

# 关节置换日间手术安全性的研究进展

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## 摘要

随着加速康复外科的发展, 关节置换日间手术由于其具有缩短住院时间、降低医疗成本等优势得到了外科医生的广泛关注。尽管国外开展关节置换日间手术的比例逐年增加, 但就关节置换日间手术的安全性问题一直存在很大争议。因此, 本文针对关节置换日间手术患者的准入、出院延迟原因、并发症和再入院率、再入院原因问题进行综述, 以期为我国开展关节置换日间手术提供部分参考。

## 关键词

日间手术, 关节置换术, 髋关节, 膝关节, 并发症, 再入院

# Research Progress on the Safety of Joint Replacement during Daytime Surgery

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## Abstract

With the development of accelerated rehabilitation surgery, joint replacement daytime surgery has attracted extensive attention of surgeons because of its advantages of shortening hospitalization time and reducing medical costs. Although the proportion of joint replacement day surgery abroad is increasing year by year, there has been great controversy about the safety of joint replacement day surgery. Therefore, this paper reviews the admission, discharge delay, complications, readmission rate and readmission reasons of patients undergoing joint replacement day surgery, in order to provide some reference for carrying out joint replacement daytime surgery in China.

## Keywords

Daytime Surgery, Joint Replacement, Hip Joint, Knee Joint, Complications, Readmission

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## 1. 引言

加速康复外科(Enhanced Recovery after Surgery, ERAS)理念是由丹麦医师 Kehlet 于上世纪 90 年代提出, 该理念是指以降低并发症、促进患者快速康复为目的的围手术期优化处理措施。近年来, 加速康复外科促进了日间手术的发展[1]。目前关于日间手术标准化定义, 国际日间手术学会将日间手术定义为患者的入院、手术和出院在 1 个工作日内完成, 除去在医师诊所或医院开展的门诊手术外[2]。日间手术有减少住院费用、缩短住院时间、提高医疗资源使用率和缓解沉重的医疗负担等优势[3], 据报道对于住院组与日间组患者的比较, 住院组平均医疗费用为 32,273 美元, 而日间组的平均医疗费用为 27,839 美元, 比住院患者低 13.7%, 且住院患者急性后护理费用超过日间患者急性后护理 8.4%。日间患者的总体成本降低了 12.8% [4]。日间手术患者平均住院天数缩短为 $(2.4 \pm 0.5)$  d, 术前等待时间缩短为 0 天, 术后住院时间缩短为 $(2.4 \pm 0.5)$  d, 相比普通患者, 均具有统计学意义( $P < 0.05$ ) [5]。因此许多骨科医生开始探索日间手术模式在关节置换术中的良好效果。有数据显示, 我国每年实施髋、膝关节置换术近 40 万台, 且正以 25%~30% 的速度逐年递增[6]。同样在美国, 每年有超过 100 万患者接受关节置换术, 预计到 2030 年, 这一数字将增长到近 400 万[7]。随着关节腔镜等手术技术、多模式镇痛、围手术期安全管理的不断改进, 关节置换手术也逐渐转为日间手术模式进行。

尽管目前已有大量研究表明[8] [9]选择合适的患者进行关节置换日间手术安全可靠。但其仍存在一个无法忽视的缺点, 更快的出院可能会阻碍对术后即时阶段的监测, 这会导致并发症和再入院率的增加。如 Nowak 等[10]和 Arshi 等[11]分别选取了 986 和 4391 名患者进行关节置换日间手术, 结果发现接受日间关节置换术患者围术期的医疗并发症风险更高。Bordoni [12]等一项 meta 分析同样发现关节置换日间手术会导致患者术后并发症数量增加。可见针对关节置换日间手术是否具有安全性的问题仍存在巨大的争议。因此本综述回顾既往相关研究, 从患者的准入、出院延迟原因、并发症和再入院率、再入院原因多层面对日间手术的安全性, 以期为我国关节置换日间手术发展提供部分参考。

## 2. 患者的准入

对患者进行严格筛选一直以来是日间手术成功的基础和前提。许多文献研究报道证实: 选择合适的患者进行关节置换日间手术, 是相对安全的[13] [14] [15]。2015 年 Courtney 等[16]在一个病例中发现: 患者本身具有慢性阻塞性肺病、心脏病和肝硬化等医疗合并症会显著增加术后 24 小时内医疗干预的并发症的风险。部分对日间手术患者的研究[17] [18] [19] [20]中研究者大多选择的是男性、美国麻醉医师协会(American Society of Anesthesiology, ASA)分类低(<III)、身体质量指数(Body Mass Index, BMI)低( $\leq 35$  kg/m<sup>2</sup>)、年龄稍小、合并症较少且术后在家中能够得到支持的患者。因此外科医生在进行日间关节置换术时往往选择更健康的患者来提高手术出院率和成功率。

目前关节置换日间手术的准入标准尚未形成, 不同研究之间存在一定的差异。借鉴已有的研究经验

并根据患者自身情况具体制定与实施患者准入是非常重要的。随着加速康复外科的发展,部分研究者开始选择具有轻症合并症的患者,进行关节置换日间手术同样也具有相似的安全性。如 Reddy 等[21]选择 ASA 分类为 $\geq$ III 并且愿意接受全关节置换(Total Joint Arthroplasty, TJA)的患者,研究发现与高风险的住院患者相比,当日出院 TJA 不会增加急诊就诊、计划外再入院和并发症的风险。Nakasone 等[22]选择有医疗合并症的患者行关节置换术,在 2 年的最低随访中,所有结果指标均有显著改善,早期翻修率和医疗并发症都很低。这为关节置换日间手术患者准入扩大到有多种合并症的患者提供了依据。

### 3. 延迟出院的原因

Hoffmann 等[23]发现大多数患者延迟出院是继发于疼痛、低血压和恶心。原因在于关节置换日间手术中存在一个潜在问题,患者在住院期间接受的康复治疗时间缩短,这可能会影响术后疼痛和功能结果,导致一部分患者延迟出院[24]。除去这些原因外,头晕[25]和疼痛[26]控制不足也是出院失败最常见的原因。

Jenkins [27]等人指出术后早期进行膝关节屈曲会增加肿胀和疼痛,并延迟活动和出院。相反的是,Prinsloo [28]等研究发现在全膝关节置换术(Total Knee Arthroplasty, TKA)达到 $90^\circ$ 后立即开始膝关节屈曲运动,并未发现早期膝关节屈曲会延迟活动或延迟出院。并且随着加速康复外科的发展,越来越多的研究鼓励术后早期活动,这有利于患者术后的恢复。除此之外,Theiss 等[29]研究发现强大的社会支持能够提高患者提前出院的信心。部分研究发现进行关节置换术患者 24 小时内直接出院回家,其并发症和再入院率较低[30] [31] [32]。由此可见,要想提高患者当日出院率,不仅需要预防患者恶心呕吐和头晕等身体方面的症状,更需要强大的家庭社会支持系统。除此之外,术后患者适当的早期活动还是有必要的。

### 4. 并发症和再入院

目前对于关节置换术后常见并发症包括僵硬、伤口愈合延迟、感染、脱位和骨折、血栓栓塞并发症、肿胀和疼痛。2005 年 Berger 教授首次[33]对筛选的 50 名患者实施全膝关节置换日间手术,48 名患者手术当日顺利出院,出院后没有发生早期严重并发症。至此,关节置换日间手术模式的安全性研究[34] [35]逐渐开展,2018 年 Gauthier 等[36]比较了全膝关节置换日间手术的患者与住院患者,术后 3 个月和术后 2 年的并发症、再入院及急诊就诊情况,其结果基本一致。2019 年 Sershon 等[37]将接受日间全髋关节置换术和普通全髋关节置换术患者进行比较,结果发现进行日间关节置换的患者术后 90 天并发症、翻修、再手术、急诊就诊率和再入院率较低。2020 年 Crawford 等[14]对 793 例日间全膝关节置换术患者进行了至少两年的随访,发现全膝关节置换日间手术对很大一部分患者是安全的。2021 年 Lan 等[38]比较了日间和住院患者进行关节置换术后 30 天内不良事件的发生率和再入院率,结果发现与风险匹配的住院患者相比,关节置换日间手术不良事件发生率较低,30 天再入院率没有增加。2022 年 Jenny 等[39]将日间手术管理的 3 名患者与使用加速康复外科(Enhanced Recovery after Surgery, ERAS)管理的 3 名患者单独匹配,随访 3 个月后发现,两组在并发症严重程度、再入院患者比例或再手术患者比例方面无显著差异。同年 Bemelmans 等[20]一项 meta 分析评估了日间关节置换术通路与住院通路相比的安全性和有效性,研究发现日间手术患者和住院患者在总体并发症、再入院率以及患者自我报告结局测评的改善方面没有显著差异。综上证明,相对于传统的关节置换术,实施关节置换日间手术在术后并发症和再入院率方面已有很好的安全性保证。

## 5. 再入院原因

### 5.1. 风险因素

日间手术被大家所接受的最大好处是减少住院时间的同时节约了医疗卫生资源[40]。然而,日间手术

术后的任何早期再入院都将抵消任何成本的节约,并可能降低医院的质量结果指标[41]。因此,充分了解影响关节置换日间手术再入院的风险因素和原因才能更好实施针对性的干预措施,提高医院质量体系。Bovonratwet 等[42]发现日间全膝关节置换术(Total Knee Arthroplasty, TKA)后 30 天再入院的高风险因素包括依赖性功能状态、高血压、慢性阻塞性肺疾病和手术时间延长的患者;日间全髋关节置换术(Total Hip Arthroplasty, THA)后 30 天再入院的高风险因素包括年龄较大和出血性疾病的患者[43]。Fleisher 等[44]研究认为手术时间延长(>2 小时)、全身/区域麻醉、心脑血管和外周血管疾病是再次入院的相关因素。Ross 等[44]指出全膝关节置换术急诊就诊和再入院的预测因素包括年龄较大、男性、低收入、合并症较多以及术后缺乏初级保健医生进行就诊访视。因此在选择患者时就应该尽量避免再入院相关风险因素的准入,方可降低再入院率。

## 5.2. 原因

在避免再入院相关风险因素的基础上还应该了解其再入院原因,方可更好的确保日间手术安全性的实施。Bovonratwet 等[18]发现全膝关节置换日间手术大多数再入院与非手术部位相关(64%),其中包括血栓栓塞和胃肠道并发症。具体的再入院率常见的非手术部位相关原因,频率由高到低依次为血栓栓塞并发症(16%)、胃肠道并发症(1%)、败血症(9%)、泌尿系统并发症(5%)和肺部并发症(5%);最常见的手术部位相关原因,频率由高到低依次为伤口并发症(25%)和疼痛(5%)。Bovonratwet 等[43]发现全髋关节置换日间手术大多数再入院与手术相关(62%),包括伤口并发症(27%)和假体周围骨折(25%)。Kelly 等[46]发现手术相关的肿胀和疼痛是 THA 和 TKA 后 90 天急诊就诊的最常见原因。THA 再入院的最常见原因是感染和不相关的择期手术;TKA 最常见的再入院原因是胃肠道和麻醉下的操作。Curtis 等[47]研究指出 TKA 再入院最常见原因包括手术部位感染、心脑血管并发症、胃肠道并发症和静脉血栓栓塞。Cross 等[48]选择 105 例患者进行膝关节置换日间手术,术后第一周内没有患者需要再次入院,而一名患者在第 12 周因感染而再次入院。综上所述,关节置换日间手术再入院原因主要还是集中在术后的感染、肿胀、胃肠道反应和血栓事件的发生,清楚这些对临床医生术后用药及护理人员健康宣教方面将有重大的指导意义。

2021 年 Gould 等[49]研究了人口学因素对关节置换日间手术再入院的影响,发现体质指数与再入院风险没有很强的相关性,而年龄对再入院风险的影响尚未明确。Carey 等[50]在近老年人群(55~64 岁)中使用倾向评分方法来匹配住院患者与日间手术患者,结果显示日间手术患者的再入院率、术后并发症和住院费用均低于住院患者。可见,关节置换日间手术对部分老年人群有一定的安全性保证。但目前关于关节置换日间手术再入院率与人口学特征方面的相关研究较少,未来应继续分析再入院的危险因素及原因将改善对手术当天可以安全出院的患者的前瞻性识别。

## 6. 展望与总结

日间手术在我国开展时间较短,目前国内针对关节置换日间手术的研究相对较少。随着我国人口老龄化社会的到来,接受关节置换术患者将会持续增加。在保证患者安全的情况下日间手术的发展将成为主流。但是目前判断关节置换日间手术的成功主要是通过临床医生评定的客观指标来量化的,其安全性研究还主要集中在术后的并发症、再入院率、关节功能等客观评价指标上。现如今重点已经转向以患者为中心。未来针对关节置换日间手术的研究应更多的关注患者的自我报告结局测量(Patient-Reported Outcome Measures, PROMS)。患者的客观指标与主观感受结合才是未来关节置换手术成功的关键,只有保证患者获得更好的就医体验和更高的满意度才能促进日间手术的发展。

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