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·临床研究·

关节镜结合腓骨截骨治疗膝内侧间室骨关节炎疗效观察

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[摘 要] **目的** 观察关节镜结合腓骨截骨治疗膝内侧间室骨关节炎的临床疗效。**方法** 回顾性分析2014年9月至2016年9月在本院就诊的36例膝骨关节炎伴有膝内翻患者的临床资料,根据手术方案的不同分为2组,对照组行单纯腓骨截骨术,观察组采用关节镜结合腓骨截骨术;以临床症状体征、VAS、ISOA得分评估并对比2组手术疗效。**结果** 对照组18例,临床痊愈0例,显效7例,有效8例,无效3例,显效以上38.9%;观察组18例,临床痊愈3例,显效10例,有效5例,显效以上72.2%,观察组疗效明显优于对照组,差异具有统计学意义($P<0.05$);2组术后VAS、ISOA较术前均改善,差异具有统计学意义($P<0.05$);观察组治疗后VAS改善优于对照组,差异具有统计学意义($P<0.05$);观察组治疗后ISOA得分明显优于对照组,差异具有极显著性统计学意义($P<0.01$)。2组症状和体征(疼痛和麻木,行走,生活及工作能力,压痛,直腿抬高试验,膝、跟键反射,总积分)评分与治疗前比较均有改善,差异有统计学意义($P<0.05$),且观察组疼痛、麻木、行走、压痛、直腿抬高试验及总积分等与对照组比较,差异均有统计学意义($P<0.05$)。**结论** 膝内侧间室骨关节炎的患者采用关节镜清理加腓骨截骨治疗创伤小、有效率高,功能恢复较好,安全可行。

[关键词] 关节镜;腓骨截骨;膝内侧间室骨关节炎;疗效观察
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Efficacy of arthroscopy combined with fibular osteotomy in treatment of medial knee osteoarthritis

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Abstract: Objective To observe the clinical efficacy of arthroscopy and fibula osteotomy in the treatment of medial knee osteoarthritis.

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Methods Thirty-six patients with medial knee osteoarthritis treated in our hospital from September 2014 to September 2016 were divided into two groups according to the acceptable surgical protocol. The control group was treated by fibula osteotomy, and the observation group received arthroscopy combined with fibula osteotomy. The clinical signs and symptoms, VAS and ISOA scores were evaluated and compared between the two groups. **Results** The control group of 18 cases, clinical recovery in 0 cases, markedly effective in 7 cases, effective in 8 cases, 3 cases with no effect, the effective rate was 38.9%; observation group of 18 cases, 3 cases clinically cured, effective in 10 cases, effective in 5 cases, the effective rate was 72.2%. The effective rate of observation group was better than that of the control group, the difference was signicant ($P<0.05$). VAS and ISOA in both groups were significantly improved after operation, the difference was signicant ($P<0.05$); VAS improvement in observation group was better than that in control group, the difference was signicant ($P<0.05$), ISOA score in observation group was significantly better than that in control group, the difference was signicant ($P<0.01$). The clinical signs and symptoms (pain and numbness, walking, living and working abilities, tenderness, straight leg raising test, knee and Achilles reflex, total score) in two groups were improved respectively compared with those before treatment, and the differences were statistically significant ($P<0.05$). The pain and numbness, walking, tenderness, straight leg raising test and total score in the observation group were significantly different from those in the control group ($P<0.05$). **Conclusion** The arthroscopy and fibula osteotomy is safe and feasible to treat patients of medial knee osteoarthritis with less traumatic, more effective and better functional recovery.

Keywords: arthroscopy; fibula osteotomy; medial compartment knee osteoarthritis; curative effect observation

膝骨关节炎(osteoarthritis, OA)为骨科临床常见病,多见于50岁的女性群体,多数膝关节骨关节炎累及内侧间室。该病以关节软骨破溃、关节间隙变窄、软骨下骨硬化、滑膜炎、骨赘的形成为主要病理表现[1-3],使膝关节负重力线分布异常,导致患者出现膝关节肿痛、步态失常,其症状进行性加重,严重影响患者的健康和生活质量。从治疗角度上看,目前较为成熟的治疗方法为关节置换术,但一些年轻患者或者耐受度不佳的患者并不适宜直接进行关节置换[4]。由于中老年患者骨质疏松明显,会造成膝关节不均匀沉降,尤其胫骨平台外侧有腓骨支撑,最终内侧平台塌陷致使膝关节内侧间室骨性关节炎[5]。因此根据膝关节炎病理过程,荔湾区骨伤科医院自2014年9月至2016年9月对36例膝内侧间室骨关节炎患者采用关节镜结合腓骨截骨治疗,取得了较好治疗效果,现结合临床病例将相关诊治经验报告如下。

1 资料与方法

1.1 临床资料

回顾性分析我院2014年9月至2016年9月就诊的膝关节内侧间室骨关节炎患者36例,男6例,女30例;年龄44~64岁,平均(54.0±9.2)岁;均为单膝患者,左膝16例,右膝20例,病程2~11年,平均病程7年。根据手术方案的不同将36例患者分为观察组和对照组,各18例。2组患者的一般资料比较,差异无统计学意义($P>0.05$),具有可比性。

所有患者均符合中华医学会风湿病学会骨关节炎诊治指南草案诊断标准[6]。纳入标准:①以内侧间室病变为临床表现;②年龄40~65岁;③X射线片显示负重位下肢力线,膝关节内侧间隙变窄,存在膝内翻畸形;膝关节内侧间隙软骨存在破坏、内侧平台软骨下骨髓水肿;④保守治疗6个月以上;⑤愿意参与研究并签署知情同意书。排除标准:①类风湿关节炎、化脓性关节炎;②膝关节外翻畸形伴外侧间隙疼痛、狭窄;③神经异常;④韧带存在损伤或断裂,膝关节、外伤史。

1.2 手术适应证

本组患者的手术适应证:①保守治疗6个月后效果不佳,膝关节疼痛均为膝前及膝关节内侧疼痛;②伴或不伴有关节内有游离体,膝关节关节间隙较好;③关节间隙轻度变窄,胫股内侧关节退行性变明显,膝关节内侧胫骨平台T1低T2高的水肿信号,对侧关节间隙显示相对正常;④屈伸肌群各肌力大于4级;⑤膝关节屈伸活动范围大于等于90°。

1.3 手术方法

观察组采用关节镜结合腓骨截骨术,对照组采用单纯腓骨截骨术。①观察组在腰硬联合麻醉下常规性患膝行关节镜治疗。关节镜下冲洗、清理增生滑膜,清除剥脱软骨、游离体,修整半月板。②取一个长约5 cm的纵行切口,于腓骨小头下方6~8 cm处,依次切开经腓骨长短肌与比目鱼肌间隙入路,行骨膜下剥离后显露腓骨,用线锯在该段腓骨切除约2 cm长的骨,钝性分离至腓骨,磨平断端,两断端骨蜡封堵防止腓骨断端愈合,逐层缝合并加压包扎。术后不作任何外固定,鼓励患者术后尽早下地活动。对照组:仅行观察组中的步骤②。

1.4 疗效评定标准

以VAS疼痛评分[7]、膝OA严重指数(ISOA)[8]为依据,并记录手术前后不良事件。ISOA分为6级,即极为严重为不低于14分、很严重为11~13分、严重为

8~10 分、中度为 5~7 分、轻度为 1~4 分和正常为 0 分。治疗后关节指数 0 分、炎症消失为临床痊愈;关节指数进步大于等于 3 级,炎症消失为显效;关节指数进步 1~2 级、炎症减轻为有效;关节指数进步、炎症不变或加重小于 1 级为无效。采用症状及体征观察量表[9]观察记录。膝关节骨性关节炎症状及体征观察量表采取我院自制量表,包括:生活及工作能力、行走、压痛、膝、跟键反射、疼痛和麻木、直腿抬高试验,总分为 100 分,最低分为 25 分,症状越严重所得分数越低。

1.5 统计学方法

采用 SPSS 17.0 统计软件。评分及 ISOA 得分等计量资料以均数±标准差($\bar{x} \pm s$)表示,符合正态分布用 t 检验;不符合正态分布,则经对数转换后采用两独立样本 t 检验。疗效情况以率(%)的形式表示,等级资料采用秩和检验。$P<0.05$ 为差异具有统计学意义;$P<0.01$ 为差异具有极显著性统计学意义。

2 结果

2.1 手术一般情况

手术时间 50~70 min,平均 60 min;术中出血量 50~100 mL,平均 75 mL;术后下床时间 3~8 d。4 例患者出现足背轻度麻木。所有患者术后未出现运动神经功能损伤、大血管损伤、感染等并发症。术后 12 周 2 组显效率经秩和检验,差异有统计学意义($Z=4.050$, $P=0.044$),提示观察组疗效明显优于对照组(表 1)。

表 1 2 组患者术后 12 周疗效比较($n=18$)

组别	临床痊愈(例)	显效(例)	有效(例)	无效(例)	总显效[例(%)]
对照组	0	7	8	3	7(38.9)
观察组	3	10	5	0	13(72.2)*

*:与对照组比较,$P<0.05$

2.2 VAS 疼痛评分及膝 OA 严重指数

由表 2 可见,术后 12 周,观察组患者疼痛明显减轻,VAS 评分明显优于对照组,差异具有统计学意义($P<0.05$)。由表 3 可见,术后 12 周,观察组患者功能恢复较好,ISOA 得分明显优于对照组,差异具有极显著性统计学意义($P<0.01$)。

2.3 2 组临床症状及体征指标评分比较

由表 4 可见,治疗后 2 组患者疼痛和麻木、行走、生活及工作能力、压痛、直腿抬高试验、膝、跟键反射等症状评分与治疗前比较均有改善,差异均有统计学意义($P<0.05$)。观察组疼痛和麻木、行走、压痛,直腿抬高试验及总积分等与对照组比较,差异均有统计学意义($P<0.05$),观察组优于对照组。

表 2 2 组患者治疗前后 VAS 评分比较[($\bar{x} \pm s$),$n=18$,分]

组别	术前	术后 12 周	t	P
对照组	7.35±1.69	4.94±2.57	-3.324	0.001
观察组	7.05±1.56	3.68±1.78	6.041	0.000
t	0.553	1.710		
P	0.291	0.049		

表 3 2 组患者治疗前后 ISOA 得分情况[($\bar{x} \pm s$),$n=18$,分]

组别	术前	术后 12 周	t	P
对照组	7.89±2.98	5.33±2.63	-2.733	0.005
观察组	7.69±2.73	3.25±2.93	-4.704	0.000
t	2.733	-2.241		
P	0.005	0.010		

*:与术前比较,$P<0.05$;#:与对照组比较,$P<0.01$

表 4 2 组患者临床症状及体征指标评分比较($\bar{x} \pm s$,$n=18$,分)

项目	对照组		观察组	
	治疗前	治疗后	治疗前	治疗后
疼痛、麻木	13.45±4.56	14.45±4.56*	13.73±4.18	17.64±3.63*#
行走	10.43±4.57	11.66±4.33*	10.36±4.73	14.36±1.63*#
生活、工作	7.57±3.43	13.55±4.58*	7.76±3.46	14.05±2.96*
压痛	8.25±4.45	12.46±3.34*	8.83±4.6	14.34±2.67*#
直腿抬高试验	8.85±4.34	12.64±4.23*	9.76±4.97	14.52±2.97*#
膝、跟键反射	9.14±3.66	13.23±4.26*	8.57±3.76	13.57±3.66*
总积分	57.78±11.64	74.57±16.55*	58.56±12.78	88.45±12.57*#

*:与治疗前比较,$P<0.05$;#:与对照组治疗后比较,$P<0.05$

2.4 典型病例

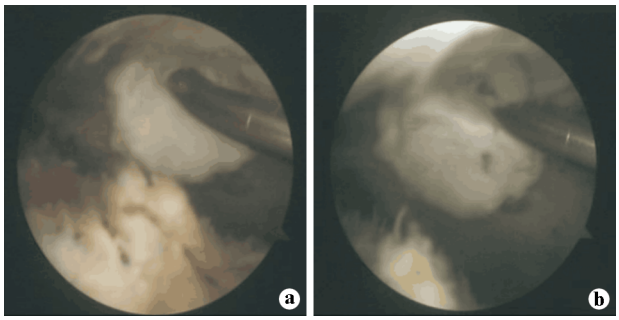
患者,女,68 岁,左膝关节疼痛 4 年,以步行时左膝内侧疼痛为主。术前 X 射线片示左膝轻度内翻,内侧间隙变窄,髌上游离体并关节内游离体(图1a、b)。



a:术前正位片;b:术前侧位片;c:术后正位片;d:术后侧位片;e:术后 6 个月正位片;f:术后 6 个月侧位片

图 1 典型病例 X 射线片

术中关节镜示左膝关节滑膜增生,关节内游离体(图2)。术后X射线片示左膝内侧关节间隙改善,腓骨近端截骨术后,髌上游离体已取出(图1c、d)。术后6个月X射线片示左下肢力线明显改善,左膝内侧关节间隙较前改善,腓骨近端截骨术后改变,断端无出现骨性连接,髌上游离体消失(图1e、f)。



a:关节镜下滑膜增生;b:关节镜下游离体

图2 术中关节镜所见

3 讨论

骨关节炎的病因是多因素的,但主因为炎性及机械性的损伤,致关节塌陷、关节破裂以及软骨软化,继而出现骨囊肿、软骨下骨硬化、骨赘。病程进展与炎症细胞及炎症因子关系密切,众多炎症细胞(如中性粒细胞、巨噬细胞等),释放细胞因子,导致侵蚀骨质[10]。Matta等[11]的研究提示,通过粒细胞-巨噬细胞集落刺激因子刺激在骨性关节炎的发展过程中,可诱导其他炎症因子和蛋白的表达,使骨赘形成,骨关节炎软骨破坏,侵蚀软骨下骨,破骨细胞激活。调节骨代谢的主要细胞因子为IL-1、IL-6、TNF-α,是参与膝骨关节炎发病进程中的重要介质。IL-1可参与滑膜炎性病变及影响骨代谢,降解软骨细胞基质、促进软骨细胞凋亡发生[12-15]。TNF-α影响滑膜炎症和免疫学反应,能激活IL-6基因,诱导IL-6生成,加重骨软骨的破坏,刺激滑膜细胞合成PGE2,IL-6在膝OA中诱发抗自身软骨的自身免疫反应,介导软骨破坏后成分暴露[16]。关节滑液中含有大量的金属蛋白酶(MMP-3)底物[17],对软骨基质有自降解作用,可导致关节软骨肿胀,抗外力作用下降;使关节软骨结构及力学性能发生改变[18]。因此,关节镜清理术对膝骨关节炎的治疗具有重要意义[19]。关节镜下清理关节内增生滑膜、破碎半月板、炎性滑膜皱襞、破碎的或者不稳定的软骨片、关节内活动的游离体、增生的骨赘等,并用大量的生理盐水彻底冲洗关节,减轻关节磨损的同时带走了大量的炎症物质,减少了炎症作用。

多数膝骨关节炎的患者都伴有膝内翻的情况,因此有学者通过临床观察和研究发现膝关节内侧沉降率和沉降速度明显大于外侧,提出不均匀沉降理论,这是导致膝关节内侧间室骨关节炎发生发展的关键因素[20]。“不均匀沉降”理论与膝关节骨关节炎有关系,论证了骨质疏松发生,认为骨质疏松是膝关节骨关节炎的基础。由于胫骨平台周围无坚强软组织包绕,胫骨近端为松质骨区,负重点向内侧偏移,内侧无骨性阻挡,负重面大,外侧有腓骨支撑,因此内外侧平台发生不均匀沉降。膝关节负重向内侧严重滑移,当站立及行走时,使内侧负荷加重,形成恶性循环,加重了内侧平台的沉降。因此腓骨支撑是形成膝内翻和内侧间隙变窄加剧了膝关节退变[21]。尸体研究发现腓骨小头向远端移位,腓骨高位截骨后向下牵拉近段腓骨,提出了“弓弦理论”假说:骨性结构为弓,在未行腓骨截骨时,腓骨头与胫骨外侧髁之间连接较紧密,而外侧的肌肉韧带等软组织为弦,间隙较小,此时弓弦长,张力较低,不能拉紧,而在截骨术后,比目鱼肌和腓骨长肌等小腿肌肉弓弦拉紧,将腓骨向远端牵拉,形成以胫骨外侧平台为支点撬起股骨内髁,形成杠杆结构,使内侧平台张力减低[22]。另外,腓骨近端截骨在一定程度上恢复了下肢负重力线,减弱了对胫骨外侧平台的支撑,减轻膝关节内侧关节面的生物应力,使膝关节载荷外移,防止胫骨平台继续发生不均匀沉降,减轻了膝关节疼痛。临床上以腓骨截骨治疗膝关节内侧间室骨关节炎[23],腓骨移植在临床广泛应用[16-17],证明腓骨截除是安全的。对腓骨截骨适应证的选择,术前要仔细阅片,应选择无外翻畸形的,而严重的上胫腓关节炎需要排除在外,因为术后腓骨几乎不产生向远端位移[24]。另外,肥胖也是不利因素[25],因为截骨术后需要腓骨近端肌群产生更大的牵拉力才能对抗膝关节负重内翻畸形。腓浅神经从腓总神经发出后,截骨术中注意避免损伤腓浅神经及其分支,于腓骨长肌与比目鱼肌间隙前方伴随腓骨中上段走行的分支及变异多位,因此临床建议采用腓骨后外侧入路减少腓浅神经损伤。

本组资料显示,观察组疗效、VAS改善、ISOA得分明显优于对照组,可以认为单纯腓骨截骨仅改变力线,对膝关节内的炎症反应、游离体不能凑效。联合膝关节镜清理,则明显改善膝关节功能并减轻疼痛。

膝骨关节炎伴内翻畸形,膝关节置换是现在常用有效的手术方式,包括单髁置换。然而,关节置换手术创伤大,并发症多,比如假体松动、假体磨损、腓总神经损伤、血栓栓塞等,且对于活动量大、年纪轻、重体力劳动多的患者不适用。腓骨截骨与关节镜清理是微创性的手术方式,对减轻炎症,纠正下肢力线,从病理及机

械力学的角度治疗该疾病,改善临床症状的具有重要作用,是延缓膝关节置换乃至避免膝关节置换的有效方法。对患者而言,该手术创口小、出血少、易于接受、疗效显著,值得临床推广。

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