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动力髋螺钉与股骨近端髓内钉内固定治疗股骨粗隆间骨折患者的疗效及安全性和关节功能对比观察*

周 崑¹ 仲文军¹ 林 程¹ 阮子平¹ 李 斌¹ 徐 伟²

(1 安徽医科大学附属滁州临床学院 / 滁州市第一人民医院骨科 安徽 滁州 239000;

2 蚌埠医学院第一附属医院骨科 安徽 蚌埠 233004)

摘要 目的:比较动力髋螺钉(DHS)与股骨近端髓内钉(PFNA)内固定治疗股骨粗隆间骨折患者的疗效及安全性和关节功能。**方法:**选取滁州市第一人民医院于2013年3月~2018年4月期间收治的160例股骨粗隆间骨折患者,根据内固定方式的不同将患者分为DHS组(n=80,采用DHS内固定)和PFNA组(n=80,采用PFNA内固定),比较两组临床疗效,采用髋关节功能Harris评分评价所有患者关节功能恢复情况,比较两组患者术前及术后相关指标,并观察患者术后并发症发生情况。**结果:**PFNA组患者临床总有效率为90.00%,高于DHS组患者的68.75%($P<0.05$)。两组患者Harris评分的优良率比较差异无统计学意义($P>0.05$)。PFNA组患者手术时间、卧床时间、骨折愈合时间、切口长度均短于DHS组($P<0.05$),术中出血量、术后引流量均少于DHS组($P<0.05$)。两组患者术后并发症总发生率比较无统计学差异($P>0.05$)。**结论:**DHS与PFNA内固定治疗股骨粗隆间骨折在术后关节功能恢复、安全性方面效果相当,但与DHS内固定治疗比较,PFNA内固定治疗的临床疗效更佳,手术时间更短,出血量更少,患者术后恢复更快,是治疗股骨粗隆间骨折较理想的手术方式。

关键词:动力髋螺钉;股骨近端髓内钉;内固定;股骨粗隆间骨折;疗效;安全性;关节功能

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Intertrochanteric Fracture of Femur: Comparison of Efficacy, Safety and Joint Function between Dynamic Hip Screw and Proximal Femoral Nail*

ZHOU Wei¹, ZHONG Wen-jun¹, LIN Cheng¹, RUAN Zi-ping¹, LI Bin¹, XU Wei²

(1 Department of Orthopedics, The Affiliated Chuzhou Clinical College of Anhui Medical University/The First People's Hospital of Chuzhou, Chuzhou, Anhui, 239000, China;

2 Department of Orthopedics, The First Affiliated Hospital of Bengbu Medical College, Bengbu, Anhui, 233004, China)

ABSTRACT Objective: To compare the efficacy, safety and joint function of dynamic hip screw (DHS) and proximal femoral nail (PFNA) in the treatment of intertrochanteric fracture of femur. **Methods:** A total of 160 patients with intertrochanteric fracture, who were treated in the First People's Hospital of Chuzhou from March 2013 to April 2018, were selected and were divided into DHS group (n=80, DHS treatment) and PFNA group (n=80, PFNA treatment) according to different internal fixation methods. The clinical efficacy of the two groups was compared. Hip function Harris score was used to evaluate the recovery of joint function in all patients. The preoperative and postoperative indicators were compared between the two groups, and the postoperative complications were observed. **Results:** The total effective rate in PFNA group was 90.00%, which was higher than that (68.75%) in DHS group ($P<0.05$). There was no significant difference in the Harris score between the two groups ($P>0.05$). The operation time, bed rest time, fracture healing time and incision length of PFNA group were shorter than those of DHS group ($P<0.05$). The intraoperative bleeding volume and postoperative drainage volume in PFNA group were less than those in DHS group ($P<0.05$). There was no significant difference in the incidence of postoperative complications between the two groups ($P>0.05$). **Conclusion:** In the treatment of patients with femoral intertrochanteric fracture, DHS and PFNA internal fixation have the same effect on joint function recovery and safety after operation, but compared with DHS internal fixation, PFNA internal fixation has better clinical effect, shorter operation time, less bleeding, and faster postoperative recovery, which is an ideal surgical method in the treatment of intertrochanteric fracture of femur.

Key words: Dynamic hip screw; Proximal femoral nail; Internal fixation; Intertrochanteric fracture of femur; Efficacy; Safety

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作者简介:周崑(1979-),男,本科,主治医师,从事关节疾病的研究,E-mail: zhoudoctor123@yeah.net

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前言

股骨粗隆间骨折是指股骨颈基底至小粗隆水平之间的骨折,好发于中老年群体,为股骨近端最常见的骨折之一^[1-3]。据统计^[4],股骨粗隆间骨折的发生率约占全身骨折的3%~4%,占髋部骨折的37%,随着我国近年来老龄化人口的加剧,其发生率呈逐年递增趋势。目前临床针对该病的治疗主要通过手术复位固定的方式,分髓内和髓外固定两大类,其中股骨近端髓内钉(Proximal femoral nail, PFNA)是常见的髓内固定方式^[5],而动力髋螺钉(Dynamic hip screw, DHS)^[6]则是常见的髓外固定方式。PFNA和DHS的内固定方式均可使患者骨折处获得稳定的复位,可有效改善患者活动能力,减少患者长期卧床引发的并发症^[7,8]。然而由于每一种内固定方式均有其各自的适应证,因此尚无统一的治疗方式适用于所有病症,如何选取合适的内固定治疗方式仍是一个值得探讨的热点。本研究通过对股骨粗隆间骨折患者采用DHS与PFNA内固定治疗的临床效果进行分析,旨在为临床治疗股骨粗隆间骨折提供参考数据。

1 资料与方法

1.1 一般资料

选取滁州市第一人民医院于2013年3月~2018年4月间收治的股骨粗隆间骨折患者160例。纳入标准:(1)所有患者入院后均行X线或CT检查确诊为股骨粗隆间骨折,且断端有移位现象;(2)均具有相关手术指征;(3)入院前未行其他相关治疗者;(4)均为首次股骨粗隆间骨折;(5)患者临床资料完整;(6)患者、家属知情本次研究并签署了同意书。排除标准:(1)患者伤前已有髋部疼痛者;(2)合并心、肺、肾等脏器功能不全者;(3)合并恶性肿瘤者;(4)合并精神障碍不能配合本次研究者。根据内固定方式的不同将患者分为PFNA组($n=80$)和DHS组($n=80$),其中PFNA组男42例,女38例,年龄55~90岁,平均(64.28 ± 3.91)岁;受伤原因:坠落伤21例,道路交通伤25例,跌伤34例;骨折改良Evans分型^[9]:I型19例,II型15例,III型16例,IV型17例,V型13例;合并糖尿病23例,合并高血压18例。DHS组男45例,女35例,年龄54~89岁,平均(63.19 ± 4.92)岁;受伤原因:坠落伤24例,道路交通伤22例,跌伤34例;骨折改良Evans分型:I型17例,II型16例,III型18例,IV型14例,V型15例;合并糖尿病19例,合并高血压22例。两组患者基线资料比较无统计学差异($P>0.05$),存在可比性。

1.2 治疗方法

所有患者入院后均给予必要的皮牵引或骨牵引处理,同时对患者基础病症进行常规对症治疗,待患者生命体征平稳后,

检查患者骨折情况,评估手术风险确定内固定治疗方式。所有手术均由同一组医师完成。术前1h静滴抗生素以预防感染,给予硬膜外或全身麻醉,患者取俯卧位,牵引复位后经C型臂X线机透视显示复位良好。在此基础上,PFNA组给予PFNA内固定治疗,具体操作如下:于股骨大粗隆顶点外侧作一5~7cm切口进行扩髓,选取直径约9~12mm的标准型PFNA进行内固定,根据股骨颈长短选取合适的股骨颈钉沿股骨颈方向旋入,至股骨头关节面下约0.5cm处,远端固定一枚锁定钉。DHS组给予DHS内固定治疗,具体操作如下:自股骨大粗隆尖端至股骨上段,作一切口,长约10cm,暴露股骨大粗隆尖端至股骨上段,在大粗隆下2cm处,维持135°颈干角以及15°前倾角,透视下于股骨头方向置入导针,经扩孔、丝攻后置入适宜长度的DHS主钉,导针位置良好后选择3~4孔钢板固定。

1.3 观察指标

(1)观察两组临床疗效,疗效判定标准^[10]:治愈:骨折复位效果满意,临床症状消失,患者活动及负重良好;好转:骨折复位效果比较满意,临床症状基本消失,但有轻微的跛行、下蹲受限,髋内翻 $<25^\circ$,短缩畸形 <2 cm;无效:骨折畸形愈合,患者无法自由活动及负重,髋内翻 $>25^\circ$,短缩畸形 >2 cm。总有效率=治愈率+好转率。(2)术后采用髋关节功能Harris评分^[11]评价所有患者关节功能恢复情况,该量表从功能、疼痛及活动等方面进行评价,总分100分,其中量表总分 <55 分为差,55~69分为中,70~84分为良,85~100为优。(3)记录两组手术时间、术中出血量、术后引流量、切口长度、卧床时间、骨折愈合时间。(4)观察患者术后并发症发生情况,包括血栓形成、内固定物断裂、肺部感染、肢体缩短、延期愈合、螺钉拔出、髋内翻等。

1.4 统计学方法

将研究数据录入SPSS20.0软件进行统计学处理,计量资料以($\bar{x} \pm s$)表示,采用t检验,计数资料以率(%)表示,采用 χ^2 检验,将 $\alpha=0.05$ 设置为检验标准。

2 结果

2.1 两组患者临床疗效比较

PFNA组患者临床总有效率为90.00%,高于DHS组患者的68.75%($P<0.05$),详见表1。

2.2 两组患者术后关节功能情况比较

两组患者Harris评分的优良率比较无差异($P>0.05$),详见表2。

2.3 两组患者手术及术后相关指标比较

PFNA组患者手术时间、卧床时间、骨折愈合时间、切口长度均短于DHS组($P<0.05$),术中出血量、术后引流量均少于DHS组($P<0.05$),详见表3。

表1 两组患者临床疗效比较 [例(%)]

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

Groups	Cure	Good	Invalid	Total effective rate
PFNA group($n=80$)	28(35.00)	44(55.00)	8(10.00)	72(90.00)
DHS group($n=80$)	26(32.50)	29(36.25)	25(31.25)	55(68.75)
χ^2				11.033
P				0.001

表 2 两组患者术后关节功能情况比较 [例(%)]

Table 2 Comparison of postoperative joint function between two groups of patients [n(%)]

Groups	Excellent	Good	Moderate	Bad	The rate of excellent and good
PFNA group(n=80)	57(71.25)	15(18.75)	5(6.25)	3(3.75)	72(90.00)
DHS group(n=80)	50(62.50)	19(23.75)	6(7.50)	5(6.25)	69(86.25)
χ^2					0.538
<i>P</i>					0.463

表 3 两组患者手术及术后相关指标比较 ($\bar{x} \pm s$)Table 3 Comparison of preoperative and postoperative indicators between two groups of patients ($\bar{x} \pm s$)

Groups	Operation time (min)	Intraoperative bleeding volum(mL)	Postoperative drainage volume(mL)	Incision length (cm)	Bed rest time (d)	Fracture healing time (week)
PFNA group(n=80)	75.89± 21.75	205.67± 32.95	52.13± 11.25	6.13± 0.47	25.17± 2.15	10.85± 1.31
DHS group(n=80)	114.26± 19.02	384.14± 24.79	102.53± 23.36	9.08± 0.55	29.23± 2.04	15.24± 1.57
<i>t</i>	11.878	38.713	17.386	26.471	12.252	19.203
<i>P</i>	0.000	0.000	0.000	0.000	0.000	0.000

2.4 两组患者术后并发症比较

($P>0.05$), 详见表 4。

两组患者术后并发症总发生率比较无统计学差异

表 4 两组患者术后并发症比较 [例(%)]

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

Groups	Internal fixation fracture	Limb shortening	Screw out	Delayed healing	Thrombosis	pulmonary infection	Coxa varus	Total incidence
PFNA group(n=80)	1(1.25)	1(1.25)	0(0.00)	1(1.25)	3(3.75)	2(2.50)	2(2.50)	10(12.50)
DHS group(n=80)	2(2.50)	1(1.25)	1(1.25)	2(2.50)	5(6.25)	1(1.25)	2(2.50)	14(17.50)
χ^2								0.784
<i>P</i>								0.376

3 讨论

股骨粗隆衔接股骨头颈部及股骨干,包括小转子、大转子和转子间区,粗隆部的骨结构以松质骨为主,周围有众多肌肉附着,使该处血液供应充足,骨折后易于愈合^[12,13]。股骨粗隆间骨折好发于中老年群体,临床倾向于使用传统的非牵引手术治疗,然而该治疗方式需要患者长期卧床,易造成感染、深静脉血栓、骨折畸形愈合等并发症,因此,对于无明显手术禁忌证的患者应尽早采取相关手术治疗,使骨折迅速愈合,提高患者预后^[14-16]。目前手术内固定治疗取得了较大的进展,DHS、PFNA 内固定被公认为是治疗股骨粗隆间骨折的典型术式。DHS 最早应用于 1995 年,其作为加压螺钉、高强度套筒钢板的三联刚性连接结构,符合髋部生物力学要求,具有静力性、动力性双重加压原理,当骨折断端存在动力持续加压时,主钉可向套管内滑动,保证骨折断端的密切接触,从而促进骨折愈合^[17,18]。然而 DHS 具有一定的缺陷,表现为在股骨头颈仅有一枚主钉固定,抗旋转效果较差,可能导致主钉旋转移位现象,失去稳定连续性^[19,20]。PFNA 则是一种新型的髓内固定系统,较为接近人体正常的生理负重曲线,同时可通过螺旋刀片较好的完

成抗旋转功能以及稳定支撑,可克服 DHS 抗旋转能力差的缺陷,设计更为合理^[21-23]。临床对于股骨粗隆间骨折采用何种术式治疗更为合理一直无定论,因此针对上述两种术式展开系统的探讨具有一定的临床意义。

本次研究结果显示,PFNA 组患者临床总有效率高于 DHS 组,表明相较于 DHS 内固定治疗,PFNA 内固定治疗可获得更好的治疗效果。分析其原因,DHS 近端主钉较粗,虽然其在股骨头颈内固定作用更强,但其抗旋转能力较一般,易导致螺钉切割股骨头或者骨折移位等情况;而 PFNA 的螺旋刀片进入股骨颈过程中可自动旋转,嵌压松质骨,从而可以提升刀片锚合力,同时,PFNA 螺旋刀片与股骨头颈部连接,力臂短、弯矩小,内侧支撑效果较好,内固定更加牢靠,大大降低了骨折断端的剪切力,可进一步提高治疗效果^[24-26]。通过对比两组手术相关指标发现,PFNA 组手术相关指标均优于 DHS 组,与缪世昌等人^[27]研究结果基本一致。这主要是由于 PFNA 具有以下几点优点:主钉顶部为 60° 的外翻弧度,利于其顺利插入骨髓腔;PFNA 螺旋刀片芯的直径逐渐加大,可填压骨质;PFNA 主钉为空心,可避免骨髓剥离,减小骨质损伤。以上优点均可有效缩短手术时间、卧床时间、骨折愈合时间,同时 PFNA 内固定手术过

程中配有精准定位装置,操作较为简便,因此术中创伤小,出血量少^[28,29]。本研究结果还显示,两组患者 Harris 评分的优良率、术后并发症总发生率比较无统计学差异,提示两组内固定治疗均可较好地恢复患者术后关节功能,且术后安全性均较好。究其原因,DHS 内固定治疗抗旋转效果差,且易出现骨折近端向外移,骨折远端向内移等现象;PFNA 内固定直径设计较大,术中扩髓可导致股骨近端骨量丢失,同时,PFNA 术中需要行多次透视确认定位,增加了 X 线暴露次数,患者所接受的射线量增加,以上原因均可能导致 PFNA、DHS 内固定治疗在关节功能恢复、并发症发生率方面无明显差异。而许菁等人^[30]认为,PFNA 治疗老年股骨粗隆间骨折效果较好,安全性较 DHS 效果更佳,这可能是由于本次研究样本选择数量较少,且存在个体差异性,致使结果存在一定的偏倚,后续研究将扩大样本量,增加观察指标,延长随访时间,以分析股骨粗隆间骨折患者的长期预后。

综上所述,PFNA、DHS 内固定治疗股骨粗隆间骨折均可有效改善患者术后关节功能,且两种内固定方式安全性均较好,但 PFNA 内固定治疗临床疗效更佳,可有效改善手术及术后相关指标,具有较高的临床应用价值。

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