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Evaluation of Pulmonary Functions in Children with Post-op Congenital Lung Malformations in Long Term Follow Up

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Objectives: Congenital lung malformations (CLM) are rare, heterogeneous group of disorders that consist of abnormal lung development. Surgical resection is the definitive treatment for these lesions. After resection of abnormal congenital lesion, it is expected that lung volumes and functions will improve due to compensatory lung growth and regeneration. Our aim is to evaluate the lung functions of patients who underwent lobectomy for CLM in long term follow-up by comparison to normal healthy children, by using spirometry and Lung Clearance Index (LCI)

Methods: 16 children, between the ages of 7-21, with CLM who had undergone surgical resection and 12 healthy children, between the ages of 7-18, as a control group were included in our study. All patients evaluated by their demographic data, physical examination findings and pulmonary function tests. Spirometric and LCI measurements performed in all participants and compared with each other.

Results: Of these 16 patients, 9 (56.2%) were boys and 7 (43.8%) were girls, median age was 8.75 years (min:6.5, max 21.25). The median age at the time of operation was 14 months (min:1, max 168) and mean post-op follow-up duration was 80.06±31 months. 68.75% of patients had congenital pulmonary airway malformations, 12.5% had bronchogenic cyst, 6.25% had bronchopulmonary sequestration, 6.25% had congenital lobar emphysema and 6.25% had combine pulmonary airway malformations and sequestration. In the healthy control group, 4 (33.3%) of the children were boys and 8 (66.6%) children were girls, median age was 12 years (min:8.5, max 17.5). The pulmonary function measurements of the participants exhibited mean predicted FEV1 was 86,25±16,88% in post operative CLM patients and 101.75+11.5% in the control group. Both groups results were spirometrically normal. By means of FEV1%, post-operative CLM patients group had significantly lower values than healthy control grup (p:0.014). Comparing the two groups by assessing LCI, median LCI values in post –op CTM patients' group were at 8.27 (min:6.39 max:11.50) and 7.55 (min:7.1 max:10.4) in healthy control group. Patients' LCI values were not statistically significant when compared with healthy control group. (p:0.548). Also, there was a strong inverse correlation between LCI and FEV1 (p: 0.014) in patients who underwent surgery for CLM.

Conclusion: Our study showed that, in long term follow –up's, patients who underwent surgery for CLM will not occur airway disease and show no differences in pulmonary function tests by comparing healthy children and LCI was more accurate detecting airway diseases than spirometry.

Keywords: Congenital lung malformations, lung clearance ındex, lung function test