doi: 10.13241/j.cnki.pmb.2021.08.020

切开与闭合复位空心钉内固定对移位股骨颈骨折患者骨折复位质量和髋关节功能的影响 *

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摘要 目的：探讨切开与闭合复位空心钉内固定对移位股骨颈骨折患者骨折复位质量和髋关节功能的影响。**方法**：本研究为回顾性研究，选取 98 例移位股骨颈骨折患者的临床资料，根据手术方式的不同将患者分为 A 组（n=50，切开复位）和 B 组（n=48，闭合复位），比较两组患者优良率、骨折复位质量、髋关节功能、围术期指标、术后并发症发生率和二次手术发生率。**结果**：A 组患者术后 6 个月的优良率为 78.00%（39/50），高于 B 组的 58.33%（28/48）（*P*<0.05）。两组术后负重下地时间、术中透视时间比较无差异（*P*>0.05）；B 组手术时间、住院时间短于 A 组，术中出血量少于 A 组（*P*<0.05）。两组患者术后 1 个月、术后 3 个月、术后 6 个月髋关节功能 Harris 评分均较术前升高，且 A 组高于 B 组（*P*<0.05）。两组二次手术及并发症发生率比较无差异（*P*>0.05）。A 组Ⅰ型、Ⅱ型的例数均多于 B 组，Ⅲ型例数少于 B 组（*P*<0.05）。**结论**：与闭合复位空心钉内固定相比，切开复位空心钉内固定虽损伤较大，但其术后骨折复位质量和髋关节功能改善效果更佳，且不增加并发症发生率和二次手术发生率。

关键词：切开复位；闭合复位；空心钉内固定；移位股骨颈骨折；骨折复位质量；髋关节功能

中图分类号：R683 **文献标识码**：A **文章编号**：1673-6273(2021)08-1494-04

The Effect of Open and Closed Reduction and Internal Fixation with Cannulated Screws on the Reduction Quality and Hip Joint Function of Displaced Femoral Neck Fractures*

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ABSTRACT Objective: To investigate the effect of open and closed reduction and internal fixation with cannulated screws on the reduction quality and hip joint function of displaced femoral neck fractures. **Methods:** This was a retrospective study, the clinical data of 98 patients with displaced femoral neck fracture were selected. According to the different operation methods, the patients were divided into group A (n=48, open reduction) and group B (n=50, closed reduction). The excellent rate, fracture reduction quality, hip joint function, perioperative index, postoperative complication rate and secondary operation rate of the two groups were compared. **Results:** The excellent and good rate of group A was 78.00% (39/50), which was higher than 58.33% (28/48) of the control group (*P*<0.05). There were no significant differences in fluoroscopy time in operation and weight-bearing time after operation between the two groups (*P*>0.05). The operation time and hospitalization time of group B were shorter than that of group A, the amount of bleeding in operation was less than that in group A (*P*<0.05). The Harris score of hip joint function in the two groups at 1 month, 3 months and 6 months after operation were higher than that before operation, and the score in group A was higher than that in group B (*P*<0.05). There were no significant differences in the secondary operation rate incidence and complication rate between the two groups (*P*>0.05). The number of type Ⅰ and type Ⅱ cases of group A was more than that of group B, and the number of type Ⅲ cases was less than that of group B(*P*<0.05). **Conclusion:** Compared with closed reduction and internal fixation with cannulated screw, open reduction has more damage, but it has better quality of fracture reduction and hip joint function, and does not increase the incidence of complications and secondary operation.

Key words: Open reduction; Closed reduction; Internal fixation with hollow nail; Displaced femoral neck fracture; Fracture reduction quality; Hip joint function

Chinese Library Classification(CLC): R683 Document code: A

Article ID: 1673-6273(2021)08-1494-04

前言

移位股骨颈骨折在临床中属于较为常见的骨折类型，多发于中老年群体，且与骨质疏松导致的骨质量下降有关[1]。由于股

* 基金项目：山西省留学人员科研资助项目(2013-114)

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（收稿日期：2020-07-30 接受日期：2020-08-24）

骨颈解剖结构及生物力学的特殊性，骨折后若未能及时予以相关治疗，容易发生骨折不愈合以及股骨头缺血坏死等并发症[2,3]。手术是治疗移位股骨颈骨折的主要方法，以早期复位内固定手术为基础，多枚空心钉实施的内固定手术具有较强的抗弯力、抗扭转力及抗剪力等，可有效促进患者术后恢复[4,5]。而内固定方式又分为切开复位[6]和闭合复位[7]，临床有关两种复位方式孰优孰劣尚存在一定的争议。本研究通过探讨切开与闭合复位空心钉内固定对移位股骨颈骨折患者骨折复位质量和髋关节功能的影响，以期为临床移位股骨颈骨折空心钉内固定复位方式的选择提供数据参考。

1 资料与方法

1.1 一般资料

回顾性分析 2017 年 2 月 ~2019 年 6 月期间我院收治的 98 例移位股骨颈骨折患者的临床资料，纳入标准：(1)经 CT 等影像学手段证实为移位股骨颈骨折；(2)Garden 分型为Ⅲ型或Ⅳ型[8]；(3)均符合手术指征者；(4)手术操作均由同一组医师完成；(5)临床资料完整，术后完成随访者。排除标准：(1)合并恶性肿瘤、严重躯体疾病者；(2)合并精神障碍，无法配合治疗者；(3)合并其他部位骨折者；(4)妊娠或哺乳期妇女；(5)合并陈旧性股骨颈骨折。根据手术方式的不同分为 B 组(n=48，闭合复位)、A 组(n=50，切开复位)，其中 A 组男 29 例，女 21 例；年龄 40~65 岁，平均(49.16± 4.82)岁；Garden 分型Ⅲ型 30 例，Ⅳ型 20 例；体质量指数 21.8~26.9 kg/m^2，平均(23.92± 0.77)kg/m^2；骨折原因：高处坠伤 14 例，车祸 24 例，摔伤 12 例。B 组男 26 例，女 22 例；年龄 39~61 岁，平均(48.61± 5.42)岁；Garden 分型Ⅲ型 26 例，Ⅳ型 22 例；体质量指数 21.2~26.3 kg/m^2，平均(23.74± 0.85)kg/m^2；骨折原因：高处坠伤 12 例，车祸 26 例，摔伤 10 例。两组患者一般资料对比未见统计学差异(P>0.05)，具有可比性。

1.2 方法

A 组给予切开复位内固定方式，患者采用腰硬联合麻醉，取平卧位，以股骨大粗隆前缘作为中心，取髂前上棘后方约 3 cm 处作一弧形切口，沿着阔筋膜张肌与臀中肌之间的间隙进入，暴露髋关节前方的关节囊，直视下进行复位。第 1 枚克氏针置于股骨大粗隆下方，第 2 枚克氏针置于其上方沿股骨后侧皮质，第 3 枚克氏针置于股骨颈上方皮质，呈倒三角形排列。随后置入 3 枚空心钉固定骨折端。术后内置乳胶引流条，不缝合关节囊，术后 24 h 拔出引流条。B 组给予闭合复位内固定处理，取平卧位，患者采用腰硬联合麻醉，透视下牵引复位，在透视下置入克氏针和空心钉，置入位置及方法同 A 组。术后操作同 A组。

1.3 观察指标

(1)采用门诊复查的方式随访 6 个月，记录两组患者优良率。采用髋关节功能 Harris 评分[9]标准对患者疗效进行评价。其中髋关节功能 Harris 评分共 100 分，优：评分≥ 90 分；良：80≤ 评分 <90 分；可：70≤ 评分 <80 分；差：评分 ＜70 分。优良率 = 优率 + 良率。(2)记录两组：术中出血量、手术时间、术中透视时间、住院时间、术后负重下地时间。(3)记录术后并发症发生率和二次手术发生率。(4)记录两组患者术前、术后 1 个月、术后 3 个月、术后 6 个月的髋关节功能 Harris 评分。(5)于术后 6 个月评价两组患者骨折复位质量，参考 Garden 分型评价[8]，Ⅰ型：侧位 X 线片显示股骨颈轴线与股骨头轴线呈 190° 角。正位 X 线片显示股骨头压力骨小梁轴心与股骨干内侧缘呈 160° 角。Ⅱ型：正位、侧位 X 线片显示的角度在 155~180° 角。Ⅲ型：正位、侧位 X 线片显示的角度有一个不在 155~180° 角。

1.4 统计学方法

数据采用 SPSS25.0 软件进行分析，计数资料以[n(%)]的形式表示，进行卡方检验，计量资料以均值± 标准差的形式表示，进行 t 检验。检验标准设为α=0.05。

2 结果

2.1 两组优良率比较

A 组患者术后 6 个月的优良率为 78.00%(39/50)，高于 B 组的 58.33%(28/48)(P<0.05)；详见表 1。

表 1 两组优良率比较 [例(%)]

Table 1 Comparison of excellent rate between the two groups [n(%)]

Groups	Excellent	Good	Can	Bad	Excellent and good rate
Group A (n=50)	16(32.00)	23(46.00)	7(14.00)	4(8.00)	39(78.00)
Group B(n=48)	10(20.83)	18(37.50)	11(22.92)	9(18.75)	28(58.33)
x^2					4.380
P					0.036

2.2 两组围术期指标情况

两组术后负重下地时间、术中透视时间比较无差异(P>0.05)；B 组手术时间、住院时间短于 A 组，术中出血量少于 A 组(P<0.05)；详见表 2。

2.3 两组髋关节功能评分比较

两组术前髋关节功能 Harris 评分比较无差异(P>0.05)；两组术后 1 个月、术后 3 个月、术后 6 个月髋关节功能 Harris 评分均较术前升高，且 A 组高于 B 组(P<0.05)；详见表 3。

2.4 两组术后并发症发生率和二次手术发生率比较

两组并发症、二次手术发生率比较无差异(P>0.05)；详见表 4。

2.5 两组患者骨折复位质量比较

A 组Ⅰ型、Ⅱ型的例数均多于 B 组，Ⅲ型例数少于 B 组(P<0.05)；详见表 5。

3 讨论

移位股骨颈骨折是指发生于股骨头下及股骨颈基底部间

表 2 两组围术期指标情况($\bar{x}\pm s$)

Table 2 Perioperative indicators of the two groups($\bar{x}\pm s$)

Groups	Operation time(min)	Amount of bleeding in operation(ml)	Fluoroscopy time in operation(s)	Weight-bearing time after operation(d)	Hospitalization time (d)
Group A (n=50)	72.28± 5.95	357.54± 24.32	26.36± 2.26	159.52± 4.42	11.16± 1.15
Group B(n=48)	47.35± 5.73	41.56± 5.01	26.64± 2.87	158.83± 3.31	8.93± 1.36
t	21.113	88.219	0.538	0.872	8.748
P	0.000	0.000	0.592	0.385	0.000

表 3 两组髋关节功能评分比较($\bar{x}\pm s$,分)

Table 3 Comparison of hip joint function scores between the two groups($\bar{x}\pm s$, scores)

Groups	Before operation	1 month after operation	3 months after operation	6 months after operation
Group A (n=50)	44.39± 7.23	71.24± 6.42^{a}	79.88± 8.78^{ab}	86.34± 6.54^{abc}
Group B(n=48)	45.11± 8.18	59.53± 7.33^{a}	68.24± 7.65^{ab}	78.38± 6.23^{abc}
t	0.461	8.399	7.005	9.265
P	0.646	0.000	0.000	0.000

Notes: compared with before operation, $^{a}P<0.05$; compared with 1 month after operation, $^{b}P<0.05$; compared with 3 months after operation, $^{c}P<0.05$

表 4 两组术后并发症发生率和二次手术发生率比较 [例(%)]

Table 4 Comparison of postoperative complication rate and secondary operation rate between the two groups [n(%)]

Groups	Complication			Secondary operation rate
	Nonunion of fracture	Femoral head necrosis	Total incidence rate	
Group A (n=50)	6(12.00)	5(10.00)	11(22.00)	5(10.00)
Group B(n=48)	5(10.42)	3(6.25)	8(16.67)	8(16.67)
x^2	0.898			1.621
P	0.343			0.203

表 5 两组患者骨折复位质量比较 [例(%)]

Table 5 Comparison of fracture reduction quality between the two groups [n(%)]

Groups	Type Ⅰ	Type Ⅱ	Type Ⅲ
Group A (n=50)	33(66.00)	14(28.00)	3(6.00)
Group B(n=48)	22(45.83)	5(10.42)	21(43.75)
x^2	4.045	4.845	18.872
P	0.044	0.028	0.000

的骨折,因该处解剖结构特殊,故相对于全身其他部位的骨折更为复杂[10]。股骨颈的血液供应来自于旋股内侧动脉、股骨干滋养动脉分支、外侧动脉、小凹动脉,当出现骨折时上述几处分支动脉受压,极易引起股骨头缺血性坏死并发症的发生[11-13]。由于移位股骨颈骨折难以通过手法、牵引复位转变为稳定骨折,加上该处的血液循环遭到不同程度的破坏,故手术治疗是其最有效的治疗方案[14,15]。既往研究表明[16],移位性股骨颈骨折 6 小时内成功复位者,其并发症发生率将明显减少,而若是在 48 小时后才复位者,其并发症的发生率可增加 30%~40%,并提高二次手术发生率。闭合或切开复位空心钉内固定术均是临床常用的手术治疗方案,有学者认为闭合复位有助于保留患者股骨头及其功能,减少破坏股骨头血液循环的风险[17]。而也有学者认为切开复位能提高骨折复位质量,同时可避免闭合复位时反复手法复位造成的血管破坏[18]。本研究就此争议展开探讨。

本次研究结果显示,闭合复位者的术中出血量少于切开复位者,手术时间、住院时间短于切开复位者,表明切开复位者的术中损伤相对更大,其围术期指标略差于闭合复位者。这主要是因为相对于闭合复位,切开复位的术式操作更复杂,相应的延长手术时间,增加术中损伤,使得术中出血量明显升高[19,20]。进一步分析两组预后可知,与闭合复位者相比,切开复位者的髋关节功能恢复更佳,疗效更为显著。分析其原因,切开复位可达到理想的解剖复位,而闭合复位内固定多不能达到理想解剖复位目的,术后力线改变,导致股骨距应力遮挡,髋关节功能恢复较慢。同时切开复位将关节囊切开减压有利于改善股骨头的血液灌注,利于患者术后恢复[21-23]。此外,A 组Ⅰ型、Ⅱ型的例数均多于 B 组,Ⅲ型例数少于 B 组,可见切开复位内固定可获得更好的骨折复位质量,多数股骨颈骨折患者通过闭合复位的方式即可获得良好的复位效果, 但由于移位股骨颈骨折的特殊性,闭合复位者往往需经反复多次的牵拉复位才可获得较好的复位质量[24-26]。而切开复位可获得良好的视觉路径,通过克氏针的轻柔操作,尽量减少对股骨颈的供应血管损伤,进而达到满意复位[27-29]。移位股骨颈骨折内固定术治疗后最主要的并发症

为骨折不愈合、股骨头坏死，而在本研究中，两组患者术后并发症发生率和二次手术发生率比较无差异，而陈黎兵等[30]学者研究结果却显示，切开复位空心钉内固定术能够有效减少术后股骨头坏死的发生率。这与本次研究结果不一致，可能是由于本次研究样本量偏小，且存在个体差异性所致，后续报道将扩大样本量、延长随访时间以获取更为准确的数据。

综上所述，与闭合复位空心钉内固定相比，切开复位空心钉内固定虽损伤较大，但其术后骨折复位质量和髋关节功能改善效果更佳，且不增加并发症发生率和二次手术发生率。

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