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Original Research

Comparison Of Functional Outcome Of Arthroscopic Meniscal Debridement V/S Arthroscopic Meniscal Repair.

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Abstract:
Background: The intra-articular fibro-cartilaginous structures known as knee menisci performs a significant and vital role in in knee biomechanics, distributing load, absorbing shock, lubricating the joint, and maintaining joint stability. Meniscal tears are treated conservatively or surgically, with the latter group including arthroscopic meniscectomy and arthroscopic meniscal repair.
Materials & methods: 40 patients presenting with pain, swelling, difficulty in bending/straightening the leg, locked knee & being clinically diagnosed with meniscal tear were enrolled. After obtaining detailed history, Clinical examination, participants were subjected to specific investigations (MRI). Group A: Subjects who underwent meniscal repair. Group B: Subjects who underwent meniscectomy (meniscal debridement). Follow up were done on 2 weeks, 6 weeks, 12 weeks & 24 weeks when participants were evaluated primarily by assessing improvement in functional range of movements on 2,6,12,24 weeks and secondarily by IKDC score on 6,12,24 weeks and visual analogue scale (VAS) on 2,6,12,24 weeks. The data were recorded in the appropriate pro forma. Data analysis was done using SSPS software.
Results: Mean duration of surgery was 88.6 minutes among participants of Group A and was significantly higher in comparison to participants of Group B (51.45 minutes). While comparing the intensity of pain as assessed by VAS among the two study groups at different time intervals, non-significant results were obtained. Among participants of Group A, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 44.11, 58.86, 64.83 and 79.41 respectively. Among participants of Group B, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 43.41, 50.44, 57.67 and 64.74 respectively. While comparing the IKDC score among the two study groups, it was seen that mean IKDC score at 6 weeks, 12 weeks and 24 weeks was increased among participants of Group A. Incidence of re-operative was 5 percent among patients of Group A while it was absent in group B. Complications (wound infection) was seen in 1 patient each (5 percent each) of both Group A and Group B respectively.
Conclusion: The technique of meniscal repair remains an excellent option of treatment for chronic tears with good clinical improvement in comparison to debridement. We recommend meniscus repair whenever possible independent from age of patient. When repair is not possible, debridement also has good results at least in short term follow-up.
Keywords- knee, joint, meniscus

Introduction

The intra-articular fibro-cartilaginous structures known as knee menisci performs a significant and vital role in in knee biomechanics, distributing load, absorbing shock, lubricating the joint, and maintaining joint stability.[1] Meniscal tears are treated conservatively or surgically, with the latter group including arthroscopic meniscectomy and arthroscopic meniscal repair.

Meniscus preservation surgery has become more important, with less than 10% of meniscal repairs failing, indicating their effectiveness. Meniscal repair aims to reduce discomfort, restore pre-injury function, and delay early knee joint deterioration.[2,3] Additionally, age and vascularity are important factors to consider when deciding between meniscal repair and meniscectomy.[4] Studies have shown that in patients under 45 years old, meniscal repairs have better outcomes than meniscectomy. Furthermore, it's important to consider patient-reported outcome measures (PROMs) in evaluating the effectiveness of these procedures. A meta-analysis has suggested that

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arthroscopic surgery for degenerative knee disease may have limited benefits and be associated with harm.[5,6] In light of the increasing cases of meniscal tears, further study and evaluation of treatment options and patient characteristics receiving these treatments is essential to improve clinical outcomes and compare failure and reoperation rates.

Materials and methods

40 patients presenting with pain, swelling, difficulty in bending/straightening the leg, locked knee & being clinically diagnosed with meniscal tear were enrolled. After obtaining detailed history, Clinical examination, participants were subjected to specific investigations (MRI). Group A: Subjects who underwent meniscal repair. Group B: Subjects who underwent meniscectomy (meniscal debridement). Follow up were done on 2 weeks, 6 weeks, 12 weeks & 24 weeks when participants were evaluated primarily by assessing improvement in functional range of movements on 2,6,12,24 weeks and secondarily by IKDC score on 6,12,24 weeks and visual analogue scale (VAS) on 2,6,12,24 weeks. The data were recorded in the appropriate pro forma. Data analysis was done using SSPS software.

Results

Mean duration of surgery was 88.6 minutes among participants of Group A and was significantly higher in comparison to participants of Group B (51.45 minutes). While comparing the intensity of pain as assessed by VAS among the two study groups at different time intervals, non-significant results were obtained. Among participants of Group A, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 44.11, 58.86, 64.83 and 79.41 respectively. Among participants of Group B, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 43.41, 50.44, 57.67 and 64.74 respectively. While comparing the IKDC score among the two study groups, it was seen that mean IKDC score at 6 weeks, 12 weeks and 24 weeks was increased among participants of Group A. Incidence of re-operative was 5 percent among patients of Group A while it was absent in group B. Complications (wound infection) was seen in 1 patient each (5 percent each) of both Group A and Group B respectively.

Table 1: Comparison of duration of surgery

Duration of surgery (mins)	Group A	Group B
Mean	88.6	51.45
SD	7.42	6.34
p-value	0.0012*	

*: Significant

Table 2: Comparison of mean IKDC score at different time intervals

IKDC score	Group A		Group B		p-value
	Mean	SD	Mean	SD	
Baseline	44.11	2.74	43.41	2.38	0.323
6 weeks	58.86	4.91	50.44	9.24	0.001*
12 weeks	64.83	4.62	57.67	10.81	0.003*
24 weeks	79.41	7.18	64.74	13.09	0.000*

*: Significant

Table 3: Distribution of patients according to Re-operation

Re-operation	Group A		Group B	
	Number	Percentage	Number	Percentage
Present	1	5	0	0
Absent	19	95	20	100
Total	20	100	20	100
p-value	0.85			

Table 4: Complications

Complications	Group A		Group B	
	Number	Percentage	Number	Percentage
Present (Wound infection)	1	5	1	5
Absent	19	95	19	95
Total	20	100	20	100
p-value	1			

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Discussion

Meniscus injuries are frequently encountered in orthopedics, with an annual incidence of 60-70 knees per 100,000. Previously viewed as 'residual tissues without function,' it is now widely accepted among surgeons that preserving meniscus tissue is crucial. This is because the meniscus plays a vital role in knee biomechanics, contributing to load distribution, shock absorption, lubrication, and joint stability.[7,8]Meniscal tears occurring in isolation or in association with ligamentous injury, can result in marked impairment in joint kinematics. The presence of clinical symptoms of pain, swelling, locking, catching, and loss of motion often require surgical intervention. Arthroscopic treatment of meniscal injuries has become one of the most common orthopaedic surgical procedures.[9] To adequately evaluate and treat such injuries, appreciation of the types of tears and their significance in regard to treatment options is needed and accurate preoperative diagnosis of these injuries allows more effective patient management.[10]

In the present study, mean age of the patients of Group A and Group B was 40.1 years and 41.15 years respectively. 70 percent of the patients of Group A and 65 percent of the patients of Group B were males. Mean duration of surgery was 88.6 minutes among patients of Group A and was significantly higher in comparison to patients of Group B (51.45 minutes). In a similar study conducted by Mittal R et al, mean duration of surgery among patients of meniscal repair group and meniscectomy group was 84.51 minutes and 45.62 minutes respectively. Similar to our study, they also reported significantly higher mean duration of surgery among patients of meniscal repair group in comparison to meniscectomy group.[11]

Among patients of Group A, mean VAS at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 3.21, 2.15, 1.30 and 0.85 respectively. Among patients of Group B, mean VAS at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 3.5, 2.3, 1.45 and 1 respectively. While comparing the intensity of pain as assessed by VAS among the two study groups at different time intervals, non-significant results were obtained. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a study conducted by Mittal R et al, authors also reported non-significant difference in terms of postoperative VAS among patients of meniscal repair group and meniscectomy group (repair VAS- 2.52; meniscectomy VAS- 2.46).[11]

Among patients of Group A, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 44.11, 58.86, 64.83 and 79.41 respectively. Among patients of Group B, mean IKDC at 2 weeks, 6 weeks, 12 weeks and 24 weeks was 43.41, 50.44, 57.67 and 64.74 respectively. While comparing the IKDC score among the two study groups, it was seen that mean IKDC score at 6 weeks, 12 weeks and 24 weeks was significantly higher among patients of Group A in comparison to patients of Group B. Hence; better results were seen among patients of repair group. In a study conducted by Mittal R et al, authors also reported significantly better results among patients of meniscal repair group.[11] Fairbank TJ et al showed that on long term there is a major difference and better score with meniscal repair.[12] Patients who underwent meniscectomy exhibited poorer patient reported outcome scores and had a higher likelihood of developing knee osteoarthritis in comparison to those who underwent meniscal repair (Paxton ES et al).[13]

Incidence of re-operative was 5 percent among patients of Group A while it was absent in group B. Our results were in concordance with the results obtained by previous authors who also reported similar findings. Sochacki et al, in a similar study, reported re-operation in 2.1 percent of the patients of the repair group and in 5.3 percent of the patients of the meniscectomy group. Hence; overall lower incidence of re-operation was seen in repair procedure.[14]

Complications such as wound infection was seen in 1 patient each (5 percent each) of both Group A and Group B respectively. In a similar study conducted by Mittal R et al, overall complications were seen in 2.86 percent of the patients of the meniscal repair group and in 2.12 percent of the patients of the meniscectomy group.[11] Sochacki et al, in a similar study, reported complications in 1.2 percent of the patients of the repair group and in 0.823 percent of the patients of the meniscectomy group.[14] Hence; similar both the procedures are associated with similar low complication rate.

Conclusion

The technique of meniscal repair remains an excellent option of treatment for chronic tears with good clinical improvement in comparison to debridement. We recommend meniscus repair whenever possible independent from age of patient. When repair is not possible, debridement also has good results at least in short term follow-up.

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