



矫形棒刚度与置钉密度对Lenke 1型特发性脊柱侧凸矫正率的影响

刘辉,郑召民,王建儒,王华,李泽民,杨豪,丁文彬,李思贝,李秉学

510080 广州,中山大学附属第一医院脊柱外科

Effect of rod stiffness and screw density on correction rate of Lenke type 1 adolescent idiopathic scoliosis

LI U Hui,ZHENG Zhao-min,WANG Jian-ru,WANG Hua,LI Ze-min,YANG Hao,DING Wen-bin,LI Si-bei,LI Bing-xue.

Department of Spine Surgery, the First Affiliated Hospital of Sun Yat-sen University, Guangzhou 510080, China

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摘要 目的 探讨矫形棒刚度与置钉密度对Lenke 1型特发性脊柱侧凸矫正率的影响。方法 2008年7月至2012年7月应用后路椎弓根钉技术进行矫形的资料完整的Lenke 1型特发性脊柱侧凸患者48例,男10例,女38例;年龄12~21岁,平均(15.65±3.21)岁。手术前及术后1周脊柱全长正侧位X线片上测量冠状面主弯Cobb角、矢状面后凸Cobb角(T₅~T₁₂)、融合节段数与置钉总数。将病例分为四组:低刚度矫形棒+低置钉密度组13例,低刚度矫形棒+高置钉密度组10例,高刚度矫形棒+高置钉密度组14例,高刚度矫形棒+低置钉密度组11例。比较各组冠状面矫正率与矢状面胸后凸矫正率的差异。结果 低刚度矫形棒+低置钉密度组冠状面矫正率为79.78%±6.89%,矢状面胸后凸矫正率为-53.02%±12.37%;低刚度矫形棒+高置钉密度组分别为80.09%±6.28%, -3.76%±41.58%;高刚度矫形棒+高置钉密度组分别为84.48%±8.06%, 46.25%±49.81%;高刚度矫形棒+低置钉密度组分别为79.35%±6.80%, -8.63%±42.69%。四组冠状面矫正率的差异无统计学意义;四组矢状面矫正率除低刚度矫形棒+高置钉密度组与高刚度矫形棒+低置钉密度组外,其他组间差异均有统计学意义。结论 矫形棒刚度与置钉密度对Lenke 1型特发性脊柱侧凸矫正率的影响主要体现在矢状面上,对冠状面矫正率无明显影响;高刚度矫形棒与高置钉密度能显著提高矢状面矫正率。

关键词: 脊柱侧凸 青少年 矫形外科手术

Abstract: Objective To investigate the effect of rod stiffness and screw density on correction rate in Lenke type 1 adolescent idiopathic scoliosis (AIS). Methods A total of 48 patients with Lenke type 1 AIS, who had undergone surgical correction with pedicle screws from July 2008 to July 2012, were analyzed in this study. There were 10 males and 38 females, aged from 12 to 21 years (average, 15.65±3.21 years). The standing anteroposterior and lateral X-rays of whole spine were obtained before surgery and at 1 week after surgery. The following parameters were measured: 1) coronal Cobb angle of the major curve; 2) sagittal Cobb angle (T₅-T₁₂); 3) number of fusion segments and screws instrumented vertebrae. All cases were divided into 4 groups: low stiffness rod with low screw density (number of screws per fusion segment/20.60) group (10 cases); high stiffness rod with high screw density group (14 cases); high stiffness rod with low screw density group (11 cases). The coronal and sagittal correction rates were compared among 4 groups. Results The correction rate of coronal and sagittal Cobb angle was respectively 79.78%±6.89% and -53.02%±12.37% in low stiffness rod with low screw density group, 80.09%±6.28% and -3.76%±41.58% in low stiffness rod with high screw density group, 84.48%±8.06% and 46.25%±49.81% in high stiffness rod with high screw density group, and 79.35%±6.80% and -8.63%±42.69% in high stiffness rod with low screw density group. There was no significantly statistical difference in coronal correction rate between four groups ($F=1.533$, $P=0.219$). The difference in sagittal correction rate was not significant between low stiffness rod with high screw density group and high stiffness rod with low screw density group (-3.76%±41.58% and -8.63%±42.69%, $P=0.654$), but significant among other groups. Conclusion For Lenke type 1 AIS patients, rod stiffness and screw density mainly influence the sagittal correction rate rather than coronal correction rate. High stiffness rod and high screw density could significantly increase the sagittal plane correction rate.

Key words: Scoliosis Adolescent Orthopedic procedures

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