Lateral Inferior Genicate Artery a Key Anatomic Landmark in Sonographic Evaluation of the Anterolateral Ligament of the Knee: A Case Report

1Amir Mahajer, DO, 1Ali S. Mellik, DO, MScE, 1Jason Georgekutty, DO, 2Jose J. Diaz, DO, 1Francisco Romero, MD
1Nova Southeastern University College of Osteopathic Medicine / Larkin Community Hospital, South Miami, FL; 2Integrative Spine & Sports, Fort Lauderdale, FL; 3Xcel Rehabilitation, Humacao, PR

ABSTRACT

Case Description:
A common clinical problem seen today by today’s physicians is knee pain often caused by trauma including sports, recreation and exercise. The most prevalent disability in America is osteoarthritis (OA), affecting 20% of Americans. Research suggests 51% of individuals that suffer a knee injury will go on to develop OA. The ALL together with the ACL plays a pivotal role in rotational stability of the knee, as can be examined by the pivot shift test and as the structure indicates an anterior knee dislocation. We suggest a systematic sonographic approach in the evaluation of the ALL.

RESULTS:
We describe one procedure using a specific technique and a key anatomic landmark that improves identification of the ALL for the musculoskeletal sonographer. As with any examination, a systematic approach is key to the time of the lateral knee. When attempting sonographic visualization of the ALL, we utilize a series of movements which simulate a “Z” pattern, termed the “Z-technique,” and the LIGA, to improve identification of the ALL and its associated pathology.

Discussion:
The ALL is a small hyperechoic fibrillar structure that can be difficult to identify on sonography. Using anatomic landmarks, systematic technique and attention to the surrounding vasculature, makes the ALL easier to perceive for the clinician. A recent study by Clancia et al. describes a sonographic technique to evaluate the ALL, but we emphasize the use of a “Z-technique” and the LIGA as a key landmark, which will help to efficiently identify the ALL.

Conclusions:
Using sonography, anatomic landmarks, the “Z-technique” and LIGA as a vascular landmark, will help to identify the ALL accurately. Further studies are required to correlate clinical significance of pathology of the ALL and its correlation to internal knee derangements.

INTRODUCTION

A common clinical problem seen today by today’s physicians is knee pain often caused by trauma including sports, recreation and exercise. The most prevalent disability in America is osteoarthritis (OA), affecting 20% of Americans. Research suggests 51% of individuals that suffer a knee injury will go on to develop OA. The ALL together with the ACL plays a pivotal role in rotational stability of the knee, as can be examined by the pivot shift test and as the structure indicates an anterior knee dislocation. We suggest a systematic sonographic approach in the evaluation of the ALL.

CASE DESCRIPTION

The right knee of a healthy 31 year old male with history of high impact athletics was assessed. The knee was placed in a comfortable exam position of 30 degrees of flexion and neutral rotation allowing for evaluation and dynamic testing. The examination utilized included a portable ultrasound system, sonographic gel, linear array transducer with the musculoskeletal (MSK) and color flow doppler settings.

LATERAL KNEE

Z - TECHNIQUE

1. First Position

Identify Gerdy’s tubercle on the tibia. Next sweep the transducer proximally to allow for visualization of both Gerdy’s tubercle and the lateral femoral condyle (LFC). This brings the iliotibial band (ITB) into view.

2. Second Position

Moving the transducer posteriorly over the fibular head, visualize the anisotropic pattern of the lateral collateral ligament.

3. Third Position

Rotating the transducer anteriorly at the axis of the proximal transducers edge, the LCL will go out of view and the distal portion of the transducer is situated between the fibular head and Gerdy’s tubercle.

Doppler

Active color flow to identify the LIGA seen in cross section as a low flow vessel. The thin fibular hyperechoic ALL of the knee is visualized superficial to the LIGA.

SONOGRAM

REFERENCES


DISCUSSION

- Complete MSK ultrasound evaluation after knee trauma should include imaging of the ALL.
- Direct visualization of an ALL derangement provides a window into likely concomitant internal knee pathology.
- Using a systematic physical and sonographic examination to evaluate for knee pathology, including the Z-technique to assess the ALL, will allow for an improved knee assessment.

CONCLUSION

- MSK Ultrasound in the hands of a trained expert is a validated, mobile and cost effective modality that allows for live direct visualization including functional testing.
- Additional studies investigating the temporal relationship of ALL pathology and it’s clinical significance on dysfunction is required.
- Sonographic visualization of the ALL may aide in clinical decision making.

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