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全膝关节置换术治疗晚期类风湿性关节炎的早期临床随访研究

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摘要 目的:探讨全膝关节置换术(TKA)治疗晚期类风湿性膝关节炎(RA)的早期临床疗效和安全性。**方法:**回顾性分析 2006 年～2011 年接受 TKA 治疗的 69 例(102 膝)晚期膝关节 RA 患者的临床资料,术后及随访时分析患者的影像学资料,末次随访时进行膝关节 HSS 评分,采用英国矫形外科协会标准评定患者满意度,SF-36 健康量表评定患者的生活质量。**结果:**54 例(81 膝)患者术后获得 2～7 年(平均 4.3 年)随访;6 例(7 膝)死亡,6 例(10 膝)失访,3 例(4 膝)翻修,获得随访患者中 1 例(1 膝)发生下肢深静脉血栓,经介入放置滤网治疗康复后出院,1 例(1 膝)感染。末次随访时,膝关节活动度(ROM)从术前平均(71.03° ± 29.51°)提高至(92.26° ± 10.29°),膝关节 HSS 评分从术前平均(47.30± 10.06)分提高至(75.93± 9.17)分;疼痛发生率和疼痛评分均较术前显著降低;冠状面和矢状面畸形率均较术前显著降低;身体健康(PCS)平均(47.98± 6.96)分,心理健康(MCS)平均(41.45± 5.67)分,均较术前显著增加,差异均有统计学意义(P<0.05)。患者的治疗满意率为 96.30%,膝关节假体 X 线片采用膝关节学会的 X 线评价与计分系统评价未见假体松动。**结论:**TKA 治疗晚期膝关节 RA 患者 2～7 年的临床及影像学效果良好,未发现骨溶解、假体松动及严重衬垫磨损等并发症。

关键词:晚期类风湿性关节炎;全膝关节置换术;髌骨置换;治疗效果;安全性

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The Short-term Clinical Outcome of Total Knee Arthroplasty in the Treatment of Patients with Rheumatoid Arthritis

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ABSTRACT Objective: To investigate the short-term clinical efficacy and safety of total knee arthroplasty(TKA) in the treatment of patients with rheumatoid arthritis(RA). **Methods:** The clinical data of 69 patients (102 knees) with RA who underwent TKA from 2006 to 2011 were retrospectively studied. The postoperative X-ray imaging data were analyzed and the clinical efficacy was assessed at the last follow-up by HSS system, the British Orthopaedic Association patient-satisfaction score and Short Form 36-item Survey (SF-36) were respectively used to evaluate the patients' satisfaction and quality of life. for patients' health statuses. **Results:** 54 patients (81 knees) obtained an average follow-up of 4.3 years (from 2 to 7 years). 6 patients (7 knees) died, 6 patients (10 knees) were lost up, and 3 patient (4 knee) underwent revision surgery. 1 patient (1 knee) had deep venous thrombosis and cured after intervention therapy. At the last follow-up visit, the ROM increased from 71.03° ± 29.51° (preoperation) to 92.26° ± 10.29° , the HSS of knee joint increased from (47.30 ± 10.06) to (75.93 ± 9.17), the incidence rate of pain, pain score, aberration rate of coronal plane and vertical plane were significantly lower than those preoperation. The PCS was (47.98± 6.96), MCS was 41.45± 5.67, which were both predominantly higher than those preoperation(P<0.05). The satisfaction rate of patients was 96.30%. No prosthetic loosening was found according to The Knee Society total knee arthroplasty roentgen graphic evaluation and scoring system. **Conclusion:** The study showed good 2-7-year clinical and radiological efficacy of TKA in the treatment of patients with RA. No serious complications such as osteolysis, loosening and severe friction was found during the treatment.

Key words: Advance rheumatoid arthritis; Total knee arthroplasty; Patellar resurfacing; Efficacy; Safety

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前言

类风湿关节炎(rheumatoid arthritis,RA)是以关节的炎性反应为表现的疾病,起病以手、足等小关节受累为主的对称性、持续性多关节炎,随时间延长会侵袭膝关节,表现为膝关节疼痛、软骨破坏,活动受限。目前,人工全膝关节置换术(total knee arthroplasty,TKA)已成为恢复受累膝关节功能、减轻患者疼痛、提高患者生活质量的最佳治疗手段[1]。笔者回顾性分析了 2006 年～2011 年接受 TKA 治疗的 69 例(102 膝)晚期膝关节 RA 患者的临床资料, 旨在探讨 TKA 治疗晚期膝关节 RA 的早期临床疗效和安全性,现将结果报道如下。

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1 资料与方法

1.1 一般资料

1.1.1 纳入标准 ①术前根据中华医学会风湿病协会 (2010)[2]明确诊断患有 RA;②全身情况可耐受手术者;③手术前、后临床资料完整且有 X 线随访资料; ④由同一组高年资医师完成且采用膝关节正中切口,经髌旁内侧入路者;⑤术前 X 线片显示无股骨远端或胫骨近端骨折、骨缺损、肿瘤等,X 线片图像清晰、易辨认;⑥术中采用骨水泥固定型膝关节假体者。

1.1.2 排除标准 ①行膝关节翻修者或初次置换采用非经髌旁内侧入路者;②不能耐受手术者;③临床或影像资料不完整者;④膝关节内、外翻畸形超过 20° 者;

本研究共纳入 RA 患者 69 例(102 膝),男 15 例,女 54 例;年龄 23～79 岁,平均 57± 3.58 岁;身高 154.0～182.0 cm,平均身高 164.83± 6.96 cm;体重 46.0～76.0 kg ,平均 58.57± 7.69 kg。5 例术前合并 1 种或多种全身性内科疾病,其中高血压 14 例,糖尿病 10 例,冠心病 6 例。

1.2 方法

1.2.1 手术方法 患者取仰卧位, 全身麻醉后常规充气止血带止血采用膝关节正中切口,经髌旁内侧入路手术,术中预防性应用抗生素。

1.2.2 术后处理 术后伤口加压包扎,抬高患肢并予以冰敷,同时常规镇痛、抗炎治疗,负压引流管于术后 24 h 拔除,预防下肢深静脉血栓形成及贫血等并发症。术后第 2 d 开始使用 CPM 机进行被动屈膝锻炼,积极行股四头肌功能锻炼。

1.3 观察指标和评价标准

1.3.1 临床疗效 采用美国特种外科医院膝关节评分[3](hospital for special surgery knee score,简称 HSS 评分)与关节活动度评价膝关节置换术效果。

1.3.2 患者满意度 采用英国矫形外科协会患者满意度评定标准评定[4]。

1.3.3 SF-36 健康量表 评估患者的生活质量[5]。

1.3.4 影像学评估 术后拍摄双下肢站立位全长平片及术侧膝关节正侧位片,测量下肢力线,根据膝关节学会的 X 线评价与计分系统对术后膝关节假体影像平片进行评价[6]。

1.4 统计学方法

应用 SPSS16.0 统计学软件进行处理, 计量资料用均值± 标准差($\bar{x}$± s)表示,手术前、后临床膝关节评分比较采用配对 t 检验,计数资料采用 x^2 检验,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 临床疗效

6 例(7 膝)死亡(患者死亡前未接受过翻修或诉及膝关节不适),3 例(4 膝)外院 TKA 后来我院行膝关节翻修;6 例(10 膝)失访。最终 54 例(81 膝)术后获得 2～7 年(平均 4.3 年)随访,其中 7 例(9 膝)髌骨置换。术前膝关节 HSS 评分平均(47.30± 10.06)分、术后随访时平均(75.93± 9.17)分,平均提高(28.63± 1.42)分,术前、术后随访时 HSS 评分比较差异有统计学意义($P<0.05$)(图 1)。术前膝关节平均活动度(ROM)71.03° ± 29.51° ,术后随访时 92.26° ± 10.29° ,平均提高 21.23° ± 29.51° ,术前、术后随访时 ROM 比较差异有统计学意义($P<0.05$),且术后随访时膝关节在伸直状态和最大屈曲状态均优于术前(图 1)。

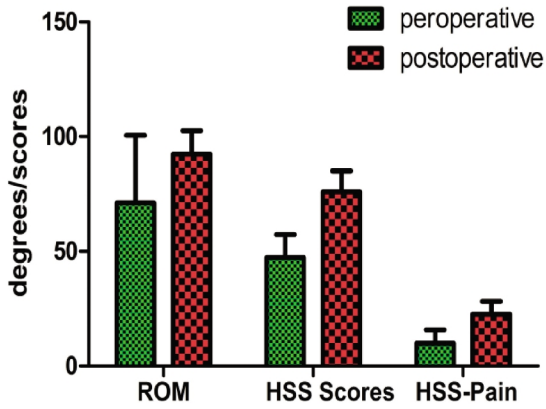

图 1 术前、术后 ROM、HSS 评分的比较

Fig. 1 Comparison of the ROM and HSS scores between pre-and postoperation

术前 HSS 评分中,35 膝(43.8%)存在中度以上疼痛,术后随访时均无中重度疼痛, 采用 Fisher's 精确检验对患者术前、术后随访时疼痛发生率比较差异有统计学意义($P<0.05$)。术前疼痛评分平均(9.88± 5.95)分,术后随访时平均(22.56± 5.57)分, 术前、术后随访时疼痛评分比较差异有统计学意义 ($P<0.05$)(图 1)。术后髌骨置换组中 1 膝出现膝前区疼痛,非髌骨置换组中 13 膝出现膝前区疼痛, 两组膝前区疼痛的发生率比较差异无统计学意义($P=0.603$)(表 1)。

表 1 髌骨不同处理方式对术后膝前区疼痛的影响

Table 1 The influence of different treatment on patellar on the pain of knee

	Pain(%)	No-pain(%)	Total
Resurfacing	1(11.1)	8(88.9)	9
Nonresurfacing	13(18.1)	59(81.9)	72
Total	14(17.3)	67(82.7)	81

Note: $x^2=0.27$, $P=0.603$, $P>0.05$.

随访的 81 膝中,术前膝外翻者 22 膝(占 27.16%),术前膝内翻 16 膝(占 19.75%);术后随访时膝关节有 2 膝(占 2.47%)仍存在畸形。术前、术后随访时冠状面畸形率比较差异有统计学意义($P<0.01$)(表 2)。术前有屈曲挛缩畸形者共 62 膝,术后随访时 4 膝矢状面存在 5° ～10° 屈曲畸形,术前、术后随访时矢状面畸形率比较差异有统计学意义($P<0.01$)(表 3)。

表 2 患者术前、术后随访时膝关节冠状面畸形率的比较

Table 2 Comparison of the percentage of coronal plane deformity between Pre-and postoperation of patients during the follow-up

	Coronal plane deformity		Total
	Neutral (%)	Valgus or varus(%)	
Preoperation	43(53.1)	38(46.9)	81
Postoperation	79(97.5)	2(2.5)	81
Total	122(75.3)	40(24.7)	162

Note: $x^2=43.023$, $P=0.000$, $P<0.01$.

表 3 患者术前、术后随访时膝关节矢状面畸形率的比较

Table 3 Comparison of the percentage of Sagittal plane deformity between pre-and postoperation of patients during the follow-up

	Sagittal plane deformity		Total
	Neutral(%)	Flexion contracture (%)	
Preoperation	19(23.5)	62(76.5)	81
Postoperation	77(95.1)	4(4.9)	81
Total	96(59.3)	66(40.7)	162

Note: x^2=91.281, P=0.000, P＜0.01.

2.2 患者的生活质量评分

术前,患者的身体健康(PCS)平均(25.49± 4.69)分,术后平均(47.98± 6.96)分,较术前显著增加,两者比较差异有统计学意义(P＜0.01);术前,心理健康(MCS)平均(41.45± 5.67)分,术后平均提高至(54.87± 5.86)分,两者比较差异有统计学意义(P＜0.01)(图 2)。

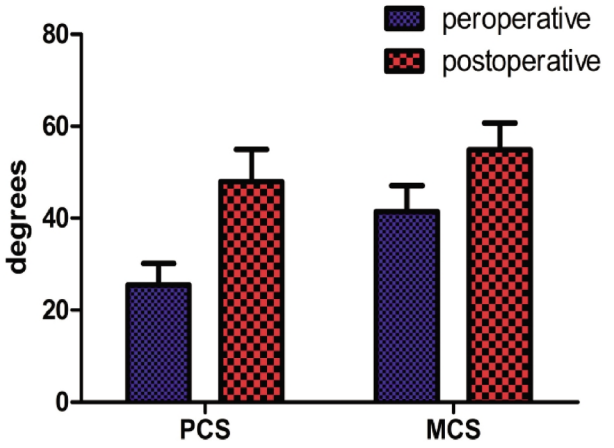

图 2 术前、术后 SF-36 评分的比较

Fig. 2 Comparison of the SF-36 scores between pre-and postoperation

2.3 患者对治疗效果的满意度

根据英国矫形外科协会患者满意度评定标准评定，治疗后,非常满意 35 膝,满意 43 膝,一般 2 膝、失望 1 膝,满意率为 96.30%(表 4)。

表 4 患者术后随访时膝关节满意度情况

Table 4 The satisfaction of patients on the knee joint during the follow-up

	knee(n)	(%)
Very satisfied	35	43.21
Satisfaction	43	53.09
General (dissatisfied)	2	2.47
Despair	1	1.23

2.4 膝关节假体状态

末次随访患者膝关节时,假体位置良好,未见骨溶解,采用膝关节学会的 X 线评价与计分系统评估未见假体松动征象(表 5,图 3)。

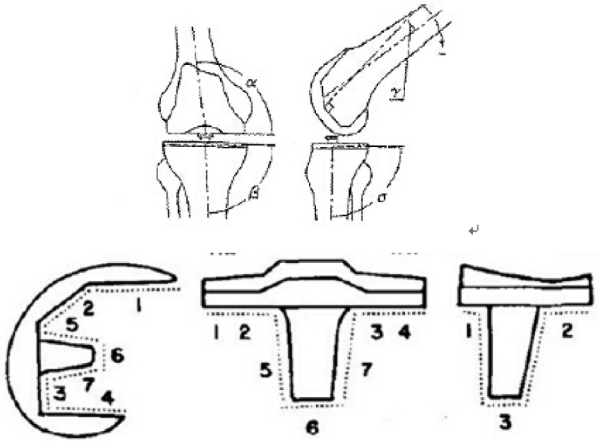

图 3 影像学测量示意

Fig. 3 Roentgenographic Evaluation

注:股 - 胫夹角(FTA)、股骨角(α)、胫骨角(β)、股骨屈曲角(γ)、胫骨平台后倾角(δ)。

Note: Femoral tibial angle (FTA), femoral angle (α), tibial angle (β), femoral flexion angle (γ), posterior tibial angle (δ).

表 5 患者膝关节假体影像学角度的测量结果

Table 5 The outcome of Roentgenographic Evaluation of knee component

Outcome	Preoperative angle(°)	Postoperative angle (°)
FTA(°)	168.13± 7.85	174.38± 2.79*
α	--	96.12± 3.74
β	--	88.75± 2.54
γ	--	2.85± 2.23
δ	--	86.89± 2.87

2.5 术后并发症

1 例(1 膝)术后 2 年因金黄色葡萄球菌感染经静脉输注抗生素保守治疗无效后行旷置,二期翻修;1 例(1 膝)下肢深静脉血栓(deep vein thrombosis,DVT),经超声下放置滤网康复出院。

3 讨论

TKA 能有效缓解患者的膝关节疼痛、矫正膝关节畸形、恢复受累膝关节的功能,可作为膝关节 RA 的最佳治疗手段[1]。本组研究患者术后随访时 ROM 92.26° ± 10.29° ，最大屈曲度 125° ,而且多数均低于 120° ,这与 Mehin R 等[7]报道 Mata 分析结果类似，作者认为 RA 患者行 TKA 后 ROM 恢复较差,和 RA 患者多关节受累有关,同样也和患者术前 ROM、BMI[8]及术后康复训练情况等因素有关。

髌骨是否需要置换目前尚存在争议。先前行 TKA 不考虑髌骨置换问题,术后随访时,有患者出现膝前区疼痛,继而开始行髌骨置换,又出现髌骨轨迹不良、半脱位及髌骨骨折等并发症。有研究认为 RA 患者通常应接受髌骨置换[9,10],因为髌骨软骨中的抗原物质会成为长期滑膜炎的致炎因素,导致免疫介导的炎性疾病反复出现,置换髌骨截骨的同时也去除了部分抗原物质[11]。Barrack 等[12]随机对照试验随访临床效果提示置换组与非置换组无显著差异,而且 Sancheti K H 等[8]研究发现髌骨置换不会提高术后 ROM。本组获得随访患者中,髌骨置换与否对

患者术后膝前区疼痛影响比较差异无统计学意义,因而我们认为髌骨不做常规置换,但是对于有明显膝前区疼痛、髌 - 股关节磨损严重的 RA 患者最好进行置换,如患者髌骨较薄,退变较轻可不置换,特别是老年患者。若术中置换髌骨应注意以下几点[11]:①髌骨截骨要充分,如截骨不够易导致外侧支持带紧张出现髌骨轨迹不良; 截骨后髌骨厚度≥ 12 mm (理想厚度 12-15 mm)用以锚定假体同时对抗膝关节屈曲时髌骨表面的应力; ②髌骨对称性截骨时截骨面平行于髌骨前表面, 只有近、远、内、外侧的髌骨厚度相同方利于髌骨周围支持组织的平衡; ③髌骨假体选小不选大,安装时宜偏内侧,同时注意恢复髌骨原厚度才可保证髌股关节恢复原有厚度有利于防止术后髌骨不稳。

深静脉血栓(deep vein thrombosis,DVT)是 TKA 术后的常见并发症之一,患者表现为肢体肿胀、疼痛,其栓子一旦脱落易导致肺栓塞(pulmonary embolism,PE),将严重危及患者生命。Rathbum 等[13]统计研究发现患者行 TKA 后如不进行预防性治疗,其血栓发生率高达 40%-84%,有研究提出术中应用止血带会增大血栓形成的机率[14-16]。Westrich 等[17]认为低分子肝素在预防 DVT 上优于阿司匹林、华法林。我们术后常规给予低分子肝素同时嘱患者被动活动足趾关节,双下肢应用弹力绷带加压包扎,早期开始 CPM 功能锻炼及直腿抬高锻炼,尽量早期下床活动,可有效降低 DVT 的发生率。本组研究中,仅 1 例发生血栓,经超声下放置滤网康复出院。虽然应用止血带可能增加术后发生血栓的风险,但术者认为应用止血带可减少术中出血,为手术提供良好的术野,可有效减少对重要软组织、血管及神经的损伤; 还可以为骨水泥假体与骨床的粘附提供更有利的条件。Tai 等随机对照实验[18]发现 TKA 术中应用止血带会造成术后疼痛水平相对升高,但不会影响患者术后恢复过程,止血带可有效减少失血, 同时避免产生过高的炎症反应及肌肉损伤。Sancheti 等[8]报道止血带在早期会影响术后 ROM,但不影响最终结果。因此,只要术后及时采取预防血栓形成的措施、密切观察,应用止血带利大于弊。

TKA 术后感染会给手术带来毁灭性的后果, 不仅会产生大量医疗费用,还给患者造成身心的痛苦。王友[19]对 RA 患者行 TKA 平均 7.2 年随访,膝关节感染的发生率为 4.7%,感染的发生主要与糖尿病、肥胖、置换前后存在感染灶、术后切口愈合情况有关。在本组研究中,1 例(1 膝)发生感染(占 1.23%),该患者有糖尿病,且术后血糖控制不佳。因此,我们认为术前应认真对患者全身情况进行评估,特别是要严格筛查疑似有局部感染灶的高危人群,采用严格消毒的层流手术室,术中注意严格无菌操作,带双层手套并充分止血,限制人员流动,术中预防应用抗生素, 术后及时对伤口换药等处理是预防早期感染的关键。患者出院后也应定期复查,杜绝感染隐患,特别是有心肺功能不全、泌尿系结石、糖尿病等基础疾病的老年患者更应重视术后整体治疗,这些措施也是术后预防感染的重要保障。

由于患者膝关节疼痛、畸形及屈伸活动受限,活动量的减少,导致部分肌肉失用性萎缩,出现肌肉力量的不平衡。术前活动度也是影响术后活动度重要因素,尤其是最大屈曲度[20];术后康复锻炼也是影响膝关节置换疗效的重要因素之一。在病房,管床医生应多督促教育患者,向患者灌输正确的锻炼方法,让患者及家属意识到术后康复锻炼的重要性,出院后继续功能锻炼。

RA 不但危害患者的生理健康, 而且影响其心理健康。Rupp[21]对 679 例 RA 患者采用 SF-36 量表进行了 2 年的随访,发现量表得分很低。PCS 是总体量化评分表,用于评价身体方面对日常生活的影响,MCS 评价精神状态; 选择 PCS 和 MCS 的最主要原因是能让统计分析量减少, 不会遗漏临床差异[22]。本研究中,RA 患者 TKA 后末次随访时 SF-36 中 PCS 评分显著提高,表明患者膝关节功能较术前明显改善;MCS 的提高提示患者对 TKA 后膝关节功能恢复满意度的变化, 同样也提示患者负面情绪得到一定改善[5]。

综上所述,TKA 治疗晚期膝关节 RA 的短期疗效确切,本组纳入研究的患者术后得到较理想的膝 ROM,患者满意度高,未见假体松动、骨溶解及聚乙烯衬垫磨损、假体脱位等并发症。但本研究尚有一些不足之处: ①术后随访患者 X 线片角度测量因影像学投射角度的问题导致其测量结果存在误差;②纳入研究并最终得到随访样本量较少,随访时间 2～7 年,随访时间跨度较大,部分患者随访时间相对较短,TKA 治疗晚期膝关节 RA 的远期疗效有待于长期进行临床跟踪随访, 同样需要更多样本的、多中心规范化的临床随机对照研究。

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