关节镜下治疗不同肩肱距离的大型和巨大肩袖撕裂的疗效比较

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摘要:目的 探讨关节镜下治疗不同肩肱距离(acromiohumeral distance,AHD)的大型和巨大肩袖撕裂的临床疗效。**方法** 回顾性分析2018年1月至2022年6月于徐州医科大学附属医院骨科接受关节镜治疗的125例大型和巨大肩袖撕裂患者的临床资料。根据AHD不同分为2组,AHD≥7 mm患者69例(AHD正常组),AHD <7 mm患者56例(AHD减小组)。比较2组患者术前和术后1年疼痛视觉模拟评分(vsual analogue score,VAS)、Constant-Murley评分、美国加州大学洛杉矶分校肩关节评分(University of California at Los Angeles Shoulder Scores,UCLA)、美国肩肘外科医师学会评分(American Shoulder and Elbow Surgeons,ASES)和肩关节活动度,并进行统计学分析。术后1年根据肩关节MRI影像学Sugaya分型标准评估肩袖愈合情况,比较2组术后肩袖再撕裂发生率。**结果** 2组患者的AHD值比较差异有统计学意义($P<0.05$);其他一般资料比较,差异均无统计学意义(均$P>0.05$)。术后1年时,2组患者的肩关节活动度较术前均有明显改善,差异有统计学意义($P<0.05$)。AHD正常组的肩关节活动度(前屈、外展、体侧外旋)优于AHD减小组(均$P<0.05$)。术后1年,2组的VAS、Constant-Murley、UCLA、ASES评分较术前均有明显改善,差异有统计学意义(均$P<0.05$)。AHD正常组的VAS、Constant-Murley、UCLA、ASES评分均优于AHD减小组(均$P<0.05$)。术后1年时复查MRI,AHD正常组再撕裂率为13.0%(9/69),AHD减小组再撕裂率为30.4%(17/56),差异有统计学意义($P=0.018$)。**结论** 对于大型和巨大肩袖撕裂患者,AHD正常者比AHD减小者肩袖修复术后疼痛缓解更明显,肩关节功能更好,肩袖再撕裂发生率更低。AHD可以作为大型和巨大肩袖撕裂修复术后临床疗效的一个预测指标。

关键词:肩关节;肩袖撕裂;关节镜检查;修复外科手术;回旋套损伤;缝合锚

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Comparison of the therapeutic effect of arthroscopic treatment of large and massive rotator cuff tears with different acromiohumeral distance

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Abstract: Objective To explore the clinical effect of arthroscopic treatment for large and massive rotator cuff tears with different acromiohumeral distance (AHD). **Methods** A total of 125 patients with large and massive rotator cuff tears who underwent arthroscopic treatment in Department of Orthopedics, the Affiliated Hospital of Xuzhou Medical University from January 2018 to June 2022 were selected and their clinical data were retrospectively analyzed. According to their AHD, the patient were divided into two groups: a normal AHD group (AHD≥7 mm, $n=69$) and a reduced AHD group (AHD<7 mm, $n=56$). Their pain visual analog score (VAS), Constant-Murley score, University of California at Los Angeles (UCLA) shoulder scores, American Society of Shoulder and Elbow Surgeons (ASES) scores, and the shoulder joint range of motion before surgery and one year after surgery were compared for statistical analysis. Their healing of the rotator cuff one year after surgery based on the Sugaya classification criteria of shoulder joint MRI imaging, and the incidence of rotator cuff retearing after surgery were recorded. **Results** A statistical difference was

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found in AHD values between the two groups ($P<0.05$). There was no statistical difference in other data (all $P>0.05$). One year after surgery, both groups showed significant improvement in shoulder joint range of motion compared with those before surgery ($P<0.05$), where the shoulder joint ranges of motion (flexion, abduction, and lateral rotation) in the normal AHD group was better than those in those reduced AHD group (all $P<0.05$). One year after surgery, both groups showed significant improvement in VAS scores, Constant-Murley scores, UCLA scores, and ASES scores compared with those before surgery ($P<0.05$), where the VAS scores, Constant-Murley scores, UCLA scores, and ASES scores in the normal AHD group was better than those in the reduced AHD group (all $P<0.05$). One year after surgery, MRI was reexamined, and the retearing rate was 13.0% (9/69) for the normal AHD group, and 30.4% (17/56) for the reduced AHD group, with statistical difference ($P=0.018$). **Conclusions** For patients with large and massive rotator cuff tears, patients with normal AHD present more significant pain relief after rotator cuff repair surgery than those with reduced AHD, with better shoulder joint functions and a lower incidence of rotator cuff retearing. AHD can serve as a predictive indicator of clinical efficacy after repair of large and massive rotator cuff tears.

Key words: shoulder joint; rotator cuff tears; arthroscopic examination; repair surgery; rotary sleeve damage; suture anchor

肩袖撕裂和肩峰下撞击之间存在着复杂的关系。有研究发现,肩袖撕裂患者肩峰和肱骨头之间的距离,即肩肱距离(acromiohumeral distance,AHD)显著减小[1]。AHD 减小通常发生在肌腱断裂回缩的大型和巨大肩袖撕裂患者中。在缺失肩袖的情况下,三角肌的牵拉会导致肱骨头向上移动[2-3]。大型和巨大肩袖撕裂往往具有肌腱退变严重、断端回缩明显,与周围组织广泛粘连的特征,手术修复难度较大,且术后肩袖再撕裂发生率较高[4-5]。Tanaka 等[6]认为关节镜下修复大型和巨大肩袖撕裂可以获得良好的临床疗效,但术后的再撕裂率仍然较高。对于大型和巨大肩袖撕裂患者,术前 AHD 正常或减小是否会影响肩袖修复术后的临床疗效? 是否会影响术后的再撕裂率? 目前尚未报道。本研究回顾性分析 2018 年 1 月至 2022 年 6 月徐州医科大学附属医院骨科采用关节镜治疗的大型和巨大肩袖撕裂患者资料,比较 AHD 正常和 AHD 减小患者的临床疗效。

1　资料和方法

1.1　*纳入与排除标准*　纳入标准:①经术前 MRI 检查和术中关节镜检查根据 DeOrio-Cofield 分型标准[7]确诊为大型(3~5 cm)和巨大(>5 cm)肩袖撕裂;②术前 MRI 评估肩袖 Goutallier 脂肪浸润分级≤ 2 级;③获得 1 年以上随访。排除标准:① 合并肩关节脱位、盂唇损伤、肩关节骨折、肱二头肌长头腱损伤需要切断或固定、肩锁关节炎需要切除锁骨远端;②合并颈椎病、糖尿病、神经损伤;③肌腱严重回缩或脂肪浸润明显而不可修复,或不能完全修复的大型和巨大肩袖撕裂;④既往肩关节手术史;⑤无法完成全部随访或术后缺少核磁共振检查的患者。

1.2　*一般资料*　回顾性分析 2018 年 1 月至 2022 年 6 月于徐州医科大学附属医院骨科接受关节镜治疗的大型和巨大肩袖撕裂患者,共 125 例。在标准肩关节正位 X 线片上,根据 AHD 不同分为 2 组,AHD≥7 mm 患者 69 例,纳入 AHD 正常组;AHD<7 mm 患者 56 例,纳入 AHD 减小组。本研究已获得徐州医科大学附属医院医学伦理委员会批准(XY-FY2022-KL408-01)。

1.3　*手术方法*　所有手术均采用全身麻醉,并由同一组医生完成。患者健侧卧位,患肢牵引。首先通过后方入路探查盂肱关节,检查肱骨头、关节盂、肱二头肌长头腱、肩袖等结构,建立前方入路,清理炎性滑膜;然后探查肩峰下间隙,清理并行肩峰下减压,适当行肩峰成形术,注意保护喙肩韧带。建立外侧入路,观察肩袖撕裂的位置、大小和形态;清理肩袖残端,对肩袖足印区域的骨床进行新鲜化,置入锚钉(施乐辉公司,美国);合并肩胛下肌腱损伤患者术中同时修复。所有患者均采用单排缝合方法修复肩袖。

1.4　*术后康复*　2 组患者术后采用相同的康复治疗方案。患者在术后 6~8 周内(大型撕裂 6 周,巨大撕裂 8 周)佩戴肩关节外展抱枕,并在同一位康复医生的指导下进行肩关节被动锻炼,如张手握拳、肘关节活动、摆动练习、肩关节被动前屈和内外旋。术后 6~8 周去除抱枕,开始进行肩关节主动锻炼,如梳头发、拉滑轮等。术后 3 个月开始进行抗阻训练,如拉弹力绳等。

1.5　*观察指标*　在术前和术后 1 年时,采用视觉模拟评分(visual analogue scale,VAS)评估疼痛。测量

肩关节前屈、外展和体侧外旋角度评价肩关节活动度。采用 Constant-Murley 评分、美国加利福尼亚大学洛杉矶分校评分(University of California at Los Angeles Shoulder Scores,UCLA)和美国肩肘外科协会(American Shoulder & Elbow Surgeons,ASES)评分评价肩关节功能。根据肩关节 MRI 影像学 Sugaya 分型标准对肩袖愈合情况进行评估。Ⅰ、Ⅱ、Ⅲ型定义为肩袖愈合;Ⅳ、Ⅴ型定义为肩袖再撕裂。记录 2 组患者肩袖再撕裂的发生率和并发症发生情况。

1.6　统计学处理　采用 SPSS 22.0 软件进行统计学分析。计量资料以 $\bar{x}\pm s$ 描述,组间比较采用 t 检验。计数资料以例(%)描述,比较采用 χ^2 检验。$P<0.05$ 为差异有统计学意义。

2　结　果

2.1　一般资料比较　AHD 正常组患者的 AHD 平均值为(9.4±1.5)mm,AHD 减小组患者的 AHD 平均值为(4.3±1.3)mm。2 组患者的 AHD 值比较,差异有统计学意义($P<0.05$);其他术前一般资料比较,差异均无统计学意义(均为 $P>0.05$)(表 1)。

2.2　肩关节活动度比较　术后 1 年,2 组患者的肩关节活动度较术前均有明显改善,差异有统计学意义($P<0.05$),AHD 正常组的肩关节活动度(前屈、外展、体侧外旋)优于 AHD 减小组(均 $P<0.05$)(表 2)。

2.3　肩关节功能比较　术后 1 年,2 组患者的 VAS、Constant-Murley、UCLA、ASES 评分较术前均有明显改善,差异有统计学意义(均 $P<0.05$)。AHD 正常组的 VAS、Constant-Murley、UCLA、ASES 评分均优于 AHD 减小组(均 $P<0.05$)(表 3)。

2.4　再撕裂率比较　术后 1 年复查 MRI,AHD 正常组再撕裂率为 13.0%(9/69),AHD 减小组再撕裂率为 30.4%(17/56),差异有统计学意义($P=0.018$)(表 3)。2 组均未发生感染、锚钉脱出、神经损伤、血管损伤等并发症。典型病例见图 1。

表 1　2 组患者的术前一般资料比较

组别	例数	AHD 值(mm)	年龄(岁)	性别(男/女,例)	侧别(左/右,例)	体重指数(kg/m²)	外伤史(有/无,例)	吸烟史(有/无,例)	撕裂大小(大撕裂/巨大撕裂,例)	病程(月)
AHD 正常组	69	9.4±1.5	57.9±10.5	29/40	27/42	24.1±2.8	15/54	9/60	45/24	18.7±5.9
AHD 减小组	56	4.3±1.3*	58.8±11.3	21/35	25/31	23.8±2.6	16/40	8/48	38/18	19.7±6.8

表 2　2 组患者的肩关节活动度比较(°,$\bar{x}\pm s$)

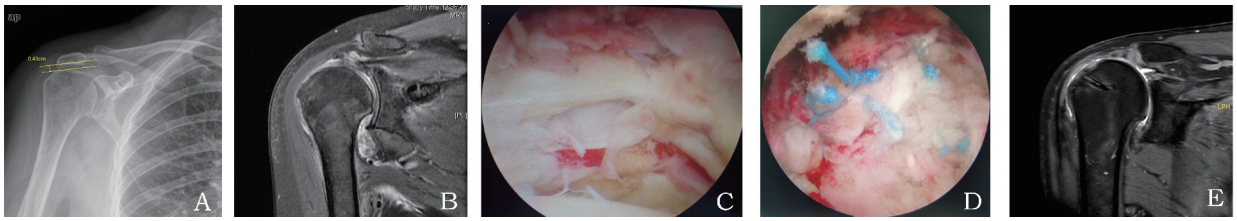
组别	例数	前屈		外展		体侧外旋	
		术前	术后	术前	术后	术前	术后
AHD 正常组	69	85.7±25.6	141.9±15.5	70.2±18.2	133.6±18.3	21.2 ±8.5	39.1±11.7
AHD 减小组	56	82.4±23.1	132.8±16.5*	67.8±16.6	125.3±16.7*	20.1±9.3	32.9±10.3*

2 组间比较:*$P<0.05$

表 3　2 组患者的 VAS、Constant、UCLA、ASES 评分及肩袖再撕裂情况比较

分组	例数	VAS 评分		Constant 评分		UCLA 评分		ASES 评分		肩袖再撕裂
		术前	术后	术前	术后	术前	术后	术前	术后	(愈合/再撕裂,例)
AHD 正常组	69	7.1±1.5	1.2±0.8	46.8±10.3	84.3±9.7	14.5±3.2	30.3±3.7	39.1±6.2	83.5±8.9	60/9
AHD 减小组	56	6.9±1.4	1.7±0.8*	45.5±9.3	78.4±8.1*	13.9±3.4	25.8±3.6*	37.9±7.0	77.4±7.8*	39/17*

2 组间比较:*$P<0.05$



患者女,60 岁,右肩巨大肩袖撕裂,AHD 为 4.3 mm,行关节镜下肩袖修复治疗。A. 肩关节正位 X 线示 AHD<7 mm;B. 术前 MRI 示肩袖全层撕裂,断端回缩;C. 术中探查见肩袖撕裂口巨大;D. 关节镜下行肩袖修复手术,撕裂口完全闭合;E. 术后 1 年复查 MRI 示肩袖再撕裂,Sugaya 分型 V 型。

图 1　AHD 减小患者行肩关节镜手术治疗

3　讨　论

AHD 通常用于测量肩峰下间隙[8],AHD<7 mm 与肩袖退行性疾病有关[9]。AHD 减小已被确定为肩袖撕裂的一个特征性指征[10]。McCreesh 等[11-12]认为 AHD 减小与肩袖撕裂相关。随着 AHD 减小,肩袖撕裂的发生率也会增加[3,13-16]。Weiner 等[17]研究发现,正常肩关节的 AHD 值为 7~14 mm ,平均为 10.5 mm,而肩袖撕裂会引起 AHD 的减小,导致肱骨头的上移。冈上肌腱缺失是肱骨头向上移位的根本原因,原因是没有向下的力来抵消三角肌向上的拉力。Hamada 等[18]提出,肩袖缺失会导致肱骨头向上移位,并增加肱二头肌长头腱的应力,以稳定三角肌向上的拉力。如果肱二头肌长头肌腱断裂,会导致肱骨头进一步的向上移位。de Oliveira 等[19]认为肱骨头的上移与肩袖撕裂的大小、回缩程度和撕裂的位置相关,肩袖上部、后部撕裂和巨大肩袖撕裂患者的上移程度更大。有学者认为,肩袖撕裂与 AHD 的减小可以互为因果,AHD 的减小可以加速肩袖的撕裂,而肩袖撕裂后盂肱关节的不稳会导致肱骨头上移,使 AHD 变得更小[1,20]。本研究结果显示,AHD 减小与肩袖撕裂相关,这也和以上多位学者的观点一致。

大型和巨大肩袖撕裂的治疗一直是临床治疗的难点,治疗方法也存在争议。在各种治疗方法中,重新连接所有撕裂的肌腱进行完全修复仍然是首选且最理想的治疗方法[21-23]。有学者发现,肩袖撕裂修复术后的临床疗效与很多因素有关,包括年龄、风湿病、肌腱修复张力、冈上肌脂肪浸润程度、术前 ASES 评分等[24-25]。本研究发现,大型和巨大肩袖撕裂修复术后的临床疗效与 AHD 相关。AHD 正常患者比 AHD 减小患者术后疼痛缓解更明显,肩关节功能更好,肩袖再撕裂发生率更低。这也和 Mirzayan 等[26-27]研究结果一致,即 AHD 不仅与肩关节疾病的疼痛程度有关,还与肩关节手术的预后相关。Nove-Josserand 等[28]也认为 AHD 减小是肩袖撕裂修复术后预后不良的标志。Caffard 等[29-30]认为肩肱距离减小与冈上肌腱修复术后发生肩袖再撕裂有关。可见,AHD 减小不仅与肩袖撕裂的诊断相关,还与肩袖修复术后的临床疗效及再撕裂率相关。因此,我们认为 AHD 可以作为肩袖修复术后临床疗效的一个预测指标。

本研究的局限性:①研究样本量较少,随访时间较短,以后需要进行大样本量的长期随访来验证其临床疗效;②本研究未纳入部分撕裂、小撕裂和中等撕裂患者;③本研究中仅纳入单排缝合方法,未考虑其他缝合方法,以后有待进一步研究。

综上所述,AHD 正常的大型和巨大肩袖撕裂患者比 AHD 减小患者,肩袖修复术后疼痛缓解更明显,肩关节功能更好,肩袖再撕裂发生率更低。AHD 可以作为大型和巨大肩袖撕裂修复术后临床疗效的一个预测指标。

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