

A Randomized Controlled Trial of Cocktail and Femoral Nerve Block Analgesia in Double Knee Arthroplasty

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Abstract

Objective: To compare the analgesic effect of intra-articular injection of cocktail and femoral nerve block on total knee arthroplasty (TKA). **Methods:** From January 2015 to October 2017, 20 patients with bilateral TKA (40 knees) were selected from our hospital, including 6 males and 14 females, aged 50~78 years, with an average age of 63 years. Randomized analgesia on both knees, one side of the knee cavity cocktail injection, femoral nerve block on one side, routine postoperative analgesia, intramuscular parecoxib sodium (40 mg twice daily), and oral celecoxib after 2 days (0.2 g, 2 times/day), record visual analogue scale (VAS) (1~10 points), operation time, and output within 72 hours after operation were used. Blood volume, knee joint mobility, length of hospital stay, and other indicators were measured using the t-test and χ^2 test. **Results:** 20 cases of 40 knees cases were followed up for 6 weeks. The VAS score after 24 h of treatment group was (3 + 1.2) points, less than control group (4.4 + 1.5), which had statistically significant difference ($P < 0.05$); the joint activity of experimental group 1 week after operation was in the range of ($100^\circ + 8^\circ$) and control group of ($90^\circ + 10^\circ$), whose difference was statistically significant ($P < 0.05$); there was no statistical significance between operation time, bleeding volume, and joint activity range at postoperative 6 weeks. **Conclusion:** TKA has better analgesic effect after the operation of the intraarticular injection of cocktail, and it does not prolong the operation time, and the early joint activity is greater after the operation.

Keywords

Knee Joint, Arthroplasty, Replacement, Knee, Cocktail

双膝置换术中鸡尾酒与股神经阻滞镇痛的随机对照研究

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摘要

目的: 对比双侧全膝关节置换(total knee arthroplasty, TKA)术中运用关节腔周围注射鸡尾酒与股神经阻滞的镇痛效果。**方法:** 选取2015年1月至2017年10月, 我院收治的20例行双侧TKA的患者(40膝), 其中男6例, 女14例; 年龄50~78岁, 平均63岁。对双膝随机进行镇痛, 一侧使用膝关节腔鸡尾酒注射, 一侧使用股神经阻滞, 术后常规镇痛, 肌注帕瑞昔布钠(40 mg, 2次/天), 2天后改为口服塞来昔布(0.2 g, 2次/天), 记录术后72 h内疼痛视觉模拟评分(visual analogue scale, VAS) (1~10分)、手术时间、出血量、出院时膝关节活动度、住院时间等指标, 并运用t检验及 χ^2 检验统计分析。结果: 20例40膝例均获6周随访, 术后24 h VAS评分: 试验组(3.0 ± 1.2)分, 小于对照组的(4.4 ± 1.5)分, 差异有统计学意义($P < 0.05$), 关节活动度术后1周实验组($100^\circ \pm 8^\circ$), 对照组($90^\circ \pm 10^\circ$), 差异有统计学意义($P < 0.05$); 而手术时间、出血量、术后6周关节活动度差异无统计学意义。结论: TKA应用关节腔周围注射鸡尾酒术后镇痛效果更佳, 不显著延长手术时间, 术后早期关节活动度更大。

关键词

膝关节, 关节成形术, 置换, 膝, 鸡尾酒

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1. 引言

TKA 治疗终末期膝关节炎取得了满意效果, 但是术后早期的疼痛不可忽视。临床镇痛模式多样, 以股神经阻滞和关节腔注射鸡尾酒较为普遍。本研究对 20 例 40 膝双侧全膝置换术患者, 双膝随机进行鸡尾酒及股神经阻滞镇痛, 报道如下。

2. 资料与方法

一、一般资料

2015 年 1 月至 2017 年 10 月, 我院收治的 20 例行双侧 TKA 的患者(40 膝), 均采用全身麻醉, 手术由同一组医生完成, 随机进行双膝鸡尾酒、股神经阻滞镇痛, 两组所用假体均为后稳定型假体。

二、手术操作、围术期处理及术后镇痛方案

1) 手术方法: 患者均采用全身麻醉, 双膝分次手术, 取仰卧位, 常规使用止血带(压力 50 kPa), 采用髌旁内侧入路, 切开关节囊后, 先切除髌骨骨赘, 依次切除内外侧半月板及前后交叉韧带, 行胫骨髓截骨并测量胫骨平台大小, 再行股骨截骨并测量股骨髓大小, 四合一截骨完成后, 行髌间窝截骨, 予相应大小试模测试, 假体及力线满意后取下试模, 脉冲冲洗枪持续冲洗 1000 ml, 调骨水泥, 先安装平台假体, 再安装股骨髓假体, 最后安装聚乙烯垫片, 复位膝关节, 伸直位至骨水泥完全硬化, 期间可行髌骨

去神经化处理并进一步修整髌骨关节面，松止血带，彻底止血，留置负压引流管，缝合关节囊，缝合皮下组织，关闭切口。一侧手术完成后行另一侧手术。

2) 围术期处理：术后 8 h 予速碧林 1 支 qd 皮下注射抗凝，使用一代头孢预防感染，使用时间不超过 48 小时；术后第 1 天行 CPM 训练，主动直腿抬高锻炼，视患者恢复情况行助行器辅助下床锻炼；常规行踝泵锻炼。

3) 鸡尾酒配方：1%罗哌卡因(300 mg)、吗啡(2.5 mg)、肾上腺素(10 滴，约 0.25 ml)、氨甲环酸(2 g)、德宝松 1 ml，总量约 80 ml，于截骨后、安装假体后行关节腔周围注射鸡尾酒约 30 ml，缝皮后经负压引流管灌注剩余药物约 50 ml，夹管，至术后 6 小时恢复引流，术后均使用肌注帕瑞昔布钠(40 mg，2 次/天)，2 天后改为口服塞来昔布(200 mg, BID)，疼痛仍较重可加用曲马多缓释片 1 片。

4) 股神经阻滞：术后由麻醉医生于 B 超引导下予罗哌卡因进行股神经阻滞。

四、数据收集

收集两侧关节置换手术时间，出血量，采用疼痛视觉模拟评分(visual analogue scale, VAS) (1~10 分) 评估术后第 1 天、第 3 天疼痛程度，出院时记录膝关节 ROM。

五、统计学方法

采用 SPSS 17.0 软件进行统计学分析，两组数据采用配对 t 检验， $P < 0.05$ 为差异有统计学意义。

3. 结果

20 例患者全部获 6 周随访，无感染、深静脉血栓、股神经损伤、假体早期松动等并发症。两组的手术时间、出血量无统计学意义($P > 0.05$)；术后第 1 天两组 VAS 评分差异有统计学意义($P < 0.05$)。术后第 3 天时两组疼痛评分差异无统计学意义($P > 0.05$)。两组患者出院前的关节活动度差异无统计学意义($P > 0.05$) (表 1)。

4. 讨论

目前骨关节炎患者的数量日益增多，其总患病率约为 15%，60 岁以上人群的患病率为 50% [1]。终末期膝关节骨关节炎患者多因疼痛无法忍受而进行膝关节置换手术[2]。随着无痛病房理念的推广，围手术期镇痛尤为重要。膝关节置换手术本身存在骨和软组织创伤，所有在术后早期可能存在较术前更明显的疼痛，引起患者的恐惧及满意度降低。已有大量报道术中行膝关节鸡尾酒注射可能有效缓解疼痛[3] [4] [5] [6]。研究表明，在合适的患者应用正确的“鸡尾酒”关节周围注药方案会产生最好的镇痛效果且不良

Table 1. Comparison of surgical effects between the two groups

表 1. 两组手术效果比较

项目	鸡尾酒组	股神经阻滞组	P 值
手术时间(min)	110.9 ± 4.7	107.7 ± 5.1	0.63
出血量(ml)	104.3	105.6	0.75
VAS 评分			
术后第一天	2.7 ± 1.2	4.5 ± 1.5	0.003
术后第三天	2.61 ± 1.4	2.87 ± 1.6	0.68
关节活动度术后 1 周	100 ± 8	90 ± 10	0.002
关节活动度术后 6 周	110.8 ± 10.2	109.5 ± 10.4	0.69

其中，术后第一天，术后 1 周关节活动度差异有统计意义， $P < 0.05$ 。

反应最小[7]。但研究多为单侧膝关节手术,存在个体差异的偏倚。本研究为同一患者双膝置换患者,一侧行鸡尾酒注射,而另一侧使用股神经阻滞,尽量避免了因个体的痛阈、体重、基础疾病等差异。鸡尾酒配方在文献报道中有很多种[8],主要包含吗啡、罗哌卡因、去甲肾上腺素、类固醇激素等药物,以减轻手术后疼痛和局部炎症。已经有研究发现在鸡尾酒中加入激素可以明显降低患者局部和全身炎症反应的同时,明显减轻 TKA 术后患者疼痛,加快患者的康复[9]。本研究 20 膝均使用了德宝松这一激素药物,术后未发生感染病例。本研究中鸡尾酒中加入了氨甲环酸,目的在于减少手术失血及关节腔积血。已有大量文献报道了其有效性及安全性[10][11][12]。

TKA 围术期采用的多模式镇痛方案各有不同,但是超前镇痛作为疼痛管理的重要组成部分,作用不容忽视[13]。Aasvang EK [14]却认为研究表明,术前使用阿片类药物会增加术后疼痛,降低术后满意度。股神经阻滞目前亦为较普遍的镇痛模式,但其存在股神经损伤风险,且镇痛效果与麻醉医生的股神经穿刺经验密切相关。本研究采用同一病人双膝随机对照,故可避免药物的干扰。虽然多项研究认为“鸡尾酒”配方局麻药与常规镇痛治疗 TKA 术后疼痛,两者术后关节活动度相似[15]。但本研究发现同一病人双膝比较,鸡尾酒镇痛侧膝关节活动度明显好于对侧,可能与疼痛改善更明显有关。“鸡尾酒”配方药物多为膝关节周围局部给药,多数学者主张全覆盖注射,即于手术前后向膝关节囊后壁、内外侧副韧带、股四头肌肌腱、髌腱、髌下脂肪垫、骨膜下及皮下组织中多点注射“鸡尾酒”镇痛药物混合液[16][17]。本研究行鸡尾酒注射时位置基本与上述相同。但笔者认为术前 MRI 有益于明确膝关节炎症部位及炎症程度,从而可以有计划的分配注射部位的药物剂量,膝关节切口关闭后通过关节腔的药物灌注即可以增加关节腔压力达到止血,也可以通过药物的药理作用达到止血止痛,效果更佳。

参考文献

- [1] Busch, C.A., Whitehouse, M.R., Shore, B.J., *et al.* (2010) The Efficacy of Periarticular Multimodal Drug Infiltration in Total Hip Arthroplasty. *Clinical Orthopaedics and Related Research*, **468**, 2152-2159. <https://doi.org/10.1007/s11999-009-1198-7>
- [2] Uesugi, K., Kitano, N., Kikuchi, T., *et al.* (2014) Comparison of Peripheral Nerve Block with Periarticular Injection Analgesia after Total Knee Arthroplasty: A Randomized, Controlled Study. *Knee*, **21**, 848 -852. <https://doi.org/10.1016/j.knee.2014.04.008>
- [3] Marques, E.M., Jones, H.E., Elvers, K.T., *et al.* (2014) Local Anaesthetic Infiltration for Peri-Operative Pain Control in Total Hip and Knee Replacement: Systematic Review and Meta-Analyses of Short- and Long-Term Effectiveness. *BMC Musculoskeletal Disorders*, **15**, 220. <https://doi.org/10.1186/1471-2474-15-220>
- [4] Rhee, S.J., Hong, S.M. and Suh, J.T. (2015) High-Flexion Total Knee Arthroplasty Using NexGen LPS-Flex System: Minimum 5-year Follow-Up Results. *Knee Surgery & Related Research*, **27**, 156-162. <https://doi.org/10.5792/ksrr.2015.27.3.156>
- [5] Wyatt, C., Wright, M., Locker, T. and Femoral, J. (2015) Nerve Infusion after Primary Total Knee Arthroplasty: A Prospective, Double-Blind, Randomised and Placebo-Controlled Trial. *Bone & Joint Research*, **4**, 11-16. <https://doi.org/10.1302/2046-3758.42.2000329>
- [6] Nakagawa, S., Arai, Y., Inoue, H., *et al.* (2016) Comparative Effects of Periarticular Multimodal Drug Injection and Single-Shot Femoral Nerve Block on Pain Following Total Knee Arthroplasty and Factors Influencing Their Effectiveness. *Knee Surgery & Related Research*, **28**, 233-238. <https://doi.org/10.5792/ksrr.2016.28.3.233>
- [7] Ranawat, A.S. and Ranawat, C.S. (2007) Pain Management and Accelerated Rehabilitation for Total Hip and Total Knee Arthroplasty. *Arthroplasty*, **22**, 12-15. <https://doi.org/10.1016/j.arth.2007.05.040>
- [8] Nakagawa, S., Arai, Y., Inoue, H., Kan, H., Hino, M., Ichimaru, S., Ikoma, K., Fujiwara, H., Amaya, F., Sawa, T. and Kubo, T. (2016) Comparative Effects of Periarticular Multimodal Drug Injection and Single-Shot Femoral Nerve Block on Pain Following Total Knee Arthroplasty and Factors Influencing Their Effectiveness. *Knee Surgery & Related Research*, **28**, 233-338. <https://doi.org/10.5792/ksrr.2016.28.3.233>
- [9] Parvataneni, H., Shah, V.P., Howard, H., *et al.* (2007) Controlling Pain after Total Hip and Knee Arthroplasty Using a Multimodal Protocol with 10-cal Periarticular Injections: A Prospective Randomized Study. *The Journal of Arthroplasty*, **22**, 33-38. <https://doi.org/10.1016/j.arth.2007.03.034>

- [10] Wu, Y.G., Zeng, Y., Shen, B., *et al.* (2016) Combination of Erythropoietin and Tranexamic Acid in Bilateral Simultaneous Total Hip Arthroplasty: A Randomised, Controlled Trial. *Hip International*, **26**, 331-337. <https://doi.org/10.5301/hipint.5000356>
- [11] He, P., Zhang, Z., Li, Y., *et al.* (2015) Efficacy and Safety of Tranexamic Acid in Bilateral Total Knee Replacement: A Meta-Analysis and Systematic Review. *Medical Science Monitor*, **21**, 3634-3642. <https://doi.org/10.12659/MSM.895027>
- [12] Xie, J., Ma, J., Yao, H., *et al.* (2016) Multiple Boluses of Intravenous Tranexamic Acid to Reduce Hidden Blood Loss after Primary Total Knee Arthroplasty without Tourniquet: A Randomized Clinical Trial. *The Journal of Arthroplasty*, **31**, 2458e2464. <https://doi.org/10.1016/j.arth.2016.04.034>
- [13] Lee, J.K., Chung, K.S. and Choi, C.H. (2015) The Effect of a Single Dose of Preemptive Pregabalin Administered with COX-2 Inhibitor: A Trial in Total Knee Arthroplasty. *The Journal of Arthroplasty*, **30**, 38-42. <https://doi.org/10.1016/j.arth.2014.04.004>
- [14] Aasvang, E.K., Lunn, T.H., Hansen, T.B., *et al.* (2016) Chronic Pre-Operative Opioid Use and Acute Pain after Fast-Track Total Knee Arthroplasty. *Acta Anaesthesiologica Scandinavica*, **60**, 529-536. <https://doi.org/10.1111/aas.12667>
- [15] Fan, L., Zhu, C., Zan, P., *et al.* (2015) The Comparison of Local Infiltration Analgesia with Peripheral Nerve Block Following Total Knee Arthroplasty (TKA): A System Review with Meta-Analysis. *The Journal of Arthroplasty*, **30**, 1664 -1671. <https://doi.org/10.1016/j.arth.2015.04.006>
- [16] 李晋玉, 贾育松, 徐林, 等. 超前镇痛和鸡尾酒疗法对初次单侧 TKA 术后镇痛与关节活动度改善的疗效评价[J]. 中国中医骨伤科杂志, 2015, 23(12): 15-18.
- [17] 叶文秀. 多模式镇痛在全膝关节置换术中的疗效分析[J]. 实用临床医药杂志, 2016, 20(8): 173-174.

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