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直接前方入路与直接外侧入路人工全髋关节置换术的临床效果比较研究*

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摘要 目的:探讨平卧位直接前方入路(DAA)与侧卧位直接外侧入路(DLA)对行初次全髋关节置换术(THA)患者髋关节功能、平衡功能和步态参数的影响。**方法:**选取2018年2月~2019年10月期间我院收治的初次THA患者97例,根据入路方式的不同随机分为A组(n=47)和B组(n=50),A组行侧卧位DLA,B组行平卧位DAA,比较两组髋关节功能、影像学参数、平衡功能和步态参数,记录两组术后并发症发生率。**结果:**术后1周、1个月、3个月及6个月两组髋关节Harris评分(HHS)、Berg平衡量表评分(BBS)依次升高,且B组高于A组($P<0.05$)。B组手术时间长于A组,术中出血量少于A组,切口长度、初次下床行走时间短于A组($P<0.05$)。术后3个月、6个月两组步频、步速、步长依次升高,且B组高于A组($P<0.05$)。两组并发症发生率对比,组间比较未见统计学差异($P>0.05$)。两组术后6个月髋臼假体外展角、前倾角对比,组间比较无显著差异($P>0.05$)。**结论:**与侧卧位DLA相比,初次THA患者行平卧位DAA可获得与其相当的手术效果,同时能更好地改善患者髋关节功能、平衡功能和步态,且安全性有保障。

关键词:直接前方入路;直接外侧入路;初次全髋关节置换术;髋关节功能;平衡功能;步态参数

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A Comparative Study on the Clinical Effects of Total Hip Arthroplasty through Direct Anterior Approach and Direct Lateral Approach*

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ABSTRACT Objective: To investigate the effects of supine position direct anterior approach (DAA) and lateral position direct lateral approach (DLA) on hip function, balance function and gait parameters in patients undergoing primary total hip arthroplasty (THA). **Methods:** 97 patients with primary THA admitted to our hospital from February 2018 to October 2019 selected, and were divided into group A (n=47) and group B (n=50) according to the different ways of approach, group A was given lateral position DLA, group B was given supine position DAA. The hip function, imaging parameters, balance function and gait parameters were compared between the two groups, and the incidence of postoperative complications was recorded. **Results:** 1 week, 1 month, 3 months and 6 months after operation, Harris score (HHS) and Berg Balance Scale score (BBS) of hip joint of the two groups showed an increasing trend, and group B was higher than group A ($P<0.05$). The operation time of group B was longer than that of group A, the intraoperative hemorrhage was less than that of group A, the incision length and time of first walking out of bed were shorter than those of group A ($P<0.05$). 3 months and 6 months after operation, the step frequency, step speed and step length of the two groups were increased in turn, and group B was higher than group A ($P<0.05$). There was no difference in the incidence of complications between the two groups ($P>0.05$). Comparison of acetabular abduction angle and anteversion angle between the two groups 6 months after operation showed no differences ($P>0.05$). **Conclusion:** Compared with lateral position DLA, the patients with primary THA are given supine position DAA, it can obtain the same surgical effect, and can improve the hip joint function, balance function and gait parameters, and the safety is guaranteed.

Key words: Direct anterior approach; Direct lateral approach; Primary total hip arthroplasty; Hip function; Balance function

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前言

随着假体的发展和手术技术的不断提高,全髋关节置换术(Total hip arthroplasty, THA)是髋部疾病晚期病变最有效且最成功的治疗方法^[1-3]。直接外侧入路(Direct lateral approach, DLA)入路损伤外展肌,修复不佳可导致术后长期跛行步态,臀中肌肌力减弱还可能增加术后假体脱位的风险^[4-6]。直接前方入路(Direct anterior approach, DAA)是近年来兴起并且逐渐在欧美等发达国家人工关节重建领域流行的髋关节置换微创入路,是传统 S-P 入路的改良。该入路为神经、肌肉间隙入路,不损伤肌肉,对软组织干扰小,患者术后早期疼痛较轻,髋关节内外旋功能好,可即刻下地活动,还可早期做下蹲、盘腿、跷二郎腿等动作,无跛行步态,脱位风险低^[7,8]。本研究拟通过对比平卧位 DAA、侧卧位 DLA 两组入路方式对行初次 THA 患者髋关节功能、平衡功能和步态参数的影响,分析其临床效果的异同,以期 THA 术式的选择提供参考依据,整理如下。

1 资料与方法

1.1 一般资料

选取 2018 年 2 月~2019 年 10 月期间我院收治的初次 THA 患者 97 例,本研究为前瞻性研究,均经患者及其家属知情同意,且通过我院伦理委员会批准实施。纳入标准:(1)符合初次 THA 手术指征;(2)临床资料齐全,完成本次研究者;(3)均签署知情同意书者;(4)手术操作均由同一组医师完成。排除标准:(1)合并严重心、肝、肾等重要脏器疾病者;(2)合并严重神经系统疾病或认知功能障碍者;(3)由任何原因导致的下肢肌力丧失或者相对减弱的患者;(4)合并下肢感染、肿瘤的患者;(5)合并下肢手术后愈合不良、畸形愈合、软组织粘连挛缩或内固定物残留患者;(6)依从性差,不能配合或随访失联患者。患者根据入路方式的不同随机分为 A 组(n=47)和 B 组(n=50),A 组行侧卧位 DLA,B 组行平卧位 DAA。其中 A 组男 21 例,女 26 例,平均年龄(61.38±10.74)岁,平均体质指数(22.35±3.16) kg/m²,其中:股骨颈骨折 19 例、股骨头坏死 17 例、髋关节骨关节炎 11 例。B 组男 18 例,女 32 例,平均年龄(63.94±9.15)岁,平均体质指数(21.81±2.32) kg/m²,其中:股骨颈骨折 24 例、股骨头坏死 16 例、髋关节骨关节炎 10 例。两组一般资料对比,未见差异(P>0.05)。

1.2 方法

(1)患者 THA 手术:均采用全身麻醉,根据术前、术中测试结果选择合适的假体,采用美国强生公司的 Depuy 初次全髋关节置换假体(Pinnacle 生物型臼杯、高交联聚乙烯内衬、Corail 生物型股骨柄、陶瓷或金属球头)。(2)术中:A 组入路方式选取侧卧位 DLA,以大转子顶点为中心,作髋关节外侧直切口,依次切开皮肤、皮下组织及阔筋膜张肌,显露臀中肌和股外侧肌近端,经大转子止点由远向近切开臀中肌前 1/3 附丽,保留股骨止点处 3-4 mm 腱性组织,切断臀小肌止点和髂股韧带,暴露髋关节囊前侧,将关节囊作“T 形”切开,自股骨颈基底部截骨,取出股骨头,清理髋臼缘软组织,行髋臼磨锉及股骨扩髓,试模成功后植入合适型号的生物型臼杯、内衬、股骨柄及股骨头假体,复位髋关节后检查活动度及稳定性,冲洗伤口,留置负

压引流管,局部注射“鸡尾酒”,逐层缝合伤口。B 组入路方式选取平卧位 DAA,从髂前上棘下 2 cm 处开始,指向腓骨小头的连线作一长切口,长约 7~10 cm。将皮肤、皮下和阔筋膜张肌肌膜逐层切开,显露阔筋膜张肌和缝匠肌之间的间隙。结扎旋股外侧动脉上升支,切开前方关节囊,取出股骨头,显露髋臼,髋臼锉逐级打磨至骨面有新鲜血液均匀渗出,植入生物型臼杯及内衬。随后松解股骨近端,内收、过伸患肢显露髓腔,用髓腔锉逐号扩髓,股骨柄假体打入髓腔压配固定,安装股骨头假体。复位髋关节后检查活动度及稳定性,冲洗伤口,留置负压引流管,局部注射“鸡尾酒”,逐层缝合伤口。(3)术后处理:引流管于术后 24h~48h 内拔除,术后预防性应用抗生素 1d,同时予局部冷敷、镇痛、抗凝、消肿、下肢气压泵等治疗。视患者恢复情况指导其适当行康复训练。

1.3 观察指标

(1)记录两组患者围术期指标:手术时间、术中出血量、切口长度以及初次下床行走时间。(2)术后以门诊复查的形式随访 6 个月。记录两组术前、术后 1 周、1 个月、3 个月以及 6 个月时的髋关节 Harris 评分(Harris score of hip joint, HHS)^[9]、Berg 平衡量表评分(Berg Balance Scale score, BBS)^[10]。其中 HHS 总分 100 分,分值越高,提示髋关节功能越好。BBS 总分 56 分,分值越高,提示平衡功能越好。(3)术后 6 个月复查髋关节 X 线片,观察两组髋臼假体角度参数(外展角及前倾角)。(4)记录两组术后并发症(血肿、神经损伤、脱位、大转子滑囊炎)的发生情况。(5)采用英国 VICON 公司生产的 V-612 型三维步态分析仪记录两组术前、术后 3 个月、6 个月时的步频、步速及步长。

1.4 统计学方法

采用 SPSS 19.0 统计学软件,以($\bar{x} \pm s$)表示计量资料,经 t 检验分析两组间数据的差异;以%表示计数资料,经 χ^2 检验分析组间差异; $\alpha=0.05$ 为检验水准。

2 结果

2.1 两组 HHS、BBS 评分比较

术前,两组患者 HHS、BBS 评分对比,组间未见明显统计学差异(P>0.05),术后 1 周、1 个月、3 个月及 6 个月两组 HHS、BBS 评分依次升高,且前 3 个月 B 组数值均显著高于 A 组(P<0.05),见表 1。

2.2 两组围术期指标比较

B 组手术时间长于 A 组,术中出血量少于 A 组,切口长度、初次下床行走时间均显著短于 A 组(P<0.05),见表 2。

2.3 两组步态参数比较

术前,两组步频、步速、步长对比,组间未见明显统计学差异(P>0.05),术后 3 个月、6 个月两组步频、步速、步长依次升高,且 B 组在术后即刻、术后 3 个月的结果显著高于 A 组,具体见表 3。

2.4 两组并发症发生率比较

两组并发症发生率对比,组间未见明显统计学差异(P>0.05),具体见表 4。

2.5 两组影像学指标比较

两组术后 6 个月髋臼假体外展角、前倾角对比,组间无明显差异(P>0.05),具体见表 5。

表 1 两组 HHS、BBS 评分比较($\bar{x} \pm s$, 分)

Table 1 Comparison of HHS and BBS scores between the two groups($\bar{x} \pm s$, scores)

Groups	Time points	HHS	BBS
Group A(n=47)	Before operation	33.35±5.29	25.06±4.33
	1 week after operation	59.41±6.33 ^a	32.74±4.25 ^a
	1 month after operation	68.31±7.24 ^{ab}	39.23±3.31 ^{ab}
	3 months after operation	75.65±6.31 ^{abc}	44.86±4.24 ^{abc}
	6 months after operation	90.89±5.14 ^{abcd}	51.96±2.41 ^{abcd}
Group B(n=50)	Before operation	33.97±4.27	24.54±3.12
	1 week after operation	68.33±6.35 ^{ac}	37.35±4.31 ^{ac}
	1 month after operation	79.01±5.26 ^{abc}	44.34±4.36 ^{abc}
	3 months after operation	86.29±6.25 ^{abce}	48.32±3.25 ^{abce}
	6 months after operation	91.31±5.22 ^{abcd}	52.34±1.29 ^{abcd}

Note: compared with before operation, ^a $P < 0.05$; compared with 1 week after operation, ^b $P < 0.05$; compared with 1 month after operation, ^c $P < 0.05$; compared with 3 months after operation, ^d $P < 0.05$; compared with group A, ^e $P < 0.05$.

表 2 两组围术期指标比较($\bar{x} \pm s$)

Table 2 Comparison of perioperative indexes between the two groups($\bar{x} \pm s$)

Groups	Operation time(min)	Intraoperative hemorrhage(mL)	Incision length(cm)	Time of first walking out of bed(d)
Group A(n=47)	62.23±4.25	201.53±14.87	14.89±2.43	3.76±0.32
Group B(n=50)	73.71±5.36	138.98±13.95	8.82±1.72	1.59±0.25
t	12.378	24.572	10.281	9.352
P	0.000	0.000	0.000	0.000

表 3 两组步态参数比较($\bar{x} \pm s$)

Table 3 Comparison of gait parameters between two groups($\bar{x} \pm s$)

Groups	Time points	Step frequency(step/min)	Step speed(m/s)	Step length(m)
Group A(n=47)	Before operation	42.64±4.19	0.66±0.18	0.81±0.13
	3 months after operation	46.13±5.11 ^a	0.78±0.24 ^a	0.97±0.15 ^a
	6 months after operation	59.62±5.91 ^{ad}	1.03±0.16 ^{ad}	1.19±0.18 ^{ad}
Group B(n=50)	Before operation	42.39±5.87	0.63±0.12	0.79±0.16
	3 months after operation	52.47±5.25 ^{ac}	0.89±0.15 ^{ac}	1.09±1.17 ^{ac}
	6 months after operation	61.93±5.04 ^{abc}	1.18±0.29 ^{abc}	1.23±0.19 ^{abc}

Note: compared with before operation, ^a $P < 0.05$; compared with 3 months after operation, ^d $P < 0.05$; compared with group A, ^e $P < 0.05$.

表 4 两组并发症发生率比较 例(%)

Table 4 Comparison of the incidence of complications between the two groups [n(%)]

Groups	Dislocation	Trochanteric bursitis	Hematoma	Nerve injury	Total incidence rate
Group A(n=47)	1(2.13)	3(6.38)	2(4.26)	1(2.13)	7(14.90)
Group B(n=50)	0(0.00)	4(8.00)	3(6.00)	2(4.00)	9(18.00)
χ^2					0.472
P					0.495

3 讨论

髋部疾病晚期病变的确切发病机制一直未能明确,且临床上尚未有特效的治疗方案可逆转髋部疾病的病理过程^[11,12]。

THA 是临床上治疗髋部疾病晚期病变的常用方法,现已成为一种成熟的骨科治疗技术^[13,14]。尽管如此,THA 术后仍然时常出现外展肌功能不良、关节脱位和双下肢不等长等并发症,影响了患者的生活质量及术后效果^[15,16]。近 10 年来有关 THA 的

表 5 两组影像学指标比较($\bar{x} \pm s, ^\circ$)Table 5 Comparison of imaging indexes between the two groups($\bar{x} \pm s, ^\circ$)

Groups	Abduction angle	Anteversion angle
Group A(n=47)	43.61±4.42	18.23±2.33
Group B(n=50)	42.09±3.38	20.64±3.47
t	0.653	0.840
P	0.515	0.403

研究报道多集中于关节的假体材料方面,而有关 THA 入路方式方面的报道一直未能有较大的进展。THA 的入路方式较多,包括平卧位 DAA、侧卧位 DLA、后外侧入路及后侧入路等,每一种手术入路都有其优缺点,其中后外侧入路及后侧入路常损伤后方臀大肌、外旋肌、关节囊,术后脱位发生率较高^[17,18]。侧卧位 DLA 是传统 THA 手术入路方式之一,术中可使髋臼充分暴露,安装方便,假体易于调整,同时该入路远离髋关节周围大血管、重要神经,减少其损伤风险,假体脱位率也低于后外侧入路^[19,20]。但侧卧位 DLA 也存在易导致臀中肌和股外侧肌乏力,部分患者术后早期出现跛行等缺点^[21]。平卧位 DAA 属于肌腱、无肌肉和神经损伤的真正意义的微创入路,是经肌肉间隙和神经间隙的微创手术入路^[22]。但是 DAA 操作较为复杂,需要进行专项培训,早期陡直的学习曲线使得不少医师望而却步,同时因操作不善可引起较多的并发症也使得平卧位 DAA 饱受争议。

本次研究结果中,两组术后 6 个月髋臼假体外展角、前倾角组间比较无差异,平卧位 DAA 除手术时间较长外,其余围术期指标如术中出血量、切口长度、下床行走时间均优于侧卧位 DLA。可见平卧位 DAA 可获得与侧卧位 DLA 大致相当的手术治疗效果。因平卧位 DAA 临床应用时间较短,操作医师普遍熟练程度相对不足,导致手术时间延长,但随着手术例数的增加,医师的手术熟练度不断增加,情况可能会有所好转^[23-25]。同时平卧位 DAA 的整个过程均属于微创入路,只损伤了阔筋膜张肌,术中出血量少,术后恢复快,可缩短下床行走时间^[26,27]。本研究中,平卧位 DAA 的初次 THA 患者髋关节功能、平衡功能和步态参数的改善效果均优于采用侧卧位 DLA 者,平卧位 DAA 利用神经界面和肌肉间隙,使髋关节的稳定结构得以最大程度的保留;同时,采用平卧位 DAA 还可以更简便、精确地进行术中双下肢长度的比较,降低术后双下肢不等长的概率。目前,部分医师对该入路的体位进行了改良,采用侧卧位下 DAA 进行全髋关节置换。该体位有一定优势,侧卧时髋周肌肉因重力下垂而不挤向切口,可使髋臼部分有效暴露,利于下肢外旋和后伸内收;该方法手术体位一次固定后不需特殊调整,可节约术中体位调整时间,也减少因体位变化而增加的手术感染风险;术中不需要调整手术床使下肢显露股骨近端,也不需要专用骨科牵引床,使用普通手术床即可完成手术^[28-30]。以上种种优势均能为早期髋臼假体带来更好的稳定性,利于早期髋关节功能康复,促进患者平衡功能掌握及步态参数的调节。同时本研究发现,随着随访时间的延长,两组患者术后均可恢复相当的步态参数,说明步态参数可通过术后康复来逐步恢复,而更好的髋关节功能、平衡功能恢复效果可促进患者步态参数的尽早调整。本研究中采用平卧位 DAA 者的并发症发生率略高

于采用侧卧位 DLA 者,但比较未见统计学差异。提示其安全性较好。本研究为单中心的前瞻性研究,病例数较少,仍需开展多中心调查、纳入大样本的后续研究以获取更为准确的研究数据。

综上所述,与侧卧位 DLA 相比,初次 THA 患者给予平卧位 DAA,可获得与其相当的手术效果,同时可更好地改善患者髋关节功能、平衡功能和步态参数,且安全性有保障,但平卧位 DAA 手术时间相对会更长。

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