RESEARCH PAPER

Arthroscopic Repair of Rotator Cuff Tears: Trans Osseous Giant Needle Sutures vs Anchor Technique

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ABSTRACT

Background: Rotator cuff injuries are a prevalent reason for shoulder pain across all age groups. Current meta-analyses and systematic reviews indicate that double-row repairs may exhibit elevated healing rates and reduced re-tear occurrences; nonetheless, clinical results don't significantly prefer one repair technique over another.

Aim: To compare clinical and radiological outcomes between arthroscopic repair of rotator cuff tears with transosseous giant needle sutures vs arthroscopic repair with anchor technique.

Patients and methods: This study is prospective comparative research of forty shoulders with rotator cuff tear that had arthroscopic cuff repair at Beni-Suef University Hospital. 40 shoulders in 40 cases were involved in this research in the period between October 2022 to February 2024.

Results: Demographics, preoperative OSS (Group 1: 38.5±4.7; Group 2: 39.8±4.1), and complications were comparable (p>0.05). Operative time was shorter in Group 2 (1.1±0.2 vs. 2.1±0.5 hours, p<0.001). Both groups showed significant OSS improvement at 6 months (Group 1: 26.2±3; Group 2: 24.6±2.3; p<0.001 within groups), with no intergroup difference (p=0.055). ROM improved significantly in both (p<0.001), but Group 2 excelled in forward flexion (161.8±8.9° vs. 138.8±16.1°, p<0.001) and external rotation (72.5±7° vs. 63.8±11.2°, p=0.005); internal rotation was similar (68±9.4° vs. 65±10.8°, p=0.353). On Group 1 retear occurred.

Conclusion: No statistically significant differences were observed among the examined groups preoperatively. However, highly statistically significant differences were identified both intra and postoperatively. Specifically, operative time (in hours) demonstrated a highly significant variation between groups. Furthermore, at 6 months postoperatively, a highly statistically significant improvement in range of motion was observed, favouring the transosseous giant needle technique.

Keywords: Rotator cuff repair, arthroscopic transosseous, giant needle, suture anchor, shoulder outcomes.

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Introduction

Rotator cuff injuries are a prevalent reason for shoulder pain across all age groups, affecting between five percent and forty percent of the population. In 1944, McLaughlin initially defined a transosseous rotator cuff repair, a procedure regarded as the gold standard for the repair of rotator cuff lesions until the conclusion of the past century **(1)**

The open transosseous approach was the first gold standard for rotator cuff repair; however, new advancements in arthroscopic surgery have introduced a less invasive treatment, resulting in reduced deltoid muscle morbidity and a comparable healing rate. In order to mimic the biomechanics of the older, time-tested method and enhance surgical results with this novel approach, multiple anchor and suture configurations have been pioneered. Simultaneously, advancements in surgical instrumentation have allowed anchorless techniques that integrate the benefits of open transosseous repair with those of arthroscopic methods **(2)**

With the rise in rotator cuff repairs, numerous surgical techniques have been developed and modified. The development continued with the single-row suture anchor technique. Subsequently, the double-row method became prevalent, as it was determined to more accurately reproduce the original footprint. The transosseous-equivalent suture anchor repair, known as "double-row repair," was designed to enhance the contact between the tendon and its footprint, comparable to conventional transosseous repair methods. The arthroscopic method gained popularity as it is functionally comparable to open and semi-open procedures while yielding a reduced incidence of surgical site infections **(3).**

Current meta-analyses and systematic reviews indicate that double-row repairs may exhibit superior healing rates and reduced re-tear occurrences; nonetheless, clinical results don't significantly favor one repair technique over another.

Furthermore, whereas rotator cuff repairs often yield net societal cost savings, research suggests that double-row repair lacks cost-effectiveness, mostly because of the incremental cost of suture anchors associated with the extra row of fixation **(4).**

Current research indicates that the transosseous tunnel approach enhances the contact area and pressure among the rotator cuff tendon and its insertion footprint. Enhanced contact features will likely optimize the healing possibilities among the repaired tendon and tuberosity **(5)**

On the other hand, transosseous rotator cuff repair can be prone to failure at the bone suture interface. Suture cut through can occurs. This failure can be problematic in osteoporotic bone, especially with an increased patient age and chronicity of the tear. Yet, several studies suggest that transosseous techniques are more suitable for patients with porotic bone **(6).**

Our study aimed to compare Radiological and clinical outcomes between arthroscopic repair of rotator cuff tears with transosseous giant needle sutures vs arthroscopic repair with anchor technique.

Patients and methods

This study is prospective comparative research of forty shoulders with rotator cuff tear that had arthroscopic cuff repair at Beni-Seuf University Hospital. 40 shoulders in 40 cases have been involved in this research in the period between October 2022 to February 2024. Follow-up range was 9-16 months with a mean of 12.5 months. They were randomly separated into 2 groups: **Group 1:** 20 shoulders with rotator cuff tear managed by arthroscopic single row anchor repair. **Group 2:** 20 shoulders with rotator cuff tear managed through arthroscopic transosseus repair by means of the Giant needle.

Criteria of inclusion: Rotator cuff tear, Size of tears: all tears except massive &irreversible tears.

Criteria of exclusion: Massive rotator cuff tears with more than 50 % fatty infiltration.

Irreparable tear. Failed previous repair. Subscapularis tear. Rheumatoid patients.

Methodology

Preoperative evaluation

Complete history taking, **General examination**, **Local examination**, **Preoperative scoring:** Oxford Shoulder Score (OSS)15: The OSS questionnaire comprises twelve items, each offering five possible answers. Cases are requested to evaluate their symptoms on a scale from 1 (minimum symptoms) to 5 (severe symptoms). The combined total gives a minimum score of twelve and a maximum of sixty. Nevertheless, counter-intuitive to other instruments, greater scores in the OSS imply worse functionality whereas reduced scores imply enhanced functionality.

Intra operative

Rotator cuff repair:

Anchor Placement and Rotator Cuff Repair in group 1: Single row anchor repair was performed in all shoulders of the anchor group. In single-row anchor, the suture anchors were placed lateral to the articular margin on the cuff footprint at the greater tuberosity (Fig 1).

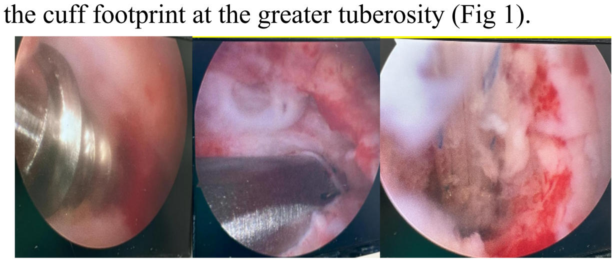


Fig (1): Anchor placement at the margin of the articular cartilage; anchor insertion

Anchor placement began posterior at the tear, and they were about one centimeter apart to anterior aspect of the tear. Anchor placement was done through the lateral portal, or sometimes other accessory incisions at the lateral aspect of the acromion, After application we tug on the sutures to make sure it is engaged in the bone, then we shuttled out through anterolateral portal, Sutures were retrieved through the lateral portal and passed via the rotator cuff in anterior to posterior direction, Then knots have been tied from anterior to posterior direction either simple or mattress stitches (Fig.2), We used 1 anchor in 6 cases, and two anchors in the remaining 14 cases. The following anchors have been utilized in the repair; HEALIX TI™ Dual Threaded Suture Anchor (DePuy Synthes) in 4 patients, JuggerKnot® All-Suture Anchor (Zimmer Biomet) in 12 patients, and TWINFIX Suture Anchor (Smith and Nephew) in 4 patients.

Fig (2): Suture are tied in mattress fashion

Sub-acromial decompression was performed in 14 cases, while in the other 6cases who 0had history of traumatic event we did not perform decompression, biceps tenodesis was performed in 2 cases we had biceps fraying evident and confirmed during arthroscopy, tenodesis was done by mini-open approach in one patient and arthroscopic in the other one. Transosseous giant needle rotator cuff repair in group 2: The entry holes of the giant needle were made by an awl just lateral to the articular cartilage (Fig.3). The number of holes has been planned with regard to the size of the tear "a hole for each 1 cm".

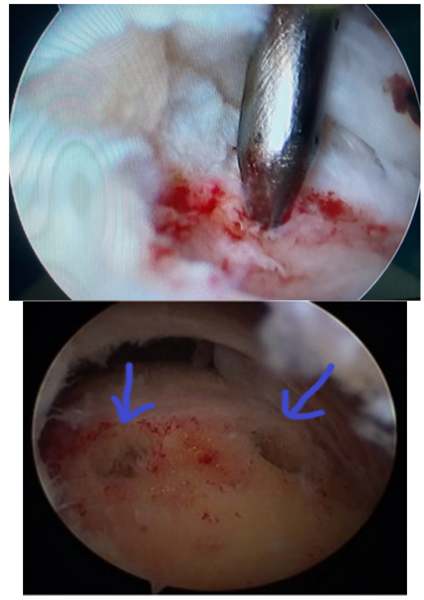


Fig (3): Arthroscopic views of footprint preparation and making of entry holes

With the arm has been held in slight abduction, the giant needle has been introduced through the skin in front of the acromion through a special needle holder till it was shown in the arthroscopic field, and subsequently it has been passed through the already made entry hole (Fig. 4.5)

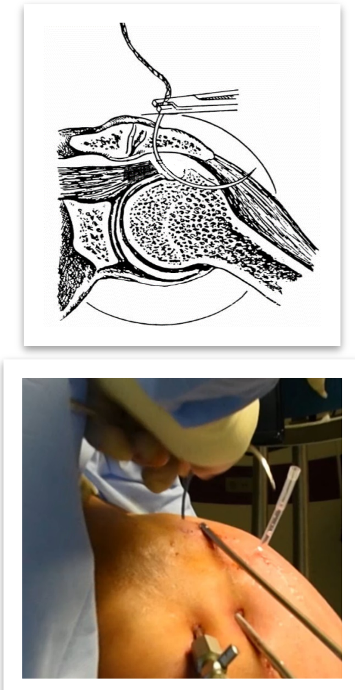


Fig 4: (Lt.) Diagrammatic and (Rt.) intra-operative view of the giant needle insertion**(7)**

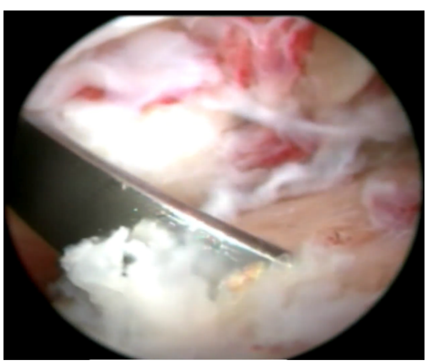


Fig 5: Arthroscopic view of the giant needle insertion

Subsequently, moving the arm in alternating rotation from the elbow and pushing the needle through placing the needle holder one centimeter from the skin and pushing the needle downward. This is repeated until the needle passes through out the lateral cortical surface through the deltoid (Fig. 6).

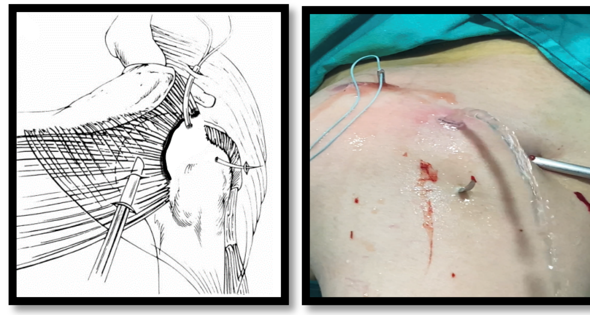


Fig 6: (Lt) Diagrammatic and (Rt.) intra-operative view (Lt) of the giant needle exit from the skin of the lateral aspect

Damage to the axillary nerve is a concern. The needle and the suture exit through the bone close to the predicated position of the axillary nerve. Consequently, care should be taken that the angle of insertion should not be too steep that the distal exit point of the needle is proximal to the predicated position of the axillary nerve. The giant needle was loaded with passing suture (Prolene 2), then the tunneling process has been repeated to make other tunnels if required. The upper limbs of the Prolene sutures were brought out of the instrumentation portal via a suture retriever, while the lower limbs were brought out by a hook probe. Each passed Prolene suture has been applied to shuttle 2 or 3 heavy sutures (FiberWire or Ultrabraid No. 2).

The medial limb of each heavy suture was passed through the cuff tendon with a suture passer or a bird beak from anterior to posterior. Then, we tied each medial and lateral limb together using different types of arthroscopic sliding knots “fisherman, SMC Samsung Medical Center and racking hitch” and secured with multiple half hitch knots (Fig. 7-8-9).

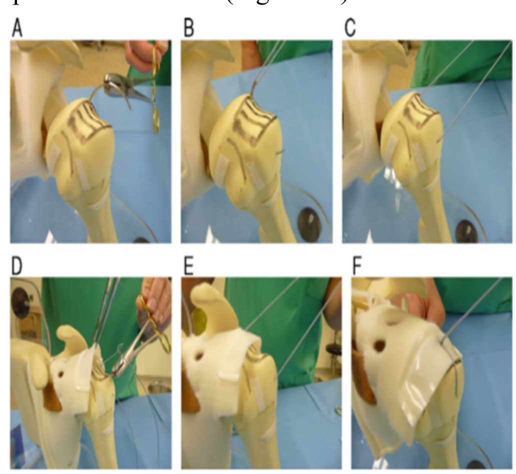


Fig 7: Demonstration of rotator cuff repair by giant needle on a model **(8)**

Routine skin closure and sterile dressing were done. The arm was put in a broad arm sling.

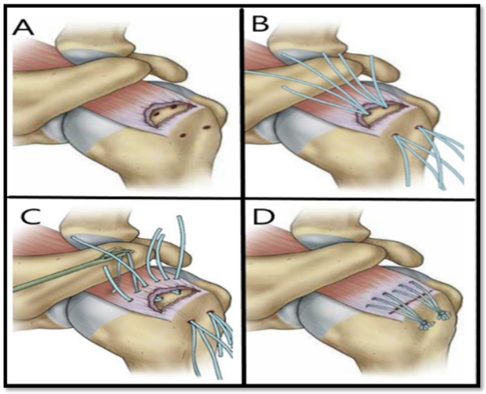


Fig 8: Diagrammatic photos showing: A) Tunnel creation. B) Passing sutures through the tunnels. C) Passing medial limbs of the sutures through the tendon. D) Final repair.

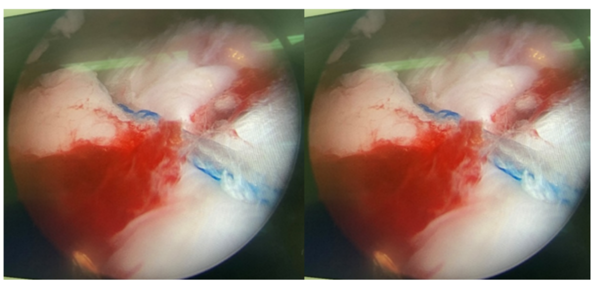


Fig 9: Arthroscopic views of final repair

Post-operative care

Postoperative analgesia included local lidocaine injection at the portal site, with vital signs and neurovascular status monitored in recovery. The operated limb was immobilized using a broad arm sling. Patients were discharged within 12 hours and received a 24-hour course of 3rd-generation cephalosporin (1 g IV every twelve hours), NSAIDs for pain, and proton pump inhibitors for gastric protection. Follow-up occurred at 2, 4, 6 weeks, and 3, 6, and 12 months. All patients followed a standardized four-phase rehabilitation program: Phase I (0–4/6 weeks) involved immobilization, ice packs, and gentle passive motion; Phase II (4–12 weeks) introduced active-assisted to full active ROM; Phase III (10–18 weeks) emphasized strengthening and resistance exercises; and Phase IV (16–26 weeks) included advanced strengthening, plyometrics, and serratus anterior activation. Return to activity required full, pain-free ROM and strength symmetry. At six months, Group 2 showed better ROM (forward flexion 161.8°, external rotation 72.5°, internal rotation 68°) than Group 1 (138.8°, 63.8°, 65° respectively). Oxford Shoulder Scores were similar (Group 1: 26.2; Group 2: 24.6). Ultrasound confirmed tendon healing in all but one Group 1 patient with supraspinatus retraction. Overall, structured rehabilitation achieved favorable recovery, with Group 2 showing superior motion outcomes.

Ethical Considerations

The research's procedures are designed to make sure that investigators abide to the principles of good clinical practice and the ethical standards established in the latest iteration of the Declaration of Helsinki. Informed consent has been obtained from all participants prior to their recruitment in the research, following an explanation of the research's nature, purpose, and potential consequences. Prior to the commencement of an investigation and in line with local regulations, the protocol and all associated paperwork will be submitted for ethical and research approval by the Council of the Orthopedics Department at Bani Suef University.The Ethics Research Committee (ERC) approved the research protocol.

Statistical analysis

Information was gathered, tabulated, and statistically examined on an IBM-compatible personal computer using SPSS statistical software version 23 (SPSS Inc., released 2015). IBM SPSS statistics for windows, version 23.0, Armonk, NY: IBM Corp).P value: P value of>0.05 has been statistically non-significant. P value of<0.05 has been considered statistically significant value of<0.001 has been considered statistically highly significant.Additionally, multivariable linear regression has been performed with the post ASES score as the dependent variable. All independent factors that were significantly correlated (P-value under .05) with the post ASES score in the univariate analyses have been assessed for inclusion in the multivariable model.

Results

Table 1: Demographic data

		Group I	Group II	P value
		Number=20	Number =20	
Age	-Range. -Mean ± SD.	(48-70) 56.7±6.2	(45-68) 56.3±7.3	0.817
Sex	*-Male.* *-Female.*	7(35%) 13(65%)	9(45%) 11(55%)	0.519
Duration of complaint	-Range. -Mean ± SD.	(2-6) 4±1.5	(1-7) 3.9±2	0.860
Tear size	-Range. -Mean ± SD.	(1-4) 2.5±1	(1-4) 2.6±1	0.813
Xray a/p view	*-None.* *-Acromion spur&joint arthritis.*	17(85%) 3(15%)	18(90%) 2(10%)	0.633

Independent Samples T test for quantitative information among both groups, Chi square test for qualitative information among both groups, Significant level at P value under 0.05

Table 1 demonstrates a comparison between demographic data of both examined groups, there were a statistically insignificant variances among the examined groups regarding age, sex, duration of complaint and X-ray a/p view.

Table 2: Intraoperative data

		Group I	Group II	P value
		Number =20	Number =20	
Operative length in hours	-Range. -Mean ± SD.	(1.5-3) 2.1±0.5	(0.5-1.5) 1.1±0.2	**<0.001***
Number of anchors	-Range. -Mean ± SD.	(1-3) 1.8±0.5	-----	-----
Number of tunnels	-Range. -Mean ± SD.	-----	(1-3) 2.2±0.6	-----
Intra op. complications	*No* *Yes*	17(85%) 3(15%)	18(90%) 2(10%)	0.633

Table 2 illustrates comparison of Intraoperative data of both studied groups; a highly statistically significant variances has been observed among the examined groups with regard to operative length in hours. The mean number of anchors used in group I was 1.8±0.5 while the mean number of tunnels utilized in group II was 2.2±0.6.

Table 3: OSS preoperative and postoperative

		Group I	Group II	P value
		Number =20	Number =20	
OSS Preoperative	Range Mean ± SD	(30-45) 38.5±4.7	(32-45) 39.8±4.1	0.356
OSS after 6 months	Range Mean ± SD	(22-30) 26.2±3	(20-28) 24.6±2.3	0.055
P value		**<0.001***	**<0.001***	

Independent Samples T test for quantitative information among both groups

Paired Samples T test for quantitative information among the two times within each group

*: Significant level at P value under 0.05

OSS: Oxford Shoulder Score

Table 3 shows a comparison of preoperative and 6 months postoperative OSS of both studied groups, a statistically insignificant distinction has been observed among the examined groups with regard to Preoperative OSS and OSS after 6 months. While a highly statistically significant variance has been observed in patients of group, I regarding pre and 6 months post operative OSS and there was highly statistically significant variance in patients of group II regarding pre and 6 months post operative OSS.

Table 4: Complications

		Group I	Group II	P value
		Number =20	Number =20	
Intra op. complications	*No* *Yes*	17(85%) 3(15%)	18(90%) 2(10%)	0.633
Post op. complications	*No* *Yes*	18(90%) 2(10%)	20(100%) 0(0%)	0.147

Table 4 shows a comparison of intra and postoperative Complications of both studied groups, there was a statistically insignificant distinction among both examined groups with regard to Intraoperative complications and post operative complications.

Table 5: Forward flexion

Forward flexion		Group I	Group II	P value
		Number =20	Number =20	
Preoperative	*Range Mean ± SD*	(70-100) 86±11.1	(30-160) 78±28.2	*0.244*
6months postoperative	*Range Mean ± SD*	(120-175) 138.8±16.1	(150-175) 161.8±8.9	***<0.001****
P value		***<0.001****	***<0.001****	

Table 5 shows a comparative analysis of the preoperative and 6 months postoperative Forward flexion of both the studied groups, there was a statistically insignificant distinction among the examined groups with regard to Preoperative. While a highly statistically significant variance has been observed among the examined groups with regard to 6months postoperative range of forward flexion in favor of group II. A highly statistically significant variance has been observed in patients of group I regarding pre and 6 months post operative Forward flexion and there was additionally a highly statistically significant variance in patients of group II regarding pre and 6 months post operative Forward flexion.

Table 6: External rotation at 0°

External rotation at 0°		Group I	Group II	P value
		Number =20	Number =20	
Preoperative	*Range Mean ± SD*	(30-70) 49.8±13	(30-70) 48.3±14.3	*0.730*
6months postoperative	*Range Mean ± SD*	(50-80) 63.8±11.2	(60-80) 72.5±7	***0.005****
P value		***<0.001****	***<0.001****	

Table 6 shows a comparative analysis of pre and 6 months postoperative External rotation at 0° there was a statistically insignificant variance among the examined groups with regard to Preoperative scores. While a statistically significant variance has been observed among the examined groups with regard to the 6months postoperative score. There was a highly statistically significant variance in cases of group I regarding pre and 6 months post operative external rotation at 0° and there was additionally a highly statistically significant variance in patients of group II regarding pre and 6 months post operative external rotation at 0°.

Table 7: Internal rotation at 90°

Internal rotation at 90°		Group I	Group II	P value
		Number =20	Number =20	
Preoperative	*-Range. -Mean ± SD.*	(30-55) 42.5±9.4	(30-55) 41±9.5	*0.619*
6months postoperative	*-Range. -Mean ± SD.*	(50-80) 65±10.8	(50-80) 68±9.4	*0.353*
P value		***<0.001****	***<0.001****	

Table7 shows a comparison of preoperative and 6 months postoperative range of internal rotation at 90°, there was no statistically significant among the examined groups with regard to Preoperative and 6 months postoperative. While there was a highly statistically significant variance in patients of group I with regard to pre and 6 months post operative internal rotation at 90°and there was also a highly statistically significant variance in patients of group II regarding pre and post operative internal rotation at 90°.

Cases presentation

Case 1

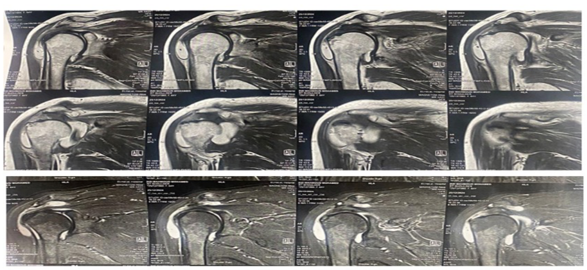
History:55 years old male complained of acute onset right shoulder pain with progressive loss of flexion, abduction, external and internal rotation for 9 months after heavy lifting.

Preop. Exam: Drop arm, ER lag, Job's, Hawkin's, Neer, bicipital groove tenderness and Speed's test all are positive.

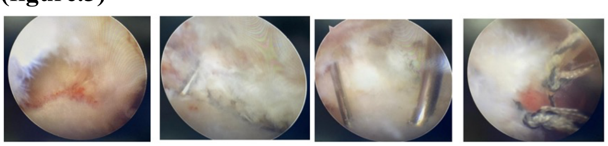
Pre-operative active ROM: Abduction 30°, flexion 60°, ER at side 20°, ER at abd. 200° and IR 20° showed in (figure .1)

Pre-operative OSS score: 42.

Preop. MRI: showed in (figure .2)



Operative details: the tear was repaired using by two transosseous tunnels using the giant needle showed in **(figure.3)**



6months Postop. Exam: ROM: abduction 150°, flexion 170°, ER at side 60°, ER at abd. 80°, IR 70°showed in (figure .4)

6months post-operative OSS score:26, no pain.

Case 2

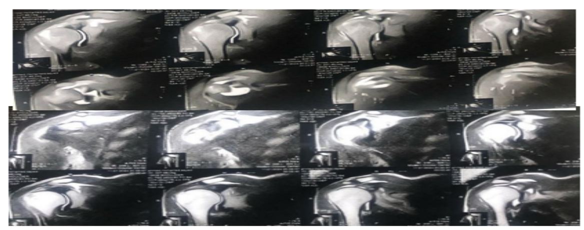
History:48years old female complained of chronic right shoulder pain with progressive loss of flexion, abduction, external and internal rotation for 9 months.

Preop. Exam: Drop arm, ER lag, Job's, Hawkin's, Neer, bicipital groove tenderness and Speed's test all are positive.

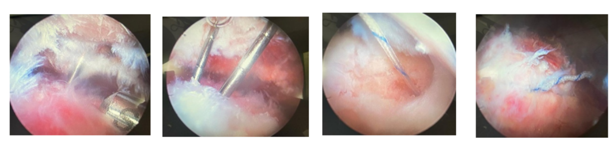
Pre-operative active ROM: abduction 30°, flexion 60°, ER at side 20°, ER at abd. 200° and IR 20°showed in figure (1).

Pre-operative OSS score: 40.

Preop. MRI: showed in (figure .2)



Operative details: the tear was repaired by two transosseous tunnels with the Giant needle showed in (figure.3)



6months Postop. Exam: ROM: abduction 140°, flexion 170°, ER at side 50°, ER at abd. 70°, IR 60°.showed in (figure.4).

6months post-operative OSS score:25, no pain.

Discussion

The present study showed that regarding demographic data, there were a statistically insignificant variances among the examined groups with regard to age, sex, duration of complaint and Xray a/p view.

Consistent with our findings, **KARADUMAN ZO et al. (9)** aimed to compare the functional and clinical results of suture anchor versus transosseous fixation methods in the repair of rotator cuff injuries. A comparison was conducted between thirty cases who had repair using suture anchors (Group 1) and thirty cases who received repair via transosseous techniques (Group 2). A total of sixty-two percent of the participants were men, while thirty-eight percent were women. The gender distribution was uniform in both groups (P-value equal 0.426). The mean age of the participants was 57.35 ± 8.69 years, ranging from forty-one to seventy-eight years. In significant variance was observed among the groups regarding mean age (P-value equal 0.232)

Our findings agreed with those of **Jeong HJ et al. (10),** who sought to compare clinical findings, retear rates, and the incidence of peri-implant cyst formation between the transosseous anchorless repair method and the conventional transosseous equivalent method with suture anchors. Their research involved 117 patients, categorized into two groups according to the repair approach employed: 23 in the transosseous group and 94 in the anchor group. The analysis indicated a statistically insignificant variations in age and sex across the examined groups.

In our study we found that regarding intraoperative data, there was a highly statistically significant variance among the studied groups as regard operative length in hours. The mean number of anchors was 1.8±0.5 whereas the mean number of tunnels was 2.2±0.6.

Our findings aligned with those of **Binder H, et al., (11),** who aimed to compare the imaging and clinical outcomes of arthroscopic transosseous-equivalent rotator cuff surgery utilizing anchors with those of arthroscopic anchorless transosseous rotator cuff repair, assessed at a minimum of two years following the operation. Group A was reported to have two bone tunnels and four sutures utilizing an X-box arrangement, whereas Group B utilized a suture bridge construct with four anchors.

In contrast to our findings, **Srikumaran U et al. (12)** aimed to assess the integrity of the rotator cuff following repair by the anchor method with that following repair utilizing an anchorless transosseous method. In significant variance has been seen between the groups in mean ± SD procedure time, recorded as 103 ± 20 minutes for transosseous anchor repair and 99 ± 20 minutes for transosseous anchorless repair (p-value equal 0.45).

In our study we found that regarding OSS preoperative and postoperative, a statistically insignificant distinction has been observed among the examined groups with regard to OSS preoperative and OSS after 6 months. While there was highly statistically significant variance in cases of group I regarding pre and post operative and there was addtionally a highly statistically significant variance in patients of group II regarding pre and post operative.

Our findings agreed with those of **KARADUMAN ZO et al. (9)**, who demonstrated significant variance in preoperative and postoperative Oxford shoulder scores in both groups, with variances among the groups observed at each duration (P-value under 0.001). In both groups, the preoperative Oxford shoulder score was significantly greater compared to the postoperative score (P-value under 0.001). The alteration in the Oxford shoulder score in Group 2 was about fifty-nine percent more than in Group 1 (P-value under 0.001).

Also, our outcomes were in line with **Fırat A, et al., (13)** who stated that regarding Oxford shoulder scores preoperative and postoperative, a statistically insignificant distincation has been observed among the examined groups with regard to OSS Preoperative and postoperative. While there was highly statistically significant variance in cases of group I with regard to pre and post operative and there was highly statistically significant variance in patients of group II regarding pre and post operative.

In our study we found that regarding management of complications, where intra operative group I there were 3 cases, in case 1; technical difficulties with scope had to convert to mini open repair, in case 2,3; the ends of anchor fiber wire knotted over each other had to convert to mini open repair to un tie the knots, while intra operative group II there were 2 cases, in case 1; technical difficulties with scope had to convert to mini open repair. In case 2; improper technique of giant needle insertion causing breakage of needle had to convert to mini open repair to extract needle and repair tendon. According to post operative group I; there were 2 cases showed by Ultrasound and MRI. A statistically insignificant variance has been observed among the examined groups with regard to Intraoperative complications and post operative complications.

As well, our results were consistent with **Randelli P, et al., (14**) who reported that there was a statistically insignificant variance among the examined groups with regard to Intraoperative complications and post operative complications.

Our findings aligned with those of **De Giorgi S, et al., (15),** who aimed to compare single-row suture anchors with the transosseous arthroscopic approach for treating cases with rotator cuff tears, emphasizing clinical structural results after a minimum of twenty-four months of monitoring. A statistically insignificant variance in complications was seen between the two groups.

Our investigation revealed that there was a statistically insignificant variance in Forward flexion across the groups preoperatively; nevertheless, a highly statistically significant variance was observed among the groups after six months following the operation. whereas there was highly statistically significant variance in cases of group I with regard to pre and post operative Forward flexion and a statistically significant distinction in case of group II in terms of pre and post operative Forward flexion.

As well **Imam MA, et al., (16)** who found that comparing pre-operative range of motion and the range of motion at the time of monitoring assessment, the average forward flexion improved significantly.

In our study we found that regarding external rotation at 0° there was a statistically insignificant distinction among the examined groups with regard to Preoperative. While a statistically significant distinction has been observed among the examined groups with regard to 6months postoperative. There was a high statistically significant variance in cases of group I regarding pre and post operative external rotation at 0° and there was addtionally a high statistically significant variance in patients of group II regarding pre and post operative external rotation at 0°.

Also**, Srikumaran U, et al., (12)** reported that regarding external rotation there was a statistically insignificant distinction among the examined groups with regard to Pre and postoperative.

In our study we found that regarding internal rotation at 90°, there was a statistically insignificant distinction among the examined groups with regard to Preoperative and 6months postoperative. While there was a high statistically significant variance in cases of group I with regard to pre and post operative
internal rotation at 90°and there was a high statistically significant variance in patients of group II regarding pre and post operative internal rotation at 90°.

As well, our outcomes were in line with **Randelli P, et al., (14)** who stated that insignificant variances have been observed among both arthroscopic repair methods with regard to radiological and functional outcomes.

Conclusion

The groups were comparable preoperatively. The transosseous giant needle technique was associated with reduced operative time and superior postoperative range of motion at 6 months. These findings suggest a clinically meaningful advantage; however, further large-scale prospective studies are still required to confirm these results.

Recommendations

Long follow up period. Arthroscopic rotator cuff repair with transosseous giant needle sutures is a promising technique but further studies are still required with larger scales to confirm our results. Participants came from a wide range of socioeconomic backgrounds; this further strengthens the external validity of the trial. Large sample size.

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