

## Case study #1 Knee

Patient is an 81 year old female that presents with chronic left knee pain for one year. Previous treatment consisted of cortisone injection with recommendation for total knee replacement per orthopedic surgeon. Patient has significant discomfort with ambulation and walks with an uneven gait.

Patient came to Neo Matrix for an initial ultrasound exam to evaluate current state of anterior, lateral, medial and posterior knee compartments with the hope of receiving stem cell therapy instead of a total knee replacement. The following is the interpretation of the complete ultrasound of the knee.

### **The Knee**

#### **Supra-Patellar LAX and SAX**

In LAX and SAX the Supra-Patellar Bursa/Pouch demonstrate excess fluid effusion with intra-bursal debris from synovial hypertrophy and extra-capsular migration. The SAX Sunrise view **does not** reveal osteophyte formation at the Medial and/or Lateral Trochlear peaks. The hyaline cartilage interface is nearly absent along the lateral facet, and demonstrates cloudy, increased echodensity along the medial facet.

#### **Infra-Patellar LAX and SAX**

In LAX the two subcutaneous bursae(Pre-Patellar,Infra-Patellar) are not effused/visible. The Patellar Tendon/Ligament does not demonstrate hyper-echoic fibrous echotexture mostly in a central portion, best seen on SAX. Compatible with tendinosis. The deep margin of the tendon/ligament are negative for Jumper's knee proximally and Deep Infra-Patellar Bursa effusion distally. Hoffa's Fat Pad, deep to the tendon/ligament demonstrates findings as with fat pad depletion and loss normal fatty echotexture of this diffusely vascularized and chondrogenic anatomy.

#### **Lateral Collateral Ligament and Lateral Meniscus and Ilio-Tibial Band** **LAX**

In LAX the LCL is intact at its Fibular attachment. The peripheral (postero-lateral) margin of the Lateral Meniscus demonstrates a longitudinal cleft irregularity/disruption as in bucket handle meniscal tear. Sub-ITB fluid collection at the Lateral Femoral Condyle and attachment deformity at Gerdy's Tubercle is demonstrated, compatible with ITB bursal effusion.

#### **Medial Meniscus Medial Collateral Ligament and Pes Anserine Bursa** **LAX**

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In LAX the Menisco-Femoral portion/interfaces of the MCL **is not** intact **with** focal areas of non-visualization as with tears. The MCL defects are noted on the proximal/Femoral side and the distal/tibial side of the joint, but also again at the distal MCL insertion on the Tibia. There is no Pes Anserine bursal fluid. The visible Medial Meniscus demonstrates irregularity/disruption as in meniscal tear with meniscal extrusion beyond the joint border.

### **Popliteal Fossa SAX and Biceps Femoris Tendon LAX**

In SAX there is not a fluid collection with the defining anatomic neck as seen with Bakers Cyst.

The Popliteal vein is compressible with sonopalpation to rule **in/out** thrombosis.

In LAX the Biceps Femoris Tendon attachment at the Fibula **is not well demonstrated. Question of off-plane imaging is raised due to apparent muscle/tendon deep to what may be the Biceps Femoris. If so, it is likely a portion of the Soleus.**

### **Impression:**

Intra-articular, supra-patellar fluid effusion with synovial proliferation. Patellar tendinosis. Hoffa's Fat Pad depletion. Trochlear cartilage loss. Suspected Popliteal tenosynovitis. ITB bursal effusion. MCL tears at multiple sites. Lateral Meniscus tear. Medial Meniscus tear and extrusion.

### **Possible Treatment Sites:**

Supra-patellar intra-articular  
Retro-patellar space (medial)  
LM  
MM  
ITB  
Hoffa's Fat Pad  
Consider Tib-Fib joint

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Interpretation findings suggested high potential for benefit of stem cell therapy. It was determined that three vials of PX50 was the most suitable product for this treatment protocol.

All recommended treatment sites were identified via ultrasound guidance with precise product placement in all sites. Patient tolerated the procedure well and was able to ambulate after the procedure.

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Patient follow-up via phone conversation was positive. Patient and patient's daughter both reported positive outcomes with regards to reduced pain and increased mobility within 2 months of product placement.

Follow-up ultrasound was performed to objectively evaluate knee treatment sites 106 days S/P treatment. The day of the follow-up exam the patient presented with significant reduction in pain and overall increased mobility. The patient was very happy with the outcome. The following is the interpretation of the follow-up exam.

### **(81 y.o. female) DOE: 6/22/16**

Sonographic images of the left knee were presented as a comparative examination to an examination on 3/8/16. There is no demonstrable change in the supra-patellar effusion and synovial debris.

Infra-patellar images demonstrate an unremarkable patellar tendon. The infra-patellar fat pad demonstrates increased echo-texture, and more normal-like and loculated appearance.

The short axis "sunrise" view of the femoral trochlea demonstrates findings suggestive of thickened osteochondral interface along the medial facet. This medial facet area demonstrates echo-texture compatible with increased echo-density similar to fibrocartilage, and not anechoic hyaline cartilage.

Comparison of the initial and followup images of the medial meniscus demonstrate increased homogeneous echogenicity of the visible posterior horn and body of the meniscus.

Images of the lateral menisci did not reveal notable change or diminishment of previous findings suggestive of defects/tears.

Images of the ilio-tibial band do not demonstrate sub-ITB effusion as previously.

### **Impression:**

No sonographic evidence of improvement or change in supra-patellar effusion/synovial debris.

Increased infra-patellar fat pad echotexture.

Finding suggestive of osteochondral remodeling at the medial facet of the femoral trochlea.

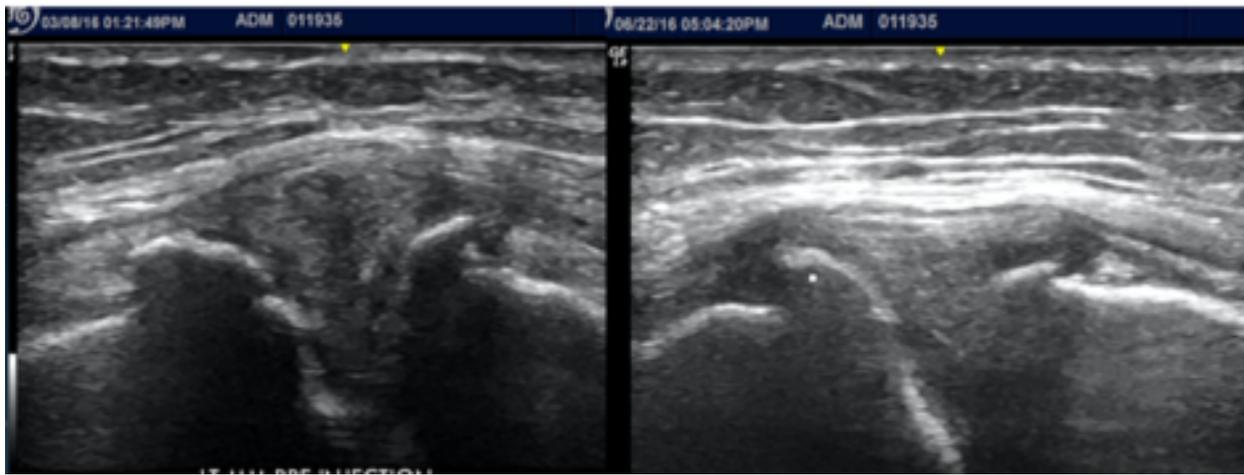
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Notable echogenic changes demonstrative of increased medial meniscus fibrocartilage.

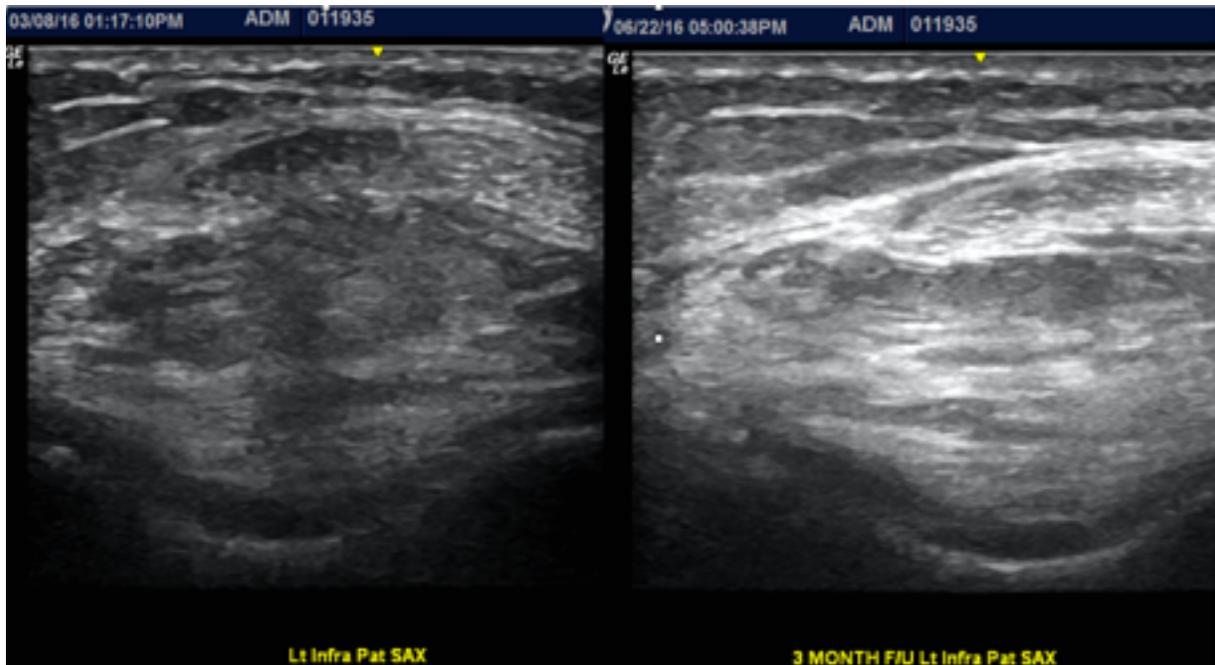
No demonstrable changes relative to lateral meniscus defects.

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The following are pre and post images demonstrating notable change in treated tissue.



The above images are pre and post images of the Medial Meniscus. The images below are pre and post images of infra-patellar fat pad.



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