

关节镜下肩袖缝线过线器捆扎缝合半月板撕裂伤疗效观察

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【摘要】 目的: 探讨采用肩袖缝线过线器进行关节镜下半月板撕裂捆扎缝合的临床疗效。方法: 自 2015 年 7 月至 2019 年 5 月采用关节镜下肩袖缝线器捆扎缝合半月板撕裂损伤患者 40 例, 其中男 27 例, 女 13 例; 年龄 20~55 (36.0±1.4) 岁。观察术后并发症情况, 术前及术后 12 个月采用 Lysholm 膝关节评分标准评价临床疗效, 采用疼痛视觉模拟评分 (visual analogue scale, VAS), 膝关节屈伸活动范围评估疼痛与功能恢复情况。结果: 所有患者获得随访, 时间 12~15 (12.6±0.7) 个月。未出现关节积液、缝合失效等并发症。2 例患者末次随访时膝关节存在轻度疼痛, 但临床查体无异常; 1 例患者中度疼痛合并关节间隙局部按压痛, 其余患者均无异常。Lysholm 膝关节评分由术前的 (49.55±1.21) 分提高到术后 12 个月的 (98.95±0.42) 分, VAS 评分由术前的 (5.18±0.78) 分降至术后 12 个月的 (1.03±0.77) 分, 膝关节屈伸活动范围由术前的 (50.63±9.20)° 提高到术后 12 个月的 (130.38±4.99)°, 差异有统计学意义 ($P<0.05$)。结论: 关节镜下使用肩袖缝线过线器捆扎缝合适用于大部分的半月板损伤, 包括内侧半月板后角撕裂, 及外侧半月板体部、后角撕裂。此项技术解决了缺乏专用半月板缝合器情况下的半月板全内缝合需求, 且具有手术操作方便, 并发症少, 术后功能好等优点。

【关键词】 关节镜; 半月板; 缝线; 撕裂伤

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ABSTRACT Objective: To explore clinical effect of arthroscopic meniscus tear strapping suture by rotator cuff suture threader. **Methods:** Forty patients with meniscus tear injury admitted from July 2015 to May 2019, including 27 males and 13 females, aged from 20 to 55 years old with an average of (36.0±1.4) years old. Menisci laceration was sutured with rotator cuff suture thread under arthroscopy. Postoperative complication was observed, Lysholm knee joint score before and after operation at 12 months were used to evaluate clinical effects, visual analogue scale (VAS) and range of knee flexion and extension were applied to evaluate recovery of pain and function. **Results:** All patients were followed up from 12 to 15 months with an average of (12.6±0.7) months. No complication such as joint effusion, suture failure occurred. Two patients occurred mild pain after activity without clinical physical abnormality, and 1 patient manifested moderate pain with joint space tenderness, the other rest without abnormal. Lysholm knee joint score was increased from (49.55±1.21) preoperatively to (98.95±0.42) at 12 months after operation, VAS score decreased from (5.18±0.78) preoperatively to (1.03±0.77) at 12 months after operation, and range of knee joint flexion and extension activity increased from (50.63±9.20)° preoperatively to (130.38±4.99)° after operation, and there were statistical differences in Lysholm knee joint score, VAS and range of knee joint flexion and extension activity ($P<0.05$). **Conclusion:** Arthroscopic strapping suture by rotator cuff suture threading device applies to most meniscus injuries, including medial meniscus posterior horn tears, lateral meniscus body tears and lateral meniscus posterior horn tears. This technique meets the need of full-internal meniscus suture without special meniscus suture, and has advantages of convenient operation, less complications and good postoperative function.

KEYWORDS Arthroscopes; Meniscus; Sutures; Lacerations

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半月板损伤后,其承载剪切的能力会逐步下降,导致半月板组织的愈合率降低,容易出现患膝的不适感。满足条件的镜下全内缝合应该是最可靠的半月板损伤修复方式。可是,镜下全内缝合必须通过一次性专用半月板缝合器,但价格相对较高。本研究自 2015 年 7 月至 2019 年 5 月采用肩袖缝合器的半月板缝合技术半月板撕裂损伤患者 40 例,临床疗效满意,现报告如下。

1 临床资料

纳入标准:(1) 年龄<60 岁。(2)MRI 提示半月板撕裂(水平撕裂或纵向撕裂)。(3)关节间隙查体存在压痛,或麦氏征检查阳性。(4)不合并膝关节周围其他损伤。排除标准:(1) 年龄>60 岁。(2)MRI 提示半月板放射状撕裂。(3)合并关节软骨大于Ⅲ度的损伤。(4)多发伤或依从性差的患者。(5) 膝关节周围合并骨折、或韧带撕裂。

本组 40 例,其中男 27 例,女 13 例;年龄 20~55 (36.0±1.4) 岁。其中,外侧半月板体部撕裂 13 例,外侧半月板后角撕裂 11 例,损伤在内侧半月板体部 7 例,损伤在内侧半月板后角 9 例。受伤至手术时间 2~5(2.7±1.4) d。

2 治疗方法

2.1 关节镜探查

腰麻成功后,取平卧位,大腿根部绑上止血带,常规消毒铺巾,首先在髌韧带两侧旁开 1.0 cm 各做一切口,置入关节镜,依次探查髌上囊、髌股关节软骨、内外侧半月板、前后交叉韧带等情况。确定半月板损伤部位、类型和程度。

2.2 半月板缝合

使用肩袖缝合器械 EXPRESS III(美国强生公司生产,图 1)。首先,修整半月板的磨损边缘,利用刨削器对半月板撕裂部做新鲜化处理。其次,安装 2 号不可吸收缝线(爱惜邦)到过线器上,并放入关节腔

内。然后,从半月板下方伸入后并超越半月板边缘(使缝针穿出的位点在半月板外缘的板胫韧带处),咬合,推动缝针,把缝线由下至上垂直板胫韧带穿出上表面,放入探钉把穿出的缝线抓住后回退过线器,或使用抓线器或组织抓钳抓住穿出的缝线端后退回过线器,利用抓线器把缝线两段再引一次线以保证打结时两段缝线在同一个软组织通道里。最后,缝线打结固定。见图 2。



图 1 美国强生公司的过线器
Fig.1 Rotator cuff suture threader from Johnson & Johnson

2.3 术后处理

术后当天常规给予膝关节支具保护在伸膝位,麻醉苏醒后即开始股四头肌肌力训练和踝关节的屈伸锻炼;术后次日行膝关节逐步屈曲功能练习,侧方抬腿和直腿抬高动作;1 周内达到屈膝 90°;术后 4 周内膝关节主动活动度维持在 0°~90°;术后 8 周支具保护下逐步负重行走,膝关节主动活动度维持在 0°~120°;术后 12 周,弃拐、完全负重行走,可尝试下蹲,并加强下肢肌肉力量训练。

3 结果

3.1 疗效评价标准

分别于术前和术后 12 个月采用 Lysholm 等^[1]膝关节评分评价临床疗效,包括跛行、拄拐、交锁、不稳定、疼痛、肿胀、爬楼梯、下蹲 8 方面,满分 100 分;采用疼痛视觉模拟评分^[2](visual analogue scale,

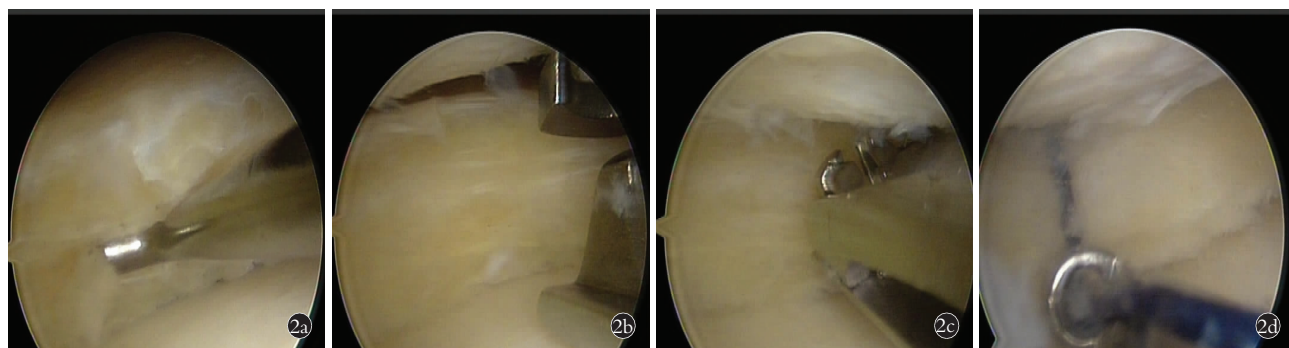


图 2 应用肩袖缝线过线器捆扎缝合操作的流程图 2a. 半月板层裂 2b. 肩袖过线器夹持层裂的半月板 2c. 导针引缝线垂直穿过半月板组织 2d. 缝合半月板

Fig.2 Sketch map of rotator cuff suture threader and strapping suture technique 2a. Meniscus tear level 2b. Occlusio tear by rotator cuff suture threader 2c. Through meniscus by lead wire with suture 2d. Suturing meniscus tear

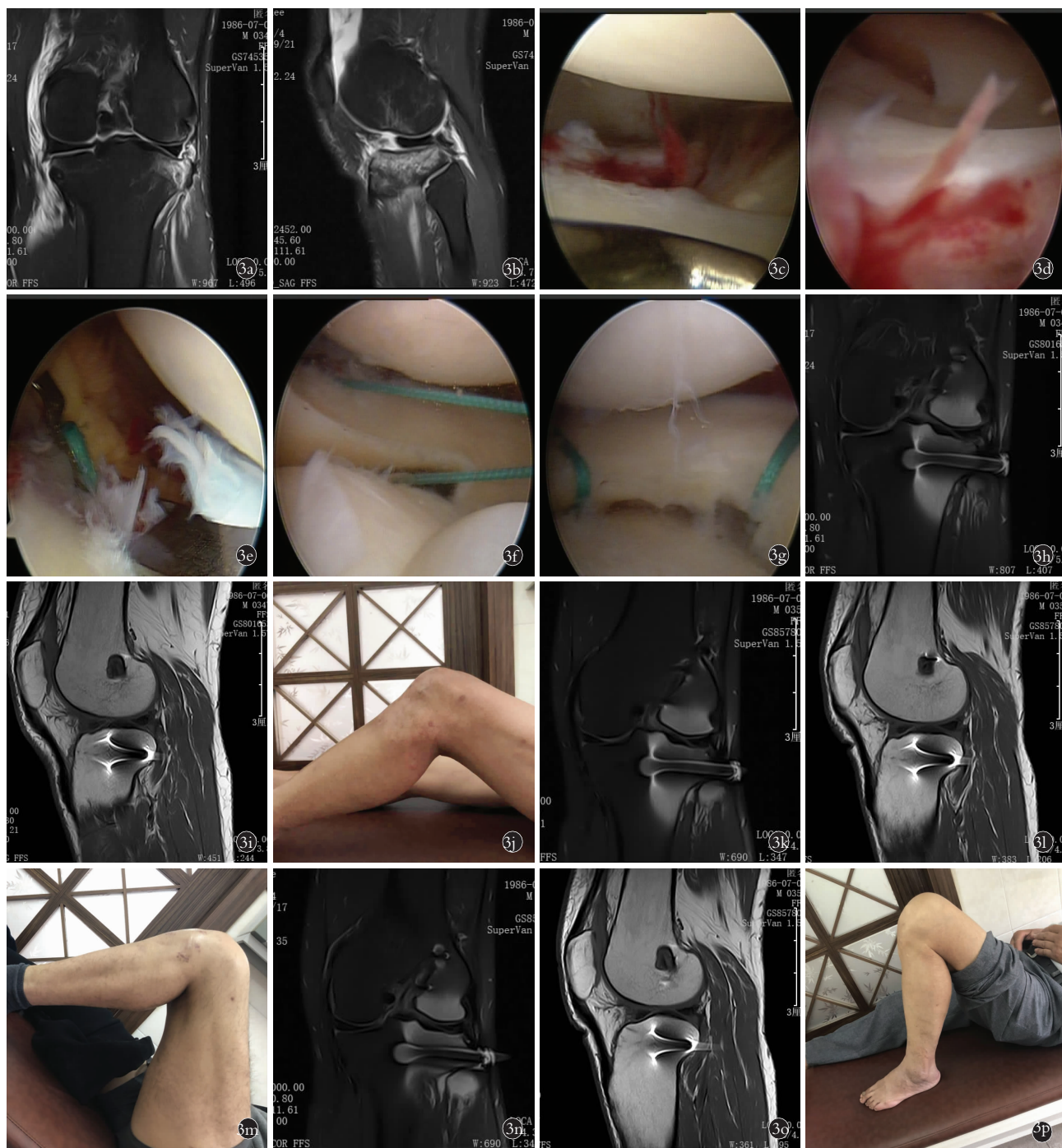


图 3 患者,男,39 岁,外侧半月板撕裂 **3a,3b**. 术前 MRI 冠状位、矢状位示外侧半月板红区桶柄样撕裂,撕裂半月板向内分离、移位 **3c,3d**. 术中关节镜下探查影像发现外侧半月板前角至体部红-红区桶柄样撕裂 **3e,3f**. 缝合,引线 **3g**. 半月板缝合后外观图 **3h,3i**. 术后 3 个月 MRI 冠状位、矢状位示外侧半月板复位良好 **3j**. 术后 3 个月外观图示膝关节功能良,屈曲 90° **3k,3l**. 术后 6 个月 MRI 冠状位、矢状位示外侧半月板复位良好,半月板愈合 **3m**. 术后 6 个月外观图示膝关节功能良好,屈曲 125° **3n,3o**. 术后 12 个月 MRI 冠状位、矢状位示外侧半月板复位良好,半月板愈合良好 **3p**. 术后 12 个月外观图示膝关节功能优,屈曲 135°

Fig.3 A 39-year male patient with lateral meniscus tear **3a,3b**. Preoperative on MRI coronal and sagittal position showed bucket-handle meniscus tear on the red region, and separated and shifted inward **3c,3d**. Intraoperative finding under arthroscopy showed bucket-handle meniscus tear on the red-red region from anterior horns to the body of lateral meniscus **3e,3f**. Lead wire and suture **3g**. Appearance of meniscal suture repair **3h,3i**. Postoperative MRI on coronal and sagittal position at 3 months showed good reduction of lateral meniscus **3j**. Postoperative appearance at 3 months showed knee joint function was good, flexion angle was about 90° **3k,3l**. Postoperative MRI on coronal and sagittal position at 6 months showed good reduction of lateral meniscus and good healing of meniscus tear **3m**. Postoperative appearance at 6 months showed knee joint function was good, flexion angle was about 125° **3n,3o**. Postoperative MRI on coronal and sagittal position at 12 months showed good reduction of lateral meniscus and good healing of meniscus tear **3p**. Postoperative appearance at 12 months showed knee joint function was excellent, flexion angle was about 135°

捆扎缝合,可完全实现全内垂直缝合,具有以下优势:(1)穿线过程简便(同肩袖手术缝合时操作步骤),效果与专门全内缝合工具相同。(2)无须做辅助入路,更加微创,完全实现全内缝合。(3)真正意义上的垂直缝合,缝合可靠,不愈合率低。捆扎缝合的特点在于缝合线不直接穿入半月板组织,而是缝经板韧带同半月板红区的交界处^[10]。

操作中仍须注意以下几点:(1)对于外侧半月板,因缝线过线器较大,应选用“4”字位以增大关节间隙,或通过调节膝关节屈伸角度,充分暴露半月板。(2)对内侧半月板进行缝合时,因内侧关节间隙相对狭小,可通过松解内侧副韧带侧束部分,增加内侧半月板的暴露。(3)操作过程中必须注意关节软骨的保护,必要时需要改用其他缝合方法。(4)过线退针时,若髁间棘阻挡,经皮置入 1 个注射针头,钩住缝线后,然后退出过线器。(5)如果过线针穿出半月板的线不够长,可先用线钩将缝线拉出,然后再退出过线器。(6)为减少因摩擦导致的缝线断裂,线结应尽量可能在半月板下表面。(7)使用刨刀进行半月板新鲜化,增加半月板愈合率。

4.4 本研究治疗体会

采用肩袖缝线过线器捆扎缝合术后,判断撕裂的半月板是否愈合,主要采用临床评估和影像学评估相结合的方法。(1)临床评估。严格的临床检查被用来确认一个临床结果是成功的,包括关节线压痛、麦氏征、膝关节积液。本组病例术后疼痛、关节线压痛发生率低,半月板临床愈合高。研究表明^[7,11],临床检查是评价修复半月板状态的可靠方法。由此一定程度佐证了临床检查评价的准确性。(2)MRI 与二次关节镜评估。本组病例末次随访复查膝关节 MRI 均提示半月板已愈合,但少数病例仍存在膝关节疼痛或关节线压痛等临床表现。因为影像学愈合(MRI 中的愈合),临床愈合(没有症状)和关节镜下愈合(在第二次关节镜中愈合和稳定)是不一样的,而且并不总是相关的^[12]。如果没有 MRI 成像或二次关节镜评估,半月板愈合的评估是困难的。因此,临床症状如果怀疑半月板不愈合,关节镜下的第二次观察仍然是评估半月板愈合的金标准^[13]。术后无症状的半月板修复并不能总是精确反映半月板的真实愈合状态,只有通过关节镜的二次检查才能证实半月板的愈合与否,这也是本研究的一个局限。

综上所述,尽管过线器体积较大,一定程度上缩小了其操作范围,但仍适用于大部分的半月板撕裂,解决了缺乏专用半月板缝合器情况下的半月板全内

缝合需求,且手术操作简便(类似肩袖手术缝合时操作步骤)、并发症少、术后疗效理想。所以,此手术方法能实现真正意义上的垂直缝合,疗效肯定,是镜下修复半月板撕裂的一种可靠术式选择。

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