

复发性髌骨外侧脱位的手术治疗现状及展望

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【摘要】 目前对于复发性髌骨外侧脱位的外科治疗主要包括内侧髌股韧带重建、胫骨结节截骨、股骨滑车成形、外侧支持带松解及旋转截骨术等。临床报道显示:单独应用一种或者联合几种术式治疗复发性髌骨脱位都取得了理想的短中期临床疗效。但目前对个体髌骨脱位的术式选择尚缺乏统一标准、也未达成共识。同时随着内侧髌股韧带重建等术式应用愈加广泛,也有越来越多值得引起关注的手术并发症和失败率。本文旨在对当前各种术式的应用现状做一系统综述,汇总目前取得的疗效、阐述各种术式的应用要点,以期更精准的指导临床个体化治疗。

【关键词】 复发; 髌骨脱位; 外科治疗; 综述

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ABSTRACT Up to now, surgical treatment of recurrent lateral patellar dislocation mainly includes: medial patellofemoral ligament reconstruction, tibial tubercle osteotomy, trochleoplasty, lateral retinacular release, derotation osteotomy and so on. Clinical reports show that: the use of a single or combined with several methods have achieved ideal short to mid-term clinical outcomes. However, there is no consolidate criterion concerning the choices of different kinds of surgical ways for the treatment of individual recurrent lateral patellar dislocation. Meanwhile, with the wide use of MPFL reconstruction and other surgical options, there are more and more complications and failures that are worthy and necessary for us to pay attention to, even though its high success rate. The aim of this article is to make a systematic review of the application status of different surgical methods, collecting the positive results we have achieved, illuminating application keys of surgical techniques, guiding patient-specific therapy more precisely.

KEYWORDS Recurrent; Patellar dislocation; Surgical treatment; Review

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复发性髌骨外侧脱位好发于 15~17 岁的年轻女性,流行病学统计显示,其发生率为 29/1 000^[1]。既往倾向认为髌骨复发性脱位由创伤导致内侧支持带不愈合或愈合不佳引起。但目前多认为绝大部分复发性髌骨脱位患者存在髌股关节不稳的基础,从而在某些特定姿势下(足部固定、膝关节屈曲,股骨内旋而胫骨外旋时)诱发髌骨脱位^[2]。对于复发性髌骨脱位的病因学研究,目前认为是多因素的^[3],分为动力性和静力性因素。动力性因素包括:髌关节外展肌及股内斜肌力量薄弱,外侧支持带和髌胫束过紧;静力性因素包括膝外翻, Q 角过大,高位髌骨, TT-TG

值过大,股骨前倾及胫骨外旋过大。对于复发性髌骨脱位,目前多主张手术治疗^[4-5]。临床报道显示:单独应用一种或联合几种术式治疗复发性髌骨脱位都取得了理想的短中期临床疗效^[6-10]。但目前对于相关术式的选择尚缺乏统一标准^[11]。以下将就各种术式的应用现状进行分述。

1 内侧髌股韧带重建术

1.1 总体介绍

内侧髌股韧带位于膝关节内侧第 2 层结构中,股骨侧起于股骨内上髁与内收肌结节之间的区域,髌骨侧纤维穿入股内斜肌^[12]。生物力学研究表明:膝关节屈曲 0°~30°时,内侧髌股韧带是限制髌骨向外脱位的主要组织结构^[13]。其损伤被认为与复发性髌骨脱位密切相关,因此,内侧髌股韧带重建术被越来越广泛用于治疗复发性髌骨脱位^[14]。根据移植材料及固定方式的不同,内侧髌股韧带重建常用的技术包括:髌骨股骨侧软组织固定、骨性固定及混合固

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定。临床报道单独应用内侧髌股韧带重建取得了理想的短中期临床疗效,大大降低了再脱位率^[6-8]。

1.2 手术并发症分析

随着内侧髌股韧带重建术应用愈加广泛,也呈现了足以引起临床医师重视的并发症和失败率^[15]。内侧髌股韧带重建术失效主要表现为膝前痛、髌骨外向不稳,失效原因主要归为内侧髌股韧带重建适应证选择不适宜、手术技术导致的重建内侧髌股韧带生物力学不佳及由于术前未能全面评估引起髌骨脱位的其他危险因素而导致的术后再次脱位^[15-16]。笔者认为这也是目前存在争议,尚需进一步研究解决。Sanchis-Alfonso 等^[16]认为内侧髌股韧带重建术的最佳适应证是:至少有 2 次确认的髌骨外侧脱位病史并在麻醉状态下可以再现髌骨脱位,TT-TG < 20 mm,膝关节屈曲 30°时,恐惧试验阳性、Caton-Deschamps 指数 < 1.2,股骨滑车分型为 Dejour-A 型。对于习惯性髌骨脱位,也不建议行单纯内侧髌股韧带重建术,因为习惯性髌骨脱位的发病机制是伸膝装置的挛缩及股骨滑车外侧髌发育扁平等相关解剖学因素。此外,对于有膝前痛、单纯影像学表现为髌骨过度外侧倾斜或者半脱位而无髌骨不稳病史的患者,也不建议行内侧髌股韧带重建。Matsushita 等^[7]也认为对于单纯膝前痛而无髌骨不稳的患者,行单纯内侧髌股韧带重建术后患者主观功能评分恢复不理想,因此对于此类患者,因慎行内侧髌股韧带重建术。Parikh 等^[15]认为内侧髌股韧带重建 47% 的术后并发症都源于手术技术问题。源于目前对于内侧髌股韧带髌骨侧的附着点认识较为一致,大部分肌纤维穿插进入股内侧肌^[17]。因此,重建肌腱时髌骨侧定位相对重要性较低。手术最核心的是重建肌腱股骨侧的定位问题,因为股骨侧的定位决定重建肌腱的长度变化及膝关节不同屈曲角度的张力变化,亦即决定肌腱的整体生物力学变化^[18]。目前公认的是 Schoettles^[19]提出的,通过术中透视,得到膝关节纯侧位像来更精准定位股骨侧定位点。但最近有学者提出^[20]在很多情况下,即使应用真正的膝关节纯侧位片也不能保证准确的股骨侧解剖位置,认为对于股骨侧的定位,影像学方法只是参考,而非唯一的定位标准。解剖定位最精确的方法是充分暴露,借助内收肌结节和股骨长轴等周围明确的解剖结构进行精准定位^[21]。很多病例正是由于内收肌结节的变异导致了内侧髌股韧带股骨附着点的位置不统一,这也很好地解释了为什么应用传统的 Schoettles 法定位出现的很多错误。另一个技术问题是重建肌腱的张力变化,在术后检查髌股关节之间压力时,应该在膝关节高度屈曲位。此外,术中应与健侧膝关节活动度对

比,在固定移植肌腱时,确保其处于非紧张状态。最后,内侧髌股韧带重建术失败源于术前未能全面评估导致髌骨不稳的其他危险因素。目前,已经确认的危险因素包括股骨滑车发育不良、高位髌骨、TT-TG 值 > 20 mm 等^[22-25]。

1.3 在未成年个体中的应用

许多研究已经证实对于未成年个体,行内侧髌股韧带重建术时股骨侧钻孔是安全可行的^[26-27]。然而也有因股骨侧定位欠佳而引起骨骺损伤,导致成年后下肢畸形的报道^[28]。因此在股骨侧打道或钻孔时,必须小心谨慎,避免伤及骨骺和软骨周围环^[29]。如果不能保证钻孔安全的实施,可以换用类似解剖内侧髌股韧带重建术^[30]。为了避免潜在的骨骺或医源性损伤,也可以使用锚钉而不必钻孔^[31]。

综上所述可以看到,以上研究结果与内侧髌股韧带重建术的理论基础相吻合:内侧髌股韧带重建的目的是在髌骨与股骨滑车相对“和谐”的基础上,稳定髌骨;而非把髌骨固定于滑车的理想位置。笔者认为对于单纯伴有股骨滑车发育不良中较轻分型(A型)、以及 TT-TG 值超过正常值一定范围的患者,单纯内侧髌股韧带重建术可以在一定程度上代偿其它危险因素带来的脱位风险。但对于畸形程度较大者,单纯内侧髌股韧带重建术显然未能解决全部问题。此时,联合股骨滑车成形、胫骨结节截骨等骨性手术就显得很有必要。

2 股骨滑车成形术

目前认为股骨滑车成形术的指征包括:股骨滑车分型为 B 或 D 型,滑车深度 < 3 mm,股骨髌上凸起 > 5 mm 并伴有典型的复发性髌骨脱位的症状以及“J”形征等体征;禁忌证为骨骺未闭的未成年患者及广泛的髌股关节炎患者^[32]。股骨滑车成形术不仅能纠正股骨滑车发育不良,还能同时纠正增大的 TT-TG 值。Camathias 等^[9]对股骨滑车分型为 B 或 D 型且骨骺已经闭合的 50 例青少年行单纯的股骨滑车成形术,通过长达至少 24 个月的随访,Kujala 与 Lysholm 评分分别从术前的 71 分提高至 92、95 分,“J”形征消失比例 39/45;髌骨恐惧试验消失比例 33/41,患者主观满意度都得到很大提高;只有 1 例在随访第 38 个月时发生再脱位,因此认为对于排除旋转对线不良的复发性髌骨脱位患者,股骨滑车成形术作为一种单独的治疗手段是非常有效的。显而易见,股骨滑车成形术后对于提高髌股关节的稳定性是可预见的,相对而言,术后疼痛预见性较低,并且可能因此而成为翻修的原因。统计显示股骨滑车成形术后总体并发症率为 13.4%,包括髌骨再脱位、膝关节活动度减少及髌股关节疼痛,此外,7.9% 的患

者在随访 69.9 个月时发生髌股关节炎^[33]。因此,对于股骨滑车成形这样复杂的术式,一定要明确适应证,再者应由高年资医师完成,以保证手术效果。

3 胫骨结节截骨术

胫骨结节截骨术^[34],包括常规的胫骨结节内移术和胫骨结节抬高内移术,主要的适应证为胫骨结节过度外移、髌骨高位。常用的术前评估指标包括 Q 角、TT-TG、TT-PCL^[35]。根据患者的临床症状和病理解剖学,胫骨结节可以向内、向前以及向远近端移位。目前倾向对于 TT-TG>20 mm 患者行胫骨结节内移术。大部分报道都显示胫骨结节内移术取得了满意的临床疗效。Mitani 等^[10]报道应用 Elmslie-Trillat 技术消除髌骨不稳的成功率高达 91%。Naveed 等^[36]对胫骨结节内移术治疗髌骨不稳的患者进行了长达 4 年的随访,79%呈现出好或者极好的临床疗效。当然,也有其相应的并发症,最常见的是固定螺钉引起的不适及截骨处的延迟愈合或不愈合,可幸的是这些并发症都很罕见^[37]。目前对于 TT-TG 的手术界值存在很大争议。总之,如胫骨结节过度外移是复发性髌骨脱位的原始危险因素,胫骨结节截骨术是一种很有效的外科固定方式。

4 旋转截骨术

旋转截骨:研究者已经证实未引起足够重视的股骨过度前倾是复发性髌骨脱位的一种危险因素,同时也是导致很多原始治疗髌骨不稳术式失效的病理因素^[16,18,24]。因此,如果怀疑有旋转畸形,应行 CT 或 MRI 全面评估畸形程度。Dickschas 等^[38-39]报道对于伴有股骨旋转畸形引起膝前痛和髌骨不稳的患者行旋转截骨术后疼痛和髌骨轨迹得到了明显改善。因此对于过度的股骨前倾(>20°)且软组织手术治疗失败的患者,应考虑行旋转截骨术。同时在评估任何髌股关节不稳定时,首先应考虑下肢力线和旋转畸形。对任何髌股关节不稳定患者,如果忽略了胫骨和股骨的旋转畸形,任何固定方式都不会是成功的^[40]。尤其是对于灾难性力线不良综合征引起的膝前痛和髌骨脱位患者。

5 外侧支持带松解术

历史上对于髌股关节不稳的治疗,外侧支持带松解是最常用的术式。由于其适应证的把握不佳及术后髌骨内侧脱位等并发症陡增,目前认为其绝对适应证是外侧支持带过紧和髌骨倾斜。对于髌骨脱位的治疗,本身并无明显作用,但可与内侧髌股韧带重建术等术式结合。梁兴森等^[41]研究表明:髌骨内侧支持带在维持髌骨稳定性及髌股关节稳定性中发挥重要作用,而外侧支持带并无特殊作用。进一步为外侧支持带松解的临床应用指征提供了理论支撑。

6 总结与展望

目前对于髌股关节不稳定的诊疗策略主要还是 Lyon 标准^[42]及 Walch 等^[43]的经验,即系统性解剖评估:股骨滑车发育不良、高位髌骨、髌骨倾斜、TT-TG 值,并结合详细的病史询问及查体。目前大部分报道手术治疗复发性髌骨脱位都取得了相对理想的临床疗效,然而这只是短中期疗效,尚缺乏长期随访。对于诸如内侧髌股韧带重建术股骨侧的定位、胫骨结节内移术的手术指征及各种术式单独和联合应用的指征等仍然是目前争议较大、亟待进一步解决的议题。再者,目前大部分可用临床资料为 4 级证据,少数为 2 级或者 3 级。因此还需更多前瞻性、随机对照研究及更统一的评估标准对比各种术式治疗复发性髌骨脱位的疗效,以获得更高等级的证据支持,以更精准指导临床个体化治疗。

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