

闭合复位加压空心螺钉内固定治疗中青年股骨颈骨折的疗效观察

胡翔¹, 刘保健², 温孝明², 郑永浩¹, 贾柯¹

(1. 甘肃中医药大学, 甘肃 兰州 730000; 2. 甘肃中医药大学附属医院关节外科, 甘肃 兰州 730000)

【摘要】 目的: 探讨闭合复位加压空心螺钉内固定在中青年股骨颈骨折治疗的临床疗效。方法: 自 2013 年 6 月至 2016 年 12 月采用闭合复位加压空心螺钉内固定治疗 33 例中青年股骨颈骨折, 其中男 17 例, 女 16 例, 年龄 19~59 岁, 平均 38.5 岁; 左侧 20 例, 右侧 13 例; 受伤至手术时间为 2~5 d, 平均 3 d。按照 Garden 分型: I 型 1 例, II 型 11 例, III 型 18 例, IV 型 3 例。术后定期随访, 复查髋关节 X 线片, 了解骨愈合和股骨头坏死情况, 末次随访采用髋关节 Harris 功能评分进行疗效评价。结果: 手术时间 30~50 min, 术中出血量 20~70 ml。33 例患者均获得随访, 时间 8~42 个月, 平均 24 个月。末次随访髋关节 Harris 功能评分: 优 18 例, 良 10 例, 中 2 例, 差 3 例, 其中疼痛 (40.61±5.08) 分, 功能 (38.94±6.78) 分, 畸形 (3.88±0.69) 分, 运动范围 (3.70±0.64) 分, 总分 (87.12±11.98) 分。30 例达到骨性愈合, 愈合时间 4~12 个月, 平均 7.5 个月, 2 例患者出现骨折不愈合 (均为 Garden IV 型), 1 例患者发生股骨头坏死 (Garden IV 型), 所有患者未出现术后感染、内固定松动、再骨折等并发症。结论: 闭合复位加压空心螺钉内固定治疗中青年股骨颈骨折具有方法简单、创伤小、固定牢靠等优势, 骨折愈合率高, 股骨头坏死风险低, 临床疗效满意。

【关键词】 股骨颈骨折; 闭合复位; 空心加压螺钉; 骨折固定术, 内

DOI: 10.3969/j.issn.1003-0034.2018.02.003

Clinical observation of closed reduction and compression cannulated screw fixation for the treatment of femoral neck fracture in young and middle-aged patients

HU Xiang, LIU Bao-jian*, WEN Xiao-ming, ZHENG Yong-hao, and JIA Ke.
*Department of Joint Surgery, Affiliated Hospital of Gansu University of Chinese Medicine, Lanzhou 730000, Gansu, China

ABSTRACT Objective: To investigate the clinical effect of internal fixation with closed reduction and hollow compression screws for the treatment of femoral neck fracture in young and middle-aged patients. **Methods:** From June 2013 to December 2016, 33 young and middle-aged patients with femoral neck fractures were treated with hollow compression screws fixation including 17 males and 16 females with an average age of 38.5 years old ranged from 19 to 59 years old; 20 cases were on the left side and 13 cases on the right side; the time from injury to operation ranged from 2 to 5 days with an average of 3 days. According to Garden classification, 1 case were type I, 11 cases were type II, 18 cases were type III, 3 cases were type IV. During regular follow-up after operation, through the hip joint X-ray, the healing situation of bone and osteonecrosis were observed. The Harris score was used to evaluate the hip function of the final follow-up. **Results:** The operation time was from 30 to 50 minutes, the blood loss during operation was 20 to 70 ml. All patients were followed up for 8 to 42 months with an average of 24 months. At the final follow-up, the Harris score of hip joint was excellent in 18 cases, good in 10 cases, fair in 2 cases and poor in 3 cases. Among them, the pain scores were 40.61±5.08, function scores were 38.94±6.78, malformation scores were 3.88±0.69, motion range scores were 3.70±0.64 and the total scores were 87.12±11.98. Thirty cases achieved bone healing, the healing time was 4 to 12 months with an average of 7.5 months, 2 patients occurred with nonunion (Garden type IV), 1 patient with femoral head necrosis (Garden type IV). All patients had no postoperative infection, internal fixation loosening, refracture and other complications. **Conclusion:** In treating the young and middle-aged patients with femoral neck fracture, closed reduction and hollow compression screw fixation has advantages of simple, stable fixation, less trauma, high rate of fracture healing, osteonecrosis of the femoral head with low risk and satisfactory clinical effect.

KEYWORDS Femoral neck fracture; Closed reduction; Hollow compression screws; Fracture fixation, internal

Zhongguo Gu Shang/China J Orthop Trauma, 2018, 31(2): 111-114 www.zggszz.com

基金项目: 兰州市科技发展计划项目 (项目编号: 2014-1-26)

Fund program: Science and Technology Development Plan of Lanzhou (No. 2014-1-26)

通讯作者: 刘保健 E-mail: lbj@zyxyfy.com

Corresponding author: LIU Bao-jian E-mail: lbj@zyxyfy.com

股骨颈骨折常见于老年人,约占全身骨折 3.58%,占髋部骨折 54%,而在中青年人群中,其发病率相对较低,仅占全部股骨颈骨折的 2%~3%^[1-2]。但近年来,随着工伤事故和交通意外事故的增多,股骨颈骨折在中青年人群的发病率也在逐渐增加^[3]。中青年股骨颈骨折多由高能量创伤所致,骨折断端大多移位明显,血运损坏较重,因此骨折后不愈合率和股骨头缺血性坏死发生率较高。据报道,中青年股骨颈骨折股骨头坏死率高达 23%^[4]。2013 年 6 月至 2016 年 12 月采用闭合复位加压空心螺钉内固定治疗中青年股骨颈骨折 33 例,报告如下。

1 临床资料

本组 33 例患者,男 17 例,女 16 例;年龄 19~59 岁,平均 38.5 岁;左侧 20 例,右侧 13 例。致伤原因:交通事故伤 20 例,高空坠落伤 9 例,摔伤 3 例,砸伤 1 例。按 Garden^[5]分型:Ⅰ型 1 例,Ⅱ型 11 例,Ⅲ型 18 例,Ⅳ型 3 例。合并脊柱骨折、骨盆骨折或全身多处骨折急需急诊手术者未纳入观察病例范围。受伤至手术时间 2~5 d,平均 3 d。

2 治疗方法

2.1 术前准备

入院后完善相关基础术前检查,排除手术禁忌。所有患者完善髋关节正位及患髋正轴位 X 线或髋关节 CT 等检查,术前常规患肢关节制动,不牵引。

2.2 手术方法

采用连续硬膜外或全身麻醉,麻醉后,患者仰卧于牵引手术床,C 形臂 X 线机辅助下行骨折复位:患肢保持外旋姿势,外展约 20°,适当牵引使患肢稍超过正常的长度,然后患肢同时内收、内旋,内旋约 15°~20°完成复位。C 形臂 X 线下参照 Garden 对位指数^[6]对骨折端复位情况进行评估,即正位片上,股骨干内侧缘与压力骨小梁中央轴的夹角为 160°~180°,侧位片上,角度约为 180°,角度在±15°范围内可以接受。对于复位较困难骨折时,可在 C 形臂 X 线辅助下,先用 1 枚克氏针临时横行钻入固定股骨头,然后牵拉远端对位,一般情况下均能达到满意的对位效果。当复位满意后,患肢牵引架上保持外展 30°、内旋 15°,术区常规无菌消毒,铺无菌单,在 C 形臂 X 线透视指导下,自股骨大转子向股骨头方向斜行转入 3 枚克氏针临时固定,正侧位透视位置良好后,于针尾部切开 1 cm 切口,予以环转开口后,分别予以 3 枚空心加压螺钉固定,C 形臂 X 线透视螺钉位置良好,髋关节活动自如。生理盐水冲洗,逐层缝合,无菌辅料加压包扎伤口。

2.3 术后处理

术后患肢外展支架固定,置入外展位 20°,防旋

鞋固定 4 周。给予抗感染、促进骨折愈合、改善患肢末梢血运循环等对症治疗,并指导早期功能康复锻炼。术后第 3 天在床上开始进行下肢肌肉收缩锻炼,术后 2 周左右进行髋关节不负重活动。术后 4~6 周,不负重情况下拄双拐下地适当运动,术后 3 个月,复查 X 线片,如骨折线模糊,可在有保护情况下部分负重活动。术后 6 个月,如复查髋关节正位片提示骨折线消失,则可以考虑逐渐放弃拄拐,开始负重行走。待骨折完全骨性愈合后,可在术后 1~2 年取出内固定螺钉,对于年龄>50 岁的患者,若无特殊不适或内固定断裂等情况,一般不建议取出内固定材料。末次随访采用髋关节功能 Harris^[7]评分,评定治疗效果。

3 结果

本组手术时间 30~50 min,术中出血量 20~70 ml。33 例患者均获得随访,时间 8~42 个月,平均 24 个月。30 例达骨性愈合,愈合时间 4~12 个月,平均 7.5 个月。2 例患者出现骨折不愈合(均为 Garden Ⅳ型),1 例患者(Garden Ⅳ型)发生股骨头坏死。所有患者未出现术后感染、内固定松动、再骨折等并发症。末次随访髋关节 Harris 评分:疼痛 40.61±5.08,功能 38.94±6.78,畸形 3.88±0.69,运动范围 3.70±0.64,总分 87.12±11.98;结果优 18 例,良 10 例,中 2 例,差 3 例。在骨折愈合中,功能较差共 3 例,2 例出现骨折不愈合,1 例患者在随访 22 个月时出现股骨头坏死并行全髋关节置换术。典型病例 X 线片见图 1。

4 讨论

4.1 适应证的把握

对于中青年股骨颈骨折,除不能耐受麻醉和手术者,一般首选手术治疗。中青年患者,骨塑形能力强,后期活动量大,术后功能要求也相对较高,一般不推荐人工髋关节置换,而能达到解剖复位并且牢固固定的加压空心螺钉内固定手术治疗成为了中青年股骨颈骨折患者治疗首选^[8-9]。结合此次临床研究,空心加压螺钉内固定在治疗 Garden Ⅰ、Ⅱ型骨折疗效满意,无骨折不愈合和股骨头坏死,而对于部分 Garden Ⅲ、Ⅳ型骨折,尽管有骨折不愈合和股骨头坏死的情况发生,但考虑到其发生率较低,分别占此次移位型骨折的 9.5%和 4.8%,而且其不良情况的发生还与患者的身体条件及后期功能活动有关,因此综合考虑,笔者认为,对于中青年股骨颈骨折的患者,首选加压空心螺钉内固定治疗。

4.2 复位质量的影响

复位质量的好坏是股骨颈骨折内固定治疗成功与否的关键,良好的复位能降低术后骨折不愈合和股骨头缺血坏死等并发症的发生率^[10]。假如骨折复

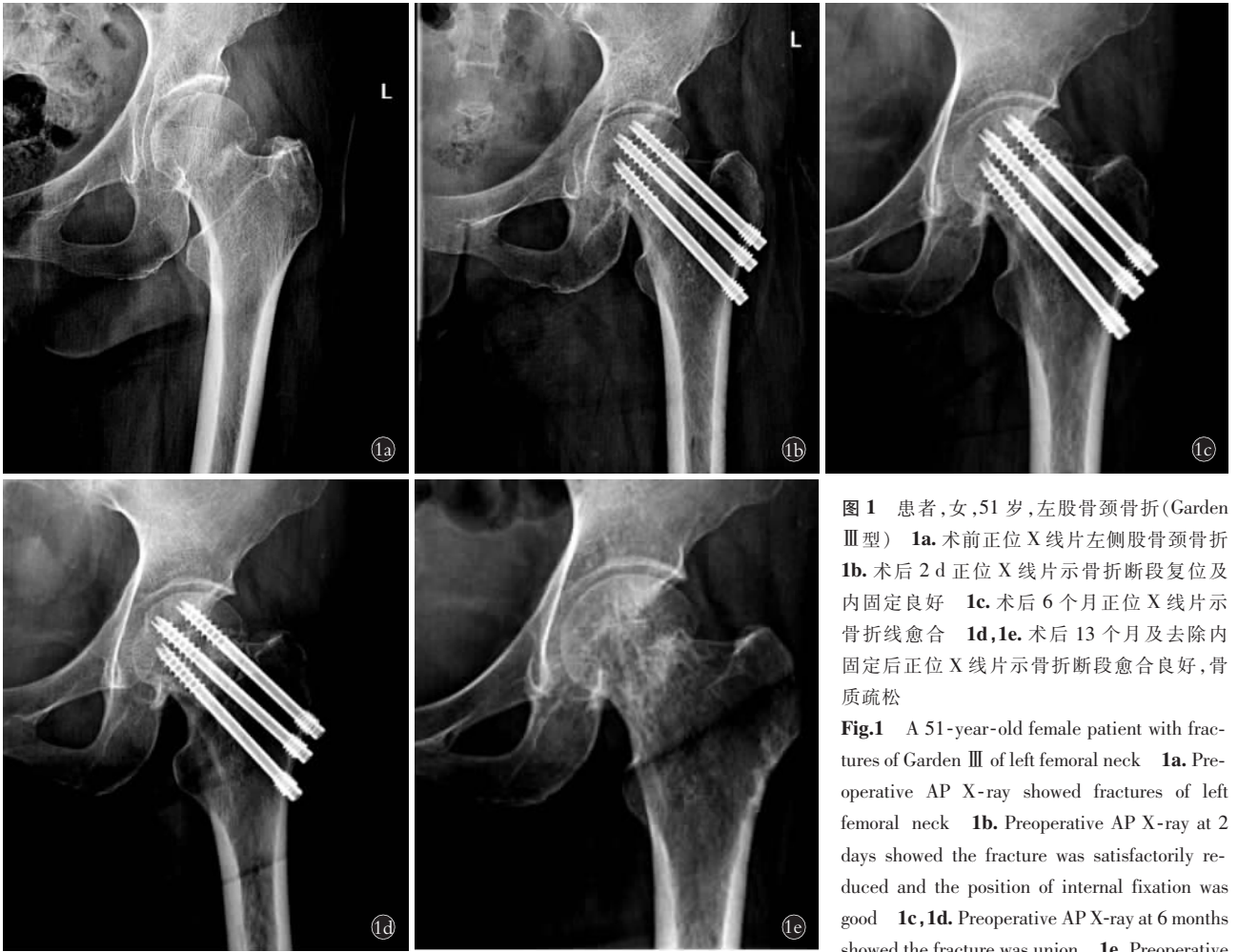


图 1 患者,女,51 岁,左股骨颈骨折(Garden III 型) 1a. 术前正位 X 线片左侧股骨颈骨折 1b. 术后 2 d 正位 X 线片示骨折断段复位及内固定良好 1c. 术后 6 个月正位 X 线片示骨折线愈合 1d,1e. 术后 13 个月及去除内固定后正位 X 线片示骨折断段愈合良好,骨质疏松

Fig.1 A 51-year-old female patient with fractures of Garden III of left femoral neck 1a. Pre-operative AP X-ray showed fractures of left femoral neck 1b. Preoperative AP X-ray at 2 days showed the fracture was satisfactorily reduced and the position of internal fixation was good 1c,1d. Preoperative AP X-ray at 6 months showed the fracture was union 1e. Preoperative

AP X-ray at 13 months and removal of internal fixation showed the fracture was well and osteoporosis

位不满意,巨大的剪切应力对新生血管、骨小梁,甚至残存的血管可能造成不可逆的损伤,明显增加了股骨头坏死的风险^[11-12]。在此次研究中,依据 Garden 复位指数 C 形臂 X 线机下透视复位,争取做到一次复位成功,最大限度做到解剖复位,以减少反复牵拉对血供的破坏。在实际临床中,多数患者在 C 形臂 X 线机辅助下均能做到一次复位满意,但仍有部分骨折断端移位较多或患者复位比较困难。本组有 5 例患者出现一次复位不理想,且多数为 Garden IV 型,骨折断端剪切力较大,单纯肌肉拉力下骨折断端不稳定,因此,对于此类难复位型的骨折,一般采用在 C 形臂 X 线辅助下,先用 1 枚克氏针临时横行钻入固定股骨头,然后牵拉远端对位的方法,达到满意的对位效果。通过此次临床研究,笔者认为,大部分股骨颈骨折闭合复位下效果满意,确有一次复位不理想者,可选择在克氏针 1 枚临时固定下复位,多数能达到理想效果。但鉴于此次纳入病例较少,且随访时间较短,因此闭合复位对于中青年患者远期的影响还有待进一步观察。

4.3 空心螺钉的特点

加压空心螺钉内固定治疗股骨颈骨折目前已被大多数学者认同^[13-14],其优点也是显而易见:(1)对股骨头颈部的血液供应影响较小:中青年患者多因暴力致伤,股骨头血供破坏严重,而空心螺钉直径较小,手术创伤小,术中对组织剥离少,没有加重对骨折断端周围血供的破坏,在尽早帮助骨折愈合的同时,也能最大限度的保护和恢复股骨头颈部血供;(2)3 枚螺钉稳定性更佳:3 枚螺钉呈“品”形或倒三角形排列方式置入,具有更稳定的生物力学,其抗剪力、抗张力、抗旋转作用较强,不易松动^[15];螺钉跨骨折线,对骨折断端起到强力加压固定,加快骨折断端愈合;(3)降低骨内压:螺钉是中空的结构,置入后可以降低骨内压,降低关节囊的压力,缓解“堵塞效应”,改善股骨头的血供,从而降低各种并发症的发生率。

总体而言,加压空心螺钉治疗中青年股骨颈骨折具有操作简单、术中出血量少等优势,空心螺钉体积小,螺纹固定牢靠,不易松动,因此对于中青年股

骨颈骨折患者而言,可作为首选的治疗方法;在治疗过程中,保证良好复位和坚强固定是关键,对骨折的愈合和后期的预后具有非常重要的作用。考虑到此次临床研究病例数较少,随访时间较短,远期疗效需积累更多病例进一步随访。

参考文献

- [1] Frihagen F, Nordsletten L, Madsen JE. Hemiarthroplasty or internal fixation for intracapsular displaced femoral neck fractures: randomised controlled trial[J]. *BMJ*, 2007, 335(7632): 1251-1254.
- [2] Davidovitch RI, Jordan CJ, Egol KA, et al. Challenges in the treatment of femoral neck fractures in the nonelderly adult[J]. *J Trauma*, 2010, 68(1): 236-242.
- [3] Raudenbush B, Walton I, Simela A, et al. Inflammatory bowel disease, high-dose steroids, osteoporosis, or an oncological etiology for a pathological femoral neck fracture in a young adult: a case report[J]. *Open Orthop J*, 2014, 8: 27-33.
- [4] Haidukewych GJ, Rothwell WS, Jacofsky DJ, et al. Operative treatment of femoral neck fractures in patients between the ages of fifteen and fifty years[J]. *J Bone Joint Surg Am*, 2004, 86(8): 1711-1716.
- [5] Garden RS. Malreduction and avascular necrosis in subcapital fractures of the femur[J]. *J Bone Joint Surg Br*, 1971, 53(2): 183-197.
- [6] 龙亚周, 张树明, 王奎友, 等. 空心加压螺钉内固定治疗老年股骨颈骨折[J]. *中国骨与关节损伤杂志*, 2015, 30(10): 1088-1089.
LONG YZ, ZHANG SM, WANG KY, et al. Cannulated screw internal fixation for the treatment of femoral neck fracture in elderly patients[J]. *Zhongguo Gu Yu Guan Jie Sun Shang Za Zhi*, 2015, 30(10): 1088-1089. Chinese
- [7] Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation[J]. *J Bone Joint Surg Am*, 1969, 51(4): 737-755.
- [8] 楼宇梁, 洪建军, 余可和, 等. 不同直径空心钉闭合复位内固定治疗股骨颈骨折疗效分析[J]. *中国骨伤*, 2015, 28(9): 792-795.
LOU YL, HONG JJ, YU KH, et al. Comparison of different diameter hollow screw for the treatment of femoral neck fractures[J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2015, 28(9): 792-795. Chinese with abstract in English.
- [9] 侯吴仁, 徐敏鸥. 动力髋螺钉加防旋螺钉与 3 枚空心螺钉治疗股骨颈粉碎性骨折的疗效比较[J]. *中国骨伤*, 2015, 28(9): 796-801.
HOU WR, XU MO. Comparison of three cannulated screws and dynamic hip screw combined with antirotation screw for comminuted fractures of femoral neck[J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2015, 28(9): 796-801. Chinese with abstract in English.
- [10] 张学全, 樊仕才, 黎惠金, 等. 带旋髂深血管髂骨瓣或股方肌骨瓣移植治疗青壮年 Garden III-IV 型股骨颈骨折的比较[J]. *中国骨伤*, 2015, 28(9): 802-807.
ZHANG XQ, FAN SC, LI HJ, et al. Case-control study on the iliac bone flap transplantation with deep circumflex iliac artery and quadratus femoris bone flap transplantation in the treatment of type III/IV femoral neck fracture of Young and middle-aged patients[J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2015, 28(9): 802-807. Chinese with abstract in English.
- [11] 刘福尧, 刘承伟, 吴声忠. 不同置钉方式修复中青年移位型股骨颈骨折: 复位质量及股骨头坏死率对比[J]. *中国组织工程研究*, 2015, 19(31): 4983-4988.
LIU FY, LIU CW, WU SZ. Different screw placement schemes in the treatment of middle-aged and young patients with displaced femoral neck fracture: reduction quality and femoral head necrosis rate[J]. *Zhongguo Zu Zhi Gong Cheng Yan Jiu*, 2015, 19(31): 4983-4988. Chinese.
- [12] Yoshimoto K, Nakashima Y, Nakamura A, et al. Neck fracture of femoral stems with a sharp slot at the neck: biomechanical analysis[J]. *J Orthop Sci*, 2015, 20(5): 881-887.
- [13] 卢华定, 董云旭, 温小粤, 等. 空心加压螺钉治疗股骨颈骨折疗效分析[J]. *中国骨伤*, 2011, 24(4): 315-318.
LU HD, DONG YX, WEN XY, et al. Analysis the rapetive effects of cannulated compression screws for the treatment of femoral neck fractures[J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2011, 24(4): 315-318. Chinese with abstract in English.
- [14] 章年年, 叶招明, 朱仰义, 等. 双螺钉系统与 3 枚空心加压螺钉治疗股骨颈骨折的比较研究[J]. *中国骨伤*, 2013, 26(7): 565-571.
ZHANG NN, YE ZM, ZHU YY, et al. Case control study on double screws system and com pressed three canulated screws in treating femoral neck fractures[J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2013, 26(7): 565-571. Chinese with abstract in English.
- [15] Kaplan T, Akesen B, Demirag B, et al. Comparative results of percutaneous cannulated screws, dynamic compression type plate and screw for the treatment of femoral neck fractures[J]. *Ulus Travma Acil Cerrahi Derg*, 2012, 18(1): 65-70.
(收稿日期: 2017-05-20 本文编辑: 王玉蔓)