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交锁髓内钉与经皮锁定钢板治疗胫骨骨折的临床对照研究

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摘要 目的:探讨交锁髓内钉与经皮锁定钢板治疗胫骨骨折的疗效。**方法:**选取了 100 例胫骨骨折患者,按住院单双号分为两组,对照组(48 例)给予交锁髓内钉,观察组(52 例)给予经皮锁定钢板治疗。通过观察并记录疗效,围手术期指标及随访 3 个月的并发症发生情况,评价交锁髓内钉与经皮锁定钢板治疗胫骨骨折的疗效。**结果:**采用经皮锁定钢板内固定和交锁髓内钉治疗胫骨骨折,两种手术方法所需手术时间无统计学差异($P>0.05$),经皮锁定钢板内固定术中出血量更少,术后观察组患者住院时间和骨折愈合时间更短($P<0.05$),术后 3 个月,观察组患者有效率明显高于对照组($P<0.05$),随访 3 个月期间,观察组并发症 5 例,发生率 9.6%,对照组并发症 12 例,发生率 25.0%,观察组并发症发生率明显低于对照组($P<0.05$)。**结论:**经皮锁定钢板对胫骨骨折具有较好的疗效,手术安全性高,并发症少,能促进骨折愈合,使患者尽早康复,值得临床推广使用。

关键词:交锁髓内钉;经皮锁定钢板;胫骨骨折;并发症;骨折愈合

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Clinical Control Study of Interlocking Intramedullary Nail and Percutaneous Locking Plate in Treatment of Tibial Fractures

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ABSTRACT Objective: To discuss the efficacy of interlocking intramedullary nail and percutaneous locking plate in treatment of tibial fractures. **Methods:** 100 patients with tibial fractures were selected. They were divided into two groups according to odd and even number of hospitalization. The control group (48 cases) was given interlocking intramedullary nail. The observation group (52 cases) was given percutaneous locking plate. The efficacy of interlocking intramedullary nail and percutaneous locking plate in treatment of tibial fractures were evaluated by the efficacy, perioperative index and incidence of complications during 3 months. **Results:** There were no statistical significance on surgical time between two groups ($P>0.05$). The bleeding volume of observation group was less than that of the control group ($P<0.05$). The hospitalization and fracture healing time of observation group was shorter than that of the control group ($P<0.05$). After 3 months surgery, the effective rate of observation group was higher ($P<0.05$). During 3 months follow up, there were 5 cases having complications in the observation group and 12 cases having complications in the control group. The complication rate was 9.6 % in the observation group and 25.0 % in the control group, and it was lower observation group ($P<0.05$). **Conclusions:** The percutaneous locking plate has a good curative effect on tibial fractures with high safety and less complications, which can promote the fracture healing so that the patients can recover as soon as possible, worthy of clinical application.

Key words: Interlocking intramedullary nail; Percutaneous locking plated; Tibial fracture; Complication; Fracture healing

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前言

胫骨骨折是骨科常见骨折,多因暴力所致,如冲撞、压砸、摔倒,交锁髓内钉由于具有手术创伤小,内固定牢固等优点常用于胫骨骨折的治疗^[1]。然而交锁髓内钉在手术操作过程中需要扩髓,对胫骨软组织血运伤害较大,再加上胫骨不同部位髓

腔直径大小不一,为实际手术操作带来了困难^[2]。本文所采用的经皮锁定钢板内固定手术,引进了微创接骨板桥接技术概念,除了具有交锁髓内钉的手术优点,还能间接使骨折闭合复位,对骨折端及周围血液影响较小。既往研究中,虽然对交锁髓内钉和经皮锁定钢板的疗效进行了对比分析,但并未深入分析术后并发症,而术后并发症是影响近远期疗效的关键因素^[3,4]。为此我院自 2013 年 2 月-2015 年 2 月选取了 100 例胫骨骨折患者,分别采用交锁髓内钉与经皮锁定钢板治疗,比较其疗效及并发症发生情况,报道如下。

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1 资料与方法

1.1 病例资料

选取胫骨骨折患者 100 例, 年限:2013 年 2 月 -2015 年 2 月, 均为我院骨科收治患者, 入组标准:① 经 X 线片确诊, 均符合胫骨骨折的诊断标准^[5,6];② 随访时间不少于 3 个月;③ 经本

院伦理委员会同意, 术前每位患者均签署书面知情书。排除标准:骨髓炎、骨肿瘤等病理性骨折、自身免疫疾病、凝血功能障碍患者。按住院单双号将患者分为两组, 单号入院患者为对照组 (48 例) 给予交锁髓内钉治疗, 双号入院患者为观察组 (52 例), 给予经皮锁定钢板治疗, 两组病例资料有可比性 ($P>0.05$), 见表 1。

表 1 两组病例资料比较

Table 1 Comparison of clinical data between two groups

Group	n	Gender (male/female)	Age (year)	Closed fracture	AO type		
					A	B	C
Observation group	52	38/14	43.5± 15.4	33	30	12	10
Control group	48	31/17	46.3± 17.9	26	25	15	8

1.2 手术方法

对照组:硬膜外麻醉, 患者取平卧位, 手法骨折解剖复位, 屈曲膝关节, 髌韧带正中行 3-5 cm 纵行切口, 于胫骨结节上方、平台下方约 1.0 cm 处稍偏内处进针, 逐级扩髓, 扩髓至髓内钉直接粗 1 mm。插入直径及长度合适的髓内钉, 将主钉置入骨折远端, 直至踝关节上 1.0 cm 处, C 臂透视下髓内钉位于胫骨远端髓腔中央, 并且为穿入踝关节, 依靠瞄准器在近远端各置入 2 枚锁定螺钉, 锁住髓内钉。确认无误后, 逐层关闭伤口。

观察组:硬膜外麻醉, 患者取仰卧位, 胫骨骨折部位近远两端各做一 3-5 cm 长的切口, 切开深筋膜, 不切开骨膜, 利用骨剥离器在近远两端之间建立一皮下隧道, 选择合适长度的钢板插入。先将钢板远端进行固定, 观察钢板与胫骨骨干贴附情况, X 线透视下复位及钢板位置满意后, 钢板远近端至少用 2 枚锁定螺钉固定。确认无误后, 逐层关闭伤口。

1.3 观察指标

① 观察并记录两组患者术中出血量, 手术时间, 住院时间

及骨折愈合时间;② 疗效:采用美国特种外科医院(HSS)制定的膝关节评分标准进行评价:>85 分为优, 84-70 分为良, 69-60 分为中等;<60 分为差;③ 并发症:随访 3 个月期间, 观察两组患者是否有骨折愈合延迟、愈合畸形、伤口感染、骨髓炎、膝部疼痛等并发症。

1.4 统计方法

采用 SPSS 17.0 统计软件分析, 数据以 $\bar{x} \pm s$ 表示, 组内术前术后相比采用配对 t 检验, 组间比较采用两独立样本 t 检验, 计数资料采用秩和或卡方检验, 以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 围手术期参数比较

采用经皮锁定钢板内固定和交锁髓内钉治疗胫骨骨折, 两种手术方法所需手术时间无统计学差异 ($P>0.05$), 经皮锁定钢板内固定术中出血量更少, 术后观察组患者住院时间和骨折愈合时间更短 ($P<0.05$), 见表 2。

表 2 两组患者围手术期参数的比较 ($\bar{x} \pm s$)

Table 2 Comparison of perioperative parameters between two groups ($\bar{x} \pm s$)

Groups	n	Bleeding (mL)	Surgical time (min)	Hospitalization (d)	Fracture healing time (week)
Observation group	52	119.7± 28.5*	108.2± 21.8	9.1± 2.4*	14.2± 2.5*
Control group	48	189.8± 22.6	111.5± 29.7	12.6± 3.3	19.7± 3.6

Note: compared with the control group, * $P<0.05$.

2.2 疗效对比

术后 3 个月, 观察组患者手术有效率为 92.3 %, 对照组患

者手术有效率为 77.1 %, 观察组患者有效率明显高于对照组 ($P<0.05$), 见表 3。

表 3 两组临床疗效比较 [n(%)]

Table 3 Comparison of efficacy between two groups [n(%)]

Groups	n	Excellent	Good	Medium	Poor	Effective rate
Observation group	52	40	8	3	1	92.3%*
Control group	48	28	9	8	3	77.1%

Note: compared with the control group, * $P<0.05$.

2.3 并发症对比

随访 3 个月期间,观察组并发症 5 例,骨折愈合延迟 1 例,伤口感染 2 例,骨髓炎 1 例,膝关节疼痛 1 例,对照组并发症

12 例,骨折愈合延迟 4 例,愈合畸形 3 例,骨髓炎 3 例,膝关节疼痛 2 例,观察组并发症发生率明显低于对照组($P<0.05$),见表 4。

表 4 两组并发症对比 [n(%)]
Table 4 Comparison of complications between two groups [n(%)]

Groups	n	Delayed heal	Malunion	Wound infection	Osteomyelitis	Knee pain	Complication rate
Observation group	52	1	0	2	1	1	5(9.6)*
Control group	48	4	3	0	3	2	12(25.0)

Note: Compared with the control group, * $P<0.05$.

3 讨论

胫骨骨折多由高能量创伤引起,胫骨中下段是胫骨骨折的高发部位。该处软组织附着薄弱,局部血供较差,倘若治疗方式不合适,容易造成骨折愈合延迟或不愈合^[7,8]。胫骨骨折临床多表现为局部的软组织损伤、骨折移位甚至粉碎性骨折,导致骨缺血坏死,术后容易导致局部皮肤坏死及伤口感染等并发症。临床多采用经皮锁定钢板和交锁髓内钉的手术方式治疗,以恢复骨骼的连续性,增加骨折断端稳定性和确保骨折愈合^[9,10]。

经皮锁定钢板内固定以牺牲骨折端的活力获得稳定性,由于锁定螺钉对钢板无加压作用,故钢板对骨皮质和骨膜作用力较小,能保护骨膜血运,大幅度减少医源性损伤,无需植骨^[11-13]。该种手术方式为弹性固定,有利于骨折端的轻微活动,避免关节过于僵硬而骨折愈合缓慢。经皮锁定钢板内固定后具有较强的生物力学强度,但应避免应力集中而导致钢板失去耐久度而折断^[14-16]。

交锁髓内钉对胫骨中端骨折具有较好的治疗效果,能提供足够的生物力学强度并保持骨折愈合过程所需的生理应力,便于患者尽早进行功能锻炼,缩短骨折愈合时间;两端全螺纹锁钉固定,可以有效防止成角、旋转使骨折获得良好对位对线,减小对骨折周围软组织的影响^[17]。但交锁髓内钉固定常需要扩髓,影响骨皮质内层血液循环,交锁髓内钉为静态固定,不利于刺激骨痂形成,造成少数骨折不愈合或延迟愈合^[18]。

熊林等^[19]采用交锁髓内钉与锁定钢板内固定治疗胫骨远端骨折,两种手术方法在手术时间和住院时间、骨折愈合时间上相比,无统计学差异。本研究中,采用经皮锁定钢板内固定和交锁髓内钉治疗胫骨骨折,两种手术方法所需手术时间无统计学差异($P>0.05$),经皮锁定钢板内固定术中出血量更少,术后观察组患者住院时间和骨折愈合时间更短($P<0.05$),分析原因,可能是在使用交锁髓内钉手术治疗时,扩髓破坏了骨皮质内层的血液循环,影响了骨折周围血供,使围手术期相关指标发生变化。

赵德来等^[20]采用闭合复位经皮锁定钢板治疗胫骨干中下段骨折患者 40 例,治疗后有效率 97.5%。本研究中,术后 3 个月,观察组患者有效率 92.3%,明显高于对照组的 77.1% ($P<0.05$),与赵德来等研究相仿,说明经皮锁定钢板对胫骨骨折具有较好的疗效,术后可以较好地恢复下肢功能。此外,经皮锁定钢

板术中无需对膝关节进行手术,术后不用外固定,对膝关节和小腿功能影响较小。杜江鸿等^[21]采用微创经皮钢板和带锁髓内钉治疗胫骨骨折,发现术后主要并发症为内固定物松动、断裂、浅表感染,无畸形愈合或愈合延迟,但并未给出相应的治疗措施,本研究中,随访 3 个月期间,观察组并发症 5 例,发生率 9.6%,对照组并发症 12 例,发生率 25.0%,观察组并发症发生率明显低于对照组($P<0.05$)。说明经皮锁定钢板治疗胫骨骨折安全性较高,可以促进骨折愈合,减少术后骨折愈合延迟和愈合畸形的发生。随访期间,共有 5 例患者发生骨折愈合延迟,均采用体外冲击波治疗,刺激骨膜成骨细胞的分裂,促进骨折愈合。3 例骨折愈合畸形,需行二次翻修术矫治。对于术后 2 例伤口感染,应及时给予大剂量抗生素抗感染。术后出现 4 例骨髓炎,首先应对病灶部位进行彻底清除,然后冲洗管持续生理盐水加庆大霉素冲洗。3 例术后膝关节疼痛,待患者功能锻炼 3 个月后,疼痛减轻。

综上所述,经皮锁定钢板对胫骨骨折具有较好的疗效,手术安全性高,并发症少,能促进骨折愈合,使患者尽早康复,值得临床推广使用。

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