

软组织带线铆钉治疗大块髌骨软骨骨折的临床观察

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【摘要】 目的: 观察软组织带线铆钉治疗大块髌骨软骨骨折的临床疗效。方法: 回顾性分析 2015 年 6 月至 2017 年 2 月收治的 25 例(25 膝)大块髌骨软骨骨折的患者, 其中男 19 例, 女 6 例; 左膝 11 例, 右膝 14 例; 车祸伤 2 例, 运动时扭伤 23 例; 年龄(25.12±6.02)岁; 体重(62.48±7.91) kg; 体重指数(23.25±1.51) kg/m²; 发病至入院时间(1.96±1.51) d。临床表现为膝关节肿胀, 浮髌试验阳性, 疼痛剧烈, 偶有关节绞索、屈伸活动受限, 髌骨外侧缘压痛明显, 髌骨外推试验阳性, 外推恐惧试验阳性。术前均行 X 线及 CT 检查, X 线示髌骨骨质连续性存在, 关节腔内有一游离体。CT 加三维重建显示髌骨软骨面骨缺损。25 例均采用软组织带线铆钉固定游离的骨块。临床疗效观察包括手术前后膝关节 Lysholm 评分及术后 Insall 疗效评价。结果: 术后所有患者获随访, 时间 3~15(9.72±4.07)个月。术前 Lysholm 评分 60.32±5.08, 末次随访 88.24±4.37, 术后评分优于术前($t=-22.926, P<0.05$)。根据 Insall 标准评价, 优 21 例, 良 4 例, 未出现骨折块分离及患膝关节粘连。术后 6 周 X 线及 CT 显示骨折块位置良好, 软骨面平滑无明显台阶, 髌骨形态良好。术后 6 个月 MRI 显示髌骨软骨关节面平整。结论: 软组织带线铆钉治疗大块髌骨软骨骨折具有操作简单、术后恢复较快、无须二次手术、并发症较少、疗效确切等优点, 值得临床推广。

【关键词】 髌骨; 骨折; 骨折固定术, 内

DOI: 10.3969/j.issn.1003-0034.2018.12.013

Clinical observation of soft tissue wire rivets in the treatment of large patellar cartilage fracture XU Xiang-feng, LIU Peng-he, YUE Long, KANG Le, and DAI Zhi-peng*. *People's Hospital of Henan Province, Zhengzhou 450003, Henan, China

ABSTRACT Objective: To explore the clinical curative effect of soft tissue wire rivet for the treatment of fracture of patella cartilage. **Methods:** A retrospective study was conducted in 25 patients (25 knees) from June 2015 to February 2017 in patients with patellar cartilage fractures. Among them, 19 were male, 6 were female, 11 were left knee, 14 were right knee. The accident occurred in 2 cases, 23 cases of sprained athletes; the average age was (25.12±6.02) years old, the average weight was (62.48±7.91) kg, and the average body mass index was (23.25±1.51) kg/m². The average time from injury to admission was (1.96±1.51) d. The clinical manifestations were swelling of knee joint, positive floating patella sign, severe pain, occasional joint strangulation, limited flexion and extension, obvious tenderness of lateral patella, positive patellar extrapolation test and positive extrapolation fear test. X-ray and CT examination were performed before operation. X-ray showed the continuity of patellar bone and a loose body in the joint cavity. CT and 3D reconstruction showed patellar cartilage and facial defects. All 25 patients were fixed with soft tissue wire rivet. The clinical efficacy included preoperative Lysholm score and Insall evaluation. **Results:** All the patients were followed up, and the duration ranged from 3 to 15 months, with an average of (9.72±4.07) months. The preoperative Lysholm score was 60.32±5.08, and the final follow-up was 88.24±4.37. The postoperative score was better than that before operation ($t=-22.926, P<0.05$). According to Insall criteria, 21 cases were excellent, 4 cases were good, no fracture fragments were found and knee joint adhesion was found. Six weeks after operation, X-ray and CT showed that the fracture was well positioned, the cartilage surface was smooth without obvious steps, and the patella was in good shape. MRI showed the smooth articular surface of patellar cartilage at the 6th month after operation. **Conclusion:** Soft tissue wire rivet for the treatment of massive patellar cartilage fracture has the advantages of simple operation, rapid postoperative recovery, no need for secondary operation pain, fewer complications, and definite effect, which is worthy of clinical promotion.

KEYWORDS Patella; Fractures; Fracture fixation, internal

Zhongguo Gu Shang/China J Orthop Trauma, 2018, 31(12): 1140-1143 www.zggszz.com

基金项目: 河南省基础与前沿技术攻关项目(编号: 162300410093); 河南省医学科技攻关项目(编号: 201602196)

Fund program: Provided by Henan Medical Science and Technology Research Project (No. 201602196)

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髌骨软骨骨折通常指的是髌骨关节面软骨及软骨下骨的骨折,在四肢骨折中较为少见,约占 1%^[1]。临床诊断较为困难,极易漏诊或误诊。国内外学者通常认髌骨软骨面损伤常见于外伤性髌骨脱位或半脱位,当髌骨受到外力撞击脱位或习惯性髌骨脱位股四头肌收缩复位的一瞬间,髌骨软骨面与股骨外侧髌猛烈撞击导致髌骨软骨损伤甚至骨折。自 2015 年 6 月至 2017 年 2 月收治的 25 例(25 膝)大块髌骨软骨骨折的患者,经漯河医专二附院伦理委员会批准,采用软组织带线铆钉内固定,术后效果满意,现报告如下。

1 临床资料

2015 年 6 月至 2017 年 2 月收治 25 例(25 膝)大块髌骨软骨骨折患者,其中男 19 例,女 6 例;左膝 11 例,右膝 14 例;车祸伤 2 例,运动时扭伤 23 例;年龄(25.12±6.02)岁;体重(62.48±7.91) kg;体重指数(23.25±1.51) kg/m²;发病至入院时间(1.96±1.51) d。临床表现为膝关节肿胀,浮髌试验阳性,疼痛剧烈,偶有关节绞索、屈伸活动受限,髌骨外侧缘压痛明显,髌骨外推试验阳性,外推恐惧试验阳性。术前均行 X 线及 CT 检查,X 线示髌骨骨质连续性存在,关节腔内有一骨性游离体;CT 加三维重建显示髌骨软骨面骨缺损。

2 治疗方法

2.1 手术方法

采用全身麻醉,麻醉成功后,患者采取仰位,查体髌骨不稳定,有外脱倾向,于大腿根部上气压止血带,压力稳定至 250 mmHg。取 AL, AM 入路,插入关节镜及出入水管,一次探查髌上囊、髌股关节、内侧沟、内侧间室、髌间窝、外侧沟、外侧间室,找到剥脱的软骨块。若软骨块最宽处>9 mm,占整个髌骨软骨面的比例较大,需复位内固定。遂取膝关节前内侧切口,髌骨向外翻转显露关节面,见髌骨软骨面及软骨下骨剥脱,找出关节腔内游离骨块,用刮匙新鲜化骨质面及髌骨骨折面,将 1 枚直径 3.5 mm Twinfix 带线铆钉置入髌骨创面中心点。将游离骨块中心点相应位置打孔,铆钉缝线 4 个游离线端自游离骨块中心

穿出,将骨块复位后向上下内外 4 个方向拉紧。在丝线经过的软骨孔之间用小刀浅切 1 个“V”形槽(刚好使丝线嵌入为度),在骨块边缘 12、3、6、9 点钟位置由内向外钻孔并分别引出 1 根缝线到髌骨表面,4 根缝线两两打结固定。检查髌骨关节面恢复良好,无台阶,冲洗,逐层缝合,包扎,患者苏醒后安返病房。

2.2 术后处理

术后屈膝 20°~30°石膏托固定 3 周,术后当天开始踝泵练习及股四头肌主动收缩运动,对症口服消肿止痛药物。术后 3 周去石膏开始主动屈伸膝关节锻炼,下地部分负重适度行走。术后 6 周恢复正常行走并行 X 线及 CT 三维重建复查,骨折块位置良好。术后 3 个月行 MRI 检查示髌骨软骨关节面平整,部分层面高信号提示组织水肿,尚未完全愈合。典型病例见图 1。

3 结果

25 例术后定期复查,随访 3~15 (9.72±4.07)个月,切口均 I 期愈合,术后未出现骨折块再次移位及髌股关节疼痛等症状。按照 Lysholm 等^[2]及 Insall 评价标准^[3]对手术前后患膝关节功能进行对比,评价手术效果。术前 Lysholm 总分 60.32±5.08,术后末次随访 88.24±4.37,术后优于术前,各项评分比较见表 1。Insall 评价标准包括临床(疼痛、活动度、稳定性)和功能评分(行走、上下楼),各 100 分,总分为两项评分总和除以 2;总分 85~100 分为优,70~84 分为良,60~69 分为可,<60 分为差。本组患者按 Insall 标准评价,术前总分 26.58±5.66,术后末次随访 90.56±7.48,术后优于术前,各项评分比较见表 2;术后优 21 例,良 4 例。

4 讨论

临床上认为髌骨软骨骨折的损伤机制是由于外力撞击导致的髌骨脱位或半脱位^[4],膝关节受到外力撞击导致髌骨脱位的一瞬间,髌骨软骨面与股骨外侧髌之间的猛烈撞击导致髌骨软骨及软骨下骨骨折。因髌骨软骨骨折为关节内骨折,单纯的作为游离体行关节镜下游离体取出将破坏髌骨关节面,影响膝关节功能并导致创伤性关节炎,所以该处骨折

表 1 髌骨软骨骨折患者 25 例手术前后 Lysholm 评分比较($\bar{x}\pm s$,分)

Tab.1 Comparison of Lysholm scores before and after surgery of 25 patients with large patellar cartilage fractures

($\bar{x}\pm s$, score)

时间	跛行	手杖支撑	绞索	关节不稳	疼痛	肿胀	爬楼梯	下蹲	总分
术前	4.48±0.75	2.28±1.10	10.08±1.85	12.40±2.93	14.20±1.87	7.60±3.21	5.84±0.80	3.72±0.79	60.32±5.08
末次随访	5.00±0.00	5.00±0.00	15.0±0.00	23.80±2.18	19.40±1.66	9.68±1.11	7.76±2.03	3.24±1.05	88.24±4.37
t 值	-2.138	-12.364	-13.322	-13.529	-9.656	-2.867	-4.096	2.071	-22.926
P 值	0.043	0	0	0	0	0.008	0	0.049	0

表 2 髌骨软骨骨折患者 25 例手术前后 Insall 评分比较 ($\bar{x}\pm s$, 分)

Tab.2 Comparison of Insall scores before and after surgery of 25 patients with large patellar cartilage fractures ($\bar{x}\pm s$, score)

时间	临床评分				功能评分			总分
	疼痛	活动度	稳定性	总分	行走	上下楼	总分	
术前	11.70±3.74	10.36±3.16	15.20±3.38	26.16±7.26	11.60±3.74	17.40±6.63	27.00±9.57	26.58±5.66
末次随访	46.20±4.15	18.76±1.85	21.00±2.04	85.12±7.50	48.40±3.74	47.60±3.85	96.00±9.35	90.56±7.48
t 值	-33.34	-12.71	-6.82	-28.45	-38.648	-20.33	-27.06	-35.78
P 值	0	0	0	0	0	0	0	0

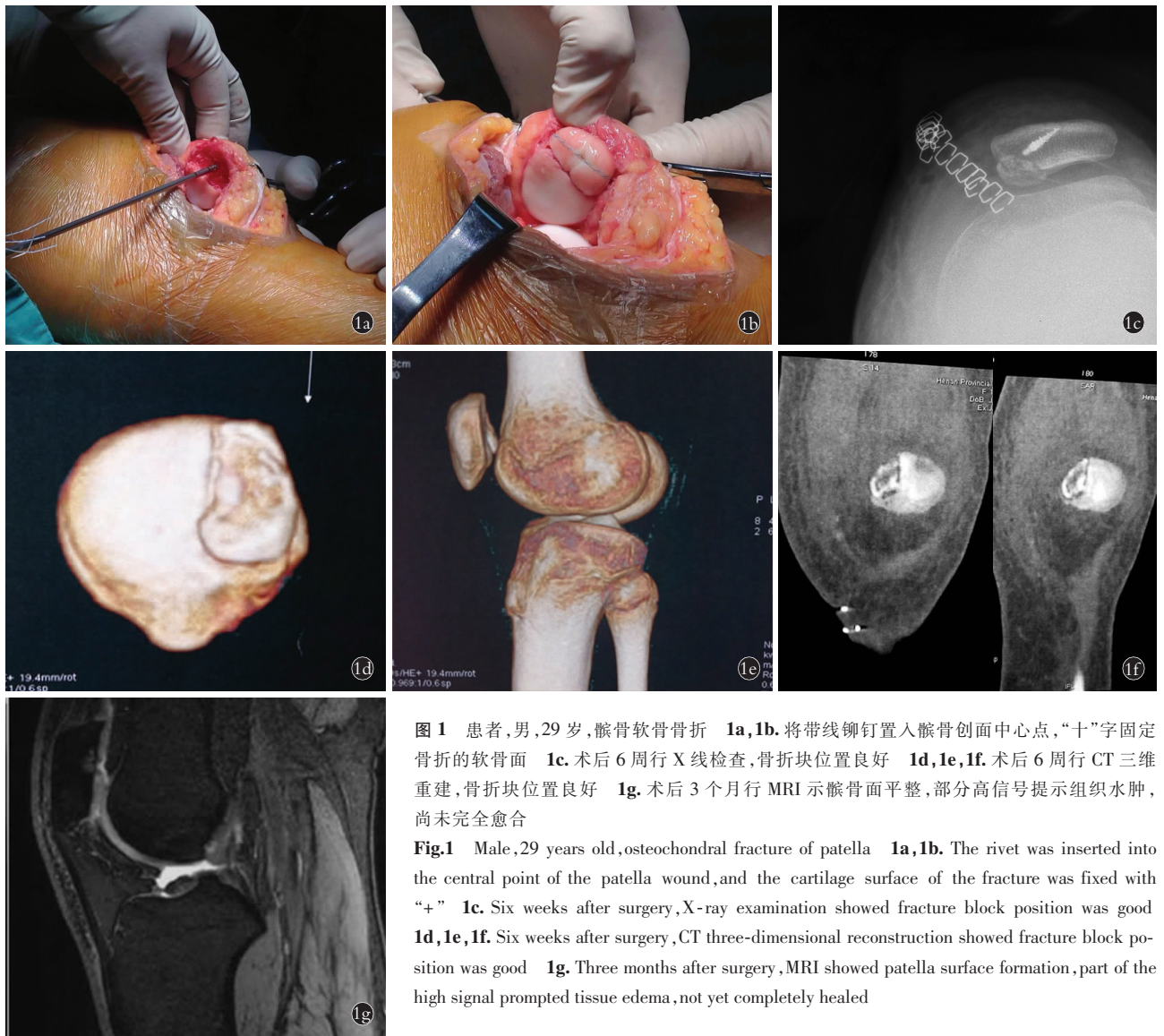


图 1 患者,男,29 岁,髌骨软骨骨折 1a,1b. 将带线铆钉置入髌骨创面中心点,“十”字固定骨折的软骨面 1c. 术后 6 周行 X 线检查,骨折块位置良好 1d,1e,1f. 术后 6 周行 CT 三维重建,骨折块位置良好 1g. 术后 3 个月行 MRI 示髌骨面平整,部分高信号提示组织水肿,尚未完全愈合

Fig.1 Male, 29 years old, osteochondral fracture of patella 1a,1b. The rivet was inserted into the central point of the patella wound, and the cartilage surface of the fracture was fixed with “+” 1c. Six weeks after surgery, X-ray examination showed fracture block position was good 1d,1e,1f. Six weeks after surgery, CT three-dimensional reconstruction showed fracture block position was good 1g. Three months after surgery, MRI showed patella surface formation, part of the high signal prompted tissue edema, not yet completely healed

要求达到解剖复位。

关节软骨的损伤一般分为两种情况^[5]:一种是直径<4 mm,另一种是直径>9 mm。直径<4 mm 的关节内软骨骨折,为防止关节软骨对关节内其他软组织造成进一步损伤,一般是在关节镜直视下将游离骨块取出。因为游离骨块可以形成一个独立的游离体浮游在关节腔中,易引起关节内紊乱,影响膝关节

的功能,此方法具有损伤小、愈合快、并发症少的特点。当直径>9 mm 的关节内软骨骨折时,为防止大块游离骨块对关节内软组织,特别是正常的软骨造成不可逆的损伤,应该尽早、尽快行复位内固定治疗,如果骨折时间>10 d,肉芽组织就会填充关节面缺损区,破坏了关节的平整,此时就很难直接解剖复位,需要对软骨缺损区进行新鲜化处理,再进行复位内

固定。

目前髌骨软骨骨折的固定方式主要集中在以下 3 种^[6]:(1) 应用直径为 3.5 mm 的可吸收螺钉,从髌骨前缘钻出螺钉的钉尖,并用沉头器把螺钉帽固定在软骨面下方,待其吸收后可恢复。(2) 采用 1 mm 克氏针,把针从骨折块冠状位中部向髌骨表面钻出,为防止克氏针滑入膝关节腔内导致骨折块移位甚至再次脱落,需将克氏针的前面弯曲后留在髌骨前方,针尾部留于软骨面下。(3) 用 1 根或多根直径 0.5 mm 的钢丝穿过游离软骨块并穿至髌骨上关节面拧紧固定。

软组织带线铆钉固定髌骨软骨面骨折优点:(1) 能在游离软骨面与骨折面之间达到垂直加压,有足够的抗移位强度,对关节面损伤小,可早期活动^[7]。(2) 可行早期较大幅度的膝关节主动或被动功能锻炼,促进关节液循环,有利于关节软骨修复、骨折面骨性愈合^[8]。(3) “十”字捆绑可降低软骨块再脱入关节腔内的概率。(4) 可降低髌骨软骨坏死率。(5) 术后无须二次手术取出内固定物^[9]。

综上所述,单纯的髌骨软骨骨折在临床中较少见,损伤机制为髌骨向外侧脱位过程中与股骨外侧髌的撞击。早期行切开复位内固定,使用软组织带线铆钉“十”字捆绑内固定技术是很好的方法,不仅固定牢固,且无须Ⅱ期手术取出内固定,早期功能锻炼、晚期负重锻炼可使软骨骨折充分修复。不足之处在于病例较少,其远期疗效尚待观察。

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(收稿日期: 2017-06-16 本文编辑: 连智华)