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可吸收螺钉与金属螺钉治疗中重度拇外翻的临床应用效果*

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摘要 目的:探讨可吸收螺钉与金属螺钉治疗中重度拇外翻的临床应用效果。**方法:**选取 2016 年 1 月至 2018 年 1 月我院收治的 28 例中重度拇外翻患者作为研究对象,按照随机数字表法分为 2 组,分别采用金属螺钉或可吸收螺钉治疗对照组和观察组拇外翻患者。比较两组患者围手术期指标,手术前后拇外翻角(HVA),第 1、2 跖骨间夹角(IMA),美国矫形足踝学会足功能评分(AOFAS),以及并发症发生情况。**结果:**两组患者手术时间、术中出血量、住院时间比较无统计学差异($P>0.05$)。两组患者术后 HVA、IMA、AOFAS 均优于术前,比较具有统计学差异($P<0.05$);两组患者术后 HVA、IMA、AOFAS 比较无统计学差异($P>0.05$)。对照组治疗优良率为 88.46%,观察组治疗优良率为 92.31%,两组间无统计学差异($P>0.05$)。两组患者截骨端延迟愈合或不愈合发生率比较无统计学差异($P>0.05$);两组患者切口感染、拇外翻复发或者术后丢失矫正度数、跖骨发生背侧移位、出现转移性跖痛、拇内翻发生率比较无统计学差异($P>0.05$)。**结论:**拇外翻截骨后采用可吸收螺钉固定,可提供稳定固定,治疗效果显著,不增加并发症发生风险,值得广泛应用于临床。

关键词:拇外翻;可吸收螺钉;金属螺钉

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Comparative Study of Clinical Value of Absorbable Screws and Metal Screw in the Treatment of Patients with Moderate to Severe Hallux Valgus*

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ABSTRACT Objective: To explore the clinical application of absorbable screws and metal screw in the treatment of patients with moderate to severe hallux valgus. **Methods:** From January 2016 to January 2018, 28 patients with moderate to severe hallux valgus admitted to our hospital were enrolled in the study. They were divided into 2 groups according to the random number table method. The control group and the observation group were treated with metal screws or absorbable screws. Patients with hallux valgus. Absorbable screws treat hallux valgus. Perioperative indicators were compared between the two groups, the hallux valgus angle (HVA) before and after surgery, the angle between the first and second metatarsal, the American Society of Orthopedic Foot and Foot Function (AOFAS), and complications. **Results:** There was no significant difference in operation time, intraoperative blood loss, and hospital stay between the two groups ($P>0.05$). The HVA, IMA and AOFAS were better than those before operation ($P<0.05$). There was no significant difference in HVA, IMA and AOFAS between the two groups($P>0.05$). The excellent and good rate of treatment in the control group was 88.46%, and the excellent and good rate in the observation group was 92.31%. There was no significant difference in the excellent and good rate between the two groups ($P>0.05$). The incidence of delayed healing or non-union, hallux valgus recurrence or postoperative loss correction in the observation group was lower than that in the control group($P<0.05$). Incision infection and tibia lateral displacement occurred in the two groups. There was no significant difference in the incidence of metastatic pain and hallux valgus ($P>0.05$). **Conclusion:** After the hallux valgus osteotomy, it can be fixed by absorbable screws, the treatment effect is remarkable, and the safety is high, which is worthy of being widely used in clinical practice.

Key words: Hallux valgus; Absorbable screw; Metal screw

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前言

拇外翻畸形为临床中常见的足部疾病,主要以前足内侧有

痛性凸起,前足增宽、拇趾明显外翻、穿鞋不适等临床表现^[1,2]。足拇外翻多见于女性,男女发病率比约为 1:8-1:15。临床研究发

现,拇外翻多为对称性、慢性发病,并呈进行性加重,但拇外翻

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畸形程度与疼痛程度不一定成正比,但随着前足足底长期受力不均,可进一步加重拇外翻畸形,轻者在行走时可出现不适感,严重者可影响活动^[3,4]。临床中对于中、重度拇外翻常采用手术治疗,并获得较好的治疗效果,可明显改善患者行走能力,提高患者生活质量^[5,6]。既往在拇外翻截骨术后,采用不可吸收螺钉固定,因足部组织较单薄,术后易出现内固定物突出、软组织刺激等症^[7,8]。

可吸收螺钉是由自身增强聚乙交酯及自身增强聚丙交酯加工而成,可以有利于骨折部位重建^[9,10]。因此,本研究探讨可吸收螺钉与金属螺钉治疗中重度拇外翻患者的临床应用效果,为临床提高拇外翻治疗效果提供参考依据。具体报道如下。

1 资料与方法

表 1 两组患者一般资料情况

Table 1 General information of patients in the two groups

Indicators	Control group	Observation group	χ^2/t	<i>P</i>
Counted	52	52	-	-
Gender	6/22	7/21	1.2064	0.3169
Age(year)	42.62± 4.71	42.05± 4.18	0.9515	0.5423
Family history(n)	15	14	1.3618	0.2187
Follow-up time(m)	13.52± 1.04	13.63± 1.53	1.1936	0.2943

1.2 方法

1.2.1 手术方法 入组患者入院后,完善术前相关检查,确定研究手术策略(本次研究均采用第一跖骨远端 Chevron 截骨术及拇趾近节 Akin 截骨术);硬联合麻醉后,患者取仰卧位,于大腿根部绑扎止血带;切口选择第 1 跖趾关节内侧纵行切口,长度约为 2 cm,逐层切口皮肤,暴露拇囊,注意保护皮神经;舌形切开拇囊,清除增生滑囊,暴露第 1 跖骨内侧增生骨;在跖骨的矢状沟内侧,顺跖骨干长轴,清除骨赘,并且用骨锉锉平;于第 1 跖趾背侧做一长约 1 cm 的纵行切口,暴露拇收肌,切断外侧悬韧带与拇收肌,松解拇关节囊,该过程注意保护第一跖骨背侧的动脉,确保术后跖骨头血供;延长第 1 跖趾关节内侧纵行切口至第 1 跖骨底,剥离骨膜,在距离基底 0.5 cm 处截骨,纠正第 1 跖骨内翻;截骨后,将截骨远端旋后下压,下压过程注意防止截骨远端出现旋前或侧移;钻孔测深;对照组采用金属螺钉固定,观察组采用可吸收螺钉固定;固定完毕后,进行关节囊裁剪、紧缩、缝合,止血、缝合伤口;用纱布团块垫开第 1、2 趾,维持拇趾内收位;两组患者术后 6 周内禁止负重。

1.2.2 术后处理 两组患者术后 6 周均行 X 线检查,复查第 1 跖骨远端及拇趾近节是否移位,固定物是否松动,若 X 线检查提示无异常活动,患者无疼痛感,可进行部分负重;术后第 12 周进行第二次复查,行 X 线检查,查看截骨愈合情况,若愈合,患者可穿鞋正常行走;术后 12 个月进行第三次复查,行 X 线检查,查看截骨愈合情况。

1.3 观察指标

1.3.1 围手术期指标 记录两组患者手术时间、术中出血量、住院时间。

1.1 一般资料

本次研究经过我院伦理委员会审核批准。纳入标准:(1)伴有拇囊炎刺激症状,经正规保守治疗后症状无好转,并且影响日常活动及穿鞋;(2)第一跖楔关节不稳;(3)拇外翻角(HVA) $\geq 30^\circ$,或者跖骨间夹角(IMA) $\geq 13^\circ$;(4)第一跖楔关节出现退行性改变;(5)同意入组研究,并签订知情同意书。排除标准:(1)伴有活动性感染;(2)伴有足部血供障碍;(3)伴有神经性关节炎;(4)青少年;(5)不能耐受手术者。根据纳入排除标准,选取 2016 年 1 月至 2018 年 1 月我院收治的 28 例中重度拇外翻患者作为研究对象,按照随机数字表法分为 2 组,对照组采用金属螺钉治疗拇外翻,观察组采用可吸收螺钉治疗拇外翻。两组基线资料无差异,可比较。见表 1。

1.3.2 足功能评价 通过门诊对两组患者进行随访,随访时间均超过 12 个月,记录两组患者术前、术后 12 周时的拇外翻角(HVA),第 1、2 跖骨间夹角(IMA),采用美国矫形足踝学会足功能评分系统(AOFAS)评估两组患者足功能^[6]。

1.3.3 治疗效果 依据美国足踝矫形学会拇外翻疗效评定标准^[11]进行评价:优:可穿平底鞋或高跟鞋行走,无疼痛感,HVA $< 15^\circ$,伤口一期愈合;良:可穿平底鞋或高跟鞋行走,可行走 1km 无疼痛感,无复发;差:术后复发、行走时有疼痛感、HVA $> 20^\circ$ 、拇囊再次形成、仅能穿较宽的鞋、出现骨坏死、骨不愈合,有以上情况之一者,均为差。优良率=(优+良)/总例数 $\times 100\%$ 。

1.3.4 并发症发生情况 记录入组患者在术后并发症发生情况,包括切口感染,截骨端延迟愈合或不愈合,拇外翻复发或者术后丢失矫正度数,跖骨发生背侧移位,出现转移性跖痛,拇内翻等并发症。

1.4 统计学分析

所有数据采用 SPSS21.0 软件进行分析,计量资料以 $\bar{x} \pm s$ 表示,符合正态分布,采用 t 检验比较差异,不符合正态分布,采用秩和检验比较差异;计数资料采用 n(%)表示,采用 χ^2 检验比较差异,当 $P < 0.05$ 时,表示差异有统计学意义。

2 结果

2.1 两组围手术期指标比较

两组患者手术时间、术中出血量、住院时间比较无统计学差异($P > 0.05$)。具体数据见表 2。

表 2 两组患者围手术期指标比较($\bar{x} \pm s$)

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

Groups	The operation time(min)	Intraoperative blood loss(mL)	The length of time(d)
Control group(n=52)	36.84± 7.16	10.29± 2.65	6.31± 1.35
Observation group(n=52)	34.18± 7.26	11.29± 1.98	7.11± 1.44
t value	1.6087	1.1067	1.4229
P value	0.0964	0.3952	0.1163

2.2 两组手术前后 HVA、IMA、AOFAS 比较

统计学差异($P<0.05$);两组患者术后 HVA、IMA、AOFAS 比较

两组患者术后 HVA、IMA、AOFAS 均优于术前,比较具有 无统计学差异($P>0.05$)。具体数据见表 3。

表 3 两组患者手术前后 HVA、IMA、AOFAS 比较($\bar{x} \pm s$)

Table 3 Comparison of HVA, IMA and AOFAS between the two groups before and after surgery($\bar{x} \pm s$)

Groups	HVA(°)		IMA(°)		AOFAS(points)	
	Before the operation	12 weeks after surgery Before the operation	Before the operation	12 weeks after surgery Before the operation	Before the operation	12 weeks after surgery Before the operation
Control group (n=52)	38.16± 3.47	14.25± 1.86	21.44± 3.75	10.51± 1.67	49.76± 3.64	90.67± 1.36
Observation group (n=52)	37.59± 5.42	13.42± 1.33	22.06± 3.17	11.24± 0.97	50.18± 2.94	89.24± 1.52
t value	1.8134	1.6248	1.5206	1.5387	0.9647	1.0587
P value	0.0812	0.0941	0.1037	0.1008	0.6732	0.5844

Note: ² $P<0.05$, compared with before surgery.

2.3 两组患者治疗效果比较

92.31%,两组治疗优良率比较无统计学差异($P>0.05$)。见表 4。

对照组治疗优良率为 88.46%, 观察组治疗优良率为

表 4 两组患者治疗效果比较[n(%)]

Table 4 Comparison of treatment effect between the two groups[n(%)]

Groups	Excellent	Good	Poor	The excellent(%)
Control group(n=52)	30(57.69)	16(30.77)	6(11.54)	88.46
Observation group(n=52)	34(65.38)	14(26.93)	4(7.69)	92.31
χ^2 value				1.7067
P value				0.0926

2.4 两组并发症发生情况

矫正度数、跖骨发生背侧移位、出现转移性跖痛、拇内翻发生率

两组患者截骨端延迟愈合或不愈合发生率比较无统计学 比较无统计学差异($P>0.05$)。具体数据见表 5。

差异($P>0.05$)。两组患者切口感染、拇外翻复发或者术后丢失

表 5 两组患者并发症发生情况[n(%)]

Table 5 Complications in the two groups[n(%)]

Groups	Infection of incision	Delayed or nonunion of the osteotomy end	Recurrence of bunions or loss of postoperative correction	Dorsal transposition of metatarsal occurs	Metastatic metatarsal pain is present	Hallux varus
Control group (n=52)	6(11.54)	4(7.69)	6(11.54)	4(7.69)	6(11.54)	2(3.85)
Observation group (n=52)	4(7.69)	2(3.85)	2(3.85)	2(3.85)	2(3.85)	2(3.85)
χ^2 value	0.8167	1.2647	1.4126	0.8410	1.0364	0.0001
P value	0.7944	0.2420	0.1165	0.7658	0.5947	1.0000

2.5 典型病例

(1)宋××,女,46岁,自诉5岁左右发现有拇外翻畸形,无明显不适,未进行诊治,近4年出现疼痛,行走后疼痛感加

重,伴有脚掌部疼痛;患者术前X线检查可见骨赘形成(见图1),截骨后,采用不可吸收金属螺钉进行固定,术后X线片(见图2)。



图1 术前X线正位

Fig.1 Preoperative positive X - ray position



图2 术后X线正位

Fig.2 Postoperatively positive X-ray position

(2)张××,女,45岁,自诉10多年前发现有拇外翻畸形,偶有疼痛感,但未进行诊治,近2年出现明显疼痛,行走困难;

患者术前X线检查可见骨赘形成(见图3),截骨后,采用可吸收螺钉进行固定,术后X线片(见图4)。



图3 术前X线正位

Fig.3 Preoperative positive X - ray position



图4 术后X线正位

Fig.4 Postoperatively positive X-ray position

3 讨论

拇外翻为一种常见病、多发病,其形成因素尚不明确,可能

与第一跖骨内翻、扁平足、高弓足、外伤引起、长时间站立行走、穿窄小高跟鞋等有关^[12,13]。正常人主要为前足负重,足底压力分布有一定规律,以第1跖骨头负重较大,内侧存有负重横弓^[14]。

研究发现^[15-17],发生拇外翻后,足的解剖结构及病理结构发生改变,以至于足处于负重状态时,第一跖骨头下的负重减少。正是由于负重的外移,导致外侧足其余跖骨头负重增加,使原理负重横弓消失或者塌陷。这些生物力学发生改变,再加上跖骨头内侧受到关节囊的牵拉,可增生形成骨赘^[18,19]。拇外翻可引起一系列病理变化,主要表现为拇趾向外倾斜、第一跖骨向内翻、拇囊炎形成等^[20]。另外,拇外翻患者伴有不同程度的疼痛,产生的原因可能与以下因素有关:(1)拇跖骨头内侧隆起后受到鞋的挤压及摩擦,出现拇囊炎,进而引起疼痛;(2)拇跖趾关节发生骨性关节炎,进而引起疼痛;(3)拇趾负重能力下降,第2、3趾承受应力增加,在跖骨头下产生胼胝,患者可出现转移性的跖骨痛;(4)拇趾外翻可挤压第二趾,出现锤状趾,趾间关节的背侧受到鞋面的摩擦后出现胼胝,进而引起疼痛^[21,22]。

拇外翻畸形治疗包括保守治疗及手术治疗,在保守治疗无效时,需要采用手术治疗。国内外研究证实,形成拇外翻畸形的原因较多,因而在诊治过程中给临床医师带来较大困难。随着对于足踝专业研究深入,越来越多学者认为手术治疗为拇外翻的最佳治疗方式。但拇外翻手术方式较多,约有130多种^[23,24],包括第1跖趾关节周围软组织手术、第1跖骨远端截骨术、第1跖骨干及基底截骨手术、第一跖趾关节融合术等。治疗拇外翻的手术方法较多,主要目的为:(1)改善拇外翻引起的足趾畸形,并寻找病因,进行针对性治疗;(2)去除拇囊炎部位增生骨赘,缓解局部炎症反应;(3)恢复内侧足弓,减少其余跖骨头负重,尽可能接近足部负重生物力学的要求;(4)通过松解第一跖趾关节外侧软组织并解除拇指外翻旋前等畸形,尽可能恢复第1跖列肌力的平衡。

随着临床足外科的不断发展,拇外翻畸形越来越受到临床重视,尤其是对足弓生物力学的研究深入,以及手术方式的改进,明显提高拇外翻畸形治疗效果,再加上微创理念被广泛应用于临床手术,改变既往传统手术的大切口、创伤大、术后钢钉内固定^[25,26]。既往多采用克氏针、金属螺钉等方式固定,但需要进行二次手术取出,增加患者痛苦及住院费用;可吸收螺钉是由自身增强聚乙交酯及自身增强聚丙交酯加工而成,其植入人体后,能够水解形成羟基乙醇单体及羟基丙醇单体,再进入细胞能量代谢进行降解^[27-29]。本次研究对入组患者均截骨后,拇外翻形态得到明显改善,减轻鞋对跖骨头内侧的压迫,并且术中去除跖趾关节内侧慢性炎症性软组织,术后疼痛感明显减轻,且不易复发^[30,31]。

本次研究结果显示,两组围手术期指标、治疗效果、术后HVA、IMA、AOFAS比较均无统计学差异,与Hatch DJ研究一致^[32],结果说明可吸收螺钉应用于重度拇外翻中,能够起到较好的固定作用,促进骨折愈合,另外,采用可吸收螺钉固定,可避免术后二次手术取出螺钉,减少患者痛苦及手术费用。本次研究采用可吸收螺钉在体内吸收的时间约为4-8周,采用该螺钉固定,未增加截骨端延迟愈合或不愈合的发生风险;并且应用可吸收螺钉,能够避免金属异物对组织的刺激,说明可吸收螺钉在拇外翻中安全性较高。但是可吸收螺钉的植入强度较低,在植入过程中易发生断裂,并且可吸收螺钉直径较粗,钉帽较大,若要完全植入钉帽,需钻较大的孔,但跖骨本身直径较短,钻孔时易发生断裂,因此,对于骨质疏松患者慎用^[33-35]。

综上所述,拇外翻截骨后采用可吸收螺钉固定,治疗效果显著,且安全性较高,值得广泛应用于临床。

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(上接第 1912 页)

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