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Effect of diabetes mellitus on functional recovery after rotator cuff surgery

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Abstract

Objective: Through a retrospective analysis, the shoulder joint function, range of motion and rotator cuff re-tear were compared between patients with diabetes mellitus (DM) and non-diabetic patients who underwent shoulder arthroscopy with absorbable anchors for rotator cuff injury. The effect of diabetes on rotator cuff repair with absorbable anchors provides a theoretical basis for the formulation of surgical plans and implant selection for patients with rotator cuff injury. Methods: The patients who underwent primary unilateral shoulder arthroscopic rotator cuff repair in our hospital from June 2018 to December 2020 were selected and divided into the diabetes group and the normal group according to the established inclusion and exclusion criteria. The pain visual analog scale (VAS), shoulder flexion, abduction, neutral external rotation, and body posture were measured before operation, at 1 month, 6 months after operation, and at the last follow-up, respectively. Range of motion (ROM) assessment of lateral pronation, The American Society of Shoulder and Elbow Physicians (ASES) score, Constant score and blood test were also recorded before operation and at the last follow-up after operation. Results: At 6 months after operation, the forward flexion angle of the diabetes group was worse than that of the normal group (P<0.05). At the last follow-up, the forward flexion, abduction, and internal rotation of the diabetes group were worse than that of the normal group (P<0.05). At 3 months after operation, the VAS score of the normal group was better than that of the diabetes group (P<0.05). there was no significant difference in VAS score between the normal group and the diabetes group at 6 months after operation and at the last follow-up (P>0.05). At 3months, 3months after operation and the last follow-up, there was no significant difference in the AESE score and Constant score between the normal and diabetic groups (P > 0.05). At the last follow-up, there was no significant difference in the rotator cuff re-tear rate between the two groups (P>0.05). Compared with the good blood sugar control group, there was no statistical difference in the rotator cuff re-tear rate in the poor blood sugar control group (P>0.05). Conclusion: The active range of motion in diabetic patients after absorbable anchors to repair the rotator cuff under arthroscopy was slightly worse than that in non-diabetic patients, but there was no significant difference in functional score and rotator cuff re-tear rate between two groups of patients.

Keywords

Diabetes; absorbable screw; functional recovery; rotator cuff tear.

1. Introduction

The shoulder plays an extremely important role in daily life and is the joint with the greatest motion range and flexibility in humans. Shoulders are easily injured by external forces. Rotator

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cuff tears (RCT) are the most common cause of shoulder disability and can cause significant pain and dysfunction. The outcome of RCT repair has been improved by recent advances in surgical techniques and instruments including arthroscopy. However, the procedure is accompanied by a high failure rate (20%–94%) of tendon-to-bone healing.

Diabetes is an important risk factor for postoperative rotator cuff retear. Animal experiments have shown that compared with nondiabetic rats, diabetic rats have less fibrocartilage and tissue collagen formation at the tendon-bone interface after rotator cuff repair, and the maximum failure load is lower, which indicates that continuous hyperglycemia can inhibit rotator cuff healing after repair. Moreover, clinical studies have revealed that diabetic patients exhibit poorer efficacy after rotator cuff repair than nondiabetic patients and present higher failure and infection rates.

In previous studies, few articles have clarified the influence of diabetes from the perspective of postoperative functional recovery. This study conducted a retrospective analysis to compare the shoulder joint function, range of motion and re-tear of rotator cuff between diabetic patients and non-diabetic patients after arthroscopic repair of rotator cuff, so as to clarify the effect of diabetes on the repair of rotator cuff with absorbable anchors, so as to provide a strong theoretical basis for the development of surgical plans and the selection of implants for patients with rotator cuff injury in clinical practice.

2. Materials and Methods

2.1. Research Data

2.1.1. Subjects

Patients who underwent primary unilateral arthroscopic rotator cuff repair in our hospital from June 2018 to December 2020 were enrolled in this study. According to the inclusion and exclusion criteria, they were divided into diabetic group (DM group) and non-diabetic group (normal group) according to the presence or absence of diabetes. Respectively in the preoperative and postoperative march, June, and, at the time of the last follow-up of patients with visual analogue scale (visual analogue scale, VAS), the American association of Shoulder Elbow surgery (American Shoulder and here Surgeons, The range of motion (ROM) of shoulder joint including forward flexion, abduction, external rotation in neutral position, and lateral internal rotation were evaluated. At the last follow-up, magnetic resonance imaging (MRI) of the affected shoulder joint was performed to evaluate the healing and re-tear of rotator cuff, and the re-tear rate of rotator cuff in the two groups was calculated. Diabetic group: 58 patients with rotator cuff tear complicated with diabetes were initially included, 6 patients had incomplete follow-up data, and 52 patients were finally included. There were 24 males and 28 females, with an average age of 61±4.6 years. Normal group: 138 rotator cuff tear patients without diabetes mellitus were initially included, 17 patients had incomplete follow-up data, and 121 patients were finally included. There were 56 males and 65 females, with an average age of 60±5.1 years. Fasting blood glucose and glycosylated hemoglobin were measured in all patients at admission. All patients in the diabetes group were treated with insulin to control blood glucose and received diabetes health education during the perioperative period. Among them, diabetic patients with glycosylated hemoglobin ≥7% were defined as poor blood glucose control group, and glycosylated hemoglobin < 7% were defined as good blood glucose control group. A 4.5-mm suture absorbable anchor (DePuy, HEALIX ADVANCE™) consisting of 70% polylactic acid and 30% β-tricalcium phosphate was used in both groups.

2.1.2. Inclusion criteria

(1) There was no history of dislocation or surgery of the affected shoulder joint;

(2) Primary unilateral arthroscopic rotator cuff repair was performed.

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(3) According to preoperative MRI and intraoperative examination, the size of rotator cuff tear was evaluated as medium tear (1cm < size ≤3cm).

(4) The anchors used during the operation were all absorbable band suture anchors.

(5) The general information and follow-up data of the patients were complete, and the follow-up time was more than 12 months.

(6) All operations were performed by the same chief physician of the same team.

Exclusion criteria

(1) The affected shoulder combined with adhesive capsulitis, labrum injury, calcifying tendinitis or shoulder joint infection;

(2) Combined with neuromuscular dysfunction, severe peripheral vascular disease, severe osteoporosis;

(3) Suffering from severe mental illness and unable to cooperate with the postoperative rehabilitation exercise program;

(4) Complicated with serious complications of diabetes;

(5) Titanium alloy, PEEK and other non-absorbable anchors were used during operation.

2.2. Methods

2.2.1. Preoperative evaluation

All patients completed hematology examination, routine electrocardiogram, X-ray film at the exit position of the supraspinatus, color Doppler ultrasound and MRI of the shoulder joint before operation. The range of motion of the shoulder joint, such as forward flexion, abduction, external rotation in neutral position, and body side internal rotation, was recorded, and VAS score, ASES score and Constant score were completed.

2.2.2. Intra-operative management

After satisfactory anesthesia, the patient was placed in the lateral decubitus position, the body was tilted back about 30°, and the affected limb was fixed by traction in the state of abduction and forward flexion. Routine disinfectant drape membrane. Mark the acromion, acromioclavicular joint, and scapular spine bone markers; The lumbar puncture needle was inserted horizontally from the posterior approach towards the superior direction of the glenohumeral joint (about 1.5cm below and 1.5cm inside the posterolateral corner of the acromion). Saline was injected to confirm that the needle tip was located in the joint cavity. The cold light source system was inserted, and the glenohumeral joint triangle (humeral head, middle glenohumeral ligament, glenohumeral glenoid) was seen. The lumbar puncture needle was monitored to establish an anterior approach (the anterolateral corner of acromion was about 1cm lower and 1cm medial, and the outer superior edge of the coracoid process). The plasma knife ablation system was used to expand the approach and clean the synovial membrane and adipose tissue in the joint cavity that blocked the view. The presence of shoulder capsule adhesion, rotator cuff injury, labrum injury, cartilage injury and bony Bankart injury were detected. For subacromial space exploration, the light source was removed, and the puncture device was entered oblique upward in the direction of subacromial from the posterior approach to the subacromial space. The lumbar puncture needle was monitored to establish an anterolateral approach (2cm lateral to the acromion and 0.5cm anterior to the midline of the humeral shaft). A small working cannula was inserted into the anterolateral approach, and the subacromial bursa, synovia, and scar tissue were removed by power planing system and plasma ablation system alternately. The subacromial space was explored for stenosis and osteophytes. Release of glenohumeral ligament and coracohumeral ligament, release of fresh rotator cuff: Release of glenohumeral ligament and coracohumeral ligament, clean the synovial capsule and adipose tissue of the medial rotator cuff, and dermabrasion and freshening of the humeral cartilage margin bone bed. Acromioplasty: observation was performed via posterior approach

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and anterolateral approach, respectively. The hyperplastic bone at the acromial end was polished by grinding drill, and the subacromial bone debris was cleaned. The long head of biceps brachii was cut off and the rotator cuff was sutured with absorbable screws. The posterolateral approach was established with the assistance of the lumbar puncture needle (2cm lateral to the acromion and 0.5cm posterior to the midline of the humeral shaft). A working cannula was inserted through the anterolateral approach, the long head of biceps brachii tendon was severed and fixed, and a 4.5mm absorbable suture anchor with thread was placed at the cartilage margin of the greater tuberosity of the humerus at an appropriate Angle and direction. The tail line was passed through the biceps brachii long head tendon and joint capsule at the appropriate site with the assistance of a wire crossing device and a wire grabbing device. The long head of the biceps brachii tendon was fixed. Several 4.5mm absorbable suture anchors (DePuy, HEALIX ADVANCE) with sutures were placed in the appropriate position of the humeral cartilage margin bone bed according to the rotator cuff tear, and the injured rotator cuff was sutured over the line (see Figs. 22-23). Each wound was closed with a full-thickness suture, routine intra-articular injection of drugs, and sterile dressing.

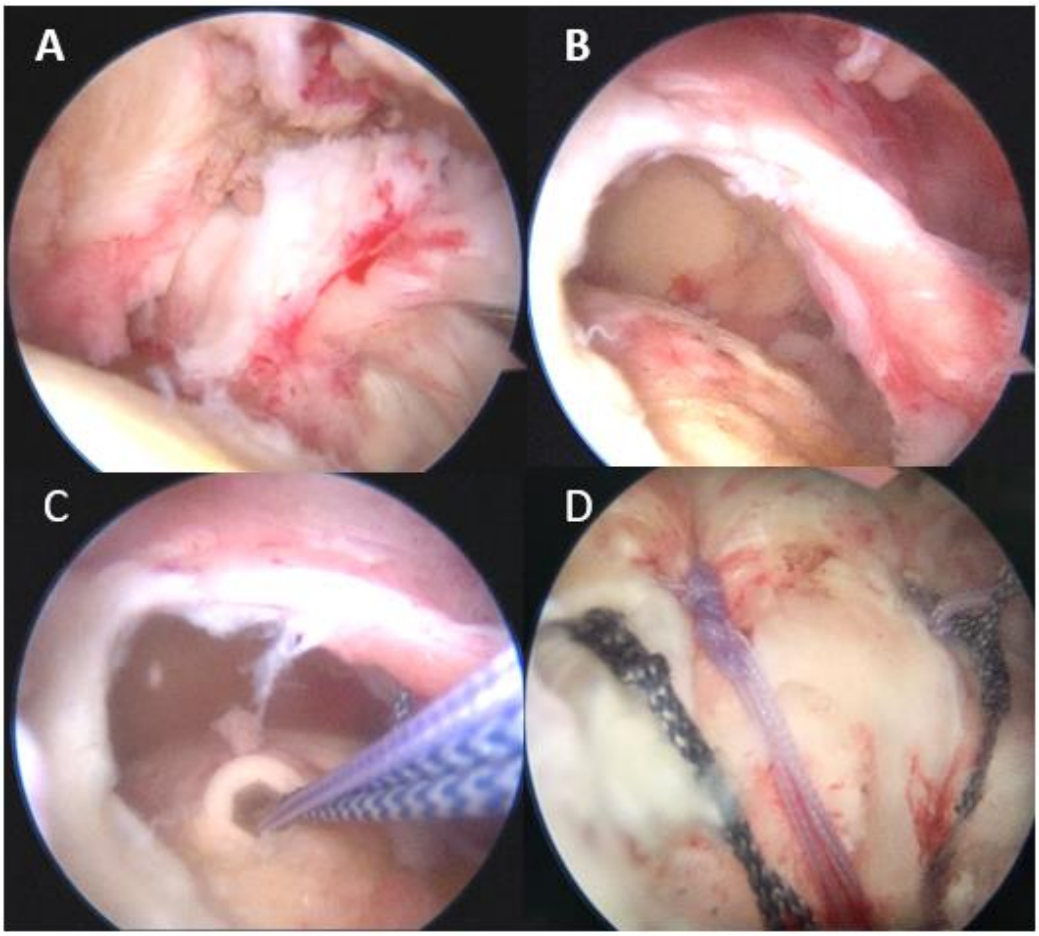

FIG. 22A. subscapularis muscle tear was observed under microscope; B. supraspinatus muscle tear

2.2.3. Postoperative rehabilitation

The postoperative rehabilitation of patients was carried out in stages, and the whole process was carried out under the guidance of rehabilitation therapists. The goal of postoperative rehabilitation is to protect the surgical repair site, control pain and inflammation, gradually increase the range of motion of the joint, and prevent joint adhesion. Phase 1 (week 0-3) : Passive joint movement under the guidance of the rehabilitation therapist. In the supine position, the contralateral limb was used to assist in active joint flexion, and the supine position

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was used to perform internal and external rotation of the scapular plane using a gymnastics stick. At the same time, shoulder stability exercises were performed in the lateral decubitus position. Maintain suspension braking outside of training. Phase 2 (3-7 weeks) : Gradually increase shoulder range of motion as tolerable as possible. Under the guidance of the surgeon and rehabilitation therapist, the suspension brake was gradually removed, and active assisted range of motion exercises of the shoulder joint were performed, including forward flexion with a gymnastics stick in the supine position, and internal and external rotation with a gymnastics stick. At the same time, after the range of motion of the shoulder joint and the muscle control of the affected limb were improved, the tension device exercise was gradually started. The third stage (7-13 weeks) : In this stage, the focus of rehabilitation was to slowly restore the full range of motion of the shoulder joint, gradually perform joint strength training, restore the patient's lower functional activities of lifting to less than 90°, increase the external rotation of the shoulder joint at 90° abduction, and strengthen the rehabilitation of the scapular region. In the fourth stage (14-19 weeks), isotonic strength exercises of the shoulder girth muscles and the muscles around the rotator cuff were continued, and isokinetic internal and external rotation exercises were performed to enhance the strength and strength of the rotator cuff muscles, so that the strength and flexibility of the shoulder joint and the affected limb gradually returned to the preoperative level.

2.2.4. Postoperative follow-up

(1) The range of motion (ROM) of shoulder joint including forward flexion, abduction, external rotation in neutral position, and internal rotation in body side were recorded at 3 months, 6 months, and the last follow-up, and the VAS score was evaluated. The forward flexion, abduction, and external rotation of the shoulder joint were measured using a common goniometer. The body side internal rotation measurement was scored using the body surface marker when the hand was at the highest point of the thumb behind the back. The assessment of the body side internal rotation body surface marker was defined as: The thigh was scored 0, buttocks 1, sacroiliac joint 2, L5 level 3, L4 level 4, L3 level 5, L2 level 6, L1 level 7, T12 level 8, T9-11 level 9, scapula 10. (2) At the last follow-up after operation, VAS score, ASES score, Constant score, glycosylated hemoglobin blood test and shoulder joint MRI examination were performed.

2.3. Evaluation indexes of shoulder joint

2.3.1. Pain and function scores

(1) VAS score: the total score of pain was 0-10 in the resting state at 3 o 'clock in the afternoon. The lowest score was 0, indicating no pain, and the highest score was 10, indicating severe pain.

(2) ASES score: the physical status of patients in the two groups was evaluated, including pain and life function. Each part was scored from 0 to 50, and the total score was 0 to 100. The increase of the score indicates that the patient's shoulder joint function gradually improves.

(3) Constant score: a scale to evaluate the shoulder joint function, a total of 100 points. A score of 100 means that the shoulder function is intact, and a score of 0 means that the shoulder function is completely lost. The pain score was 15 points, the daily activities score was 20 points, the ROM score was 40 points, and the abductor muscle strength score was 25 points.

2.3.2. Evaluation of rotator cuff integrity

All patients underwent shoulder magnetic resonance examination at the last follow-up to evaluate the healing and re-tear of rotator cuff.

2.4. Statistical analysis

All data were analyzed by SPSS 21.0 software. Independent sample t test was used for measurement data, mean ± standard deviation ($\bar{\chi} \pm s$) was used to represent measurement data,

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and χ^2 test was used for comparison of count data. For all statistical methods, *P<0.*05 was considered statistically significant.

3. Results

3.1. Preoperative basic data of the two groups

Diabetic group: 24 males, 28 females, a total of 52 cases. The average age was 61.34 years, and the average disease duration was 8.43 months. The mean body mass index (BMI) was 26.82. The mean follow-up time was 16.89 months. Normal group: 56 males, 65 females, a total of 121 cases. The average age was 60.4 years and the average disease duration was 7.14 months. The average BMI was 25.26. The mean follow-up time was 15.69 months. By independent sample t test analysis, there was no significant difference in preoperative age, disease duration, BMI, and last follow-up time between the two groups (*P>0.*05). By Chi-square test, there was no significant difference in gender and left and right sides between the two groups before operation (P>0*.05)* (see Table 6).

Table 6 Comparison of general conditions between the two groups ()$\bar{\chi} \pm s$

Table6 General information of the patients in two groups ($\bar{\chi} \pm s$)

	Diabetes group	Normal group	P-value
Number of cases (n)	52	121	/
Gender (male/female)	24/28	56/65	0.988
Age (years)	61.34 + / - 4.6	60.40 + / - 5.1	0.546
Duration (months)	8.43 + / - 4.70	7.14 + / - 3.88	0.322
Body mass index (kg/m2)	26.83 + / - 5.62	25.26 + / - 3.09	0.258
Left/right side (example)	19/33	51/70	0.491
Last follow-up time (months)	16.89 + / - 4.02	15.69 + / - 5.32	0.255

3.2. Comparison of shoulder joint active range of motion (ROM) between the two groups

The flexion and abduction angles of the two groups at 3 months, 6 months and the last follow-up were significantly increased compared with those before operation (*P<0.*05). The external rotation in neutral position and internal rotation in body side were significantly increased in the two groups at 6 months after operation and at the last follow-up compared with those before operation (P<0*.05)*. At 3 months after operation, there was no significant difference in forward flexion, abduction, external rotation in neutral position, and body side internal rotation between the two groups (*P>0.*05). At 6 months after surgery, the forward flexion Angle of the diabetic group was smaller than that of the normal group, and the difference was statistically significant (P<0*.05)*. At the last follow-up, the forward flexion, abduction and lateral internal

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rotation of the diabetic group were smaller than those of the normal group, and the difference was statistically significant (P<0.05) (see Table 7).

Table 7 Comparison of shoulder range of motion (ROM) between the two groups ($\bar{\chi} \pm s$)

		Diabetic group	Normal group	*P* value
Forward flexion (°)	Before surgery	61.34 + / - 18.65	63.74 + / - 20.66	0.344
	3 months after surgery	106.37 * 24.15 mm	102.28 * 18.07 mm	0.122
	6 months after surgery	122.26 * 23.05 mm	130.22 * 21.66 mm	0.034
	Last FOLLOW-UP	150.28 * 16.55 mm	167.83 * 10.53 mm	0.016
Abduction (°)	Preoperative	64.30 + / - 15.650	61.64 + / - 18.09	0.544
	3 months after surgery	98.34 * 19.60 mm	96.30 * 18.88 mm	0.612
	Six months after surgery	119.37 * 20.60 mm	125.22 * 21.61 mm	0.210
	Last FOLLOW-UP VISIT	143.27 * 20.61 mm	156.65 * 17.43 mm	0.022
External rotation in neutral position (°)	Before surgery	23.70 + / - 8.66	24.07 + / - 8.12	0.346
	3 months after surgery	23.88 + / - 8.01	25.73 + / - 7.08	0.433
	Six months after surgery	33.79 * 10.69 mm	37.68 * 8.46 mm	0.212
	Last follow-up	40.70 * 11.56 mm	43.40 * 12.54 mm	0.166
Body side internal rotation (°)	Preoperative	3.0 (2.0-4.0)	3.0 (3.0-4.0)	0.246
	3 months after surgery	3.0 (3.0-4.0)	4.0 (3.0-4.0)	0.322
	Six months after surgery	7.0 (6.0-8.0) *	7.0 (6.0-8.0) *	0.766
	Last follow-up	8.0 (7.0-9.0) *	9.0 (8.0-10.0) *	0.033

* : $P < 0.05$ compared with pre-operation in this group

3.3. Comparison of VAS scores between the two groups

The VAS scores of the two groups at 3 months, 6 months and the last follow-up were significantly lower than those before operation (*P<0.*05). Compared with the normal group, the VAS score of the diabetic group was significantly increased at 3 months after operation (*P<0.*05). Compared with the normal group, there was no significant difference in VAS scores at 6 months after operation and at the last follow-up in the diabetic group (P>0*.05)* (see Table 8).

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Table 8 Comparison of shoulder joint VAS scores between the two groups ()$\bar{\chi} \pm s$

	Diabetic group	Normal group	P-value
Before surgery	5.68 + / - 1.22	5.34 + / - 1.04	0.342
3 months after surgery	3.03 * 0.62 mm	2.25 * 0.83 mm	0.032
6 months after surgery	1.24 * 0.42 mm	1.02 * 0.63 mm	0.207
Last FOLLOW-UP VISIT	0.85 * 0.58 mm	0.80 * 0.69 mm	0.133

* : $P < 0.05$ compared with pre-operation in this group

3.4. Comparison of ASES scores between the two groups

Compared with pre-operation, the ASES scores of the two groups were significantly increased at 3 months, 6 months and the last follow-up (*P<0.*05). Compared with the normal group, there was no significant difference in ASES score at 3 months, 6 months and the last follow-up in the diabetic group (*P>0.*05) (see Table 9).

Table 9 Comparison of shoulder joint ASES scores between the two groups ()$\bar{\chi} \pm s$

	Diabetes mellitus group	Normal group	P value
Preoperative	49.24 + / - 10.48	45.55 + / - 13.57	0.335
3 months after surgery	68.37 * 8.97 mm	71.12 * 8.61 mm	0.247
6 months after surgery	80.18 * 9.56 mm	84.12 * 8.03 mm	0.359
Last follow-up	88.57 * 7.41 mm	89.21 * 6.32 mm	0.504

* : $P < 0.05$ compared with pre-operation in this group

3.5. Comparison of Constant scores between the two groups

Compared with pre-operation, the Constant scores of the two groups were significantly increased at 3 months, 6 months and the last follow-up (*P<0.*05). Compared with the normal group, there was no significant difference in the Constant scores at 3 months, 6 months and the last follow-up in the diabetic group (*P>0.*05) (Table 10).

Table 10 Comparison of shoulder joint Constant scores between the two groups ()$\bar{\chi} \pm s$

	Diabetic group	Normal group	P-value
Preoperative	46.83 + / - 12.68	45.20 + / - 13.06	0.364
3 months after surgery	57.36 * 9.36 mm	61.39 * 10.74 mm	0.412
6 months after surgery	68.64 * 10.49 mm	71.93 * 11.02 mm	0.336
Last FOLLOW-UP VISIT	86.68 * 10.60 mm	89.03 * 9.61 mm	0.242

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3.6. Comparison of rotator cuff retear rate at the last follow-up between the two groups

At the last follow-up, there were 3 patients with rotator cuff re-tear in the diabetic group, and the re-tear rate was 5.77%. In the non-diabetic group, 5 patients had rotator cuff re-tear, and the re-tear rate was 4.13%. There was no significant difference in the rate of rotator cuff retear between the diabetic group and the normal group by Chi-square test (P=0.940). Compared with the well-controlled group, there was no statistically significant difference in the rate of rotator cuff retear in the poorly controlled group (P=0.672) (see Table 11).

Table 11 Comparison of rotator cuff retear rate at the last follow-up between the two groups

	Intact rotator cuff	Torn rotator cuff	P value
Normal group	116	5	
Diabetes group			
Sum up Blood sugar	49	3	0.940
Well-controlled group	31	1	
Poor glycemic control group	18	2	0.672

4. Discussion

In this study, we found that the active range of motion of the shoulder joint was significantly improved, the pain was relieved, and the ASES and Constant functional scores were significantly increased in both diabetic group and normal group after arthroscopic repair of rotator cuff with absorbable anchors. Although the forward flexion, abduction and lateral internal rotation of the diabetic group were lower than those of the normal group at the last follow-up, there was no significant difference in functional scores between the two groups. The rate of rotator cuff retear was slightly higher in the diabetic group than in the normal group, but the difference was not statistically significant. This may be related to the long-term stability of blood glucose in the diabetic group through the use of insulin and diabetes health education during the perioperative period. At the same time, it may be related to the factors such as too few cases included in the two groups and insufficient follow-up time.

Comparison of function scores between the two groups

After arthroscopic rotator cuff repair, the shoulder joint pain, joint function and range of motion can be significantly improved regardless of whether the patient has T2DM or not. However, persistent hyperglycemia increases the possibility[32] of failure of rotator cuff healing after repair. One study found that T2DM had a certain effect on the short-term shoulder joint function recovery after arthroscopic rotator cuff repair of medium and large rotator cuff tears. At the same time, the pain of patients with T2DM was more intense than that of normal patients in the short term after arthroscopic rotator cuff repair, especially perioperative analges[33]ia in T2DM patients. Another study found that diabetes delayed recovery after rotator cuff repair, but there was no difference[34] in recovery between patients with and without diabetes at 1 year after surgery.

In this study, we found that the active range of motion of the shoulder joint was significantly improved, the pain was relieved, and the ASES and Constant functional scores were significantly

increased in both diabetic group and normal group after arthroscopic repair of rotator cuff with absorbable anchors. Although the forward flexion, abduction and lateral internal rotation of the diabetic group were lower than those of the normal group at the last follow-up, there was no significant difference in functional scores between the two groups. This may be related to the use of insulin to control blood glucose in the diabetic group during the perioperative period, and the diabetic health education was carried out to control the blood glucose in the diabetic group.

4.1. Comparison of rotator cuff retear rate between the two groups

Clinical studies have revealed that diabetic patients exhibit poorer efficacy after rotator cuff repair than nondiabetic patients and present higher failure and infection rates. One study compared results of open repair of full-thickness rotator cuff tears in 30 diabetic patients with those of a matched, nondiabetic population. Complications occurred in 5 diabetic patients (17%), with 2 failures (7%) and 3 infections (10%), as compared with 1 failure (3%) and no infections in the comparison group. Another study retrospectively evaluated a total of 335 shoulders that were available for magnetic resonance imaging (MRI) evaluation at least 6 months after arthroscopic rotator cuff repair using the suture-bridge technique with a minimum follow-up of 1 year. In assessing the repair integrity with postoperative MRI scans, 39 of 271 cases in group A (14.4%) and 23 of 64 cases in group B (35.9%) had retears, and the difference between the 2 groups was statistically significant ($P < .001$).

In the present study, the rate of rotator cuff retear was slightly higher in the diabetic group than in the normal group, but the difference was not statistically significant. This may be related to the long-term stability of blood glucose in the diabetic group through the use of insulin and diabetes health education during the perioperative period. At the same time, it may be related to the factors such as too few cases included in the two groups and insufficient follow-up time.

4.2. Limitations of this study

This study has the following shortcomings: first, this study is a single-center retrospective study, and there is no randomization, which has certain bias; Second, the sample size is limited and the follow-up time is not long, so long-term follow-up is still needed to prove the conclusions of this study. Third, this study made a preliminary analysis on the effect of patients' blood glucose control on rotator cuff tear at admission, but no further analysis was performed on the effect of patients' long-term blood glucose control on rotator cuff tear, which caused a certain bias in the results. Fourth, in this study, the bone mineral density of the two groups of patients was not examined, and there was no stratified analysis of the patients' osteoporosis, which may have a certain impact on the study results.

5. Conclusion

The active range of motion of rotator cuff repair with absorbable anchors in diabetic patients is slightly worse than that in non-diabetic patients, but there is no significant difference in shoulder joint function and rotator cuff re-tear rate between the two groups.

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