

·专家述评·

发育性髋关节发育不良病人的全髋关节置换术： 探索，挑战，求精

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发育性髋关节发育不良(developmental dysplasia of the hip, DDH)是导致继发性髋关节炎的常见原因,终末期病人往往需要接受全髋关节置换术(total hip arthroplasty, THA)以解决患肢疼痛,提高生活质量^[1-3]。虽然据文献报道,THA治疗不同程度的发育性髋关节脱位均可达到令人满意的临床结果,但由于此类病人往往呈现出不同程度的异常解剖形态,其THA手术极具挑战性,术后并发症的发生率也更高^[4,5]。与此同时,除了解剖学异常,此类病人往往在较为年轻时就出现临床症状,其接受初次THA术后或许还会面临翻修术^[6]。基于这些挑战,详尽地评估病人解剖形态,采取正确的手术方式,选用合适的假体都是保证手术成功的重要前提。

一、解剖形态异常

DDH病人的髋臼发育较浅,形态呈卵圆形,髋臼顶部往往过度倾斜,髋臼角度加大。随着脱位程度的增加,髋臼外上方骨量进一步减少,而髋臼内壁骨量增多^[7]。基于以上解剖学异常,髋臼对股骨头的覆盖程度减少。与正常人相比,DDH病人髋臼前倾角度可以呈无明显变化或轻度增加,即便髋臼前倾角度增加,其与DDH病人股骨颈前倾角增加的程度相比,并不明显^[8]。与正常人群相比,DDH病人股骨颈前倾角度增加并且变化范围较大,有研究表明,

DDH病人股骨前倾角的度数从 -3.2° 到 58.2° 不等,平均为 22.2° (正常人群为 10.8°)^[9]。同时,DDH病人股骨髓腔在内外和前后两个平面均较窄,随着半脱位程度的增加,股骨髓腔旋转异常增加,股骨偏心距减少^[10]。除此以外,DDH病人往往合并大转子向后方移位,股骨颈短缩及髓内翻畸形,病人股骨头失去原有正常形态,呈现扁平状^[11,12]。伴随着髋臼及股骨形态的异常改变,DDH病人的骨盆发育也受到影响^[13,14]。Bilgen等^[15]发现,DDH病人的骨盆解剖形态改变呈现为髋臼区域增加,而髂翼部和坐耻部发育不全。本期DDH系列研究中,陈云苏团队通过分析对比165例单侧DDH病人和40例正常对照者病人骨盆及各部位的高度,发现DDH影响整个骨盆解剖的发育,髋关节发育不良程度越大,骨盆不对称性和各部位的变化越明显。在单侧Crowe III、IV型DDH病人的THA术中,推荐使用髂髂远侧关节连线作为参考线,以平衡下肢长度。除了骨性结构解剖学异常,DDH病人髋周软组织也有异常改变。病人外展肌走行趋于横向;腰大肌肌腱、髋关节囊、圆韧带及孟唇异常肥厚;内收肌、股直肌短缩。在单侧DDH病人中,与健侧相比,患侧坐骨神经走行远离股骨,靠近坐骨和髂骨^[16]。

二、分型

在诸多DDH分型中,临床中最为常用的是Crowe分型和Hartofilakidis分型^[17,18]。Hartofilakidis分型分为三型:I型指股骨头仍然位于真臼内;II型

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也称低位脱位,指股骨头向上脱出,与假臼形成关节,但股骨头下缘与真臼上缘仍有接触;Ⅲ型也称高位脱位,指股骨头完全脱出于真臼,股骨头不与髌臼形成关节。Crowe分型基于影像学上股骨头向近端的移位程度,共分为四型,将泪滴连线与股骨头颈交界处的垂直距离定义为移位距离,根据患侧移位距离与对侧股骨头高度的比值进行分型,小于50%为Ⅰ型,50%~75%为Ⅱ型,75%~100%为Ⅲ型,大于100%为Ⅳ型。

三、髌臼侧重建

鉴于髌臼侧解剖标志往往较为模糊,髌臼侧假体植入具有一定难度,骨科医生往往需要综合考虑,在髌臼假体大小、外展角、前倾角和髌臼假体覆盖程度中作出平衡。为了保证髌臼对假体的覆盖和髌臼的稳定性,有学者提出可以作出适当妥协,将髌臼假体安放于高于理想旋转中心的位置,高旋转中心也可以重建偏心距,获得良好的长期随访结果^[19-21]。Kaneuji等^[22]研究表明,相比正常旋转中心,将旋转中心置于高出泪滴20 mm时,两者的聚乙烯磨损情况并无明显差异。然而,Bicanic等^[23]发现,旋转中心每上移1 mm,髌部负荷将增加近0.1%,此种情形下,骨量一般不充足,与外展肌力臂相比,病人自身重量的力臂要长许多,进而导致髌关节过度负荷。同时,髌臼假体承受的剪切力可能会导致早期松动,对于单侧DDH病人,将髌臼假体安置于高旋转中心,会进一步加重跛行,引起下肢不等长的出现。更多的学者推崇将髌臼假体放在真臼位置,此时髌臼外上方对假体的覆盖往往有不同程度的欠缺。Dunn等^[24]提出可以髌臼内陷技术将髌臼杯位置内移以增加髌臼外上方对假体的覆盖程度。一些学者提出,髌臼外上方对假体覆盖的欠缺程度介于20%~50%是可以接受的,并不影响假体稳定性及生存率^[25-27]。若未覆盖程度较大,可以采用结构性植骨或于髌臼外上方安置金属垫块以支撑未被覆盖的髌臼假体。研究表明,采用术中自体股骨头进行结构性植骨,10年生存率高达94%^[28-30]。本期DDH系列研究中,何川团队随访18例采用THA合并自体股骨头旋转植骨技术治疗CroweⅢ、Ⅳ型病人,平均随访40.8个月,植骨愈合率高,临床效果令人满意。

采用骨小梁金属则可以避免诸如结构性植骨和特殊定制假体的使用,同时骨小梁金属可以在有限接触面积下获得骨长入,提供牢固的生物固定,但是其缺点在于一旦出现感染,取出假体将面临困难^[31,32]。本期DDH系列研究中,孙立团队比较了37

例Ⅱ、Ⅲ型DDH病人行THA的临床疗效,发现通过标准的结构性植骨原臼重建或适度升高内移髌关节旋转中心来处理Ⅱ、Ⅲ型DDH行THA的髌臼侧骨缺损,都是可靠的临床选择。鉴于DDH病人髌臼侧解剖形态的改变,选择合适的假体固定方式也极为重要。文献报道,髌臼侧采用骨水泥型固定方式,松动率及假体失败率较高。这或许与病人年龄较轻、活动量较大及骨性支撑不足有关^[33]。所以,目前髌臼侧普遍采用生物型固定方式,如有必要,可以加用螺钉以提供更好的初始稳定性,直至骨长入出现。

四、柄侧重建

DDH病人股骨前倾角增加,了解了病人这一解剖特点后,采用初次普通柄或组配式柄均可纠正前倾,获得合适的髌关节生物力学。对于股骨极度前倾的DDH病人,组配式股骨柄可以通过调节,以适配病人的干骺端和骨干。除了组配式股骨柄,也可以选用非组配式股骨柄,带槽柄及锥形柄,此类股骨柄通过股骨近端,填充股骨远端骨干以获得稳定。但有学者提出,不同于组配式股骨柄,许多普通柄是远端固定,增加了近端应力遮挡的风险,应在DDH病人的初次THA中使用组配式股骨柄^[34]。本期DDH系列研究中,柴伟团队对比分析了组配式假体与普通假体在单侧CroweⅠ、Ⅱ型DDH病人THA中的关节功能等相关指标,发现组配式假体比普通假体更易获得双下肢等长及更佳的功能评分。在这类病人中,推荐使用组配式假体以获得尽可能正常的髌关节。笔者认为,诸如S-ROM这种组配式股骨柄虽然可以获得满意的临床效果,但其价格高昂。笔者研究中心在CroweⅣ-HartofilakidisⅢ型DDH病人的初次THA中,常规使用Zweymüller锥形柄,中期随访结果令人满意,但鉴于此种柄近端较大,术中骨折发生率较高,需要结合病人股骨近端解剖形态选择合适的病人^[35]。同时,张晓岗团队报道,采用Wagner Cone这种非组配式锥形生物型股骨柄假体,其表面8条纵行凸纹设计,具有良好的旋转稳定性,可以任意调节股骨的前倾角度,在HartofilakidisⅢ型DDH病人的初次THA中,可以有效地平衡双下肢长度,缓解患髌疼痛,而且操作简单;并发症较少,临床效果令人满意。总的来说,并没有一种完美的假体适用于所有DDH病人,术前需要综合考虑病人的股骨解剖形态及经济条件,选择合适的生物型股骨柄。

在严重脱位的DDH病人中(CroweⅢ或Ⅳ型),往往需要行股骨短缩截骨以将脱位的股骨头复位于

正常解剖位置,进而恢复旋转中心。股骨转子下短缩截骨就是一种非常有效的方法,在伴有术前严重患肢短缩的DDH病人中,采用此法可以更为简易地获得股骨头复位,减轻软组织挛缩,保护神经血管组织,随访14年,生存率高达75%^[36-38]。股骨转子下短缩截骨的方式多种多样,包括横行截骨、楔形截骨、“Z”型截骨、双“V”型截骨^[39-43]。Muratli等^[44]通过实验室载荷生物机械研究发现,这四种转子下短缩截骨方法的稳定性并无显著差别。我国朱振安教授团队研究表明,在中重度脱位的DDH病人THA中,相对于不截骨的病人,接受转子下短缩截骨的病人术后康复更快,更容易,术后出现可逆性神经损伤和膝关节外翻畸形的病人更少^[45]。在众多股骨转子下短缩截骨方法中,笔者研究中心常规使用横行截骨,因为“Z”型截骨和“V”型截骨虽可提供较强的旋转稳定性,但操作复杂;横行截骨操作相对简单、省时,把握宁少勿多的原则进行截骨,避免过多截骨后软组织松弛导致关节脱位的出现。

鉴于DDH病人诸多解剖形态的改变,及其变化多样、年龄较轻,此类病人的THA极具挑战性。本期DDH系列研究中,不同学者分别通过DDH病人解剖学研究分析、髋臼侧重建及柄侧重建方法以及假体选择等方面,对此类病人的THA进行了全面的分析,相信他们的临床经验和成果能够对读者的工作有所启迪和帮助,有助于更好地为此类病人服务,提升我国对DDH病人的THA治疗水平。

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