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Correlation between Plica Mediopatellar Damages and Cartilage Lesions on Arthroscopic Findings of the Knee

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ABSTRACT

Introduction: The mediopatellar plica are folds in the synovium that represent the embryological remnant in the development of the synovial cavity of the knee. Our study aim to investigate the damage to the mediopatellar plica using the Sakakibara classification and cartilage lesions using the Outerbridge classification based on the arthroscopy findings of the knee.

Methods: A multi-center retrospective cross-sectional analytical study was conducted on patients at Wahidin Sudirohusodo Hospital and network teaching hospitals in Makassar, South Sulawesi Indonesia, the study was conducted in January – March 2021. The results of assessment the damage to mediopatellar plica using the Sakakibara classification and Cartilage lesions use the outer bridge classification. After that, data was processed to analyze the correlation between damage to the mediopatellar plica and cartilage lesions as well as related variables.

Results: In the early study, 119 patients were included, where the final follow-up was obtained for 91 patients (76.5%). The existence of a positive correlation between damage to the mediopatellar plica based on the Sakakibara Classification and cartilage lesions based on the Outerbridge Classification, where the greater the damage to the mediopatellar plica based on the Sakakibara Classification, the higher the cartilage lesions based on the Outerbridge Classification.

Conclusions: There is a relationship between the characteristics of the sample and plica damage based on the Sakakibara classification, meanwhile, the plica damage based on the Sakakibara classification shows the opposite result. There is a corelation between plica damage based on the Sakakibara classification and Cartilage lesions based on the Outerbridge classification.

ARTICLE DETAILS

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INTRODUCTION

The mediopatellar plica are folds in the synovium that represent the embryological remnant in the development of the synovial cavity of the knee.(1) The plicas are inward folds of the synovial layer and are present over most of the knee.(2)(3)(4) The plicas are found along the medial wall of the joint. the knee originates superiorly, extends obliquely and inferiorly, and is inserted into the synovial layer of the infrapatellar fat pad.(4) Normally, the plica is thin and flexible and appears almost transparent. The mediopatellar is clinically important, its attached to the muscle of the genus articularis, while it runs distally to the intraarticular synovial layer and fuses with the medial patellotibial ligament on the medial aspect of the retropatellar fat pad.(5)(6)

There is a large variation in the reported incidence of medial folds ranging from 17 to 75%,(7) recent arthroscopic studies in which tissue folds were considered as plica gave an overall incidence of 92% and 72%.(6)(8)(9) The plica becomes pathological when its innate qualities are altered due to an inflammatory process that alters the flexibility of the synovial tissue. A pathological synovial plica that has been through this inflammatory process can become inelastic, tight, thickened, fibrotic, and sometimes hyalinized. A synovial plica affected by such changes may bowstring across the femoral trochlea, causing impingement between the patella and femur in knee flexion.(2)(10)(11)(12) A pathological synovial plica may express a large number of symptoms; clinical history usually reveals nonspecific anterior or anteromedial knee pain.(13)(14)(15) During arthroscopic examination, many investigators have noticed varying degrees of cartilage degeneration on the surface of the medial femoral condyle facing the medial plica. Most of the discussion focuses on the

mechanism of lesion formation, and many investigators suggest that the pathological medial plica locks or impinges on the underlying femoral condyle during knee movement and causes erosive changes in the articular cartilage.[16][17]

Recently, it was found that in patients who have a medial plica structure in their knee, regardless of the size of the fold, the incidence of varying severity of cartilage lesions of the medial femoral condyle is 97%,[1] then some patients with severe synovial fold syndrome who undergo arthroscopic treatment noted that the mediopatellar plica as bands or cords enter the articular cartilage surface and cause grooves for repeated friction.[10] In another study, the synovial shelf of the knee was associated with an increased incidence of cartilage lesions.[18] The shape of the synovial medial plica and the duration between symptom onset and surgery are associated with cartilage damage.[19] Even though they are clinically absent and sometimes even indistinguishable from other intraarticular conditions such as meniscal tears, articular cartilage injuries or osteochondritic lesions, they present a distinct diagnostic challenge and surgeons' lack of awareness of these structures often leads to failure to diagnose and treat these conditions.[2]

The frequency of mediopatellar plica and cartilage lesions that we often find in routine arthroscopic procedures coupled wiht the lack of research in the literature that focuses on mediopatellar folds and cartilage lesions themselves attracted us to investigate them. The purpose of this study was to investigate the damage to the mediopatellar plica using the Sakakibara classification and cartilage lesions using the outerbridge classification based on the arthroscopy findings of the knee. The main focus is on the correlation between Mediopatellar Plica Damage using the Sakakibara classification and Cartilage Lesions using the outerbridge classification. We postulated that as the Mediopatellar Plica Damage increases, the Cartilage Lesions will increase.

METHODS

A multi-center retrospective cross-sectional analytical study was conducted on patients at Wahidin Sudirohusodo Hospital and other network teaching hospitals Makassar, South Sulawesi Indonesia, the study was conducted in January – March 2021. This study used secondary data from data on patients who had undergone arthroscopic procedures between January 2019 to December 2020. Samples were collected using a total sampling technique and selected based on inclusion criteria, including: The patient underwent an arthroscopic procedure for the first time, the patient's age was 12 years or older and Mediopatelar plica and cartilage were found which were visualized at the time of assessment. while the exclusion criteria included the patient having undergone previous surgical management in knee, intra-articular fracture of the knee, Mediopatelar plica and cartilage that are not well visualized/doubtful at the time of assessment, incomplete data such as identity, demographics and damaged arthroscopic video, missing/none.

This study mainly analyzes and highlights clinical findings and other important findings. The results analyzed were an assessment of the damage to the mediopatellar plica using the Sakakibara classification; type A Plica has a cord-like elevation in the synovial wall, type B Plica has a shelf-like appearance but does not cover the anterior surface of the medial femoral condyle, type C Plica has a large shelf appearance. -like appearance that covers the anterior surface of the medial femoral condyle and type D plica have a double insertion image to the medial wall or have a central defect (fenestrated plicae).[20] Cartilage lesions use the outer bridge classification; grade 0 Indicates normal cartilage, grade I: chondral lesion characterized by tenderness and swelling that often requires tactile feedback with a probe or other instrument to assess, grade II partial thickness defect with a cleft that is not 0.5 inches in diameter or reaches the subchondral bone, grade III moderately fractured cartilage with diameter > 0.5 inch de only areas reaching the subchondral bone and grade IV erosion of the articular cartilage showing the subchondral bone.[21]

STATISTICAL ANALYSIS

The results of assessment the damage to mediopatellar plica using the Sakakibara classification and Cartilage lesions use the outer bridge classification are then supervised by consultants who are experts in their fields. After the results of the assessment were supervised, the data was processed to analyze the correlation between damage to the mediopatellar plica and cartilage lesions as well as related variables using SPSS Statistics for Windows, Version 25.0.

Univariate analysis to describe the characteristics of the study sample, bivariate analysis using Chi Square test to analyze the relationship between characteristic variables such as Gender, Age, Occupation, Body Mass Index (BMI), Chief Complaint, Etiology, Clinical Diagnosis, mediopatellar plica damage and cartilage lesions . Spearman test to analyze the correlation between mediopatellar plica damage and cartilage lesions. *p*-value <0.05 is considered statistically significant.

The local ethics committee at Health research ethics committee Hasanuddin University Hospital, dr. Wahidin Sudirohusodo Hospital through ethical approval recommendation number 356/UN4.6.4.31/PP36/2021.

RESULT

The study flow chart is presented as Figure 1 119 (100%) patient data collected, patients who had previous surgical management of the knee 7 patients (5.9%), intra-articular fracture of the knee 5 (4.2%) patients, plica Mediopatelar and cartilage not visualized well/doubtful at the time of assessment 0 (0%) patients, incomplete data such as identity, demographics of 6 (5.0%) patients and arthroscopic video damaged, missing/absent 4 (3.4)) %) patient. Final follow-up was obtained for 91 patients (76.5%).

PATIENT CHARACTERISTICS

The characteristics of the 91 patients who met the criteria obtained were patients aged between 12 – 69 years, with a mean value of 31.1 ± 13.1 years. An overview of the sample is shown in table 1.

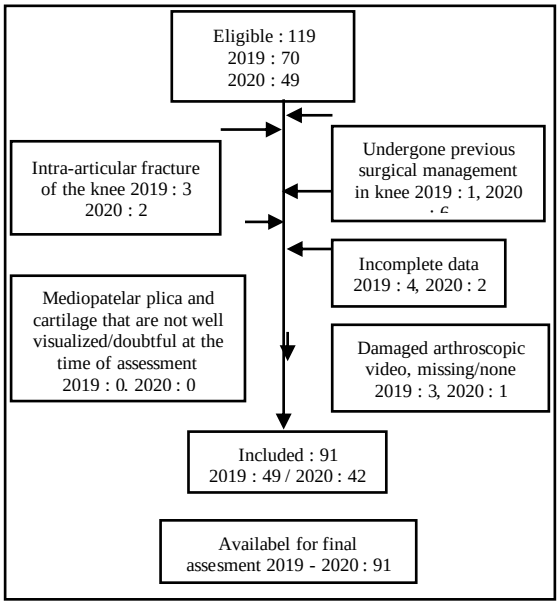

Figure. 1 Study flowchart

Table 1. Patient Characteristics

Characteristic		n	%
Gender	Male	66	72,5
	Female	25	27,5
Age	Young (12-25y.o)	39	42,9
	Adult (26-45y.o)	39	42,9
	Elderly (46-65y.o)	13	14,3
Body Mass Index	Underweight	2	2,2
	Normal	55	60,4
	Overweight	29	31,9
	Obese 1	5	5,5
Accupation	Government Employee	5	5,5
	Private Employee	41	45,1
	College Student	18	19,8
	Student	15	16,5
	Housewife	11	12,1
	Pensionary	1	1,1
Chief complain	Knee pain (Anterior knee pain)	83	91,2
	Clicking	2	2,2
	Stiffness	1	1,1
	Unstable knee	5	5,5
Etiology	Sport	51	56
	Trauma	33	36,3
	Nonsport/Nontrauma	7	7,7
Clinical Diagnosis	Meniscus tear	16	17,6
	Synovitis	21	23,1
	ACL rupture	43	47,3
	PCL rupture	3	3,3
	Knee Osteoarthritis	6	6,6
	Other	2	2,2

Source: Secondary data 2019-2020

In table 1, patient characteristics based on gender show that of the 91 patients, the most male patients were 66 (72.5%) patients while the least female patients were 25 (27.5%) patients. Patient characteristics based on age group were mostly found in adolescent and adult age group 39 (42.9%) patients, while the least patients were elderly age group 13 (14.3%) patients. Characteristics of patients based on Body Mass Index found the most patients with Normal Body Mass Index 55 (60.4%) patients while the least patients with Low Body Mass Index were 2 (2.2%) patients.

Table 1 also shows the characteristics of patients based on occupation, the most patients are private employees / professional experts 41 (45.1%) patients while the least patients are retired 1 (1.1%) patients, patient characteristics are based on the patient's chief complaint the most patients with knee pain / anterior knee pain were 83 (91.2%) patients while the least patients with joint stiffness complaints were 1 (1.1%) patients, patient characteristics based on etiology were mostly found due to sports injuries 51 (56%) patients while the least patients with nonsport/traumatic etiology were 7 (7.7%) patients and patient characteristics based on clinical diagnosis found the most patients with anterior cruciate ligament rupture 43 (47.3%) patients while the most slightly with others, namely 2 (2.2%) patients.

ARTHROSCOPY FINDINGS OF THE KNEE

Arthroscopic findings of the knee assessing damage to the mediopatellar plica based on the Sakakibara classification and cartilage lesions based on the Outerbridge classification can be seen in Table 2.

Table 2. Findings of mediopatellar plica damage and cartilage lesions on knee arthroscopy

Arthroscopic Findings		n	%
Plica Damage (Sakakibara Classification)	Type A	14	15,4
	Type B	15	16,5
	Type C	37	40,7
	Type D	25	27,5
Cartilage Lesion (Outerbridge Classification)	Grade 0	28	30,8
	Grade 1	11	12,1
	Grade 2	32	35,2
	Grade 3	11	12,1
	Grade 4	9	9,9

Source: Secondary data 2019-2020

In table 2, the findings of damage to the mediopatellar plica based on the Sakakibara classification on knee arthroscopy were the most found in patients with Mediopatellar Plica Damage in the Sakakibara C classification, 37 (40.7%) patients, while the least patients with Sakakibara A classification were 14 (15.4%) patients, for the findings of cartilage lesions based on the outerbridge classification, the most patients with Outerbridge 2 Classification Cartilage Lesions were 32 (35.2%) patients while the least patients with Outerbridge 4 Classification were 9 (9.9%) patients.

CHARACTERISTICS OF PATIENTS WITH ARTHROSCOPIC FINDINGS OF THE KNEE

Characteristics of patients and their relationship to arthroscopic findings of the knee both in the damaged mediopatellar fold based on the Sakakibara classification and cartilage lesions based on the Outerbridge classification can be seen in table 3.

Table 3. Characteristics of Patients with Arthroscopic Findings of the knee

Patient Characteristics	Arthroscopic Findings of the knee	
	Sakakibara	Outerbridge
	p	*p*
Gender	0,459	0,026
Age	0,861	0,001
BMI	0,971	0,028
Occupation	0,477	0,000
Chief Complain	0,404	0,726
Etiology	0,292	0,001
Clinical Diagnosis	0,627	0,035

Source: Secondary data 2019-2020

Table 3 shows that the characteristics of patients with Mediopatellar Plica Damage (Sakakibara Classification) do not have a significant relationship seen in the p value of the sex variable p 0.459, age group p 0.861, age of productivity p 0.283, occupation p 0.477, Body Mass Index p 0.971 , Main complaint p 0.404, etiology 0.292 and clinical diagnosis p 0.627 where all variables have a p value > 0.05 which means there is no significant correlation. Meanwhile, the characteristics of patients with cartilage lesions (Outerbridge Classification) did not have a significant relationship with the variable Chief Complaint p 0.404, where the variable had a p value > 0.05 which means it has no significant correlation. While gender p 0.026, age group p 0.001, occupation p 0.000, Body Mass Index p 0.028, etiology 0.001 and clinical diagnosis p 0.035 have a significant relationship where the variable has a p value <0.05 which means it has a significant correlation.

CORRELATION OF MEDIOPATELLAR PLICA DAMAGE WITH CARTILAGE LESIONS

The correlation between Mediopatellar Plica Damage based on Sakakibara classification and Cartilage Lesions based on Outerbridge classification can be seen in table 4.

Table 4. Correlation between Mediopatellar Plica Damage (Sakakibara Classification) with Cartilage Lesion (Outerbridge Classification)

		Outerbridge					*p*	R
		0	**1**	**2**	**3**	**4**		
Sakakibara	A	8	1	4	1	0	0,042	0,213
	B	3	1	7	3	1		
	C	12	6	10	7	2		
	D	5	3	11	0	6		
Total		28	11	32	11	9		

Source: Secondary data 2019-2020

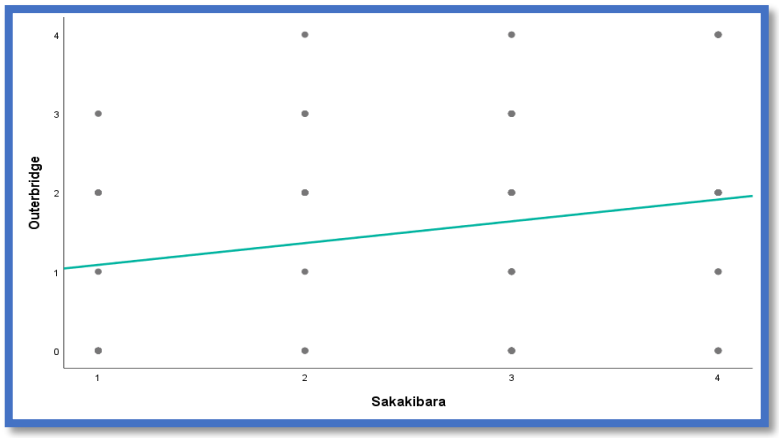

Figure 2. Correlation of Mediopatellar Plica Damage with Cartilage Lesions

Table 4 shows that the Mediopatellar Plica Damage based on the Sakakibara Classification type A has the most outerbridge cartilage lesions in type 0 which is 8 patients while the least in type 4 is 0 patients, for the Sakakibara Classification type B the most is in type 2 which is 7 patients and at least in types 1 and 4,1 patient each, for the Sakakibara Classification type C the most in type 0 which is 12 patients and the least in type 4, 2 patients, for the Sakakibara Classification type D the most in type 2, 11 patients and at least in type 3, 0 patients with a p value of 0.042 (<0.05) which means that Mediopatellar Plica Damage has a significant correlation to Cartilage Lesions (Outerbridge Classification) with the magnitude of the correlation (R) between the two including the weak category (0.213). Figure 2. shows the coordinates of damage to the mediopatellar plica based on the Sakakibara Classification with cartilage lesions based on the Outerbridge Classification of each subject. The green line shows the trend of changes in cartilage lesions based on the Outerbridge Classification if the damage to the mediopatellar plica based on the Sakakibara Classification increases. So the curve provides information on the existence of a positive correlation between damage to the mediopatellar plica based on the Sakakibara Classification and cartilage lesions based on the Outerbridge Classification, where the greater the damage to the mediopatellar plica based on the Sakakibara Classification, the higher the cartilage lesions based on the Outerbridge Classification.

DISCUSSION

Patient characteristics with Arthroscopic Findings of the Knee

Characteristics of patients with mediopatellar plica damage showed that all characteristics including gender, age, Body Mass Index, occupation, chief complain, etiology and clinical diagnosis did not have a significant relationship. In contrast to Nakayama who stated that the incidence of Sakakibara type A, B, C, and D medial plicae was 35.2%, 22.4%, 12.3%, and 10.0%, respectively. This pattern was reflected in all age groups in both genders, except in women aged 20 to 39 years. The coefficient was moderate, at 0.407, in the patients in whom both knee joints were examined.[20] In another study showed that no difference was found in terms of gender, mean age (40.16, 39.95, respectively), BMI (26.12, 27.05, respectively) and laterality (Right / Left; 19/14, 18/17, respectively) in the patient and control groups ($p > 0.05$).[22]

Characteristics of patients with cartilage lesions based on the outerbridge classification showed that almost all characteristics including gender, age, Body Mass Index, occupation, etiology and clinical diagnosis had a significant relationship to cartilage lesions based on the outerbridge classification, while the chief complaint did not have a significant relationship. In contrast to the study conducted by Kan et al that the comparison of the knee with mild and severe cartilage damage (International Cartilage Research Society classification) showed no significant difference between the groups in gender (p 0.41) and BMI (p 0.13).[19] In addition, increased participation in recreational and competitive sports has been associated with an increased incidence of sport-related articular cartilage injuries to the knee. [23][24][25][26] This shows that sports injuries are one of the main etiologies that cause cartilage lesions in the knee in addition to trauma such as motor vehicle accidents or degenerative processes. Furthermore, if someone has a job as a professional sports athlete, especially sports that use a lot of knees as the main mechanism in exercising, the risk of damage to cartilage lesions will also increase, both of these have a close relationship between etiology and work, sports injury as one of the main etiologies of knee cartilage damage and work-related sports also increase the risk of cartilage damage in the knee itself.

In this study also found injury to the anterior cruciate ligament (ACL) as the most common clinical diagnosis in situations where there is damage to the mediopatellar plica and cartilage lesions of the knee. These cartilage injuries often occur in association with other knee injuries and have been described in more than 50% athletes undergoing anterior cruciate ligament (ACL) reconstruction.[23][26] Based on the reported incidence of 200,000 ACL injuries annually, up to 100,000 new articular cartilage injuries are estimated to occur in this population alone.[27][28] Other research shows that patients who had sustained meniscal tears showed a higher average rate of progression of cartilage loss (22%) than that seen in those who had intact menisci (14.9%) ($P < 0.018$). Anterior cruciate ligament (ACL) tears had a borderline significant influence ($P < 0.06$) on the progression of cartilage pathology.[29] The existence of other pathological conditions that accompany the occurrence of damages on the mediopatellar plica and cartilage lesions, makes surgeons have to establish a good diagnosis and holistic and complete preoperative management planning. So that the treatment of patients becomes more efficient.

Correlation of Mediopatellar plica damage with cartilage lesions

In this study, it was found that there was a correlation between damage to the mediopatellar plica (Sakakibara classification) and cartilage lesions (outerbridge classification) where damage to the mediopatellar plica and cartilage lesions had a positive significant correlation, the increasing type of mediopatellar plica damage, the degree of cartilage lesions also increases. The Correlation magnitude between them is in the weak category. Christoforakis reported in 1000 consecutive knee arthroscopies, that an increased incidence of articular lesions was found in patients with synovial shelves, in comparison with patients without shelves (94.7% vs. 81% respectively).[18] When arthroscopy was performed, we found the position or location of the mediopatellar plica in a pathological condition trapped in the knee joint space, especially the medial part, we assumed that the presence of this mediopatellar plica created friction that damaged the cartilage of the knee joint, the same thing has been stated previously that the mediopatellar plica as a band or strap to insert into the articular cartilage surface and causes grooves for repeatedly friction.[10] Another study found that the shape of the medial synovial plica were associated with cartilage damage (p 0.0011),[19] where this study uses the Sakakibara classification for plica damage and the International Cartilage Research Society classification to assess cartilage lesions. Surgical treatment should be considered when the medial synovial plica covers part of the anterior aspect of the medial femoral condyle or ruptures, or when pain persists over a long period, thus reducing the potential for cartilage damage.[19] The illustrations that we found in this study can be seen in Figures 3 to 8.

The figure shows that the type of damage to the mediopatellar plicas corresponds to the degree of cartilage lesions in the knee, where the higher the type of damage to the mediopatellar plicas, the more severe the degree of cartilage lesions to the knee. in figures 3 and 4 with type A mediopatellar plica damage and knee cartilage lesions of grades 0 and 1, figure 5 with type B mediopatellar plica damage and grade 2 knee cartilage lesions, figure 6 with type C mediopatellar plica damage and grade 3 knee cartilage lesions and figures 7 and 8 with type D mediopatellar plica damage with grade 4 knee cartilage lesions.

Figure 3. A male 20 years old with plika mediopatellar sakakibara type A (red arrow) dan lesi kartilago outerbridge grade 0 (blue arrow)

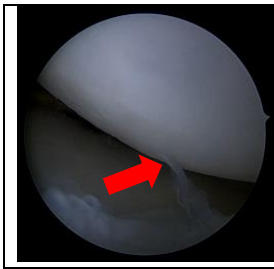

Figure 4. A male 22 years old with plika mediopatellar sakakibara type A (red arrow) dan lesi kartilago outerbridge grade 1 (blue arrow)

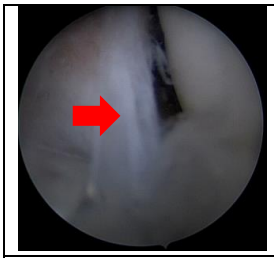

Figure 5. A male 27 years old with plika mediopatellar sakakibara type B (red arrow) dan lesi kartilago outerbridge grade 2 (blue arrow)

Figure 7. A female 40 years old with plika mediopatellar sakakibara type D (red arrow) dan lesi kartilago outerbridge grade 4 (blue arrow)

Figure 8. A male 28 years old with plika mediopatellar sakakibara type D (red arrow) dan lesi kartilago outerbridge grade 4 (blue arrow)

Figure 6. A Female 55 years old with plika mediopatellar sakakibara type C (red arrow) dan lesi kartilago outerbridge grade 3 (blue arrow)

LIMITATIONS

There are some limitations in this study. This is a retrospective study, so there is a risk of bias in this type of study. The lack of research that uses the same assessment parameters, even though there are many studies with the same theme, makes it difficult to compare the results of this study. The shape of the medial synovial plica were associated with cartilage damage (p 0.0011), where this study uses the Sakakibara classification for plica damage and the International Cartilage Research Society classification to assess cartilage lesions.[19]

This study has not been able to rule out the existence of other pathological conditions that can induce damages of the mediopatellar plica and lesion to the knee cartilage, whether these conditions have existed before or after damages of the mediopatellar plica and lesion to the knee cartilage. More specific methods and modalities are needed in assessing the relationship between the two, patients who had sustained meniscal tears showed a higher average rate of progression of cartilage loss (22%) than that seen in those who had intact menisci (14.9%) ($P < 0.018$). Anterior cruciate ligament (ACL) tears had a borderline significant influence ($P < 0.06$) on the progression of cartilage pathology.[29]

The preoperative clinical condition was not investigated further and the postoperative clinical condition was not reassessed nor was the procedure performed. There is a small and interesting portion of the arthroscopic findings including astroscopic findings that are out of sync. This raises a new question whether a mild lesion of the mediopatellar plica can cause further lesion to the knee cartilage or a more severe damage of the mediopatellar plica without significant lesion to the knee cartilage.

CONCLUSIONS

The characteristics of the sample were found more in the male sex with young age and adults of productive age, working as a private employee, with a normal body mass index, complaints of anterior knee pain, caused by sports activities, clinically diagnosed with ACL rupture, damage mediopatellar plica in Sakakibara type C with cartilaginous lesions on the Outerbridge type 2.

There is a relationship between the characteristics of the sample (Gender, Age, Occupation, BMI, Etiology and Clinical Diagnosis) and plica damage based on the Sakakibara classification, meanwhile, the plica damage based on the Sakakibara classification shows the opposite result. There is a positive corelation between plica damage based on the Sakakibara classification and Cartilage lesions based on the outerbridge classification.

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None.

AUTHOR CONTRIBUTIONS

Muhammad Sakti and Muhammad Andry Usman designed the research, monitored and supervised data collection, conducted data analysis. Andi Firman Mubarak drafted the script and wrote the final script. All authors monitored data collection at their own center, reviewed drafted manuscripts, read and received final manuscripts.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

FUNDING

This research was conducted independently and did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ETHICAL APPROVAL

This study was approved by the local ethics committee at Health research ethics committee Hasanuddin University Hospital, dr. Wahidin Sudirohusodo Hospital through ethical approval recommendation number 356/UN4.6.4.31/PP36/2021.

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FIGURE LEGENDS

Figure 1. Study flowchart

Figure 2. Correlation of Mediopatellar Plica Damage with Cartilage Lesions

Figure 3. A male 20 years old with plika mediopatellar sakakibara type A (red arrow) dan lesi kartilago outerbridge grade 0 (blue arrow)

Figure 4. A male 22 years old with plika mediopatellar sakakibara type A (red arrow) dan lesi kartilago outerbridge grade 1 (blue arrow)

Figure 5. A male 27 years old with plika mediopatellar sakakibara type B (red arrow) dan lesi kartilago outerbridge grade 2 (blue arrow)

Figure 6. A Female 55 years old with plika mediopatellar sakakibara type C (red arrow) dan lesi kartilago outerbridge grade 3 (blue arrow)

Figure 7. A female 40 years old with plika mediopatellar sakakibara type D (red arrow) dan lesi kartilago outerbridge grade 4 (blue arrow)

Figure 8. A male 28 years old with plika mediopatellar sakakibara type D (red arrow) dan lesi kartilago outerbridge grade 4 (blue arrow