TT-TG Measurements Obtained In Weight Bearing and Non-Weight Bearing States are Different

Abstract ID# 22950
All Authors:
Payton Price UNITED STATES
Geoffrey S. Van Thiel MD, MBA UNITED STATES
Peter Cirrincione BA UNITED STATES

Summary:
The same knees with patellar instability were imaged with CT in weight bearing and non weight bearing states and the measured TT-TG distances were different.

Data:
Background There are multiple aspects of lower extremity alignment that can contribute to patellar instability. Physicians regularly consider TT-TG distance when planning treatment for patients with patellar instability. TT-TG has been classically measured on non-weight bearing magnetic resonance imaging (MRI) or computed topography (CT) scans, but more recently clinicians have been obtaining these measurements on weight bearing CT scans.

TT-TG Measurements performed in weight-bearing vs. non-weight-bearing positions of the same knees. Materials and Methods The images of patients with patellar instability who obtained weight bearing and non-weight bearing CT scans between the dates of January 1st, 2014 and December 31st, 2021 were measured for TT-TG distance. A paired two sample t test for means was utilized to compare the measurements. Results Thirty knees had both a weight bearing and non-weight bearing TT-TG length CT scan performed that could be used to measure TT-TG distance. The weight bearing group, with an average of 15.2 mm, was significantly greater than the non-weight bearing group, averaging 10.2 mm (p<0.0001). Additionally, the variance in measurements for knees under the weight bearing positions (37.6 mm) was more than twice as large as the variance for measurements obtained in the non-weight bearing position (16.5 mm). Conclusion TT-TG distance is routinely used while diagnosing and planning treatment of patients with patellar instability. In this study, TT-TG distance was found to be significantly greater in the weight bearing position compared with the non-weight bearing position of the same knee. This fact is both critical to understand and useful in planning the appropriate instability procedure. Dynamic motion, rotation and axial loading play a role in patellar instability and need to be evaluated to arrive at the appropriate treatment algorithm.

TT-TG Measurements Obtained In Weight Bearing and Non-Weight Bearing States are Different

Abstract ID# 22950
All Authors:
Payton Price UNITED STATES
Geoffrey S. Van Thiel MD, MBA UNITED STATES
Peter Cirrincione BA UNITED STATES

Summary:
The same knees with patellar instability were imaged with CT in weight bearing and non weight bearing states and the measured TT-TG distances were different.

Data:
Background There are multiple aspects of lower extremity alignment that can contribute to patellar instability. Physicians regularly consider TT-TG distance when planning treatment for patients with patellar instability. TT-TG has been classically measured on non-weight bearing magnetic resonance imaging (MRI) or computed topography (CT) scans, but more recently clinicians have been obtaining these measurements on weight bearing CT scans.

TT-TG Measurements performed in weight-bearing vs. non-weight-bearing positions of the same knees. Materials and Methods The images of patients with patellar instability who obtained weight bearing and non-weight bearing CT scans between the dates of January 1st, 2014 and December 31st, 2021 were measured for TT-TG distance. A paired two sample t test for means was utilized to compare the measurements. Results Thirty knees had both a weight bearing and non-weight bearing TT-TG length CT scan performed that could be used to measure TT-TG distance. The weight bearing group, with an average of 15.2 mm, was significantly greater than the non-weight bearing group, averaging 10.2 mm (p<0.0001). Additionally, the variance in measurements for knees under the weight bearing positions (37.6 mm) was more than twice as large as the variance for measurements obtained in the non-weight bearing position (16.5 mm). Conclusion TT-TG distance is routinely used while diagnosing and planning treatment of patients with patellar instability. In this study, TT-TG distance was found to be significantly greater in the weight bearing position compared with the non-weight bearing position of the same knee. This fact is both critical to understand and useful in planning the appropriate instability procedure. Dynamic motion, rotation and axial loading play a role in patellar instability and need to be evaluated to arrive at the appropriate treatment algorithm.

The Impact of Tibial Tubercle-Trochlear Groove Distance and Patellar Height on the Outcome of Isolated MPFL Reconstruction: An ISAKOS-Sponsored Multi-Center Study

Abstract ID# 23092
All Authors:
Julian A. Feller FRACS, FAOthA AUSTRALIA
Robert A Magnussen MD, MPH UNITED STATES
Elizabeth A. Arendt MD UNITED STATES

Summary:
Isolated MPFL reconstruction had a low rate of recurrent patellar instability and it appears that an increase in the previously reported thresholds for when to add a bony procedure to an MPFL reconstruction can result in successful outcomes in some patients.

Data:
Background In treating recurrent patellar instability, one of the questions of interest is how far the indications for an isolated MPFL reconstruction can be extended. This ISAKOS-sponsored multi-center study followed the outcomes of patients undergoing isolated MPFL reconstruction using higher thresholds than widely accepted for additional surgery for patella alta and tibial tubercle trochlear groove (TT-TG) distance. Methods 199 patients from 5 countries (USA, Australia, Finland, Japan and Chile) were enrolled. All underwent an isolated MPFL reconstruction. The decision to perform additional stabilization surgery such as a tibial tubercle osteotomy was left to the discretion of the individual surgeon, but patients having additional surgery were not included. The guiding principle was a TT-TG distance up to 24 mm on MRI and a Caton-Deschamps index (CDI) up to 1.4 were not considered to be an indication for a tibial tubercle osteotomy. Rates of further patellar dislocation and PROMs (Norwich Patellar Instability, Marx Activity and KOOS QOL scores) were recorded preoperatively and at 1 and 2 years. Results 66% patients were female, 62% had a non-contact injury originally, and 42% had a positive family history of patellar instability. The mean age at surgery was 21 (SD: 6.7). TT-TG distance ranged from 4.0 to 29.0mm with a mean 15.1 (SD: 4.4). CDI ranged from 0.7 to 1.7 with a mean 1.1 (SD: 0.2). Only 14% had no trochlear dysplasia and 45% had Dejour B-D dysplasia. 54/199 (27%) had a J-sign on the affected side. The re-dislocation rate at 12 months was 1% and this increased to 2% at 2 years. The mean preoperative Norwich Patellar Instability score was 42.6 (SD: 23.6). This improved to 17.7 (SD: 23.9) at 1 year (p<0.05) and was similar at 2 years (21.7, SD:28.0) at 2 years. The mean preoperative Marx activity score was 7.7 (SD: 6.4) and did not change significantly at 1 year (mean: 6.9, SD: 5.6) or at 2 years (mean:7.2, SD: 5.7). The mean preoperative KOOS QOL score was 30.3 (SD:21.2). This improved to 66.6 (SD:24.1) at 1 year (p<0.001) and was unchanged at 2 years: 69.4 (SD:23.1).

Discussion The re-dislocation rate and PROMs indicated satisfactory outcomes in this patient cohort. However, the project has highlighted the practical difficulties of addressing the question of how far the indications for isolated MPFL reconstruction can be extended as patients undergoing any bony procedure were automatically excluded and the thresholds for an additional procedures were at the individual surgeon's discretion. In addition, the re-dislocation rate was low, thereby precluding a useful comparison between recurrent dislocators and patients who had no further instability episodes. Nonetheless, the fact that patients with a CDI of up to 1.7, a TT-TG of up to 29mm, or Dejour D trochlear dysplasia were included, does suggest that an increase in the previously reported thresholds for when to add a bony procedure to an MPFL reconstruction can result in successful outcomes in some patients.

C-Arm Position Influences Radiographic Positioning In Medial Patellofemoral Ligament Reconstruction

Abstract ID# 23174
All Authors:
Grégoire Thürié MD SWITZERLAND
Adrian Deichsel Dr. med. GERMANY
Christian Peetz MD GERMANY
Thorben Briese MD GERMANY
Johannes Glasbrenner MD GERMANY
Elinar Herbst MD, PhD GERMANY
Michael J. Raschke MD, Prof. GERMANY
Christoph Kittl MD, MD(res) GERMANY