ORIGINAL RESEARCH

Assessment of efficacy of proximal fibulectomy combined with arthroscopic partial meniscectomy in patients with medial compartment osteoarthritis and medial meniscal tears

[1]Dr. Ranjeet Kumar, [2]Dr. Rakesh Kumar

[1]Senior Resident, [2]Associate Professor, Department of Orthopaedic, Sri Krishna Medical College Hospital, Muzaffarpur, Bihar, India

Corresponding Author
Dr. Rakesh Kumar
Associate Professor, Department of Orthopaedic, Sri Krishna Medical College Hospital, Muzaffarpur, Bihar, India

Received: 13 March, 2024 Accepted: 18 April, 2024

ABSTRACT

Background: Medial meniscal tears can occur due to traumatic injury, such as twisting the knee forcefully while weight-bearing, or as a result of degenerative changes over time (wear and tear). The present study was conducted to evaluate efficacy of proximal fibulectomy combined with arthroscopic partial meniscectomy (APM) in patients with medial compartment osteoarthritis and medial meniscal tears. **Materials & Methods:** 60 patients with medial compartment osteoarthritis and medial meniscal tears of both genders underwent APM and proximal fibulectomy. Preoperative and postoperative Visual Analog Scale (VAS) pain scores, hospital for special surgery (HSS) knee scoreswere recorded. **Results:** Out of 60 patients, males were 38 and females were 22. Pain (VAS) pre- operatively was 8.4 and post- operatively was 2.1. HSS score pre- operatively was 74.2 and post- operatively was 88.6. Patient satisfaction level was very satisfied in 46, satisfied in 12, fairly satisfied in 2. Complications were infection in 2 and temporary palsy of the superficial peroneal nerve in 1 patient. The difference was significant (P< 0.05). **Conclusion:** When proximal fibulectomy and APM were coupled, surgical results were satisfactory. APM and concurrent proximal fibulectomy could be viewed as a secure, minimally intrusive course of treatment.

Keywords: arthroscopic partial meniscectomy, fibulectomy, peroneal nerve

INTRODUCTION

The meniscus is cartilage that acts as a cushion between the femur (thigh bone) and tibia (shin bone) in the knee joint. It helps distribute weight and absorb shock during movement. The medial meniscus is located on the inner side of the knee joint, between the femur and tibia.[1] Medial meniscal tears can occur due to traumatic injury, such as twisting the knee forcefully while weight-bearing, or as a result of degenerative changes over time (wear and tear). Athletes involved in sports that involve pivoting movements are particularly prone to such injuries.[2]

Patients with medial compartment osteoarthritis of the knee frequently have medial meniscal tears.[3] Initial treatment recommendations for symptomatic patients with mild medial compartment osteoarthritis and medial meniscal tears may include medication and exercise therapy. APM is advised when patients do not respond to conservative treatment.[4] Nevertheless, it was stated that APM is unable to stop the advancement of osteoarthritis. A recent biomechanical investigation revealed that following a partial fibulectomy, the knee stress is shifted from the medial compartment to the lateral compartment.[5] Two trials have examined the use of partial fibulectomy in individuals with medial compartment osteoarthritis to date. The partial fibulectomy has been found to be effective in stopping the progression of medial compartment osteoarthritis.[6]The present study was conducted to evaluate efficacy of proximal fibulectomy combined with arthroscopic partial

meniscectomy (APM) in patients with medial compartment osteoarthritis and medial meniscal tears.

MATERIALS & METHODS

The present study was conducted at ANMMC Gaya, Bihar from Study period Feb 2016 to Feb 2017. It consisted of 60 patients with medial compartment osteoarthritis and medial meniscal tears of both genders.All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. APM was performed initially to manage medial meniscal tears. This was followed by the proximal fibulectomy, during which a 20-mm long proximal fibular segment was excised. Preoperative and postoperative Visual Analog Scale (VAS) pain scores, hospital for special surgery (HSS) knee scoreswere recorded. Postoperative complications and subjective patient satisfaction were recorded.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 60		
Gender	**Male**	**Female**
Number	38	22

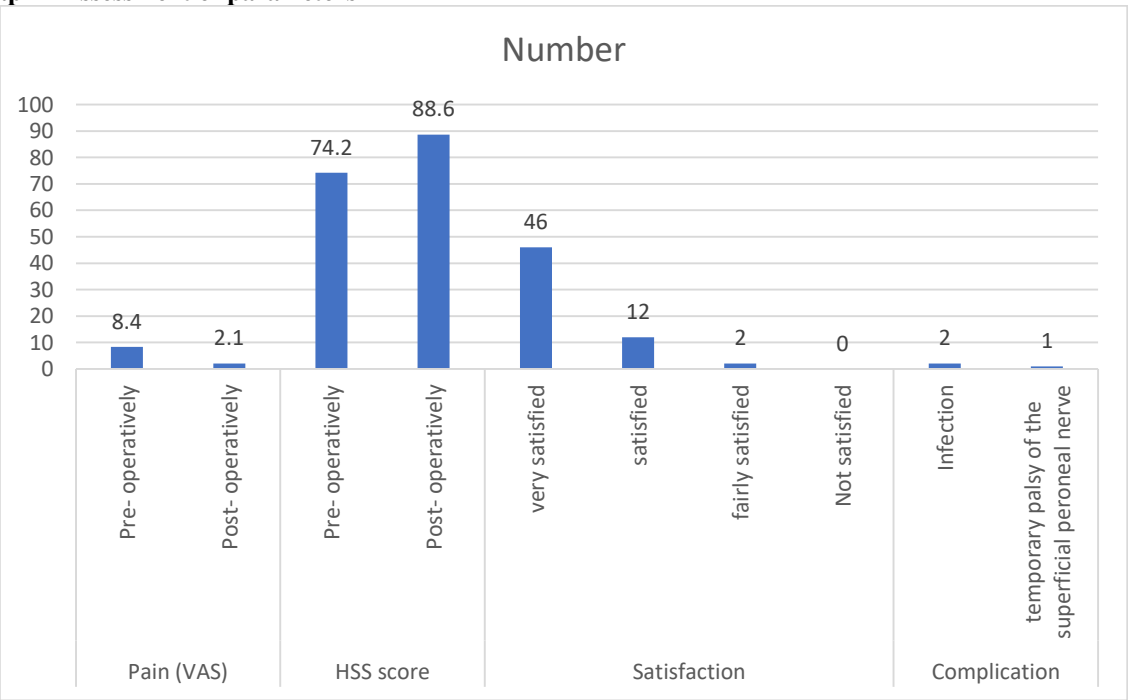
Table I shows that out of 60 patients, males were 38 and females were 22.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Pain (VAS)	Pre- operatively	8.4	0.01
	Post-operatively	2.1	
HSS score	Pre- operatively	74.2	0.05
	Post-operatively	88.6	
Satisfaction	very satisfied	46	0.02
	satisfied	12	
	fairly satisfied	2	
	Not satisfied	0	
Complication	Infection	2	0.51
	temporary palsy of thesuperficialperoneal nerve	1	

Table II, graph I shows that pain (VAS) pre- operatively was 8.4 and post- operatively was 2.1. HSS score pre-operatively was 74.2 and post- operatively was 88.6. Patient satisfaction level was very satisfied in 46, satisfied in 12, fairly satisfied in 2. Complications were infection in 2 and temporary palsy of the superficial peroneal nerve in 1 patient. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Degenerative medial meniscal tears are thought to be a component of the pathology observed in medial compartment osteoarthritis and a risk factor for additional articular cartilage degradation in middle-aged and older patients.[7,8]Common symptoms include pain, swelling, stiffness, and a catching or locking sensation in the knee joint. Some individuals may also experience difficulty fully straightening or bending the knee.[9,10]Diagnosis typically involves a thorough history, physical examination, and imaging studies such as MRI (Magnetic Resonance Imaging). MRI is particularly useful for visualizing the extent and location of the meniscal tear.[11,12]The present study was conducted to evaluate efficacy of proximal fibulectomy combined with arthroscopic partial meniscectomy (APM) in patients with medial compartment osteoarthritis and medial meniscal tears.

We found that out of 60 patients, males were 38 and females were 22. Lu et al[13]assessed the efficacy of proximal fibulectomy combined with Arthroscopic Partial Meniscectomy (APM) for symptomatic middle-aged and elderly patients with mild medial compartment osteoarthritis and medial meniscal tears. APM was performed initially to manage medial meniscal tears. A total of 31 out of 38 patients were included. Seven patients were excluded due to follow up loss. The mean follow up duration was 25.3±1.5 months. The postoperative median VAS score and Interquartile Range (IQR) were 0 (0–1), which was significantly lower than the preoperative median VAS score and interquartile range 6 (5–7) ($p< 0.001$). The mean HSS score improved from 78.2±8.2 points preoperatively to 90.1±4.5 points postoperatively ($p< 0.001$). No patients had radiographic evidence of osteoarthritis progression or fibular bony union, or required conversion to other surgeries. Subjective patient satisfaction was rated very satisfied in 7 patients (22.6%), satisfied in 20 patients (64.5%), fairly satisfied in 3 patients (9.7%), and not satisfied in 1 patient (3.2%). Complication in a single patient included a temporary palsy of the superficial peroneal nerve.

We found that pain (VAS) pre- operatively was 8.4 and post- operatively was 2.1. HSS score pre-operatively was 74.2 and post- operatively was 88.6. Patient satisfaction level was very satisfied in 46, satisfied in 12, fairly satisfied in 2. Complications were infection in 2 and temporary palsy of the superficial peroneal nerve in 1 patient. Ghislain et al[14] in their study one hundred and seventeen patients were divided in two groups T and NT according to the presence of distinct previous traumatic events to the knees. Two subgroups were formed in each groups T and NT respectively at a mean follow up of 1 and 4 years. Postoperative clinical outcome were assessed using Lysholm scores and Rand SF-36 survey.One hundred and seventeen patients were included in the present study with 60(51.28%) patients in the traumatic group and 57(48.71%) in the degenerative group. 95(81.19%) patients in total were satisfied with their health status at end of follow up. The mean value of Lysholm scores at 1 year were respectively 85.25±8.78 for traumatic group and 86.38±12.14 for non-traumatic group and at 4 years were respectively 92.63±7.31 for traumatic group and 72.90±20.77 for non-traumatic group. According to Rand SF-36 health, traumatic group showed better improvements compare to non-traumatic group between 1 and 4 years after arthroscopic meniscus surgery.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that when proximal fibulectomy and APM were coupled, surgical results were satisfactory. APM and concurrent proximal fibulectomy could be viewed as a secure, minimally intrusive course of treatment.

REFERENCES

1. Herrlin SV, Wange PO, Lapidus G, Hallander M, Werner S, Weidenhielm L. Is arthroscopic surgery beneficial in treating non-traumatic, degenerative medial meniscal tears? A five year follow up. Knee Surgery, Sports Traumatology, Arthroscopy: Official Journal of the ESSKA. 2013;21(2):358-64.
2. Mezhov V, Teichtahl AJ, Strasser R, Wluka AE, Cicuttini FM. Meniscal pathology - the evidence for treatment. Arthritis Research & Therapy. 2014;16(2):206.
3. Roemer FW, Kwoh CK, Hannon MJ, Hunter DJ, Eckstein F, Grago J, et al. Partial meniscectomy is associated with increased risk of incident radiographic osteoarthritis and worsening cartilage damage in the following year. European Radiology. 2017;27(1):404-13.
4. Yazdi H, Mallakzadeh M, Mohtajeb M, Farshidfar SS, Baghery A, Givehchian B. The effect of partial fibulectomy on contact pressure of the knee: a cadaveric study. European Journal of Orthopaedic Surgery & Traumatology: OrthopedieTraumatologie. 2014;24(7):1285-89.
5. Yang ZY, Chen W, Li CX, Wang J, Shao DC, Hou ZY, et al. Medial compartment decompression by fibular osteotomy to treat medial compartment knee osteoarthritis: a pilot study. Orthopedics. 2015;38(12):e1110-14.
6. Ahlback S. Osteoarthrosis of the knee. A radiographic investigation. ActaRadiologica: Diagnosis. 1968:Suppl 277:07-72.
7. Berthiaume MJ, Raynauld JP, Martel-Pelletier J, Labonte F, Beaudoin G, Bloch DA, et al. Meniscal tear and extrusion are strongly associated with progression of symptomatic knee osteoarthritis as assessed by quantitative magnetic resonance imaging. Annals of the Rheumatic Diseases. 2005;64(4):556-63.
8. Arno S, Bell CP, Xia D, Regatte RR, Krasnokutsky S, Samuels J, et al. Relationship between meniscal integrity and risk factors for cartilage degeneration. The Knee. 2016;23(4):686-91.
9. Giri S, Santosha, Singh Ch A, Datta S, Paul V, Masatvar P, et al. Role of arthroscopy in the treatment of osteoarthritis of knee. J ClinDiagn Res. 2015;9(8):RC08- RC11.

10. Kirgis A, Albrecht S. Palsy of the deep peroneal nerve after proximal tibial osteotomy. An anatomical study. The Journal of Bone and Joint Surgery American Volume. 1992;74(8):1180-85.
11. Rupp RE, Podeszwa D, Ebraheim NA. Danger zones associated with fibular osteotomy. Journal of Orthopaedic Trauma. 1994;8(1):54-58.
12. Ryan W, Mahony N, Delaney M, O'Brien M, Murray P. Relationship of the common peroneal nerve and its branches to the head and neck of the fibula. Clinical Anatomy (New York, NY). 2003;16(6):501-05.
13. Lu ZK, Huang C, Wang F, Miao S, Zeng L, He S, Ye X, Chen W. Combination of Proximal Fibulectomy with Arthroscopic Partial Meniscectomy for Medial Compartment Osteoarthritis Accompanied by Medial Meniscal Tear. Journal of Clinical & Diagnostic Research. 2018 Jan 1;12(1).
14. Ghislain NA, Wei JN, Li YG. Study of the clinical outcome between traumatic and degenerative (non-traumatic) meniscal tears after arthroscopic surgery: A 4-years follow up study. J ClinDiagn Res. 2016;10(4):RC01-RC04.