

# Triple-Endobutton 技术治疗 Tossy III 型肩锁关节脱位

孙辽军, 卢迪, 陈华

(温州医科大学附属第二医院, 浙江 温州 325027)

**【摘要】** 目的: 分析 Triple-Endobutton 技术治疗 Tossy III 型肩锁关节脱位的临床疗效及并发症。方法: 2011 年 1 月至 2013 年 1 月, 采用 Triple-Endobutton 技术重建喙锁韧带治疗 Tossy III 型肩锁关节脱位 45 例, 其中男 35 例, 女 10 例; 年龄 19~60 岁, 平均 30.5 岁。末次随访时采用 VAS、DASH 及 Constant-Murley 评分评估治疗效果。结果: 所有患者获随访, 时间 15~36 个月, 平均 25.1 个月。术后无血管、神经损伤, 切口感染及应力性骨折等并发症发生, 但 3 例术后发生复位丢失。末次随访时 VAS 评分(0.2±0.1)较术前(5.7±1.6)降低; DASH 评分(0.3±0.1)较术前(19.6±4.3)降低; Constant-Murley 评分(94.8±3.5)较术前(34.4±4.3)提高。结论: 采用 Triple-Endobutton 技术治疗肩锁关节脱位疗效满意, 但复位丢失仍是其最常见的并发症, 细致的围手术期处理是防止复位丢失的重要因素。

**【关键词】** 肩锁关节; 脱位; 治疗效果; 外科手术

DOI: 10.3969/j.issn.1003-0034.2015.06.003

**Triple-Endobutton technique for the treatment of Tossy type III acromioclavicular joint dislocation** SUN Liao-jun, LU Di, and CHEN Hua. Department of Orthopaedics, the 2nd Hospital Affiliated to Wenzhou Medical College, Wenzhou 325027, Zhejiang, China

**ABSTRACT Objective:** To evaluate the clinical outcomes and complications of Triple-Endobutton plates in treating Tossy type III acromioclavicular joint dislocation. **Methods:** From January 2011 to January 2013, 45 patients with Tossy type III acromioclavicular joint dislocation were treated with Triple-Endobutton plates. There were 35 males and 10 females with an average age of 30.5 (ranged from 19 to 60) years old. At the final follow-up, VAS, DASH, Constant-Murley criterion were used to evaluate shoulder function. **Results:** All patients were followed up from 15 to 36 months. No neurovascular injury, wound infection and stress fractures were found, but 3 patients had a re-dislocation. At the final follow-up, the mean VAS score was decreased from (5.7±1.6) preoperatively to postoperative (0.2±0.1); DASH score was significantly decreased from (19.6±4.3) preoperatively to (0.3±0.1) postoperatively; Constant-Murley score was improved from (34.4±4.3) before operation to (94.8±3.5) after operation. **Conclusion:** Clinical outcomes of treating Tossy type III acromioclavicular joint dislocation with Triple-Endobutton plates is satisfactory. However, re-dislocation is still the most common complication. Careful perioperative management is an important factor in preventing re-dislocation.

**KEYWORDS** Acromioclavicular joint; Dislocations; Treatment outcomes; Surgical procedure, operative

Zhongguo Gu Shang/China J Orthop Trauma, 2015, 28(6): 495-499 www.zggszz.com

肩锁关节脱位是常见的上肢损伤, 其发生率约占所有肩部损伤的 12%<sup>[1]</sup>。根据肩锁关节脱位的程度不同, 按 Tossy 分度可分为 3 型<sup>[2]</sup>。目前普遍主张对 Tossy III 型肩锁关节脱位患者采取手术治疗<sup>[1,3-4]</sup>。肩锁关节脱位的手术方法众多, 包括克氏针固定、螺钉固定、锁骨钩钢板固定、韧带转移、喙锁缝线和缝合锚等等<sup>[1,3-5]</sup>, 但目前临床上治疗肩锁关节脱位的手术方式仍无统一标准。

2007 年 Struhl 等<sup>[6]</sup>首次将原用于进行交叉韧带

重建的 Double-Endobutton 钢板用来重建喙锁韧带以治疗肩锁关节脱位, 短期随访疗效满意。随着研究的深入及随访时间的延长, 有学者陆续报道了 Double-Endobutton 技术的并发症, 并提出采用 Triple-Endobutton 技术治疗肩锁关节脱位, 以减少复位丢失等并发症<sup>[7-9]</sup>。自 2011 年 1 月至 2013 年 1 月采用 Triple-Endobutton 技术治疗肩锁关节脱位 45 例, 疗效满意, 现报告如下。

## 1 临床资料

本组 45 例, 男 35 例, 女 10 例; 年龄 19~60 岁, 平均 30.5 岁。纳入标准: 新鲜肩锁关节脱位; Tossy III 型; 无严重骨质疏松。排除标准: 合并喙突骨折; 狭

通讯作者: 陈华 E-mail: chenhuayishi@163.com

Corresponding author: CHEN Hua E-mail: chenhuayishi@163.com





图 1 患者,女,46 岁,Tossy III 型左肩锁关节脱位 1a. 术前 X 线片 1b. 术后第 2 天肩关节正位 X 线片示肩锁关节脱位完全复位,但喙突下 Endobutton 钢板位置偏于内侧 1c. 术后 50 d 肩关节正位 X 线片示肩锁关节发生再次脱位,喙突下 Endobutton 钢板往内上方偏移

Fig. 1 A 46-year-old female patient with Tossy type III left acromioclavicular joint dislocation 1a. Preoperative X-ray 1b. Postoperative AP X-ray of acromioclavicular joint on the 2nd day showed good reduction of acromioclavicular joint, but the endobutton plate under the coracoid tilted to inside 1c. Postoperative AP X-ray on the 50th day showed redislocation of acromioclavicular joint and the endobutton plate under the coracoid shifted to the inside and upper

多国内外学者报道了该技术良好的短期效果<sup>[12-14]</sup>。早期研究中大多数学者均采用 2 块 Endobutton 钢板结合 2 根 5 号爱惜邦线来重建喙锁韧带锥状部分,但对斜方韧带未行真正解剖重建。随着研究的深入,有学者报道了上述双 Endobutton 技术的缺陷及并发症,包括复位丢失、松动、钢板周围骨质吸收等<sup>[12,15]</sup>。为了减少并发症,有作者<sup>[7]</sup>提出采用 4 股 2 号爱惜邦线加环形祥和 6 股 2 号爱惜邦线结合 Endobutton 钢板,分别重建锥状韧带和斜方韧带,即所谓的 Triple-Endobutton 技术。与 Double-Endobutton 技术相比, Triple-Endobutton 技术的爱惜邦线数量增加,在重建斜方韧带时加用 1 块 Endobutton 钢板。生物力学试验证实 3 股 2 号爱惜邦缝线的拉伸强度与喙锁韧带基本相当<sup>[16]</sup>。Endobutton 钢板的拔出强度可达 1 150 N,环形祥的强度和刚度则超过自身喙锁韧带的 40%<sup>[6]</sup>。从上述生物力学角度看, Triple-Endobutton 技术明显优于 Double-Endobutton 技术。本研究也采用与上述相同的 Triple-Endobutton 技术,实现解剖重建锥状韧带和斜方韧带,使肩锁关节获得牢固固定,术后即可早期开始肩关节功能锻炼,促进关节功能恢复。此外, Triple-Endobutton 技术具有操作简单,创伤小,无须 II 期取出内固定物。本组的良好结果也进一步证实了 Triple-Endobutton 技术的可靠临床效果。

#### 4.2 Triple-Endobutton 技术的疗效及并发症分析

Triple-Endobutton 技术的总体疗效目前文献报道较满意,术后平均 VAS 评分在 0.2~0.5 之间,平均 Constant 评分 85.0~95.7<sup>[7-9]</sup>。本研究术后 VAS 评分为 0.2±0.1, Constant 评分为 94.8±3.5。本组术后均未见

血管、神经损伤、感染,应力骨折及袢断裂等并发症发生,然而复位丢失仍是其最常见的并发症发生。文献报道 Endobutton 技术的复位丢失率在 4.3%~7.1%<sup>[7,9,17]</sup>。本组 3 例发生复位丢失,均为早期病例,笔者总结以往经验并结合文献,分析其原因主要有以下几个方面:(1)Endobutton 钢板在临床应用时间较短,手术操作有一个相对的学习曲线过程,手术操作的准确性及熟练度是复位丢失的最主要原因。(2)术中导针的钻孔位置没在喙突基底部中央,及反复钻孔容易致喙突骨折或孔道过大致 Endobutton 钢板从孔道滑脱。(3)喙突下的 Endobutton 钢板没有翻转并紧贴置于喙突的下表面,过分偏内侧或者外侧。(4)锁骨上钻孔位置偏差。正确的钻孔位置应在距离肩锁关节内侧约 2 cm 偏前和 3 cm 偏后位置处,此处复位及固定力量最强<sup>[6]</sup>。(5)Endobutton 钢板袢的长度选择不当。为了满足弹性固定的要求,应选择比实际测量值稍长的钢板袢。尽管有学者<sup>[18]</sup>强调锁骨复位时应给予过度复位(选择比测量值小 1 号的袢),以此来减少复位丢失,但不符合肩锁关节的生理状况,无法保证锁骨的正常转动,也不利于肩锁关节的微动。有学者<sup>[12]</sup>甚至发现术中过度复位的患者术后喙锁间距增加距离大于正常复位患者,但袢过长容易造成复位丢失。(6)袢的方向与钢板的方向没有垂直。在肩锁关节周围持续的节律性运动下高分子袢对喙突及锁骨可产生切割作用,必然导致环形袢的蠕变,强度逐渐下降容易导致固定松动甚至失败<sup>[19]</sup>。(7)应修复肩锁韧带及关节囊,以维持肌力平衡,恢复肩锁关节水平稳定。(8)术后正确的康复锻炼也是一个重要的影响因素。本组 3 例均为术

后 1~2 个月发生再次脱位, 此时正是患者肩关节运动量明显增加的时期, 正确指导患者进行康复锻炼尤为重要。

#### 参考文献

- [1] Tauber M. Management of acute acromioclavicular joint dislocations: current concepts[J]. Arch Orthop Trauma Surg, 2013, 133(7): 985-995.
- [2] Tossy JD, Mead NC, Sigmond HM. Acromioclavicular separations: useful and practical classification for treatment[J]. Clin Orthop Relat Res, 1963, 28: 111-119.
- [3] Modi CS, Beazley J, Zywiell MG, et al. Controversies relating to the management of acromioclavicular joint dislocations[J]. Bone Joint J, 2013, 95(12): 1595-1602.
- [4] Beitzel K, Cote MP, Apostolakis J, et al. Current concepts in the treatment of acromioclavicular joint dislocations[J]. Arthroscopy, 2013, 29(2): 387-397.
- [5] Epstein D, Day M, Rokito A. Current concepts in the surgical management of acromioclavicular joint injuries[J]. Bull NYU Hosp Jt Dis, 2012, 70(1): 11-24.
- [6] Struhl S. Double endobutton technique for repair of complete acromioclavicular joint dislocation[J]. Tech Shoulder Elbow Surg, 2007, 8(4): 175-179.
- [7] 王海明, 陈云丰, 陆叶, 等. Triple-Endobutton 技术与锁骨钩钢板置入治疗肩锁关节脱位的比较[J]. 中国组织工程研究, 2012, 16(17): 3105-3110.  
Wang HM, Chen YF, Lu Y, et al. Comparison of Triple-Endobutton and clavicular hook plate implantation for the treatment of acromioclavicular joint dislocation[J]. Zhongguo Zu Zhi Gong Cheng Yan Jiu, 2012, 16(17): 3105-3110. Chinese.
- [8] 尹吉恒. Triple-Endobutton 钢板置入治疗 Rockwood III-V 型肩锁关节脱位[J]. 中国骨伤, 2014, 27(1): 61-63.  
Yin JH. Triple-Endobutton plates for the treatment of rockwood type III to V acromioclavicular joint dislocation[J]. Zhongguo Gu Shang/China J Orthop Trauma, 2014, 27(1): 61-63. Chinese with abstract in English.
- [9] Wei HF, Chen YF, Zeng BF, et al. Triple endobutton technique for the treatment of acute complete acromioclavicular joint dislocations: preliminary results[J]. Int Orthop, 2011, 35(4): 555-559.
- [10] Constant CR, Murley AH. A clinical method of functional assessment of the shoulder[J]. Clin Orthop Relat Res, 1987, (214): 160-164.
- [11] De Smet L. The DASH questionnaire and score in the evaluation of hand and wrist disorders[J]. Acta Orthop Belg, 2008, 74(5): 575-581.
- [12] 颜瑞健, 陆建伟, 张春. 改良双 Endobutton 技术治疗 Tossy III 型肩锁关节脱位的远期疗效分析[J]. 中国骨伤, 2014, 27(1): 9-12.  
Yan RJ, Lu JW, Zhang C. Analysis on the long-term effects of modified double endobutton technique in the treatment of Tossy type III acromioclavicular joint dislocations[J]. Zhongguo Gu Shang/China J Orthop Trauma, 2014, 27(1): 9-12. Chinese with abstract in English.
- [13] 诸力, 杨贺杰, 赵万军, 等. Endobutton 袢钢板和锁骨钩钢板治疗新鲜肩锁关节脱位的病例对照研究[J]. 中国骨伤, 2012, 25(2): 120-123.  
Zhu L, Yang HJ, Zhao WJ, et al. Case-control study on endobutton plate or clavicular hook plate for the repair of acromioclavicular joint dislocations[J]. Zhongguo Gu Shang/China J Orthop Trauma, 2012, 25(2): 120-123. Chinese with abstract in English.
- [14] Shetty NS, Yoo YS, Kim do Y, et al. Open anatomical coracoclavicular ligament reconstruction using a tendon graft with an Endobutton loop[J]. Acta Orthop Belg, 2009, 75(6): 828-831.
- [15] 田竞, 于海龙, 薛海鹏, 等. Endobutton 技术治疗肩锁关节脱位失效的原因分析[J]. 中国骨与关节外科, 2012, 5(6): 497-500.  
Tian J, Yu HL, Xue HP, et al. Failure cause of treating acromioclavicular joint dislocation by Endobutton technique[J]. Zhongguo Gu Yu Guan Jie Wai Ke, 2012, 5(6): 497-500. Chinese.
- [16] Barber FA, Herbert MA, Richards DP. Sutures and suture anchors; update 2003[J]. Arthroscopy, 2003, 19(9): 985-990.
- [17] 朱建伟, 刘璠, 张建华, 等. 三重固定纽扣钢板解剖重建陈旧性 III 度肩锁关节脱位[J]. 中国修复重建外科杂志, 2012, 26(2): 201-204.  
Zhu JW, Liu F, Zhang JH, et al. Triple endobutton technique for repair of chronic complete acromioclavicular joint dislocations[J]. Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi, 2012, 26(2): 201-204. Chinese.
- [18] Wang SJ, Wong CS. Transacromial extra-articular Knowles pin fixation treatment of acute type V acromioclavicular joint injuries[J]. J Trauma, 2008, 65(2): 424-429.
- [19] Lim YW, Sood A, Van Riet RP, et al. Acromioclavicular joint reduction, repair and reconstruction using metallic buttons-early results and complications[J]. Techniques in Shoulder & Elbow Surgery, 2007, 8(4): 213-221.

(收稿日期: 2014-12-24 本文编辑: 连智华)