

· 临床研究 ·

三种克氏针张力带治疗尺骨鹰嘴骨折的疗效比较

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【摘要】目的: 比较 3 种常见的克氏针张力带治疗尺骨鹰嘴骨折的临床效果。**方法:** 回顾分析 2016 年 3 月至 2020 年 5 月克氏针张力带固定治疗 64 例尺骨鹰嘴骨折患者的临床资料, 克氏针髓内置钉组(A 组)19 例, 男 8 例, 女 11 例; 年龄(48.2±18.3)岁, Mayo 分型 I 型 3 例, II 型 16 例。克氏针双皮质置钉组(B 组)20 例, 男 13 例, 女 7 例; 年龄(43.5±20.4)岁, Mayo 分型 I 型 3 例, II 型 17 例。带孔克氏针组(C 组)25 例, 男 15 例, 女 10 例; 年龄(55.2±17.5)岁, Mayo 分型 I 型 4 例, II 型 21 例。比较 3 组患者的手术时间, 术中出血量、透视次数、骨折愈合时间及并发症情况。术后 3 d 采用视觉模拟评分(visual analogue scale, VAS)进行疼痛程度评价, 末次随访采用 Mayo 肘关节功能评分标准进行肘关节功能评价。**结果:** 3 组病例手术时间、术中透视次数、术后 VAS、软组织激惹情况比较, 差异有统计学意义($P < 0.05$)。A、C 组患者在手术时间、术中透视次数优于 B 组($P < 0.05$); C 组在术后 VAS、术后软组织激惹情况优于 B 组($P < 0.05$)。3 组末次随访 Mayo 肘关节功能评分比较, 差异有统计学意义($P < 0.05$), A、C 组均高于 B 组($P < 0.05$)。**结论:** 较之传统的双皮质置钉方式, 克氏针髓内置钉和带孔克氏针张力带固定, 操作简单, 固定牢靠, 软组织激惹少, 手术并发症少, 效果满意。

【关键词】 尺骨鹰嘴; 骨折; 克氏针张力带

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**Comparison of the efficacy of three types of Kirschner wire tension bands for ulnar olecranon fracture**

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ABSTRACT Objective To compare the clinical effect of three types of Kirschner wire tension band for olecranon fracture. **Methods** The clinical data of 64 patients with olecranon fracture treated by Kirschner wire tension band fixation from March 2016 to May 2020 were retrospectively analyzed. Among them, 19 patients were treated with intramedullary K-wires fixation (group A) including 8 males and 11 females with an average of (48.2±18.3) years old, 3 patients were type I, and 16 patients were type II according to Mayo classification; 20 patients were treated with transcortical K-wires fixation (group B) including 13 males and 7 females with an average of (43.5±20.4) years old, 3 patients were type I and 17 patients were type II according to Mayo classification; 25 patients were treated with perforated Kirschner wire (group C) including 15 males and 10 females with an average of (55.2±17.5) years old, 4 patients were type I and 21 patients were type II according to Mayo classification. The operative time, intraoperative blood loss, times of Intraoperative fluoroscopy, fracture healing time and complications of 3 groups were compared. At the final follow-up, elbow function was assessed using the Mayo Elbow Function Scale. **Results** There were differences in operative time, intraoperative fluoroscopy times, postoperative VAS and soft tissue irritation among the three groups ($P < 0.05$). The operative time, intraoperative fluoroscopy times in group A and C was better than that in group B. The postoperative VAS score, skin irritability in group C was better than that of group B. The difference was statistically significant on Mayo elbow function score at the final follow-up among three groups ($P < 0.05$), the scores of group A and C were higher than that of group B. **Conclusion** Compared with transcortical K-wires screw fixation, both intramedullary K-wires screw fixation and perforated Kirschner wire fixation, which can significantly reduce the occurrence of soft tissue irritation, reduce surgical complications and shorten the operation time.

KEYWORDS Olecranon; Fractures; Kirschner wire tension band

尺骨鹰嘴骨折是一种常见的肘部骨折。因累及肱尺关节面, 为获得关节解剖复位, 减少创伤性关节

炎发生, 多需要手术切开复位治疗^[1]。克氏针张力带固定操作简单, 固定确切, 利于患者早期康复^[2]。因而广泛应用于 Mayo 分型^[3] I、II 型骨折患者。笔者发现, 对于克氏针的置钉方式, 传统克氏针张力带有髓内置钉与双层皮质置钉两种形式, 近年来, 带孔克

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氏针张力带,因其较少退钉及软组织激惹等优点,亦较常应用。但目前对比这 3 种固定方式的临床效果,用来指导临床工作的高质量病例对照性研究并不多。故笔者尝试将 3 种固定的效果进行比较,以观察其临床应用价值。回顾性分析自 2016 年 3 月至 2020 年 5 月,采用 3 种克氏针张力带固定方式治疗 64 例尺骨鹰嘴骨折患者的临床资料,对比临床疗效,现报告如下。

1 资料与方法

1.1 病例选择

纳入标准:年龄 13~88 岁;内固定方式为克氏针张力带固定;Mayo 分型 I、II 型骨折;新鲜闭合性骨折。排除标准:累及冠状突及长斜形骨折;鹰嘴皮质失去支撑的严重粉碎骨折;同侧肢体多发骨折;病理性骨折;既往肘关节畸形史;合并神经血管损伤;失访患者。

1.2 一般资料与分组

回顾性分析 2016 年 3 月至 2020 年 5 月使用克氏针张力带固定治疗尺骨鹰嘴骨折 64 例患者的临床资料。分别采用克氏针髓内置钉 19 例(A 组)、克氏针双皮质置钉 20 例(B 组)、带孔克氏针 25 例(C 组)。三组患者术前一般资料比较,差异无统计学意义($P>0.05$),具有可比性,见表 1。本研究患者对手术方式均知情同意并签署知情同意书,经医院伦理委员会批准(编号:202203031056000478407)。

1.3 治疗方法

患者取平卧位,采取常规臂丛或全身麻醉,患肢置于胸前,上臂上气囊止血带充气后,取肘后侧弧形切口,自鹰嘴顶点上方向下沿尺骨鹰嘴内侧至尺骨嵴,长 6~8 cm。切开皮肤及皮下组织,显露骨折端,清理骨折端和关节腔内软组织及血肿,直视下解剖复位骨折端并用复位钳临时固定。

(1)A 组手术方法:用 2 枚直径为 2.0 mm 克氏针,从鹰嘴近端经骨折线平行尺骨纵轴钻入,置于尺骨髓腔内,并且置入克氏针足够长,使克氏针利用髓

腔的曲度形成张应力,防止退钉发生。在尺骨鹰嘴近端入针点纵行切开肱三头肌腱,确保针尾紧贴皮质。在骨折线远端 2~3 cm 处的尺骨后缘以 2.0 mm 克氏针钻一直径的双皮质横行骨孔,穿入直径 1.3 mm 的钢缆,在尺骨背侧交叉做“8”字后,穿过肱三头肌止点深层以及 2 枚克氏针深部,拧紧钢缆,使用锁紧扣固定,折断克氏针尾部,并将预折弯部分嵌入鹰嘴骨质,修补上方肱三头肌腱,严密止血、逐层缝合切口。

(2)B 组手术方法:骨折复位后,用 2 枚直径为 2.0 mm 克氏针,从鹰嘴近端与关节面平行打入,尖端穿过尺骨前方皮质少许,其余操作同 A 组。(3)C 组手术方法:骨折复位后,用 2 枚直径为 2.0 mm 带孔克氏针,从鹰嘴近端经骨折线平行尺骨纵轴钻入,置于尺骨髓腔内,并使克氏针带孔部紧贴尺骨鹰嘴皮质,纵行劈开部分肱三头肌腱,暴露克氏针尾部圆孔,钢缆穿过肱三头肌止点深层及尾部圆孔,做张力带固定。

1.4 术后处理

术后前臂吊带悬吊患肢置于胸前保护,术后 24 h 内使用抗生素预防感染,术后第 2 天创口清洁换药,拍摄肘关节正侧位 X 线片,并开始肘关节主动屈伸锻炼,每日 3~4 次,逐渐增加训练时间及活动范围。遵循个体化、渐进性、全面性的原则,切忌暴力被动锻炼^[4]。

1.5 观察项目与方法

比较 3 组患者的手术时间、术中出血量、透视次数、骨折愈合时间及并发症情况。术后 3 d 采用视觉模拟评分(visual analogue scale, VAS)^[5]进行疼痛缓解程度评价,末次随访采用 Mayo 肘关节功能评分标准^[6],对患者肘关节功能进行评分,包括医生评估的肘关节疼痛(45%)、屈伸活动度(20%)和稳定性(10%),以及 5 个日常生活中的活动项目(25%),即梳头、吃饭、个人卫生、穿衣及穿鞋,其中使用单项选择法对患者疼痛进行评估。患者得分越高代表肘关节功能越好,并可以分为 4 个等级,即优秀(90~

表 1 各组尺骨鹰嘴骨折患者术前临床资料比较

Tab.1 Comparison of general data among three groups of patients with olecranon fracture

组别	例数	性别/例		年龄 ($\bar{x}\pm s$)/岁	身体质量指数 ($\bar{x}\pm s$)/($\text{kg}\cdot\text{m}^{-2}$)	Mayo 分型/例		受伤原因/例			受伤至手术时间 ($\bar{x}\pm s$)/d
		男	女			I 型	II 型	车祸伤	摔伤	高处坠落伤	
A 组	19	8	11	48.2±18.3	24.1±2.5	3	16	3	11	5	3.4±1.1
B 组	20	13	7	43.5±20.4	24.1±2.1	3	17	6	6	8	3.9±1.6
C 组	25	15	10	55.2±17.5	23.8±2.5	4	21	5	14	6	3.2±0.8
检验值		$\chi^2=2.310$		$F=2.237$	$F=0.347$	$\chi^2=0.009$		$\chi^2=4.077$			$F=1.967$
P 值		0.315		0.115	0.708	0.996		0.396			0.149

注:A 组,克氏针髓内置钉固定组;B 组,克氏针双皮质置钉固定组;C 组,带孔克氏针固定组。下同

100 分)、良好(75~89 分)、及格(60~74 分)和差(0~59 分)。

1.6 统计学处理

采用 SPSS 25 软件进行统计处理,定量资料以均数±标准差($\bar{x}\pm s$)表示,3 组间手术时间、术中透视次数、骨折愈合时间、术后 Mayo 肘关节功能评分比较采用单因素方差分析,两两比较采用独立样本 t 检验。术后是否存在软组织激惹和内固定术后失效等定性资料比较行 χ^2 检验。以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 各组术后一般情况比较

所有病例获得随访,时间 10~24(16.1±2.4)个月。骨折均获得骨性愈合,肘关节功能康复良好。各组患者手术时间、术中透视次数、术后 VAS、软组织激惹情况比较,差异均有统计学意义($P<0.05$)。组间两两比较,A、C 组患者手术时间、术中透视次数优于 B 组($P<0.05$);C 组术后 VAS、软组织激惹情况优于 B 组($P<0.05$)。见表 2。

2.2 Mayo 功能评分比较

3 组患者末次随访采用 Mayo 肘关节功能评分结果见表 3,肘关节稳定性、日常活动均恢复良好,部分患者存在屈伸活动度轻度受限,但肘关节运动弧>100°,旋转功能良好。3 组肘关节疼痛及总分比较,差异有统计学意义($P<0.05$),A、C 组疼痛、总分均明显高于 B 组($P<0.05$),见表 3。典型病例见图 1、图 2、图 3、图 4、图 5、图 6。

3 讨论

3.1 内固定方式的选择

尺骨鹰嘴骨折需要通过手术恢复关节面的解剖位置,修复伸肘装置,坚强固定以利于肘关节早期功能康复^[7-9]。克氏针张力带是目前治疗尺骨鹰嘴骨折较为成熟的方法。SCHLIEMANN 等^[10]认为,使用钢板和张力带固定在临床效果方面没有明显区别,两者都能达到骨性愈合。但钢板更容易引起患者的不适,需要及早取出;且钢板的费用远高于张力带^[11]。在同样效果的前提下,建议将张力带作为首选的治疗方案^[12]。

张力带固定技术常用于治疗横行的、简单的非粉碎性尺骨鹰嘴骨折,尤其是移位骨块在尺骨鹰嘴切迹中点以近,张力带通常能提供坚强固定,骨折愈合率高,疗效显著。目前主要有克氏针髓内置钉,双层皮质置钉以及带孔克氏针张力带 3 种固定方式,是比较成熟的手术方式。但对比这 3 种固定方式的临床效果,用来指导临床工作的高质量病例对照性研究并不多。

本研究 B 组病例为双层皮质置钉,是 AO 组织推荐的经典的张力带固定技术(图 2),此方法虽然不容易出现退针^[13],但易发生皮肤激惹,以及克氏针尖部过长,损伤尺骨前方组织,影响上尺桡关节活动等并发症^[14-15]。而克氏针髓内置钉是传统的克氏针张力带固定方法,但由于在髓腔内不稳定,易造成术后创伤性关节炎发生^[16]。近年来,采用改良的克氏针髓内置钉方法(A 组病例),置入克氏针足够长,利用

表 2 各组尺骨鹰嘴骨折患者一般随访情况比较

Tab.2 Comparison of postoperative clinical data among three groups of patients with olecranon fracture

组别	例数	手术时间 ($\bar{x}\pm s$)/分	出血量 ($\bar{x}\pm s$)/ml	术中透视次数 ($\bar{x}\pm s$)/次	VAS ($\bar{x}\pm s$)/分	骨折愈合时间 ($\bar{x}\pm s$)/周	软组织激惹/例		内固定失效/例	
							是	否	是	否
A 组	19	53.7±4.8	24.7±8.4	7.6±1.5	4.9±1.1	16.0±2.9	7	12	3	16
B 组	20	67.0±11.7	28.5±11.4	12.3±1.6	5.3±1.3	16.2±3.2	10	10	6	14
C 组	25	54.8±20.9	22.4±7.8	7.4±1.3	4.9±1.1	16.3±0.9	3	22	2	23
检验值		$F=10.795$	$F=2.443$	$F=75.518$	$F=3.456$	$F=0.091$	$\chi^2=7.861$		$\chi^2=3.602$	
P 值		0.001	0.095	0.001	0.001	0.914	0.021		0.153	

表 3 各组尺骨鹰嘴骨折患者末次随访时 Mayo 功能评分比较($\bar{x}\pm s$)

Tab.3 Comparison of postoperative MEPS at final following up among three groups of patients with olecranon fracture($\bar{x}\pm s$)
单位:分

组别	例数	疼痛	屈伸	稳定	日常活动	总分
A 组	19	40.26±7.16	20.00±0.00	10.00±0.00	24.73±1.15	94.21±7.86
B 组	20	37.50±7.69	19.50±1.54	10.00±0.00	24.00±3.48	90.25±10.57
C 组	25	43.80±4.15	20.00±0.00	10.00±0.00	25.00±0.00	98.80±4.15
F 值		5.552	2.330	1.104	1.389	6.855
P 值		0.006	0.106	0.340	0.257	0.002



图 1 患者,女,56岁,摔倒致左尺骨鹰嘴骨折,采用克氏针张力带(髓内置钉)治疗 **1a.** 术前肘关节侧位及正位 X 线片示尺骨鹰嘴骨折 (Mayo II B 型) **1b.** 术后 2 d 肘关节侧位及正位 X 线片示骨折位置满意 **1c.** 术后 10 个月肘关节正侧位 X 线片示骨性愈合,克氏针依旧未退出且远离皮下,钢缆亦未松动 **1d.** 拆除内固定术后 2 d 正侧位肘关节 X 线片示骨折愈合良好,关节面平整

Fig.1 A 56-year-old female patient with left olecranon fracture caused by falling down was treated with Kirschner wire tension band intramedullary fixation **1a.** Preoperative lateral and AP X-rays of elbow showed an olecranon fracture of Mayo II B **1b.** Lateral and AP X-rays of elbow at 2 days after operation showed fracture healing well **1c.** Lateral and AP X-rays of elbow at 10 months after operation showed bony healing, the Kirschner wire was still not withdrawn and far away from the skin, and the steel cable was not loose **1d.** AP and lateral X-rays of the elbow at 2 days after removal of internal fixation showed good fracture union and the articular surface was smooth

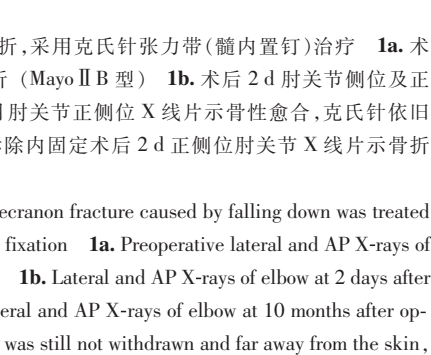
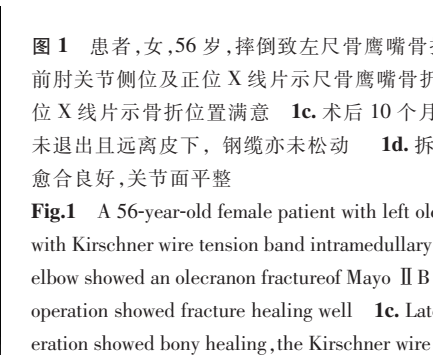


图 2 患者,男,35岁,摔倒致左尺骨鹰嘴骨折,采用克氏针张力带(双皮质置钉)治疗 **2a.** 术前肘关节侧位及正位 X 线片示尺骨鹰嘴骨折 (Mayo II B 型) **2b.** 术后 2 d 肘关节正侧位 X 线片示骨折位置满意,克氏针未退出,钢丝未松动 **2c.** 拆除内固定术后 2 d 肘关节正侧位 X 线片示骨折愈合良好,关节面平整

Fig.2 A 35-year-old male patient with left olecranon fracture caused by falling down was treated with Kirschner wire tension band transcortical fixation **2a.** Preoperative lateral and AP X-rays of elbow showed olecranon fracture of Mayo II B **2b.** Lateral and AP X-rays of elbow at 2 days after operation showed fracture healing well, the Kirschner wire was not withdrawn and the wire was not loose **2c.** AP and lateral X-rays of the elbow at 2 days after removal of internal fixation showed good fracture union and the articular surface was smooth

髓腔的曲度来阻挡退钉发生。并且克氏针尾部折弯后能更紧贴鹰嘴骨质,并将与钢缆组成的张力带系统置于肱三头肌腱深层,通过肱三头肌腱的包裹,避免软组织激惹以及伸肘牵拉张力带引起的退钉情况,有效减少并发症发生(图 1)。近几年流行的带孔克氏针张力带内固定(C 组病例),因在尾部设计圆孔使得钢缆与克氏针连为一体,在同一平面深埋于软组织,固定牢靠,且避免了尾部突起于软组织表面所致的潜在皮肤激惹风险^[16-17]。带孔克氏针的圆孔与钢缆连接处,可能会产生应力集中,影响张力带的

力学一体性,存在张力带的断端加压失效和钢缆断裂的风险(图 3)。

3.2 各种克氏针张力带固定方式的比较

本研究中,A、C 组病例在手术时间、术中透视次数优于 B 组;C 组在术后 VAS、软组织激惹情况以及末次随诊 Mayo 肘关节功能评分优于 B 组。

笔者认为,克氏针髓内置钉组(A 组),因髓内置钉,克氏针平行尺骨纵轴,针尾能更靠近鹰嘴尖部并与张力带埋于肱三头肌腱下方,软组织激惹发生情况明显减少。同时增加髓内置钉长度,针尾能置于肱



图 3 患者,男,55 岁,高处坠落致左尺骨鹰嘴骨折,采用带孔克氏针张力带治疗 **3a.** 术前肘关节侧位及正位 X 线片示尺骨鹰嘴骨折(Mayo II A 型) **3b.** 术后 2 d 肘关节侧位及正位 X 线片示骨折位置满意,克氏针未退出,钢丝未松动 **2c.** 拆除内固定术后 2 d 肘关节侧位及正位 X 线片示骨折愈合良好,关节面平整

Fig.3 A 55-year-old male patient with left olecranon fracture caused by falling accidents was treated with perforated Kirschner wire tension band **3a.** Pre-operative lateral and AP X-rays of elbow showed olecranon fracture of Mayo II A **3b.** Lateral and AP X-rays of the elbow at 2 days after operation showed fracture healing well, the Kirschner wire was not withdrawn and the wire was not loose **3c.** Lateral and AP X-rays of the elbow at 2 days after removal of internal fixation showed good fracture union and the articular surface was smooth



图 4 患者,男,47 岁,高处坠落致右尺骨鹰嘴骨折,采用克氏针张力带(髓内置钉)治疗 **4a.** 术前肘关节正侧位 X 线片示尺骨鹰嘴骨折(Mayo II B 型) **4b.** 术后 2 d 肘关节正侧位 X 线片示克氏针穿出内侧,钢丝未松动 **4c.** 内固定调整后 2 d 肘关节正侧位 X 线片示骨折复位良好

Fig.4 A 47-year-old male patient with right olecranon fracture caused by falling accidents was treated with Kirschner wire tension band intramedullary fixation **4a.** Preoperative AP and lateral X-rays of elbow showed olecranon fracture of Mayo II B **4b.** AP and lateral X-rays of the elbow at 2 days after operation showed the Kirschner wire was pierced through the inside, and the fixation was not loose **4c.** AP and lateral X-rays of the elbow at 2 days after adjusting the fixation showed the fracture was well reduced

三头肌腱深层,避免了肘关节屈伸时三头肌腱对针尾的撬动影响。故退钉及内固定失效情况明显减少。需要注意的是尺骨在冠状面上存在近端外翻,中段内翻的生理曲度,置钉时要注意克氏针进针角度,建议电钻低速慢进,避免穿出皮质外(图 4)。

克氏针双皮质固定组(B 组),术中需将克氏针折弯并敲击穿出对侧皮质,置钉不当,可引损伤尺骨前方正中神经,尺动脉及肌肉组织等,需多角度摄片确定置钉方向。本研究发现 1 例克氏针过长,打入上尺桡关节,影响前臂旋转并出现退针现象(图 5)。而且克氏针与尺骨纵轴存在 $10^{\circ}\sim 30^{\circ}$ 成角,使克氏针尾部更加靠近尺骨鹰嘴背侧皮下,更容易引起软组织激惹及疼痛。故双皮质组在手术时间、术中透视次数及术后疼痛及软组织激惹方面,要高于其余 2 组。

带孔克氏针张力带(C 组),因针尾部圆孔设计

使钛缆与骨针连为一体,防止钛缆滑脱,防止皮肤激惹、退针等并发症发生,操作简单,缩短手术时间^[18]。但笔者发现带孔克氏针张力带在肱三头肌腱上方完成后,再敲入深部,拉紧钢缆,虽然操作简单,却会造成钢缆箍住肱三头肌止点处,造成术后疼痛,以及活动后轻度松动(图 6)。故笔者习惯将带孔克氏针先打入肱三头肌肌腱深部,贴近尺骨鹰嘴皮质。再纵行劈开肌腱,显露圆孔。再用钢缆带针从肱三头肌腱一侧穿入,并确保置入深层的克氏针圆孔后再从对侧穿出。完成张力带固定后,修补肱三头肌腱。操作稍费时,且需注意钢缆出现绕圈情况,但因张力带系统置于肱三头肌深层,避免了对肌腱的压迫,术后能显著减少软组织激惹。

三组在手术出血量、骨折愈合时间、内固定失效的差异并无明显区别。笔者认为,3 种克氏针张力带



图 5 患者,女,67 岁,跌倒致右尺骨鹰嘴骨折,采用克氏针张力带(双皮质置钉)治疗 **5a.** 术前肘关节正侧位 X 线片示尺骨鹰嘴骨折(Mayo II B 型) **5b.** 术后 2 d 肘关节正侧位 X 线片示骨折位置满意,但克氏针尖端偏长偏桡侧,影响上尺桡关节旋转 **5c.** 术后正侧位 X 线片示克氏针退针,张力带失效,但骨折未移位,内固定未做调整 **5d.** 拆除内固定术后 2 d 肘关节侧位及正位 X 线片示骨折愈合良好,关节面尚平整,肘关节少许骨赘形成,患者屈伸及旋转稍受限

Fig.5 A 67-year-old female patient with right olecranon fracture caused by falling down was treated with Kirschner wire tension band transcortical fixation **5a.** Preoperative AP and lateral X-rays of elbow showed olecranon fracture of Mayo II B **5b.** AP and lateral X-rays of elbow at 2 days after operation showed good reduction of the fracture, but the tip of Kirschner wire was too long which affected the rotation of the upper radioulnar joint **5c.** Postoperative AP and lateral X-rays of elbow showed Kirschner wire withdrawal, failure of tension band, but the fracture was not displaced and the internal fixation was not adjusted **5d.** Lateral and AP X-rays of elbow at 2 days after removal of internal fixation showed that the fracture healed well, the articular surface was smooth, a few osteophyte formed in the elbow, and the patient's flexion, extension and rotation of the elbow were slightly limited

affected the rotation of the upper radioulnar joint **5c.** Postoperative AP and lateral X-rays of elbow showed Kirschner wire withdrawal, failure of tension band, but the fracture was not displaced and the internal fixation was not adjusted **5d.** Lateral and AP X-rays of elbow at 2 days after removal of internal fixation showed that the fracture healed well, the articular surface was smooth, a few osteophyte formed in the elbow, and the patient's flexion, extension and rotation of the elbow were slightly limited



图 6 患者,女,63 岁,跌倒致左尺骨鹰嘴骨折,采用克氏针张力带治疗 **6a.** 术前肘关节侧位及正位 X 线片示尺骨鹰嘴骨折(Mayo II B 型) **6b.** 术后 2 d 肘关节侧位 X 线片示骨折位置满意 **6c.** 术后 4 个月肘关节侧位 X 线片示克氏针出现退针,张力带因钢缆置于克氏针尾孔内,未失效,骨折未移位 **6d.** 拆除内固定术后 2 d 肘关节侧位及正位 X 线片见骨折愈合良好,关节面平整

Fig.6 A 63-year-old female with left olecranon fracture caused by falling down was treated with perforated Kirschner wire tension band **6a.** Preoperative lateral and AP X-rays of elbow showed olecranon fracture of Mayo II B **6b.** Lateral and AP X-rays of elbow at 2 days after operation showed fracture healing well **6c.** Lateral and AP X-rays of elbow at 4 months after operation showed slight withdrawal of the Kirschner wire, because the steel cable was placed in the tail hole of the Kirschner wire, the tension band did not fail and the fracture was not displaced **6d.** Lateral and AP X-rays of elbow at 2 days after removal of internal fixation showed good fracture union and the articular surface was smooth

方法均已被成熟运用,术中常规使用止血带,减少术野出血。坚强固定,强调术后不制动,早期功能锻炼,制定规范、合理、适度、有效的康复训练方案,注重患侧及健侧上肢整体功能恢复^[4,19]。患者均能恢复良好的肘关节功能。

本研究的病例局限于 Mayo I、II 型鹰嘴骨折,完整的随访病例数偏少,随访时间偏短。今后争取收集更多病例,延长随访时间,细化骨折康复期各阶段

的 Mayo 肘关节功能评分情况,完善 3 组固定方法在术后康复阶段的对比研究,为尺骨鹰嘴骨折治疗提供更加详尽的参考。

综上,对于简单的尺骨鹰嘴骨折,克氏针张力带固定为首选治疗方法。较之经典的双皮质置钉方式,克氏针髓内置钉和带孔克氏针张力带固定,不易损伤尺骨前方组织,操作简单,能减少手术时间,且显著减少术后软组织激惹发生,可根据术者习惯,适当

采用。

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