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全髋关节置换术用于股骨颈骨折患者的临床疗效评价及对血清 OPG、BGP、ALP、CRP、IL-6 的影响 *

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摘要 目的: 分析全髋关节置换术用于股骨颈骨折患者的临床效果及对血清骨保护素(OPG)、骨钙素(BGP)、碱性磷酸酶(ALP)、C反应蛋白(CRP)、白细胞介素-6(IL-6)的影响。**方法:** 选择我院 2014 年 3 月~2016 年 3 月收治的 102 例股骨颈骨折患者,按抽签法分为对照组与研究组,每组各 51 例。对照组采用半髋关节置换术治疗,研究组采用全髋关节置换术治疗。比较两组的临床疗效,治疗前后 Harris 评分、血清 OPG、BGP、ALP、CRP、IL-6 水平的变化及术后并发症的发生情况。**结果:** 治疗后,研究组的优良率显著高于对照组($P<0.05$);两组 Harris 评分、血清 OPG、BGP、ALP、CRP、IL-6 水平均较治疗前显著上升,且研究组 Harris 评分显著高于对照组($P<0.05$),而两组 OPG、BGP、ALP、CRP、IL-6 水平比较差异无统计学意义($P>0.05$)。**结论:** 全髋关节置换术用于股骨颈骨折的临床效果肯定,虽可引起血清 OPG、BGP、ALP、CRP、IL-6 水平上升,但未增加手术风险。

关键词: 股骨颈骨折;全髋关节置换术;临床效果;骨保护素;骨钙素;碱性磷酸酶;C 反应蛋白;白细胞介素-6

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Evaluation of the Clinical Efficacy of Total Hip Replacement in the Treatment Femoral Neck Fracture and the Effect on Serum OPG, BGP and ALP, CRP, IL-6 Levels*

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ABSTRACT Objective: To analyze the clinical efficacy of total hip replacement in the treatment of femoral neck fracture and the effect on serum osteoprotegerin (OPG), osteocalcin (BGP), alkaline phosphatase (ALP), c-reactive protein (CRP) and interleukin 6 (IL-6) levels. **Methods:** 102 cases of patients with femoral neck fracture from March 2014 to March 2016 were selected and divided into the control group and the research group according to the draw method with 51 cases in each group. The control group was treated with hemiarthroplasty, while the research group was treated with total hip arthroplasty. The curative effect, changes of Harris score, serum OPG, BGP and ALP, CRP, IL-6 levels before and after operation and the incidence of postoperative complications were compared between two groups. **Results:** After treatment, the excellent rate of research group was higher than that of control group($P<0.05$); the Harris scores, serum OPG, BGP, ALP, CRP and IL-6 levels of both groups was all obviously decreased than those before treatment, the Harris score of research group was higher than that of the control group ($P<0.05$), no significant difference was found in the serum OPG, BGP, ALP, CRP and IL-6 levels between two groups ($P<0.05$). **Conclusion:** Total hip replacement was effective in the treatment of femoral neck fracture, although it could cause the increase of serum OPG, BGP and ALP, CRP, IL-6 levels, but it did not increase the risk of surgery.

Key words: Femoral neck fracture; Total hip replacement; Clinical effect; Osteoprotegerin Osteocalcin; Alkaline phosphatase; C-reactive protein; Interleukin-6

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前言

股骨颈骨折是临床常见骨折类型,是由外力、髋周肌肉群退变、骨质疏松等所致,多于老年人群发生,其中女性多见于男

性,其致残率及病死率较高,是引起老年患者生活质量降低或者死亡的主要诱因之一^[1]。股骨颈骨折由于解剖部位相对特殊,容易引起血供缺乏,经内固定治疗后可出现股骨头坏死,但常规保守治疗患者需长时间卧床,容易增加肺炎、压疮等并

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发症,且可引起畸形愈合,影响患侧功能^[2]。关节置换术是其最佳疗法,可避免股骨颈不愈合及股骨头坏死,其中全、半髋关节置换术均可起到较好的临床效果,但关于二者的临床效果仍存在争议^[3]。

研究表明血清碱性磷酸酶(ALP)、骨保护素(OPG)、骨钙素(BGP)水平能够反映机体骨代谢状态,并可介导骨形成^[4]。此外,全髋关节置换术因麻醉、手术等操作容易激活机体的炎症反应,从而增加C反应蛋白(CRP)、白细胞介素-6(IL-6)等炎性介质的释放,其水平过高可能引起病理改变,增加术后并发症可能^[5]。本研究主要探讨了全髋关节置换术用于股骨颈骨折患者的临床效果及对血清 OPG、BGP、ALP、CRP、IL-6 的影响。

1 资料与方法

1.1 一般资料

选择我院 2014 年 3 月~2016 年 3 月收治的 102 例股骨颈骨折患者,按抽签法分为对照组与研究组,每组各 51 例。对照组有 20 例男,有 31 例女;年龄 60~75 岁,平均(67.43±2.35)岁;骨折分型:有 29 例 GardenIII型,有 22 例 GardenIV型。研究组有 22 例男,有 29 例女;年龄 61~73 岁,平均(67.98±2.51)岁;骨折分型:有 27 例 GardenIII型,有 24 例 GardenIV型。两组一般临床特征比较差异均无统计学意义(P>0.05),具有比较性。102 例股骨颈骨折患者均签署家属及患者知情同意书。

1.2 纳入与排除标准

纳入标准:吻合股骨颈骨折相关诊断标准^[6];外伤史明确,髋部明显疼痛,活动受限,患侧肢体呈短缩畸形,外旋内收,下肢可见明显纵向叩击痛,并经 X 线平提示为单侧移位股骨颈骨折(Garden);髋臼软骨未见显著退变;未见其他部位骨折;年龄在 60 岁以上。排除既往伴髋关节置换术史、伴类风湿关节炎或者腰部疾病史、陈旧性股骨颈骨折、造血系统、心、肝肾等严重病变。

1.3 方法

1.3.1 半髋关节置换术 对照组采用半髋关节置换术治疗,指导患者为健侧卧位,常规全身麻醉后消毒。于关节后方取切口,将关节囊完全切开,并显露、切断股骨颈,取出股骨头,并保留约 1.3 cm 残端。冲洗髓腔,灌注骨水泥并置入双极股骨头假体,调整适宜长度并稳定加压,待全部干涸。

1.3.2 全髋关节置换术 研究组采用全髋关节置换术治疗,指导患者为侧卧位,保持患侧肢体在上,持续硬膜外全身麻醉后

常规消毒。于髋关节后缘外侧取手术切口,钝性分离深筋膜,沿着粗隆后嵴将阔筋膜切开,并将臀大肌纤维束适当向上切开,使臀中肌及臀小肌向内牵开,保持患肢内旋,沿粗隆缘将部分短外旋肌及梨状肌切断,并予以缝线、标记。将后方关节囊与短外旋肌界面进行钝性分离,使后方关节囊标记进行 "U" 型切开并完全显露,并沿后上方掀起,使股骨颈与股骨头充分显露。对股骨颈进行常规截骨,并将股骨头完全取出,使髋臼显露,对孟唇行充分清理。将残留的圆韧带及髋臼的瘢痕组织切除,磨锉髋臼软骨,待骨面出现点状渗血,保持软骨下骨的完整性。冲洗髋臼并灌注骨水泥,将选择的适宜假体置入其中,持续加压,处理股骨残端,彻底清除骨碎屑,扩充骨髓腔,置入股骨柄假体,并放置人工股骨头。使髋关节过度内旋,并外旋复位。缝合切口,放置引流管。

1.3.3 术后处理 两组术后均常规使用抗生素防止感染,并予以抗凝处理。术后第 1 天保持患侧肢体处于外周中立位,并行髋关节的主被动的屈伸运动等训练,术后第 7 天时开始扶拐下地的不负重行走,术后 4 周指导患者行负重训练。于术后 6 个月时对疗效及 Harris 评分进行评估。

1.4 观察指标

1.4.1 Harris 评分及疗效 Harris 评分:总分为 100 分,包含疼痛(44 分)、活动功能(47 分)、关节活动面(5 分)、畸形(4 分)。疗效评估:参照 Harris 评分进行,总分为 100 分,超过 90 分表示优;80~90 分之间表示良,70~79 分表示可,低于 70 分表示差^[7,8]。

1.4.2 血清指标 于手术前及术后 1 周抽取 2 mL 患者晨起静脉血,以 3000 r/min 分离 10 分钟,保存上清液待检。OPG、BGP、ALP 采用酶联免疫吸附法进行检测。CRP、IL-6 采用免疫比浊法进行检测。

1.4.3 并发症 于术后对患者血尿常规、肝肾功能等进行定期检测,记录并发症情况。

1.5 统计学分析

选择 SPSS18.0 行数据统计,计量资料用($\bar{x} \pm s$)表示,用 t 检验比较,计数资料用[(例)%]表示,用 χ^2 检验比较,以 P<0.05 为差异有统计学意义。

2 结果

2.1 两组临床疗效的比较

治疗后,研究组优良率为 96.07%,显著高于对照组(84.32%),差异有统计学意义(P<0.05),见表 1。

表 1 两组临床疗效的比较[(例)%]

Table 1 Comparison of the clinical efficacy between two groups [(n)%]

Item	Control group(n=51)	Research group(n=51)
Optimal	11(21.57)	28(54.90)
Good	17(33.33)	13(25.49)
Can be	15(29.41)	8(15.69)
Poor	8(15.69)	2(3.92)
Excellent rate	43(84.31)	49(96.07)#

Note: Compared with control group #P<0.05.

2.2 两组手术前后 Harris 评分的比较

术前,两组 Harris 评分比较差异无统计学意义(P>0.05);术

后,两组 Harris 评分均较术前显著降低(P<0.05),且研究组显著低于对照组,组间差异有统计学意义(P<0.05),见表 2。

表 2 两组手术前后 Harris 评分的比较($\bar{x} \pm s$)Table 2 Comparison of the Harris score between two groups before and after the surgery($\bar{x} \pm s$)

Item	Time	Control group(n=51)	Research group(n=51)
Harris score(points)	Before surgery	55.28 $\pm$ 6.87	54.96 $\pm$ 6.75
	After surgery	87.24 $\pm$ 10.89*	93.50 $\pm$ 11.62**

Note: Compared with control group *P<0.05; Compared with before surgery *P<0.05.

2.3 两组手术前后血清 OPG、BGP、ALP、CRP、IL-6 水平的比较

术前,两组血清 OPG、BGP、ALP、CRP、IL-6 水平比较差异均无统计学意义;术后,两组血清 OPG、BGP、ALP、CRP、IL-6 水平比较差异均无统计学意义。

ALP、CRP、IL-6 水平均较术前显著上升,组内比较有统计学意义(P<0.05),但组间差异无统计学意义(P>0.05),见表 3。

表 3 两组手术前后血清 OPG、BGP、ALP、CRP、IL-6 的比较($\bar{x} \pm s$)Table 3 Comparison of the serum OPG, BGP, ALP, CRP and IL-6 levels between two groups before and after the surgery($\bar{x} \pm s$)

Item	Time	Control group(n=51)	Research group(n=51)
OPG(ng/L)	Before surgery	255.87 $\pm$ 31.81	255.12 $\pm$ 31.20
	After surgery	288.71 $\pm$ 36.12*	289.53 $\pm$ 35.97*
BGP(μ g/L)	Before surgery	12.25 $\pm$ 1.53	12.98 $\pm$ 1.62
	After surgery	21.43 $\pm$ 4.20*	21.90 $\pm$ 4.35*
ALP(U/L)	Before surgery	122.56 $\pm$ 15.25	121.89 $\pm$ 15.96
	After surgery	184.60 $\pm$ 23.06*	185.87 $\pm$ 23.54*
CRP(pg/L)	Before surgery	10.87 $\pm$ 1.35	10.54 $\pm$ 1.28
	After surgery	24.51 $\pm$ 3.06*	24.90 $\pm$ 3.52*
IL-6(ng/L)	Before surgery	10.25 $\pm$ 1.29	10.36 $\pm$ 1.21
	After surgery	22.89 $\pm$ 2.86*	22.99 $\pm$ 2.45*

Note: Compared with before surgery *P<0.05.

2.4 两组术后并发症发生情况的比较

两组均有静脉血栓、关节疼痛、髋关节松动发生,研究组并

发症率(9.8%)低于对照组(33.33%),差异有统计学意义(P<0.05),见表 4。

表 4 两组术后并发症发生情况的比较[(例)%]

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

Item	Control group(n=51)	Research group(n=51)
Vein thrombosis	3(5.88)	2(3.92)
Joint pain	8(15.69)	2(3.92)
Hip loose	6(11.76)	1(1.96)
Complication rate	17(33.33)	5(9.80)*

Note: Compared with control group *P<0.05.

3 讨论

股骨颈骨折是老年人群的常见骨折类型,由于老年患者多伴程度不一的骨质疏松及股骨颈的退行性变化引起张力及压力骨小梁减少,导致股骨颈易于外力作用下发生骨折^[9]。股骨颈骨折可伴疼痛、畸形、肿胀、功能障碍、患侧大粗隆升高等临床表现,且股骨颈囊中血管容易受到影响,引起股骨头血供受限,延迟骨折愈合^[10]。传统内固定及牵引手术可引起系列并发症,临床上应使患者关节活动能力尽快恢复,以促进预后的改善^[11]。人工髋关节置换术可避免多数因素所致的二次手术,是指采用陶瓷、金属、高分子聚乙烯等材料参照机体髋关节结构、功能、形态,制作而成的人工关节假体,可替代患侧关节,起到恢复关节功能、缓解疼痛的目的,现已成为老年股骨颈患者的

首选治疗方式^[12,13]。

半髋关节置换术存在操作简单、失血量少等优势,但髋臼下软组织容易与人工关节的股骨头产生磨损,诱导髋部疼痛,且假体容易产生松动,增加假体的翻修率^[14]。全髋关节置换术能够确保股骨假体与人髋臼的完全匹配,从而创造一个无痛、稳定的关节,可缓解髋臼磨损,存在有效、安全、疼痛轻等优势^[15]。髋关节优良率是一种反映人工髋关节置换术疗效的最佳体现,同时 Harris 评分是评估髋关节功能的常用评分系统,包含疼痛、活动功能、关节活动面、畸形 4 个方面,其信效度较高^[16]。本研究结果显示全髋关节置换术后髋关节优良率、Harris 评分显著优于半髋关节置换术组,说明髋关节置换术的效果肯定,能够利于术后患者髋关节功能的恢复,使患者的生活质量得到提高^[17]。

骨折创伤可引起骨代谢产生相应改变,OPG 主要来自于骨细胞,为骨代谢的一种主要负调控细胞因子,能够竞争性结合 RANKL,从而使骨吸收产生抑制,增加骨量,促进愈合^[18]。BGP 作为一种多肽类因子,多于成骨细胞内生成并释放,能够直观反映成骨细胞的功能,骨质形成状态。ALP 来自于成骨细胞,机体骨形成较明显时其浓度可显著上升,是骨形成与成骨细胞活性的重要标志物^[19]。同时,假体异物置入、手术创伤等外界因素均可刺激机体产生系列应激反应,其中炎症反应是其主要表达方式^[20]。CRP 能够起到调节炎症反应、免疫反应等系列生物学作用,其作为一种急性时相蛋白,机体正常状态下含量极低,创伤、炎症等可诱导其浓度增加^[21]。IL-6 主要来自于肝细胞、巨噬细胞、浆细胞等,是机体炎症反应及防御机制的关键介质,能够介导趋化因子和黏附因子的表达^[22]。本结果显示两组术后血清 OPG、BGP、ALP、CRP、IL-6 水平均较术前显著上升,但组间比较差异无统计学意义,说明全髋关节置换术较半髋关节置换术并未增加机体创伤及手术风险。同时,本研究显示两组术后均有并发症发生,但全髋关节置换术组关节疼痛、髋关节脱位率显著低于半髋关节置换术组,证实全髋关节置换术容易可显著降低疼痛、髋关节松动的发生率。

综上,全髋关节置换术用于股骨颈骨折的临床效果肯定,虽可引起血清 OPG、BGP、ALP、CRP、IL-6 水平上升,但未增加手术风险。

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