

闭合复位空心螺钉在儿童胫骨远端骨骺骨折中的应用

夏永杰,韩镜明,游超,吴德超

(深圳市儿童医院骨二科,广东 深圳 518026)

【摘要】目的 探讨闭合复位空心螺钉治疗儿童胫骨远端骨骺骨折的临床疗效。**方法** 选择深圳市儿童医院骨二科2014年5月至2018年3月收治的胫骨远端骨骺骨折患儿58例,采用闭合复位空心螺钉固定治疗,评价临床治疗效果、踝关节功能恢复时间、骨折临床愈合时间、术后空心螺钉取出时间、踝关节功能Teeney评分。**结果** 所有患儿术中、术后均无血管、神经损伤情况发生。通过随访,无骨不连、成角畸形、骨延迟愈合、下肢不等长现象,无复位丢失、骨骺早闭、骨骺停止生长现象。所有患儿下肢力量、踝关节活动度、外观无主管感觉异常,满意度高,临床疗效优良率为100%。骨性愈合时间(10.1 ± 2.1)周,踝关节功能恢复时间(11.1 ± 1.9)周,空心螺钉取出时间(8.2 ± 1.9)个月,末次随访踝关节功能Teeney评分平均(95.1 ± 5.9)分。**结论** 通过手法闭合复位或有限切开复位空心螺钉固定治疗儿童胫骨远端骨骺骨折疗效理想,固定牢固,可早期进行功能锻炼,有利于踝关节功能的恢复。

【关键词】 闭合复位空心螺钉;儿童;胫骨远端骨骺骨折

【中图分类号】 R726.8 **【文献标识码】** A **【文章编号】** 1003—6350(2018)18—2601—03

Effect of closed reduction and percutaneous hollow screw fixation in the treatment of distal tibial epiphyseal fracture in children. XIA Yong-jie, HAN Jing-ming, YOU Chao, WU De-chao. Second Department of Orthopedics, Shenzhen Children's Hospital, Shenzhen 518026, Guangdong, CHINA

[Abstract] **Objective** To discuss the effect of closed reduction and percutaneous hollow screw fixation in the treatment of distal tibial epiphyseal fracture in children. **Methods** A total of 58 cases of distal tibial epiphyseal fracture from Second Department of Orthopedics, Shenzhen Children's Hospital from May 2014 to March 2018 were included in the study, which were treated with closed reduction and percutaneous hollow screw fixation. The clinical effect of treatment, bone healing time, ankle function recovery time, hollow screw extraction time, ankle function Teeny score were evaluated. **Results** All children had no vascular or nerve injury during and after operation. After follow-up, no bone nonunion, angular deformity, delayed bone healing, and unequal length in lower extremity were observed. No reduction loss, premature epiphyseal closure, and epiphyseal cessation of growth were found. All children had no abnormalities in lower limb strength, ankle joint activity, and appearance, and the excellent and good clinical efficacy rate was 100%, with high satisfactory degree. The bone healing time, ankle function recovery time, hollow screw extraction time, ankle function Teeny score in the last follow-up were (10.1 ± 2.1) weeks, (11.1 ± 1.9) weeks, (8.2 ± 1.9) months, (95.1 ± 5.9), respectively. **Conclusion** Therapeutic effect of closed reduction or limited open reduction and hollow screw fixation in the treatment of distal tibial epiphyseal fracture in children is desirable, which can achieve firm fixation and is helpful for early functional exercise and recovery of ankle function.

[Key words] Closed reduction and percutaneous hollow screw fixation; Children; Distal tibial epiphyseal fracture

胫骨远端骨骺损伤是儿童骨骼损伤常见类型,儿童胫骨远端骨骺较脆弱,是全身第三脆弱骨骺处,发生胫骨远端骨折时常合并骨骺的损伤,进而导致远端骨骺缺血坏死、骨骼生长障碍、关节畸形等并发症。内外踝由多个踝关节、韧带附着,韧带具有更强大的力量,易导致骨骺端骨折,损伤后可因骨折复位不良、小关节移位以及多个关节面平整性较差等原因导致后期骨骺板早闭、关节畸形、关节炎等^[1-3]。损伤程度、治疗效果等直接影响踝关节功能、形态,由于患儿年龄较小,其损伤后对复位的标准要求相对更高,而由于儿童骨骼的生理特点,伤后固定的稳定性相对较差,因此,保守治疗常导致骨折再移位。故手术治疗是最理想的方法,但手术方式及手术适应证长期存在

较多的争议^[4-5]。笔者应用闭合复位空心螺钉内固定术治疗儿童胫骨远端骨骺骨折58例,取得了较为理想的疗效,现将结果报道如下:

1 资料与方法

1.1 一般资料 选择深圳市儿童医院2014年5月到2018年3月收治的胫骨远端骨骺骨折患儿58例,男性32例,女性26例;年龄6~14岁,平均(8.9 ± 2.1)岁;右侧33例,左侧25例;受伤至手术时间1~7 d,平均(2.5 ± 1.5)d;致伤原因中摔伤39例,高空坠落伤9例,道路交通伤8例,其他2例;骨折分型(Salter-Harris分型)^[6]:Ⅱ型33例,Ⅲ型10例,Ⅵ型15例。所有患儿均未损伤及神经及血管。所有患儿均经X线、CT等影像学检查手段证实为胫骨远端骨骺骨折并断端移位。

1.2 治疗方法 给予闭合复位空心螺钉固定治疗。所有患儿麻醉方式均为全麻,常规手术区域皮肤消毒,铺无菌巾,闭合复位后于C型臂X线复查复位满意,由助手维持复位状态,并使用临时克氏针进行内固定,空心螺钉导针平行于骨骺线(但须注意,在骨骺线之外)、垂直于骨折线引导下,将直径为3.0~4.0 mm的空心螺钉沿导针拧入后加压固定(注意:空心螺钉需置于骨骺线以外)。再次C型臂X线检查,确认对位、对线满意后给予石膏外固定。若患儿同时合并腓骨骨折,则应给予手法闭合复位,而不对腓骨骨折进行特殊处理。若患儿合并影响踝关节稳定性、移位较为明显的外踝骨折,应首先恢复外踝长度,充分固定后再对胫骨骨骺骨折进行处理。如果术中手法复位较为困难,可小切口切开复位。开放性骨骺骨折者,于术前30 min以及术后1 d内给予抗生素静脉滴注预防感染,但对闭合损伤者则无需预防性抗感染治疗。术后第1天即行X线检查,以确认骨折复位、内固定情况。术后石膏外固定4~6周,拆石膏后开始非负重踝关节功能锻炼。术后8周再次X线检查了解骨折愈合情况,若已达到临床愈合,则可扶拐负重行走锻炼。术后6~12个月取出空心螺钉。

1.3 观察指标 观察患儿踝关节功能恢复时间、骨折临床愈合时间、术后空心螺钉取出时间、踝关节功能Teeny评分(疼痛、步行距离、跑步、需要辅助器、足趾背伸、登山下山、走楼梯、跳跃活动、软组织肿胀、踝趾屈活动度、踝背伸活动度)。

1.4 疗效评价标准 ①优:无任何临床症状,双下肢等长,患肢无缩短畸形,骨折成角<5°,踝关节屈伸活动受限<5°;②良:无明显临床症状,患肢缩短低于2 cm,骨折成角<15°,踝关节屈伸受限为10°~15°;③差:患儿自感疼痛,患肢缩短超过2 cm,骨折成角>15°,踝关节屈伸活动受限>15°,患肢无法负重行动。优良率=(优+良)/总例数×100%。

2 结 果

术后1 d复查X线均显示骨折解剖复位满意、内固定优良,无骨骺板与关节面损伤。58例患儿均获得满意随访,随访时间为3~12个月,平均(6.1±2.1)个月。本研究中所有患儿均无血管及神经损伤。通过随访,无骨不连、成角畸形、骨延迟愈合、下肢不等长现象,无复位丢失、骨骺早闭、骨骺停止生长现象。所有患儿下肢力量、踝关节活动度、外观无主管感觉异常,满意度高,临床疗效优57例,良1例,差0例,优良率为100%。骨性愈合时间8~12周,平均(10.1±2.1)周;踝关节功能恢复时间8~12周,平均(11.1±1.9)周;空心螺钉取出时间6~12个月,平均(8.2±1.9)个月。末次随访踝关节功能Teeny评分平均(95.1±5.9)分,其中跑步(3.8±0.9)分、足趾背伸(3.5±0.8)分、走楼梯(1.5±0.7)分、疼痛(40.0±3.0)分、需要辅助器(6.1±0.4)分、软组织肿胀

(1.9±0.2)分、踝跖屈活动度(1.8±0.2)分、步行距离(6.1±0.5)分、登山下山(1.8±0.9)分、跳跃活动(5.9±0.8)分、踝背伸活动度(3.2±0.3)分。

3 讨 论

骨骼在发育过程中,骨骺板的连接与正常韧带、肌腱、关节囊均薄弱,遭受外伤时更易受损,踝关节结构复杂,功能较多,且作为一个杵状关节,踝关节需在一个平面上进行背伸以及跖屈等运动活动,且在踝关节活动时,外踝尚伴有较为轻微的旋转运动,从而能够适应距骨顶宽度的变化。由于踝关节活动幅度有限,加之其解剖学特点,胫骨远端骨骺损伤风险较高^[7-8]。在儿童骨骺损伤中,胫骨远端骨骺损伤较为重要,其损伤程度及治疗效果均直接影响胫骨后期的生长发育以及踝关节的功能和形态。

空心螺钉在儿童胫骨远端骨骺骨折的优点主要有以下几点:①空心螺钉直径不同,主要适用于胫骨远端Ⅱ、Ⅲ、Ⅳ型骨骺损伤;②可针对骨折断端进行加压,对于骨折的复位以及固定的牢固性均具有重要意义,同时利于术后早期功能锻炼;③空心螺钉为中空设计,利用导针导向,易于对骨折端进行固定和解剖复位,且对骨质的破坏作用及对骨骺的损伤作用均较小,利于骨折的愈合;④手法复位成功后,使用中空的螺钉经皮行骨折块固定,能够有效减少软组织与骨质的再次损伤,减少对血供的影响,利于骨折愈合。另外,值得注意的是,在临床使用中,空心螺钉的选择应根据骨折的具体类型进行,对I、V、VI、及Ⅱ型干骺端骨折块极小的患者则不应采用空心螺钉治疗^[9-10]。本研究给予胫骨远端骨骺骨折儿童闭合复位空心螺钉治疗获得理想疗效,随访中未发现骨不连、成角畸形、骨延迟愈合、下肢不等长现象,无复位丢失、骨骺早闭、骨骺停止生长现象。所有患儿下肢力量、踝关节活动度、外观无主管感觉异常,满意度高,临床疗效优良率为100%。但在实际临床操作过程中,由于空心螺钉的直径相对较大,可能对骨骺造成一定损伤,故在空心螺钉置入过程中,一定使之在骨骺线以外对骨折进行固定。

综上所述,手法闭合复位或有限切开复位联合空心螺钉内固定术在儿童胫骨远端骨骺骨折的治疗中具有较为理想的疗效,不仅能够获得牢固的固定、优良的复位,还能够在早期进行功能锻炼,对于踝关节功能的恢复具有重要临床意义,同时手术安全性高,患儿恢复快,值得临床推广。

参 考 文 献

- [1] 韩艳久,刘向阳,刘勇,等.微创内固定系统LISS与解剖钢板治疗复杂型胫骨中下段骨折疗效比较[J].海南医学,2017,28(14):2271-2274.
- [2] 严斌,叶小林,李庆标.微创经皮与传统切开复位内固定治疗胫骨骨折疗效对比研究[J].海南医学,2017,28(22):3654-3656.

可吸收线结合皮肤吻合器在颅骨修补术头皮切口缝合中的应用

蔡明,王志明,冯斌,殷尚炯,翟晓东,王鹏

(中国人民解放军第251医院神经外科,河北 张家口 075000)

【摘要】目的 探讨可吸收线结合皮肤吻合器在颅骨修补手术头皮缝合中的应用价值。**方法** 回顾性分析2015年1月至2018年4月在中国人民解放军第251医院神经外科住院行颅骨修补手术的66例患者的临床资料,按术中头皮缝合方法分组,其中采用可吸收线皮下连续缝合+皮肤吻合器缝合切口的36例作为可吸收线缝合组,采用传统的丝线分层间断缝合切口的30例作为传统缝合组,比较两组患者的切口缝合时间、术后切口甲级愈合率、线结排异反应或皮缘坏死等指标的差异。**结果** 可吸收线缝合组患者的缝合时间为 (18.36 ± 2.50) min;甲级愈合35例,乙级愈合1例,发生线结排异反应1例;传统缝合组患者的缝合时间为 (25.46 ± 2.12) min;甲级愈合25例,乙级愈合5例,发生线结排异反应或皮缘坏死16例,颅骨修补材料外露3例。两组患者的切口缝合时间和线结排异反应发生率比较差异均有统计学意义($P<0.05$),而手术切口甲级愈合比较差异无统计学意义($P>0.05$)。**结论** 可吸收线皮下连续缝合结合皮肤吻合器用于颅骨修补术中头皮切口缝合,可以减少缝合时间,避免线结排异反应、皮缘坏死、减少术后头皮感染。

【关键词】 可吸收线;皮肤吻合器;头皮切口缝合

【中图分类号】 R651.1 **【文献标识码】** A **【文章编号】** 1003—6350(2018)18—2603—03

Application of absorbable line combined with skin stapler for scalp incision suture in cranioplasty. CAI Ming, WANG Zhi-ming, FENG Bin, YIN Shang-jiong, ZHAI Xiao-dong, WANG Peng. Department of Neurosurgery, the 251th Hospital of PLA, Zhangjiakou 075000, Hebei, CHINA

[Abstract] **Objective** To explore the application value of absorbable line combined with skin stapler for scalp suture in cranioplasty. **Methods** A retrospective analysis of the clinical data was performed for 66 patients who underwent cranioplasty in the Department of Neurosurgery in the 251th Hospital of PLA from January 2015 to April 2018. According to the methods of incision suture, the patients were divided into two groups: 36 patients were selected as the absorbable suture group who were treated with subcuticular continuous suture closure using absorbable line and skin stapler; and 30 patients were enrolled as the traditional suture group who were treated with interrupted layered suture closure using traditional threads (non-absorbable sutures). The differences in incision-suture time, grade A postoperative wound healing rate, suture knot rejection or skin edge necrosis were compared between the two groups. **Results** In the absorbable suture group, the suture time of patients was (18.36 ± 2.50) minutes; there were 35 cases of grade A healing, 1 case of grade B healing, and 1 case of suture knot rejection. In the traditional suture group, the suture time of patients was (25.46 ± 2.12) minutes, and there were 25 cases of grade A healing, 5 cases of grade B healing, 16 cases of suture knot rejection or skin edge necrosis, and 3 cases of skull repair materials exposure. There were statistically significant differences in incision-suture time and the incidence of suture knot rejection between the two groups ($P<0.05$), but there was no significant difference in the grade A wound healing rate between the two groups ($P>0.05$). **Conclusion** Subcuticular continuous suture closure with absorbable line and skin stapler for the scalp incision suture in cranioplasty can reduce suture time, avoid suture knot rejection, skin edge necrosis, and reduce postoperative scalp infection.

【Key words】 Absorbable line; Skin stapler; Scalp incision suture

通讯作者:王志明。E-mail:wangzm0304@163.com

- [3] 陈西民,许洪涛.空心螺钉固定治疗儿童胫骨远端骨骺骨折[J].创伤外科杂志,2017,19(11): 859-861.
- [4] Kraus R, Kaiser M. Growth disturbances of the distal tibia after physeal separation what do we know, what do we believe we know? A review of current literature [J]. Eur J Pediatr Surg, 2008, 18(5): 295-299.
- [5] 邓学海,刘传康,唐强,等.空心螺钉选择性治疗儿童胫骨远端骨骺损伤[J].四川医学,2013,34(11): 1678-1680.
- [6] Yildirim AO, Oken OF, Kati YA, et al. Factors affecting the closed reduction of diaphyseal fractures of the femur [J]. Eur J Orthop Surg Traumatol, 2012, 43(8): S14.
- [7] 徐蕴岗,沈恺颖,张宇琛,等.儿童胫骨远端干骺交界区严重骨折的微创治疗[J].中华小儿外科杂志,2016,37(1): 69-72.
- [8] Nenopoulos A, Beslikas T, Gigis I, et al. The role of CT in diagnosis and treatment of distal tibial fractures with intra-articular involvement in children [J]. Injury, 2015, 46(11): 2177-2180.
- [9] 叶聪聪,赵友明,郭伟军,等.经皮克氏针固定治疗严重移位儿童胫骨下端骨折[J].中国骨伤,2014,27(8): 691-693.
- [10] Leary JT, Handling M, Talerico M, et al. Physeal fractures of the distal tibia: predictive factors of premature physeal closure and growth arrest [J]. J Pediatr Orthop, 2009, 29(4): 356-361.

(收稿日期:2018-04-25)