



三维CT评价特发性脊柱侧凸患者术后肺形态学变化的研究

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Assessment of lung morphology in adolescent idiopathic scoliosis following posterior spinal fusion by three - dimensional computed tomography

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摘要 目的 利用三维CT评价特发性脊柱侧凸患者脊柱后路内固定融合术后肺容积、肺高度、顶椎平面肺横截面积和凸侧/凹侧肺容积比的变化,探讨特发性脊柱侧凸患者矫形术后肺容积与肺功能之间的关系。方法 自2009年4至2013年8月,共30例符合入选标准的患者纳入研究。男9例,女21例;年龄11.3~18.0岁,平均15.7岁。Lenke分型: I型19例、 II型4例、 III型7例。Risser征: 3级11例、4级7例、5级12例。所有患者均于术前和术后1周左右进行脊柱三维CT扫描,CT扫描时患者仰卧位并保持深吸气末期。将所有CT扫描的资料导入工作站,利用Syngo软件分别测量肺容积、肺高度和顶椎平面肺横截面积。结果 特发性脊柱侧凸患者术前左侧肺高度为(21.4±2.6)cm,术后为(22.6±2.5)cm;右侧肺高度术前为(21.9±2.1)cm,术后增加至(22.7±2.7) cm。术前的顶椎平面肺横截面积为(232.9±43.6) cm²,术后减小至(223.1±38.4) cm²。左侧肺容积、右侧肺容积、总肺容积以及凸侧/凹侧肺容积比的手术前后改变均无统计学意义。左肺高度、右肺高度和顶椎平面肺横截面积的改变与患者的性别、年龄、Lenke分型、Risser征、主胸弯的矫正率以及胸椎后凸的矫正率之间无明显的相关性。结论 特发性脊柱侧凸患者后路内固定融合术后即刻发生了肺形态的变化,但术后即刻肺容积没有变化,仅表现为肺高度的增加。

关键词: 脊柱侧凸 青少年 脊柱融合术 肺 成像, 三维 体层摄影术,螺旋计算机

Abstract: Objective To evaluate the changes in the lung volume, lung height, convex to concave lung volume ratio and pulmonary cross-sectional area of apical vertebral plane after posterior spinal fusion and to further analyse the relation between postoperative lung volume and pulmonary function. Methods From April 2009 to August 2013, a total of 30 patients were involved in this study. There were 9 males and 21 females, whose age ranged from 11.3 to 18.0 years old, with an average age of 15.7 years. The Risser sign of the subjects were 11 Risser III, 7 Risser IV, 12 Risser V, while the Lenke's classification were 19 Lenke I, 4 Lenke II and 7 Lenke III. All scans were obtained during deep inspiration breath-hold in supine position and performed both preoperatively and a week after operations. Then, we used Syngo software to manage the computed tomography scan imaging and to calculate the lung volume, the lung height and the pulmonary cross-sectional area of apical vertebral plane. Results Left lung height increased from (21.4±2.6) cm to (22.6±2.5) cm postoperatively. Right lung height was (21.9±2.1) cm while it increased to (22.7±2.7) cm postoperatively. The pulmonary cross-sectional area of apical vertebral plane decreased to (223.1±38.4) cm² postoperatively. Left lung volume, right lung volume, total lung volume and convex to concave lung volume ratio showed no statistically significant difference. The changes in left and right lung height and the pulmonary cross-sectional area of apical vertebral plane showed no significant correlation with patients` sex, age, Lenke's classification, Risser sign, and the correction of predominant thoracic curve or kyphosis angle from T₅ to T₁₂. Conclusion The current study demonstrates the changes in lung morphology in AIS patients a week after posterior spinal fusion. It shows that lung height in AIS patients immediately increases postoperatively. However, the postoperative lung volume shows no statistical difference.

Key words: Scoliosis Adolescent Spinal fusion Lung Imaging, three->dimensional Tomography, spiral computed

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付君,张永刚,施新革等. 三维CT评价特发性脊柱侧凸患者术后肺形态学变化的研究[J]. 中华骨科杂志, 2014, 34(5): 525-530.

Fu Jun,Zhang Yonggang,Shi Xinge et al. Assessment of lung morphology in adolescent idiopathic scoliosis following posterior spinal fusion by three - dimensional computed tomography[J]. Chin J Orthop, 2014, 34(5): 525-530.

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