



## 成人髋关节发育不良不同Crowe分型的三维CT影像学特征

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Study on relationship between Crowe type and 3D CT reconstruction evaluation for adults with developmental dysplasia of the hip

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**摘要** 目的 通过三维CT重建分析成人髋关节发育不良不同Crowe分型之间髋臼形态的演变规律。方法 2010年6月至2013年1月收治成人髋关节发育不良患者62例68髋,男6例8髋,女56例60髋;年龄47~59岁,平均(53.7±5.8)岁。Crowe I型14例17髋,II型17例17髋,III型15例17髋,IV型16例17髋。行标准髋关节CT扫描及三维重建。在侧位三维图像上标记Harris窝,确定髋臼旋转中心,利用十字坐标轴确定髋臼旋转中心的冠状面和横断面位置;在正位三维图像上利用Ranwant三角确定髋臼旋转中心的矢状面位置;在髋臼水平重建图像上确定髋臼旋转中心。观察髋臼前后缘增生及髋臼前后柱发育不良程度,测量并比较不同Crowe分型患者的髋臼前倾角、前覆盖角、后覆盖角和内壁宽度。结果 随Crowe分型增加,髋臼前倾角逐渐加大,两者呈正相关,除Crowe I型和II型组间外,其余组间差异有统计学意义;髋臼前覆盖角逐渐减小,两者呈负相关,各组间差异均有统计学意义,Crowe III、IV型组平均值小于50°;髋臼后覆盖角逐渐减小,两者呈负相关,各组间差异均有统计学意义,Crowe III、IV型组平均值小于90°;髋臼内壁宽度逐渐增加,两者呈正相关,各组间差异均有统计学意义。结论 不同Crowe分型成人髋关节发育不良的髋臼形态变化存在一定的演变规律。对Crowe I型和II型髋臼的重建可充分利用髋臼前后柱骨量,对Crowe III、IV型髋臼的重建可适度上移和(或)内移髋臼中心。

关键词: 髋臼 髋脱位 先天性 体层摄影术 X线计算机

**Abstract:** Objective To analyze the evolution of acetabular morphology changes of different Crowe types among adults with developmental dysplasia of the hip through standard hip 3D CT reconstruction. Methods From June 2010 to January 2013, there were 62 patients with 68 hips (8 hips of 6 male cases, 56 female cases of 60 hips) diagnosed as acetabular dysplasia in our hospital, with an average age of 53.7±5.8 years old (range, 47-59 years). According to Crowe classification, there were 14 cases (17 hips) of Crowe type I, 17 cases (17 hips) of Crowe type II, 15 cases (17 hips) of Crowe type III, and 16 cases (17 hips) of Crowe type IV. Through standard hip 3D CT reconstruction, Harris nest in the pelvic side 3D image was marked, and the coronal and horizontal position of acetabular rotation center was determined by using the cross axis; secondly, in the anteroposterior 3D image (by gray level adjustment to the shape of X ray perspective effect) through Ranwant triangulation, sagittal position of the center of rotation of the hip joint was determined; finally, the acetabular rotation center in the acetabular horizontal reconstruction plane. The bone stock of anterior and posterior columns of acetabular was observed and acetabular anteversion, front cover angle, rear cover angle and medial wall thickness were measured. Results 1) With Crowe type increased, acetabular anteversion angle gradually increased as well, and there was a positive correlation between them with statistically significant ( $P<0.05$ ) except in Crowe I and II group. 2) With Crowe type increased, anterior acetabular coverage angle was significantly decreased; the mean anterior acetabular coverage angle of Crowe III and IV groups was less than 50°. 3) With Crowe type increased, posterior acetabular coverage angle was decreased significantly as well the mean posterior acetabular coverage angle of Crowe III and IV groups was less than 90°. 4) With Crowe type increased, acetabular medial wall thickness was increased significantly. Conclusion Adult acetabular morphology changes between different Crowe types in patients with developmental dysplasia of the hip. For acetabular reconstruction of Crowe I and II, we could make full use of the

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acetabular bone stock of anterior and posterior column; for acetabular reconstruction of Crowe III and IV, we could moderately shift the acetabular center superiorly and (or) medially.

Key words: Acetabulum Hip dislocation, congenital Tomography, X-ray computed

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