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前外侧肌间隙入路式微创全髋关节置换术对患者髋关节功能及炎症细胞因子水平的影响 *

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摘要 目的:探讨前外侧肌间隙入路式微创全髋关节置换术对患者髋关节功能及炎症细胞因子水平的影响。**方法:**选取 2015 年 1 月至 2017 年 1 月间在我院行全髋关节置换术的 98 例患者作为此次研究的研究对象。采用随机数字表法对患者进行分组,其中 49 例患者作为对照组,行传统全髋关节置换术治疗;49 例患者作为观察组,行前外侧肌间隙入路式微创全髋关节置换术治疗。观察并比较两组患者围术期指标,包括切口长度、手术时间、术中失血量、术后 1 d 引流量。检测并比较两组患者手术前及术后 24 h 检测血清炎症因子 TNF- α 、IL-1、IL-6 水平。术前及术后 3 个月和 6 个月均采用 Harris 评分评价所有患者髋关节功能。记录并比较两组患者治疗及随访过程中的不良反应发生情况。**结果:**观察组术中失血量及术后 1 d 引流量均明显低于对照组,切口长度明显短于对照组,但手术时间明显长于对照组($P<0.05$)。术后 24 h,观察组血清 TNF- α 、IL-1、IL-6 水平明显降低,且明显低于对照组($P<0.05$)。术后 3 个月、6 个月,两组患者的 Harris 评分逐渐升高($P<0.05$),且与同时期的对照组患者比较,观察组患者的 Harris 评分明显较高($P<0.05$)。观察组不良反应发生率为 8.16%,明显低于对照组的 28.57%($P<0.05$)。**结论:**前外侧肌间隙入路式微创全髋关节置换术能明显改善患者的围术期指标、降低手术早期的炎症反应,同时能明显促进患者髋关节功能恢复,且安全性良好,值得临床推广。

关键词:前外侧肌间隙入路;全髋关节置换术;髋关节功能;炎症因子

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Effects of Minimally Invasive Total Hip Arthroplasty on Hip Function and Inflammatory Cytokine Levels in Patients with Anterolateral Interspace Interspace Approach*

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ABSTRACT Objective: To explore the effects of minimally invasive total hip arthroplasty on hip function and inflammatory cytokine levels in patients with anterolateral interspace interspace approach. **Methods:** 98 cases of total hip arthroplasty in our hospital from January 2015 to January 2017 were selected as the research subjects. Patients were grouped by random digital table, 49 patients were treated as the control group with traditional total hip replacement therapy, 49 patients were treated as the observation group with minimally invasive total hip arthroplasty with anterolateral interspace interspace approach. The perioperative indexes of the two groups were observed and compared, including the length of the incision, operation time, the amount of blood loss during the operation, and the flow rate of 1d after the operation. The serum inflammatory factors TNF- α , IL-1, and IL-6 levels in two groups before and 24 h after operation were compared. Harris scores were used to evaluate the hip function of all patients before operation, 3 months and 6 months after operation. The incidence of adverse reactions during the treatment and follow-up of two groups was recorded and compared. **Results:** The amount of blood loss and the flow rate of 1 d after operation in the observation group were significantly lower than that of the control group, the length of the incision was significantly shorter than that of the control group, but the operation time was significantly longer than that of the control group ($P<0.05$). 24 h after operation, the serum levels of TNF- α , IL-1 and IL-6 in the observation group were significantly lower than those in the control group ($P<0.05$). 3 months and 6 months after operation, the Harris score of the two groups increased gradually ($P<0.05$), compared with the control group in the same period, the Harris score of the patients in the observation group was significantly higher ($P<0.05$). The incidence of adverse reaction in the observation group was 8.16%, which was significantly lower than 28.57% of the control group ($P<0.05$). **Conclusion:** Minimally invasive total hip arthroplasty with the anterolateral interspace approach can significantly improve the perioperative indicators and lower the early inflammatory response, it can obviously promote the recovery of the hip joint function and safety, it is worthy of clinical promotion.

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前言

全髋关节置换术是临床治疗退行性髋关节炎、股骨头坏死、股骨颈骨折等疾病的一种较为常用且有效的治疗方法^[1-3]。近年来,微创技术飞速发展,全髋关节置换术也提升到了一个新的技术水平,微创全髋关节置换术在临床上得到了较为广泛的应用^[4]。传统全髋关节置换术中常采用后外侧入路,其手术暴露充分,视野较为清晰,有利于假体安放,但同时存在切口大、创伤恢复时间长等问题,难以达到真正意义上的微创效果^[5,6]。前外侧肌间隙入路则更为重视“微”导入,其在特殊机械的辅助下,从肌肉间隙向深层剥离,完成手术入路及髋关节置换^[7]。此入路具有创伤小、出血少、恢复快的优点,更为重视术后患者的关节功能恢复情况^[8,9]。本研究观察并比较了前外侧肌间隙入路式微创全髋关节置换术与传统全髋关节置换术对患者关节功能及炎性细胞因子水平的影响,以期临床术式的选择提供依据。报道如下。

1 对象与方法

1.1 研究对象

选取2015年1月至2017年1月间在我院行全髋关节置换术的98例患者作为此次研究的研究对象。纳入标准^[10,11]:①患者年龄不低于45岁;②术前均经影像学检查,确认需行全髋关节置换术治疗;③均为首次行全髋关节置换术;④耐受性良好,且术前检查无手术禁忌症;⑤随访时间不低于6个月;⑥患者及家属对本研究知情同意。排除标准:①心、肝、肾功能严重受损者;②超重或肥胖者;③髋关节严重受限者;④合并精神疾病者;⑤依从性差者。采用随机数字表法对患者进行分组,其中49例患者作为对照组,行传统全髋关节置换术治疗;49例患者作为观察组,行前外侧肌间隙入路式微创全髋关节置换术治疗。对照组男31例,女18例,年龄47~78岁,平均 (58.62 ± 6.39) 岁,体质指数(BMI) $17 \sim 26 \text{ kg/m}^2$,平均 $(21.36 \pm 1.13) \text{ kg/m}^2$ 。观察组男29例,女20例,年龄45~79岁,平均 (57.78 ± 5.89) 岁,BMI $17 \sim 26 \text{ kg/m}^2$,平均 $(21.07 \pm 1.34) \text{ kg/m}^2$ 。两组患者一般资料无显著性差异($P > 0.05$)。本研究已经医院伦理委员会评审通过。

1.2 方法

1.2.1 手术方法 对照组行传统手术进行全髋关节置换:患者取健侧卧位,行腰硬联合麻醉,在大粗隆、髂后上棘连线的中外三分之一处与大粗隆之间将皮肤切开,并沿着股外侧轴进行延伸,仔细分离坐骨神经,避免神经损伤,显露大转子。将近端三分之一的股方肌切断,并切断距大转子1 cm处的各外旋肌腱,使关节囊充分暴露。切开关节囊后,常规安放假体。观察组行前外侧肌间隙入路式微创全髋关节置换术:患者取健侧卧位,行腰硬联合麻醉,自大转子前缘起取一向髂前上棘后方延伸的切口,切口长约6~7 cm,自臀中肌与阔筋膜张肌的间隙进入,使前方关节囊暴露,切开关节囊后,常规安放假体。为避免手术中的人为误差,所有手术均由同一组熟悉手术过程的医师完成。全髋关节生物假体及相关手术器械均购自Zimmer公司。

1.2.2 术后恢复 术后24 h拔除患者伤口引流管,进行常规抗凝。康复医师于术后当日即开始指导患者进行直腿抬高、曲髋等锻炼;术后3 d,所有患者均拍摄髋关节正侧位X线片观察手术效果,并于术后3 d即可通过助行器协助进行部分负重锻炼;根据患者的恢复情况,于术后3~4周进行单拐行走锻炼,5~6周进行完全负重功能锻炼。术后3个月、6个月对患者进行定期随访,常规拍摄X线片。手术恢复过程中均叮嘱患者不能过度锻炼。

1.3 观察指标

观察并比较两组患者围术期指标,包括切口长度、手术时间、术中失血量、术后1 d引流量。两组患者均在手术前及术后24 h检测血清炎症因子TNF- α 、IL-1、IL-6水平。术前及术后3个月和6个月均采用Harris评分评价所有患者髋关节功能。记录并比较两组患者治疗及随访过程中的不良反应发生情况。

1.4 统计学方法

采用SPSS19.0软件对数据进行处理。计数资料以率表示,采用卡方检验,计量资料以均数 $\pm$ 标准差的形式表示,采用t检验。检验标准为 $\alpha = 0.05$ 。

2 结果

2.1 两组患者手术情况

观察组术中失血量及术后1 d引流量均明显低于对照组,切口长度明显短于对照组,但手术时间明显长于对照组,差异均具有统计学意义($P < 0.05$)。

表1 两组围术期指标比较

Table 1 Comparison of perioperative index of two groups

Groups	n	Length of the incision(cm)	Operation time(min)	Amount of blood loss during the operation(mL)	Flow rate of 1d after the operation(mL)
Control group	49	11.72 ± 2.18	68.21 ± 12.39	408.53 ± 38.65	122.51 ± 9.84
Observation group	49	6.69 ± 0.82	74.32 ± 11.43	277.23 ± 31.91	83.51 ± 8.80
t	-	15.117	2.537	18.338	20.680
P	-	0.000	0.013	0.000	0.000

2.2 两组患者血清炎症因子变化情况

两组患者手术前血清 TNF- α 、IL-1、IL-6 水平无显著性差异($P>0.05$)。术后 24h, 对照组血清 TNF- α 、IL-1、IL-6 水平无明

显变化($P>0.05$), 观察组血清 TNF- α 、IL-1、IL-6 水平明显降低, 且明显低于对照组($P<0.05$)。见表 2。

表 2 两组患者血清 TNF- α 、IL-1、IL-6 水平比较(pg/mL)Table 2 Comparison of serum levels of TNF- α , IL-1 and IL-6 in the two groups of patients (pg/mL)

Groups	Time	TNF- α	IL-1	IL-6
Control group(n=49)	Before operation	193.89 $\pm$ 29.87	122.72 $\pm$ 26.39	96.81 $\pm$ 16.43
	24 h after operation	190.37 $\pm$ 27.54	121.08 $\pm$ 20.27	94.95 $\pm$ 15.17
	t	0.606	0.345	0.582
	P	0.546	0.731	0.562
Observation group(n=49)	Before operation	194.41 $\pm$ 31.05	121.94 $\pm$ 25.87	95.72 $\pm$ 15.82
	24 h after operation	168.52 $\pm$ 26.72	110.03 $\pm$ 15.41	87.18 $\pm$ 11.64
	t	4.424	2.769	3.044
	P	0.000	0.007	0.003

2.3 两组患者髋关节功能变化情况

两组手术前 Harris 评分比较无显著性差异($P>0.05$)。术后 3 个月、6 个月, 两组患者的 Harris 评分逐渐升高, 差异具有统

计学意义($P<0.05$), 且与同时期的对照组患者比较, 观察组患者的 Harris 评分明显较高($P<0.05$)。见表 3。

表 3 两组患者 Harris 评分比较(分)

Table 3 Comparison of Harris scores in two groups (score)

Groups	n	Before operation	3 month after operation	6 month after operation
Control group	49	36.15 $\pm$ 4.72	81.04 $\pm$ 7.71*	86.32 $\pm$ 5.71**
Observation group	49	35.21 $\pm$ 5.03	87.21 $\pm$ 6.34*	92.23 $\pm$ 5.48**
t		0.954	4.327	5.227
P		0.343	0.000	0.000

Note: compared with before operation, * $P<0.05$; compared with 3 months after operation, ** $P<0.05$.

2.4 两组患者不良反应发生情况

28.57%($P<0.05$)。

观察组不良反应发生率为 8.16%, 明显低于对照组的

表 4 两组患者不良反应发生情况比较[n(%)]

Table 4 Comparison of the incidence of adverse reactions between the two groups

Groups	n	Incisional infection	Heterotopic ossification	Prosthesis dislocation	Deep venous thrombosis	Incidence of adverse reactions
Control group	49	4(8.16)	3(6.12)	4(8.16)	3(6.12)	14(28.57)
Observation group	49	1(2.04)	2(4.08)	0(0.00)	1(2.04)	4(8.16)
χ^2						6.806
P						0.009

3 讨论

随着手术技术的不断提高, 全髋关节置换术逐渐成为临床中多种髋关节疾病的首选治疗方式, 且其良好的疗效也在大量临床病例的随访中得到证实^[12,13]。然而全髋关节置换术术后并发症仍然常常发生, 如并发症中较为常见的人工髋关节脱位, 在给患者带来极大痛苦的同时, 还可能引发更多的并发症、导致二次手术, 严重影响患者的术后恢复^[14-16]。通常认为术后患者的恢复情况既受到患者年龄、身体素质、股骨头直径、髋周肌肉

状况等患者自身因素的影响, 同时也受到手术方式的影响^[17-19]。

前外侧肌间隙入路式微创全髋关节置换术是近年来逐渐兴起的一种全髋关节置换术^[20], 本研究中观察组患者均采用该术式进行治疗, 与对照组比较, 其切口长度明显较短, 且术中失血量及术后 1 d 引流量均较少, 但手术时间较长。与传统全髋关节置换术比较, 前外侧肌间隙入路无需破坏关节附近肌群, 其由臀中肌与阔筋膜张肌间的间隙进入关节^[21,22], 在缩短手术创口的同时, 失血量及引流量均减少。但值得注意的是, 本研究开展前期进行手术的观察组患者, 其手术切口长度及手术时间

与后期进行手术的患者相比均较长,应与手术医师的熟练程度有关。该手术入路对手术医师的要求较高,如术中钝性分离肌群时,需轻柔操作;处理股骨时需使股骨大粗隆周围组织得到充分松解,使患者患肢保持外旋后伸和内收^[23,24],因此在对手术过程不够熟练时,手术时间也较长。

本研究中观察组术后 24 h 的血清炎症因子较对照组明显降低,同时术后 3 个月、6 个月,观察组患者的 Harris 评分逐渐升高,且与同时期的对照组患者比较,观察组患者的 Harris 评分明显较高($P < 0.05$)。患者行传统全髋关节置换术通常恢复较为缓慢,研究认为^[25],早期炎症反应是导致患者恢复困难的一个重要原因,而传统全髋关节置换术对血清炎症因子无明显的抑制作用。而本研究中观察组的血清炎症因子得到抑制,其髋关节功能恢复也明显优于对照组,说明前外侧肌间隙入路式微创全髋关节置换术能抑制患者的早期炎症反应,促进患者的术后恢复。同时观察组不良反应发生率为 8.16%,明显低于对照组的 28.57%,符合阙玉康等人^[26]的研究结果,说明前外侧肌间隙入路式微创全髋关节置换术具有较好的安全性,该手术中对肌腱止点的保留较为重视,对患者外展肌的损伤较少,同时创口小、失血少,对降低感染率有较好的作用。同时此次研究中观察组假体脱位的发生率为 0.00%,而既往研究中传统全髋关节置换术假体脱位的发生率为 5%~9%^[27,28]。推测其原因为多数髋关节假体脱位均为后脱位,而传统手术对后方肌肉、软组织等的损伤是其发生的重要因素^[29,30]。前外侧肌间隙入路式微创全髋关节置换术不损伤髋周肌肉组织,也几乎不会对后方软组织造成损伤,因此能有效防止假体脱位的发生。

综上所述,前外侧肌间隙入路式微创全髋关节置换术具有较好的安全性,能明显改善患者的围术期指标、降低手术早期的炎症反应,同时能明显促进患者髋关节功能恢复,值得有条件的医院推广应用。

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