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Comparison of short-term clinical outcomes of medial patellofemoral ligament reconstruction between using superficial quadriceps tendon and using hamstring tendon in patella instability

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Presenter Disclosure Information

ISAKOS annual congress

Disclosure of Conflict of Interest

Yuki Suzuki

No COI with regard to the current presentation.

Patellar dislocation and medial patellofemoral ligament reconstruction (MPFLR)

- Incidence of patellar dislocation: 29 per 100,000 pediatric patients
- High recurrence rate ranging from 30-70%

Jain et al. Sports Health 2011

Zhang et al. Medicine (Baltimore) 2022

- MPFL is considered to be the most crucial soft tissue structure in preventing lateral patellar dislocation (resisting 53-60% of the force)

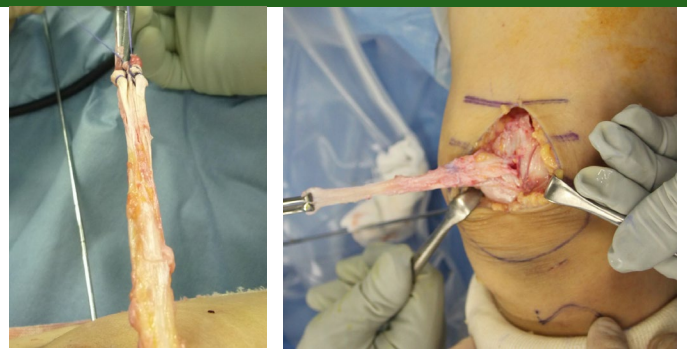
Desio et al. AJSM 1998

- MPFLR is widely acknowledged as a therapeutic approach for patellar dislocation and has been reported to show good results

Stupay et al. Arthroscopy 2015

McNeilan et al. Arthroscopy 2018

MPFLR



Raghuveer et al. Indian J Orthop 2012

- Graft choice
  - Hamstring tendon
  - Superficial quadriceps tendon (SQ) — *Steensen et al. Arthroscopy 2005*
  - Allograft — *Migliorini et al. KSSTA 2022*
- However, few studies have assessed the comparison of clinical outcomes between grafts
- Objective

  To compare the short-term clinical outcomes of isolated MPFLR using SQ and using hamstring tendon

Methods

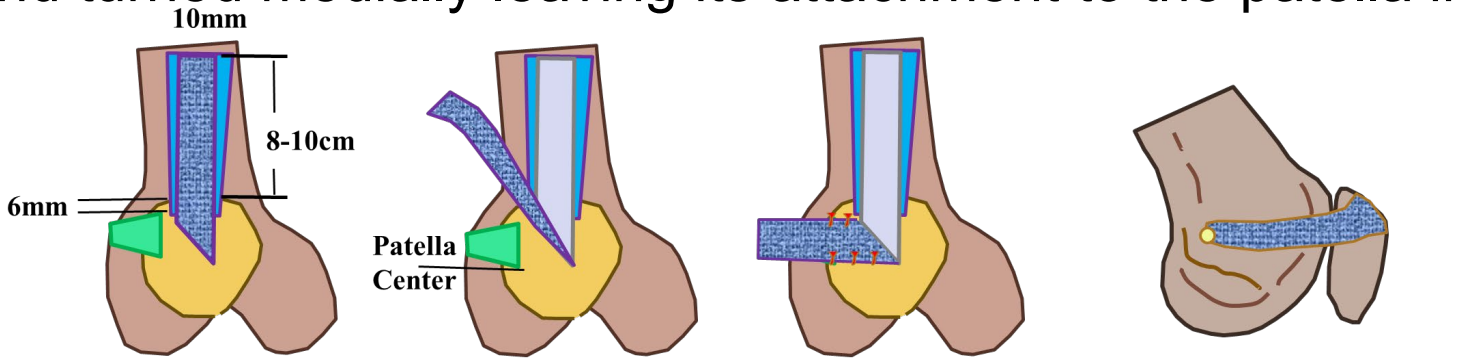
- A retrospective study (2009 – 2020)
- 65 patients (24 men and 41 women) 70 knees: underwent isolated MPFLR for patellar dislocation and were able to follow up for more than 2 yrs
- Exclusion criteria: history of previous surgery in the same knee
- Graft choice: SQ (SQ group) / semitendinosus tendon (ST group)
- Background evaluation
  - Sex, age
  - Height, weight, body mass index (BMI)
  - General joint laxity

Clinical evaluation @ pre-op, post-op 6, 12 mos.

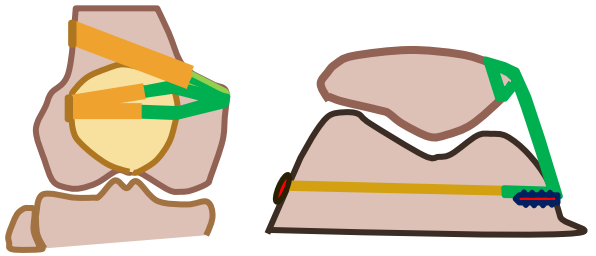
- Range of motion (ROM)
- Radiographic features
  - Sulcus angle, tibial tubercle-trochlear groove (TT-TG) distance, patellar tilt
- Clinical scoring
  - Kujala score, Tegner activity score, Lysholm score
- Complications
- Statistical analysis: student's t-test, paired t-test and two-way repeated ANOVA with Bonferroni test
  - Significance: P-value < 0.05

Surgical procedure

- SQ group: the center third of the superficial layer of the quadriceps tendon graft was harvested and turned medially leaving its attachment to the patella intact



- ST group: ST was inserted to the patellar bone tunnel formed at superomedial corner of the patella or through the whole patella

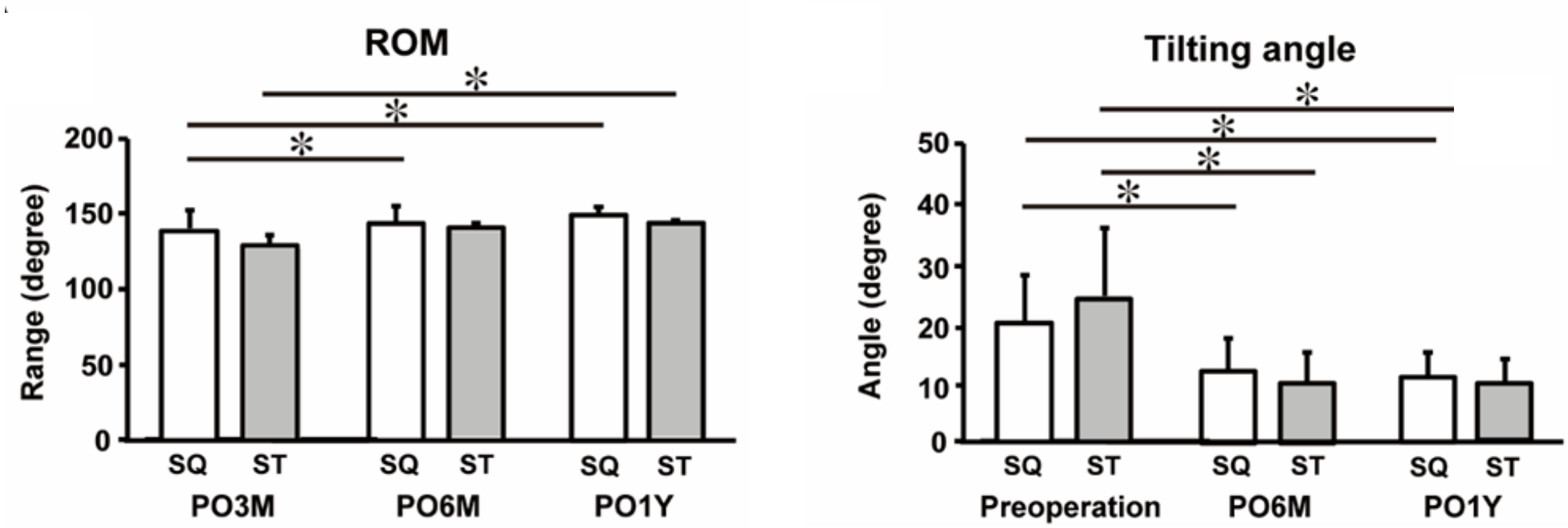


- Both grafts were fixed at Schottle's point
  - Initial tension and knee angle: 10-20 N, 30 degrees

Background of the patients

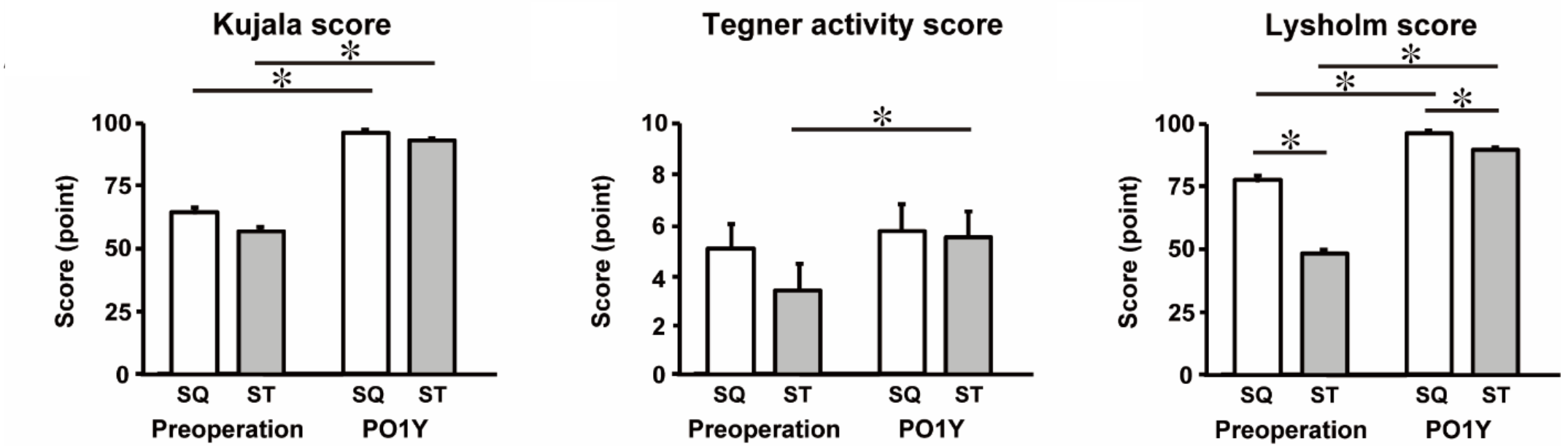
	SQ group	ST group	P value
Subjects (knee)	43 (46)	22 (24)	
Age (years)	19.8 ± 9.8	24.2 ± 11.8	0.11
Sex (Male (knees) :Female (knees))	16(17) : 27 (29)	8 (8) : 14 (16)	0.76
Height (cm)	163.9 ± 8.6	162.3 ± 7.7	0.55
Weight (kg)	62.8 ± 15.7	58.2 ± 10.9	0.30
BMI (kg/cm^2)	23.2 ± 4.2	22.0 ± 2.3	0.28
General joint laxity	16 (34.8%)	7 (29.2%)	0.52
TT-TG distance (cm)	14.5 ± 4.2	16.3 ± 3.1	0.10
Sulcus angle (degree)	139.5 ± 8.8	140.5 ± 11.1	0.23
Sports (knees)	Total 32 Basketball 7, Football 5, Judo 4, Soft tennis 4, Tennis 4, Dance 3, Badminton 2, Baseball 2, Volleyball 1	Total 9 Football 2, Tennis 1, Basketball 1, Hand ball 1, Baseball 1, Gymnastic 1, Kendo 1, Shorinji 1	

ROM and radiological features



- In both groups, ROM increased, and tilting angle decreased postoperatively revealing that both grafts contribute to restoring MPFL function

Clinical scoring



- Clinical scoring improved in both groups postoperatively
- 3 complications in ST group (13.6%): 2 patellar fractures
  1 patellar dislocation

MPFLR graft choice

- Grafts & characteristics
  - Autograft: pain and muscle atrophy possibility
    - ✓SQ tendon: membrane-like, less patellar complication
    - ✓Hamstring tendon: cord-like (stiffer and stronger than native MPFL)

    } Widely used
    - ✓Adductor tendon
    - ✓Patellar tendon
  - Allograft: equal to or greater clinical result than autograft, long-term result needed
  - Synthetics: no need to sacrifice tissues, good mid-term results, different stiffness from native MPFL

Outcomes of isolated MPFLR

Author	Journal	Graft (Auto)	Cases	Follow up period	Recurrent Rate	Complication rate
Current study		SQ ST	46 24	2 yrs	0% 1.6%	0% 3.3%
Goyal et al.	AJSM (2013)	SQ	32	38 mo	0%	0%
Vavalle et al.	JOT (2016)	SQ	16	38 mo	0%	0%
Fink et al.	Knee (2014)	SQ	17	1 yrs	0%	0%
Sappey-Marinier et al.	AJSM (2019)	ST	201	5.8 yrs	4.7%	0%
Erickson et al.	AJSM (2019)	ST	90	2 yrs	2.2%	2.2%

- Present study resulted in favorable short-term outcomes, which is consistent with past treatment outcomes
- SQ autograft may be safe and considerable for MPFLR

Conclusion

- The present study compared the short-term clinical outcomes of isolated MPFLR using superficial quadriceps tendon and using hamstring tendon.
- Both groups had good short-term results, and improvement in tilting angle reveals that both grafts contribute to restoring MPFL function.
- Although there was no significant difference in clinical outcomes, concerning 3 failures occurred in the ST group, SQ autograft may be safe and considerable for isolated MPFLR.