

- LIANG CX, ZHENG QJ, LIN XP. Short-term outcome of arthroplasty for hip fractures in patients undergoing chronic hemodialysis [J]. *Zhonghua Guan Jie Wai Ke Za Zhi (Dian Zi Ban)*, 2011, 5(6): 745-749. Chinese.
- [8] 门德华, 邢宏. 改良 Hardinge 入路人工股骨头置换治疗高龄股骨颈骨折 [J]. *中国骨与关节损伤杂志*, 2010, 25(10): 911-912.
- MEN DH, XING H. Modified Hardinge approach artificial femoral head replacement for femoral neck fracture in elderly patients [J]. *Zhongguo Gu Yu Guan Jie Sun Shang Za Zhi*, 2010, 25(10): 911-912. Chinese.
- [9] 中华医学会骨科学分会. 中国骨科大手术静脉血栓栓塞症预防指南 [J]. *中华骨科杂志*, 2016, 36(2): 65-71.
- Society of Orthopaedics, Chinese Medical Association. Guidelines for the prevention of venous thromboembolism in major orthopaedic surgery in China [J]. *Zhonghua Gu Ke Za Zhi*, 2016, 36(2): 65-71. Chinese.
- (收稿日期: 2021-07-20 本文编辑: 王玉蔓)

高龄膝骨关节炎患者人工单髁关节置换疗效分析

鞠晓聪¹, 王冰², 王峰², 孙海宁²

(1. 山东第一医科大学第三附属医院创伤骨科, 山东 济南 250000; 2. 解放军九六〇医院骨科, 山东 济南 250355)

【摘要】 目的: 探讨 75 岁以上膝骨性关节炎患者行人工单髁关节置换术后临床疗效。方法: 自 2010 年 4 月至 2015 年 5 月应用 Oxford 第 3 代人工单髁关节治疗膝内侧间室骨性关节炎患者 42 例, 根据手术单双侧置换情况将患者分为双侧同期置换组和单侧置换组: 同期置换组 11 例, 男 3 例, 女 8 例, 年龄 (79.18±3.06) 岁; 单侧置换组 31 例, 男 13 例, 女 18 例, 年龄 (78.16±3.48) 岁。观察比较患者患膝假体生存现状、术前后血细胞比容变化、术中及术后的失血总量, 比较患者术前后膝关节 HSS (Hospital for Special Surgery knee-rating) 评分。结果: 两组术后围手术期并发症比较差异有统计学意义 ($P < 0.05$)。42 例患者获得随访, 时间 (5.7±2.3) 年。1 例既往高血压合病史患者术后第 4 个月发生脑血栓, 1 例患者在术后第 4 个月发生衬垫脱位, 2 例患者于术后 3 年因其他内科疾病死亡 (1 例心肌梗塞, 1 例肺癌)。双侧同期置换组术后失血总量高于单侧置换组 ($P < 0.05$); 4 例行双侧同期置换患者术后分别输血 2 U。两组术后 9 个月 HSS 评分除稳定性评分其他各项评分和总分均高于术前 ($P < 0.05$)。结论: 内侧单间室退变的 75 岁以上老年骨性关节炎患者选择人工单髁关节置换术是可行的手术治疗方法。对于双膝病变 75 岁以上老年患者, 双侧同期人工单髁关节置换术同单侧单髁关节置换术相比, 创伤大, 会增加围手术期并发症发生率, 影响术后快速康复, 增加失血量。虽然远期疗效同单侧单髁关节置换术相当, 但为保证手术安全性, 仍建议分期手术。

【关键词】 关节成形术, 置换, 膝; 骨关节炎, 膝; 老年人

中图分类号: 687.4+2

DOI: 10.12200/j.issn.1003-0034.2022.07.009

开放科学 (资源服务) 标识码 (OSID):



Effect of unicompartmental knee arthroplasty in patients over 75 years old with knee osteoarthritis JU Xiao-cong, WANG Bing, WANG Feng, and SUN Hai-ning*. *Department of Orthopedics, PLA 960th Hospital, Jinan 250000, Shandong, China

ABSTRACT Objective: To investigate the clinical effect of unicompartmental knee arthroplasty in patients with knee osteoarthritis over 75 years old. **Methods:** From April 2010 to May 2015, 42 patients with knee medial compartment osteoarthritis were treated with Oxford third-generation unicompartmental knee arthroplasty. According to the single and bilateral replacement, the patients were divided into bilateral simultaneous replacement group and unilateral replacement group: 11 patients in the simultaneous replacement group, 3 males and 8 females, aged (79.18±3.06) years; There were 31 cases in the unilateral replacement group, 13 males and 18 females, aged (78.16±3.48) years. The survival status of patients with knee prosthesis, the changes of hematocrit before and after operation, and the total amount of blood loss during and after operation were observed and compared; The HSS (Hospital for Special Surgery knee rating) scores of patients before and after operation were compared. **Results:** There was significant difference in perioperative complications between two groups ($P < 0.05$). All 42 patients were followed up for (5.7±2.3) years. One patient with a history of previous hypertension developed cerebral thrombosis in the 4th month after operation, one patient developed pad dislocation in the 4th month after operation, and two patients died of other

通讯作者: 孙海宁 E-mail: shnjzy@163.com

Corresponding author: SUN Hai-ning E-mail: shnjzy@163.com

medical diseases (1 myocardial infarction and 1 lung cancer) 3 years after operation. The total amount of postoperative blood loss in bilateral simultaneous replacement group was higher than that in unilateral replacement group ($P<0.05$); Four patients with bilateral simultaneous replacement received 2U blood transfusion after operation. The HSS score and total score of the two groups at 9 months after operation were higher than those before operation ($P<0.05$). **Conclusion:** Unicompartmental knee arthroplasty is a feasible surgical treatment for osteoarthritis patients over 75 years old with medial single compartment degeneration. For elderly patients over 75 years old with bilateral knee lesions, bilateral simultaneous unicompartmental knee arthroplasty is more traumatic than unilateral unicompartmental knee arthroplasty, which will increase the incidence of perioperative complications, affect the rapid postoperative recovery and increase the blood loss. Although the long-term effect is equivalent to that of unilateral unicompartmental knee arthroplasty, staged operation is still recommended to ensure the safety of operation.

KEYWORDS Arthroplasty, replacement, knee; Osteoarthritis, knee; Aged

单髁膝关节置换术(unicompartmental knee arthroplasty, UKA)已被用于治疗膝关节骨性关节炎。最初,单髁膝关节置换术经常报道会出现较高的失败率^[1-3]。随着外科技术,假体设计以及手术适应证的不断完善,单髁膝关节置换术在符合单髁膝关节置换手术标准骨性关节炎患者人群中取得可观的临床效果,单髁关节置换术使用率越来越高^[4-8]。骨性关节炎患者大多是中老年人群,有数据统计约 50%的骨性关节炎患者关节退变发生在内侧间室^[9]。世界卫生组织(World Health Organization)将 65 岁以上人群定义为老年期,随着社会进步和医疗保健卫生的完善,人均寿命延长以及老龄化现象加剧,有研究对老年患者数据深度分析后重新定义老年期年龄为 75 岁以上^[10-11]。对于中晚期内侧间室退变的老年骨性关节炎患者而言,由于身体机能衰退且常合并多种内科疾病,其围手术期并发症和死亡率要高于正常人群,单髁膝关节置换术具备手术创伤小,快速康复等优点,同全膝关节置换手术(total knee arthroplasty, TKA)相比,减少了围手术期并发症和死亡率。目前国内文献外对于老年骨性关节炎患者行单髁置换术后并发症和生存率的报道较少,对 2010 年 4 月至 2015 年 5 月接受人工单髁关节置换的 75 岁

以上老年膝骨性关节炎患者进行回顾性研究,目的是研究老年患者接受人工单髁关节置换的临床疗效和探讨双侧膝关节病变老年患者的手术策略。

1 资料与方法

1.1 病例选择

纳入标准:(1)年龄 ≥ 75 岁。(2)术前影像学评估仅为内侧间室退变的患者。(3)术前膝关节活动度 $>90^\circ$,内翻畸形 $<15^\circ$,屈曲畸形 $<15^\circ$ 。排除标准:(1)术中探查前交叉韧带功能不全的患者。(2)全膝关节炎性病变的患者。(3)严重骨质疏松患者。

1.2 一般资料

自 2010 年 4 月至 2015 年 5 月,应用 Oxford 活动平台人工单髁关节置换手术治疗 75 岁以上高龄膝内侧骨性关节炎患者 42 例,其中 11 例双膝关节病变行双侧同期单髁关节置换手术治疗(双侧同期置换组),31 例患者行单侧单髁膝关节置换手术(单侧置换组)。两组患者术前一般临床资料比较见表 1,差异无统计学意义,具有可比性。

1.3 方法

1.3.1 手术方法 所有手术由同一名资深骨科医师主刀,本组患者全部采用第 3 代 Oxford 活动半月板型单髁假体。患者采用全麻麻醉,手术步骤均按照

表 1 两组高龄膝内侧骨性关节炎患者术前临床资料比较

Tab.1 Comparison of preoperative clinical data between two groups of elderly patients with medial knee osteoarthritis

组别	例数	性别(岁)		年龄($\bar{x}\pm s$, 岁)	BMI($\bar{x}\pm s$, kg/m ²)	术前血红蛋白($\bar{x}\pm s$, g/L)	术前血容量($\bar{x}\pm s$, U)				
		男	女								
双侧同期置换组	11	3	8	79.18 \pm 3.06	27.18 \pm 3.25	133.42 \pm 15.09	4.17 \pm 0.63				
单侧置换组	31	13	18	78.16 \pm 3.48	25.68 \pm 2.33	127.82 \pm 14.08	4.22 \pm 0.58				
检验值		$\chi^2=0.667$		$t=0.860$	$t=1.648$	$t=-1.076$	$t=0.110$				
P 值		0.508		0.395	0.107	0.288	0.197				
组别	例数	术前合并症(例)						术前特殊用药(例)			
		高脂血症	高血压	糖尿病	下肢周围血管病变	冠心病	慢性阻塞性肺疾病	陈旧性脑梗死	阿司匹林	利血平	二甲双胍
双侧同期置换组	11	5	9	7	7	5	2	2	5	4	6
单侧置换组	31	7	15	13	11	8	3	3	8	6	8
χ^2 值		1.137						0.974			
P 值		0.286						0.587			

标准 UKA 操作手册实施^[12];切口从髌骨内侧中点斜向外至胫骨结节内上(长 6~8 cm),采用髌旁内侧入路显露膝关节内侧间室,术中不脱位髌骨,常规探查确认内侧间室软骨病变,交叉韧带完整性和股骨滑车磨损情况;切除内侧半月板,清理周缘增生骨赘,采用胫骨髓外定位方式行胫骨截骨,测量切下的胫骨平台,以确定胫骨假体的尺寸;股骨骨髓内定位(在后交叉韧带止点前约 1 cm 处),先后髌截骨,再研磨股骨髌,股骨研磨从 1 mm 开始逐渐增加致屈伸间隙平衡;按照假体试模确认无撞击,内外翻应力试验示膝关节稳定,冲洗骨面,安装假体,骨水泥固定后安装聚乙烯活动衬垫,再次确认衬垫无撞击和旋转;松止血带,电刀充分止血,关节周围注射鸡尾酒术后逐层缝合手术切口,手术常规放置引流管,术后 24 h 内拔除引流管。

1.3.2 术前后处理 既往长期口服阿司匹林药物,利血平类药物均给予停药 1 周后再行手术治疗,口服二甲双胍类药物的患者给予术前术后停药 2 d 处理,以减少术中术后相关并发症的发生。对合并有高血压患者,术前血压应控制在 160/90 mmHg 以内;糖尿病患者术前血糖一般控制在 8 mmol/L 以内;冠心病患者应适当给予扩冠状血管和营养心肌等药物。术后多模式镇痛,静脉使用抗生素预防感染,手术 6 h 后给予利伐沙班片 10 mg 口服,每日 1 次,预防下肢深静脉血栓形成。加强术后监测。术后 24 h 复查血常规观察血红蛋白指标,若患者血红蛋白低于 100 g/L 伴出现精神及心肺功能不耐受情况,及时给予输血处理。术后即刻开始股四头肌主动收缩练习和直腿抬高锻炼,鼓励患者早起下地,1~2 d 后开始下地扶助行器行走。

1.4 观察项目与方法

随访记录患者围手术期生存情况,术前基础疾病,术后切口愈合情况,并发症发生情况等。通过术前与术后血红蛋白变化情况评估计算术中及术后血红蛋白丢失量,统计所有患者身高和体重,术前与术后血细胞比容变化情况量,运用 Gross 方程计算术中及术后的失血总量^[13]。失血总量(total red blood cell volume loss)=术前血容量(patient blood volume, PBV)×(Hct 术前-Hct 术后)。PBV 可以通过 Nadler 等方法计算:PBV=k1×身高(m)³+k2×体重(kg)+k3。男性患者 k1=0.366 9, k2=0.0321 9, k3 =0.604 1;女性患者 k1=0.356 1, k2=0.0330 8, k3=0.183 3。所有患者术后 2 周拆线出院,患者术后定期门诊复查,术后 1 年以上患者每隔半年电话随访一次,了解患者膝关节情况和生存情况,若出现异常要求患者及时门诊复查,若患者去世则随访结束。

1.5 疗效评价方法

采用膝关节 HSS 评分^[14](Hospital for Special Surgery knee-rating)评价患者术前后关节疼痛、关节功能、活动度、肌力、畸形情况。

1.6 统计学处理

采用 SPSS 23.0 软件包进行数据统计,定量资料用均数±标准差($\bar{x}\pm s$)表示,检验方差齐性,若方差齐,两组间比较采用独立样本 *t* 检验分析;若方差不齐,非参数组间比较采用 Kruskal-wallis H 检验分析。以 *P*<0.05 为差异有统计学意义。

2 结果

2.1 一般随访结果

85%患者术前存在一种以上合并症,2 例既往糖尿病患者,术后血糖水平调控稳定,但切口延迟愈合;2 例既往糖尿病患者术后血糖水平不稳定,5 例既往高血压病患者术后出现血压偏高;1 例既往慢性阻塞性肺疾病患者术后出现肺部感染。双侧同期置换组术后围手术期并发症:切口延迟愈合 1 例,血糖不稳定 1 例,血压不稳定 2 例,肺部感染 1 例;单侧置换组术后围手术期并发症:血糖不稳定 1 例,血压不稳定 3 例。42 例患者获得随访,时间 4~9(5.7±2.3)年。1 例既往高血压病史患者术后第 4 个月发生脑血栓,1 例患者术后第 4 个月发生衬垫脱位,2 例患者于术后 3 年因其他内科疾病死亡(1 例心肌梗死,1 例肺癌),5 年假体生存率 82.61%。两组患者术前血容量、术后失血量、术后血红蛋白测量结果见表 2,两组术后失血量、血红蛋白测量结果比较差异有统计学意义(*P*<0.05)。

表 2 两组高龄膝内侧骨性关节炎患者围手术期血液指标测量结果($\bar{x}\pm s$)

Tab.2 Perioperative blood index measurement results of two groups of elderly patients with medial knee osteoarthritis

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

组别	例数	术后失血量(ml)	术后血红蛋白(g/L)
双侧同期置换组	11	268.46±71.18	107.73±15.41
单侧置换组	31	206.31±137.19	115.52±13.17
<i>t</i> 值		1.428	1.428
<i>P</i> 值		0.048	0.013

4 例双侧同期行单髌关节置换患者术前长期服用阿司匹林(6.50±2.65)年且合并多种内科疾病,术后复查血红蛋白下降至 100 g/L 以下,均给予输血 2 单位,见表 3。

2.2 HSS 评分结果

两组患者术前、术后 9 个月 HSS 评分结果见表

4. 术前和术后 9 个月两组间 HSS 评分差异均无统计学意义 ($P>0.05$); 两组患者术后 9 个月 HSS 评分除稳定性评分外, 其他各项评分和总分均高于术前 ($P<0.05$)。典型病例见图 1。

3 讨论

老年骨性关节炎患者对手术接受率较高, 在符合 UKA 手术标准的老年患者中, 选择 TKA 还是 UKA 手术方式的选择尚未达成一致^[12]。传统 TKA 术式出现时间早, 手术技术发展成熟, 临床疗效确切; 但是手术创伤大, 术中及术后失血多, 术后恢复慢; 同时在接受 TKA 手术患者人群中, 5%~20% 患者仅为单内侧间室严重病变^[15]。本研究 42 例 75 岁以上老年患者中 85% 患者术前存在一种以上的合并症, 对于身体条件较差的老年骨性关节炎患者而言, 围

手术并发症和死亡的发生率相应增加^[16], 对于这部分人群, 产品和技术已发展成熟的 UKA 手术也是不错的选择。

对符合 UKA 手术标准的老年患者, UKA 术式较 TKA 相比, 患者心理接受程度高, 手术时间短, 创伤小, 出血量少, 术后患者康复时间短, 功能恢复快, 术后并发症风险发生率低, 具有较高的关节手术遗忘率^[17-19], 近年来研究报道 UKA 在老年骨性关节炎患者人群中取得不错的临床效果^[20-21]。从成本效益角度看, UKA 和 TKA 具有相似的成本效益特征, 并不会对患者及家属造成过多的经济负担(成本效益包括了种植体存活率、成本、围手术期死亡率和感染率, 以及每个手术所达到的效用值^[22])。本研究 42 例老年患者术前术后 HSS 评分分析, 单髁置换术

表 3 同期双侧置换 4 例患者术中及术后输血情况

Tab.3 Intraoperative and postoperative blood transfusion in 4 patients with simultaneous bilateral replacement

患者序号	性别	术前阿司匹林服用时间(年)	既往内科疾病	术前血红蛋白(g/L)	术后血红蛋白(g/L)	总失血量(ml)	输血时间	输血量(U)
1	女	5	高血压, 冠心病, 陈旧性脑梗死, 高脂血症	108	93	271.29	术后	2
2	女	7	高血压, 糖尿病, 下肢周围血管病变	106	91	255.42	术后	2
3	女	4	高血压, 下肢周围血管病变	115	97	334.71	术后	2
4	女	10	高血压, 高脂血症, 下肢周围血管病变	117	98	361.63	术后	2

表 4 两组高龄膝内侧骨性关节炎患者术前后 HSS 评分比较 ($\bar{x}\pm s$, 分)

Tab.4 Comparison of HSS scores between two groups of elderly patients with medial knee osteoarthritis before and after operation ($\bar{x}\pm s$, score)

组别	例数	疼痛		功能		活动度		肌力		屈曲畸形		稳定性		总分	
		术前	术后 9 个月	术前	术后 9 个月	术前	术后 9 个月	术前	术后 9 个月	术前	术后 9 个月	术前	术后 9 个月	术前	术后 9 个月
双侧同期置换组	11	3.86±3.06	26.62±4.12	10.00±2.89	19.54±3.41	12.62±1.05	13.56±5.12	7.18±2.11	9.54±0.12	8.27±1.39	9.35±0.72	8.91±1.02	9.27±0.98	49.25±5.16	89.29±8.46
		4.52±3.94	26.77±2.04	11.29±2.78	18.77±1.06	12.48±1.2+	13.92±1.02	6.06±2.22	9.21±0.11	8.13±1.49	9.05±1.77	9.29±0.97	9.29±0.97	50.19±4.05	87.51±4.63
<i>t</i> 值		-0.649	-2.42	-1.636	0.076	0.403	-0.545	1.843	1.054	0.54	0.763	-1.378	-0.065	-0.742	-0.582
<i>P</i> 值		0.520	0.254	0.108	0.861	0.689	0.342	0.071	0.517	0.724	0.447	0.174	0.949	0.462	0.272

注: 术前与术后 9 个月比较: 双侧同期置换组, 疼痛 $t=-20.921, P=0.000$; 功能 $t=-10.264, P=0.000$; 活动度 $t=-4.011, P=0.000$; 肌力 $t=-1.553, P=0.000$; 屈曲畸形 $t=-2.758, P=0.009$; 稳定性 $t=-1.528, P=0.236$; 总分 $t=-22.634, P=0.000$ 。单侧置换组, 疼痛 $t=-24.966, P=0.000$; 功能 $t=-10.930, P=0.000$; 活动度 $t=-5.392, P=0.000$; 肌力 $t=-6.206, P=0.000$; 屈曲畸形 $t=-2.776, P=0.007$; 稳定性 $t=0.000, P=1.000$; 总分 $t=-31.966, P=0.000$

Note: comparison between preoperative and postoperative 9 months; in bilateral simultaneous replacement group, pain $t=-20.921, P=0.000$; Function $t=-10.264, P=0.000$; Activity $t=-4.011, P=0.000$; Muscle strength $t=-1.553, P=0.000$; Flexion deformity $t=-2.758, P=0.009$; Stability $t=-1.528, P=0.236$; Total score $t=-22.634, P=0.000$. In unilateral replacement group, pain $t=-24.966, P=0.000$; Function $t=-10.930, P=0.000$; Activity $t=-5.392, P=0.000$; Muscle strength $t=-6.206, P=0.000$; Flexion deformity $t=-2.776, P=0.007$; Stability $t=0.000, P=1.000$; Total score $t=-31.966, P=0.000$



图 1 患者,男,78 岁,左膝关节疼痛受限加重 5 年,诊断左膝关节骨性关节炎,跛行,膝关节内侧压痛,左膝关节屈伸活动度 $0^{\circ}\sim 110^{\circ}$,麦氏征阳性。术前 HSS 评分 48.75 分,术后 1 周 HSS 评分 51.5 分,术后 3 个月 HSS 评分 89 分,截至末次随访未出现并发症 **1a,1b**。左膝术前外观照(屈曲位和伸直位),活动度 $0^{\circ}\sim 110^{\circ}$,无伸直滞缺 **1c,1d,1e,1f**。术前膝关节 X 线片(双下肢全长,负重正侧位,髌骨轴位)示:左膝内翻 10.5° ,左膝前内侧间室磨损,髌骨轴位片示髌股间隙变窄 **1g,1h,1i**。患者 I 期行左膝 Oxford 内侧单髁关节置换术,见股骨髁和胫骨平台软骨呈 IV 级退变图 **1j,1k**。术后 1 周复查 X 线(左膝关节正侧位),假体在位良好 **1l,1m**。术后 7 d 左膝关节外观照,下肢功能恢复良好,伸直无滞缺,膝关节屈曲可达 110°

Fig.1 A 78-year-old male patient with pain limitation of left knee joint gradually aggravating for 5 years, was diagnosed with left knee osteoarthritis, claudication, tenderness on the inside of knee joint, flexion and extension range of motion of left knee joint 0° to 110° , and positive Michaelis sign. The preoperative HSS score was 48.75, the HSS score one week after operation was 51.5, and HSS score three months after operation was 89. As of the last follow-up, there were no complications **1a,1b**. Preoperative appearance photos of the left knee (flexion position and extension position), the range of motion is 0° to 110° , and there was no extension lag **1c,1d,1e,1f**. The preoperative X-ray film of knee joint (full length of both lower limbs, positive and lateral position of load, axial position of patella) showed that the left knee varus 10.5° , the anteromedial compartment of the left knee was worn, and the axial film of patella showed that the patellofemoral space was narrowed **1g,1h,1i**. The patient underwent Oxford medial single condylar joint replacement of the left knee in one stage. It was found that the cartilage of femoral condyle and tibial plateau showed grade IV degeneration **1j,1k**. One week after operation, the X-ray (positive and lateral position of left knee joint) was rechecked, and the prosthesis was in good position **1l,1m**. Seven days after operation, the appearance of the left knee joint was illuminated. The lower limb function recovered well, straightened without stagnation, and the knee flexion reached 110°

后患者膝关节功能恢复效果显著。早期报道称 UKA 翻修率要高于 TKA^[23],但随着 UKA 技术的不断发展和成熟,UKA 和 TKA 翻修率趋于相似性,越来越多的报道支持符合 UKA 手术标准的老年患者选择 UKA 手术治疗^[24-26]。既往文献报道老年患者 TKA 置换术后随访的 HSS 评分优良率在 88.3%左右^[27],同本研究单髁置换术后 9 个月 HSS 评分优良率(84.91%)接近。因此笔者认为对于符合单髁手术标准的老年患者选择单髁关节置换手术可获得同 TKA 手术相似的手术效果受益。

对同期行双侧 TKA 和分期行双侧 TKA 的争议很大^[28],有研究报道同期双侧 TKA 和分期行双侧 TKA 相比增加了急性期失血、输血相关问题,提高了心肌缺血,下肢血栓及围手术期死亡率的发生率^[29-30]。同 TKA 手术相比,同期双侧单髁关节置换手术具备同期双侧 TKA 置换手术优势的同时,还减少了手术并发症和围手术期死亡率的发生^[30],有研究发现同期双侧 UKA 可以在不增加围手术期死亡率或并发症的情况下进行^[31]。本研究发现 75 岁以上患者同期双侧置换组较单侧置换组,术后围手术期并发症增加($P<0.05$)。同期双侧置换组和单侧置换组术前和术后 3,9 个月 HSS 评分差异无统计学意义,但是术后 1 周 HSS 评分单侧置换组要优于双侧置换组($P<0.05$)。对于 75 岁以上老年患者,从远期疗效看,同期双侧 UKA 置换手术同单侧置换组术后康复可获得同等受益;但近期疗效看,双侧同期 UKA 置换手术增加了术后围手术期并发症的发生率,一定程度上延缓了老年患者术后的快速康复。

UKA 手术具备创伤小和失血少的优点,但是双侧同期置换组和单侧置换组患者术后总失血量分别达到(268.46±71.18) ml 和(206.31±137.19) ml,有研究报道隐性失血约占总失血量的 50%^[32]。尽管 UKA 术中失血量少,但是老年患者的心血管系统代偿能力差,机体大量失血后不能有效调节毛细血管床张力,组织间隙的体液不能及时进入血管补充循环血量,因此造成隐性失血量较大。笔者认为老年患者身体耐受能力差,要适当放宽患者的输血标准,对于术前贫血,术中及术后失血量大或因失血出现精神及心肺功能不足症状的患者要及时给予输血治疗,减少术后并发症发生。本研究 4 例输血患者均行同期双侧 UKA 手术治疗,术前身体条件差(血色素偏低,合并多种内科疾病,长期口服阿司匹林药物),尽管术前及时给予停药处理,复查凝血指标正常,但术后还是失血较多;阿司匹林作为抗血小板聚集药物,增加了外科手术术中出血及术后隐性失血的风险^[33]。本研究发现双侧同期置换组患者术后总失血量要高

于单侧置换组,因此推测双侧同期置换手术创伤增加,术前身体条件差(血色素偏低,合并多种内科疾病,长期口服阿司匹林药物)是导致老年患者术中及术后失血较多的重要因素。由于老年患者体质差,内科疾病及复杂用药导致手术并发症,围手术期死亡率要高于正常人群,为提高手术安全性,对于双膝病变的老年患者建议分期手术。

内侧单间室退变的 75 岁以上老年骨性关节炎患者选择人工单髁关节置换术是可行的手术治疗方法。对双膝病变 75 岁以上老年患者,双侧同期人工单髁关节置换术同单侧单髁关节置换手术相比,创伤大,会增加围手术期并发症发生,影响术后快速康复,增加失血量。虽然远期疗效同单侧单髁关节置换手术相当,为保证手术安全性,仍建议分期手术。

参考文献

- [1] Goodfellow J, O'Connor J. The mechanics of the knee and prosthesis design[J]. J Bone Joint Surg Br, 1978, 60(3): 358-369.
- [2] Barrett WP, Scott RD. Revision of failed unicompartmental knee arthroplasty[J]. J Bone Joint Surg Am, 1987, 69(9): 1328-1335.
- [3] Bae DK, Guhl JF, Keane SP. Unicompartmental knee arthroplasty for single compartment disease. Clinical experience with an average four-year follow-up study[J]. Clin Orthop Relat Res, 1983, (176): 233-238.
- [4] Crawford DA, Berend KR, Thienpont E, et al. Unicompartmental knee arthroplasty: US and Global perspectives[J]. Orthop Clin North Am, 2020, 51(2): 147-159.
- [5] Witjes S, Gouttebauge V. Return to sports and physical activity after total and unicompartmental knee arthroplasty: a systematic review and meta-analysis[J]. Sports Med, 2016, 46(2): 269-292.
- [6] Garner A, van Arkel RJ, Cobb J. Classification of combined partial knee arthroplasty[J]. Bone Joint J, 2019, 101(8): 922-928.
- [7] Dunn AS, Petterson SC, Plancher KD. Unicompartmental knee arthroplasty: intramedullary technique[J]. Clin Sports Med, 2014, 33(1): 87-104.
- [8] Agarwal A, Miller S, Hadden W, et al. Comparison of gait kinematics in total and unicompartmental knee replacement surgery[J]. Ann R Coll Surg Engl, 2019, 101(6): 391-398.
- [9] Willis-Owen CA, Brust K, Alsop H, et al. Unicompartmental knee arthroplasty in the UK National Health Service: an analysis of candidacy, outcome and cost efficacy[J]. Knee, 2009, 16(6): 473-478.
- [10] Hanssen AD, Stuart MJ, Scott RD, et al. Surgical options for the middle-aged patient with osteoarthritis of the knee joint[J]. Instr Course Lect, 2001, 50: 499-511.
- [11] Argenson JN, Chevrol-Benkeddache Y, Aubaniac JM. Modern unicompartmental knee arthroplasty with cement: a three to ten-year follow-up study[J]. J Bone Joint Surg Am, 2002, 84: 2235-2239.
- [12] Goodfellow JW, O'Connor JJ, Pandit H, et al. Unicompartmental arthroplasty with the Oxford knee[M]. New York: Oxford University Press, 2006.
- [13] Hu KZ, Sun HY, Sui C. Effects of five treatment regimens on blood loss and blood transfusion in total knee arthroplasty: a preliminary study in China[J]. Int J Clin Pharmacol Ther, 2017, 55(5): 433-

- 444.
- [14] Slupik A, Bialoszewski D. Comparative analysis of clinical usefulness of the Staffelstein Score and the Hospital for Special Surgery Knee Score (HSS) for evaluation of early results of total knee arthroplasties. Preliminary report [J]. *Ortop Traumatol Rehabil*, 2007, 9(6): 627-635.
- [15] Satku K. Unicompartmental knee arthroplasty: is it a step in the right direction surgical options for osteoarthritis of the knee [J]. *Singapore Med J*, 2003, 44(11): 554-556.
- [16] Hussain N, Chien T, Hussain F, et al. Simultaneous versus staged bilateral total knee arthroplasty: a meta-analysis evaluating mortality, perioperative complications and infection rates [J]. *HSS J*, 2013, 9(1): 50-59.
- [17] Halawi MJ, Barsoum WK. Unicompartmental knee arthroplasty: Key concepts [J]. *J Clin Orthop Trauma*, 2017, 8(1): 11-13.
- [18] 曾智敏, 陶崑, 凌晶, 等. 固定平台单髁置换术治疗膝关节内侧骨性关节炎 [J]. *中国骨伤*, 2019, 32(8): 755-758.
ZENG ZM, TAO K, LING J, et al. Treatment of medial knee osteoarthritis with fixed platform unicompartmental arthroplasty [J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2019, 32(8): 755-758. Chinese with abstract in English.
- [19] Cinar BM, Akpınar S, Uysal M, et al. Unicompartmental knee arthroplasty in medial unicompartmental osteoarthritis: technical faults and difficulties [J]. *Eklemler Hastalik Cerrahisi*, 2010, 21(1): 31-37.
- [20] Holzer LA, Holzer G. The most influential papers in unicompartmental knee arthroplasty [J]. *Knee Surg Relat Res*, 2020, 9, 32(1): 54.
- [21] Lyons MC, MacDonald SJ, Somerville LE, et al. Unicompartmental versus total knee arthroplasty database analysis: is there a winner [J]. *Clin Orthop Relat Res*, 2012, 470(1): 84.
- [22] Siman H, Kamath AF, Carrillo N. Unicompartmental knee arthroplasty vs total knee arthroplasty for medial compartment arthritis in patients older than 75 years: comparablereoperation, revision, and complication rates [J]. *J Arthroplasty*, 2017, 32(6): 1792-1797.
- [23] Slipman CW, Lipetz JS, Jackson HB, et al. Diagnosing acute venous thrombosis [J]. *Int J Trauma Nurs*, 2000, 6(1): 30.
- [24] 杨自权. 膝关节置换的研究现状 [J]. *中国骨伤*, 2020, 33(1): 1-4.
YANG ZQ. Research status of total knee arthroplasty [J]. *Zhongguo Gu Shang/China J Orthop Trauma*, 2020, 33(1): 1-4. Chinese.
- [25] Lim JW, Cousins GR, Clift BA, et al. Oxford unicompartmental knee arthroplasty versus age and gender matched total knee arthroplasty-functional outcome and survivorship analysis [J]. *J Arthroplasty*, 2014, 29(9): 1779-1783.
- [26] Ghomrawi HM, Eggman AA, Pearle AD. Effect of age on cost-effectiveness of unicompartmental knee arthroplasty compared with total knee arthroplasty in the U.S. [J]. *J Bone Joint Surg Am*, 2015, 4, 97(5): 396-402.
- [27] 曹光磊, 沈惠良, 安帅, 等. 高龄患者人工全膝关节置换术的并发症及疗效分析 [J]. *中华关节外科杂志*, 2015, 9(1): 50-54.
CAO GL, SHEN HL, AN S, et al. Analysis of complications and curative effect of total knee arthroplasty in elderly patients [J]. *Zhonghua Guan Jie Wai Ke Za Zhi*, 2015, 9(1): 50-54. Chinese.
- [28] Liu L, Liu H, Zhang H, et al. Bilateral total knee arthroplasty: Simultaneous or staged. A systematic review and meta-analysis [J]. *Medicine (Baltimore)*, 2019, 98(22): e15931.
- [29] Lindberg-Larsen M, Pitter FT, Husted H, et al. Simultaneous vs staged bilateral total knee arthroplasty: a propensity-matched case-control study from nine fast-track centres [J]. *Arch Orthop Trauma Surg*, 2019, 139(5): 709-716.
- [30] Vulcano E, Mentsoudis S, Della Valle AG. Bilateral total knee arthroplasty guidelines: Are we there yet [J]. *J Knee Surg* 2013, 26: 273-279.
- [31] Ma T, Tu YH, Xue HM. Clinical outcomes and risks of single-stage bilateral unicompartmental knee arthroplasty via Oxford Phase III [J]. *Chin Med J (Engl)*, 2015, 128(21): 2861-2865.
- [32] Sehat KR, Evans RL, Newman JH. How much blood is really lost in total knee arthroplasty correct blood loss management should take hidden loss into account [J]. *Knee*, 2000, 7(3): 151-155.
- [33] Shah A, Palmer AJR, Klein AA. Strategies to minimize intraoperative blood loss during major surgery [J]. *Br J Surg*, 2020, 107(2): e26-e38.

(收稿日期: 2021-12-20 本文编辑: 王玉蔓)