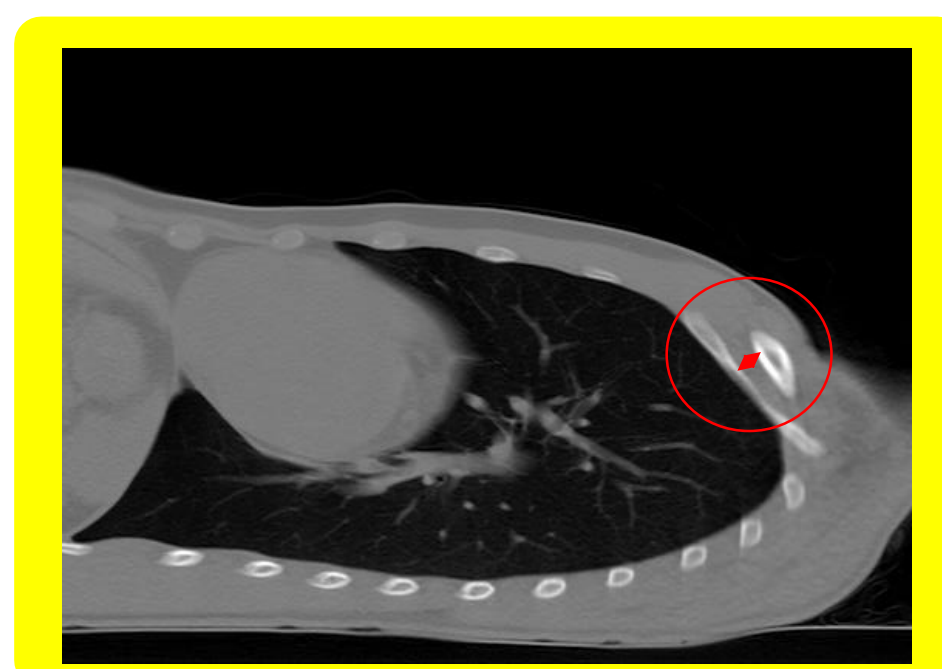


Fig. 1. Measurement of the shortest distance of the costoclavicular space

Results

Average age of the 203 patients (167 men, 36 women) was 14.3 years old. Fifty five patients had symmetric defects and 148 patients had asymmetric defects. Single bar was inserted in 60 patients and multiple bars were inserted in 143 patients.

The postoperative shortest distances were decreased than their preoperative values on both sides (differences between preoperative and postoperative shortest distance; left side: 1.3 mm, $p < 0.0001$; right side: 0.1 mm, $p < 0.0001$). There were no significant differences in these variables among groups by defect type, number of bars and patient age.

Table 1. Patient characteristics

Variable	No. of patients [percentage]
Age (years)	
≤6	47 [23.2]
7-12	20 [9.9]
≥13	136 [67.0]
Sex	
Male	167 [82.3]
Female	36 [17.7]
Defect type	
Symmetric	55 [27.1]
Asymmetric	148 [72.9]
Number of Bar	
Single	60 [29.6]
Multiple	143 [70.4]

Table 2. Differences between preoperative and postoperative variables

Variables (n=161)	Mean	Range	p-value*
Haller index	1.2	0.8-1.9	< 0.0001
Shortest distance (mm)			
Right	1.0	0.5-2.1	< 0.0001
Left	1.3	0.5-2.5	< 0.0001

*The Wilcoxon signed-rank test was completed. Statistical significance was defined as $p < 0.05$.

Table 3. Differences in variables by defect type, number of bars, and patient age

Variables	Defect type			Bars			Age (years)			
	Symmetric	Asymmetric	P*	Single	Multiple	P*	≤ 6	7-12	≥ 13	P*
N	55	148		60	143		47	20	136	
HI	1.38	1.14	0.20	1.03	1.17	0.45	1.53	0.87	1.15	<0.01
RSD	1.06	0.99	0.79	0.97	1.02	0.91	1.34	0.79	1.06	0.62
LSD	1.23	1.31	0.66	0.97	1.35	0.16	1.07	0.80	1.33	0.23

*Kruskal-Wallis tests were completed. HI = Haller index; RSD = right shortest distance; LSD = left shortest distance.

Statistical significance was defined as $p < 0.05$.

Conclusion

Narrowing of costoclavicular space following MIRPE was observed in pectus excavatum surgery. Further research will be necessary to determine the relationship between these observations and symptoms for thoracic outlet syndrome after MIRPE.

Relevant Financial Relationship
Disclosure Statement

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