

MSK Ultrasound Clinical Case Study

Lumbrical tear



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Graduated with a degree in radiography from Newcastle University in 2009 and completed a post-graduate diploma in Medical Ultrasound at Queensland University of Technology (QUT) in 2013. Aaron has a special interest in MSK ultrasound borne out of a passion for sport.

Introduction

This case features a 49-year-old female patient who sustained an injury at yoga, and was referred for an ultrasound of her right hand. The patient presented with a small lump on the palmar aspect of her right hand, over the second metacarpal. She also had pain associated with flexion and extension of the index finger. Differential diagnosis at the time of referral was Dupuytren's contracture, a collagen disorder where the fascia in the hands becomes thickened and fibrotic. The abnormal collagen proliferation of this disorder means the condition will often first present as a thickening or nodule in the palm.

Case Study

An ultrasound examination was performed using the new Canon Aplio i800 / Prism Edition and a high frequency 24 MHz (PLI-2004BX) linear matrix transducer. The Flexor Digitorum Profundus (FDP) and Flexor Digitorum Superficialis (FDS) tendons of the second finger was seen intact however there were changes to echogenicity of the adjacent lumbrical muscle. The muscle appeared enlarged and heterogenous with anechoic areas consistent with fluid. Increased vascularity was seen with Superb Micro-vascular Imaging (SMI) using Doppler Luminance. These findings were thought to be consistent with a possible partial tear of the lumbrical muscle.

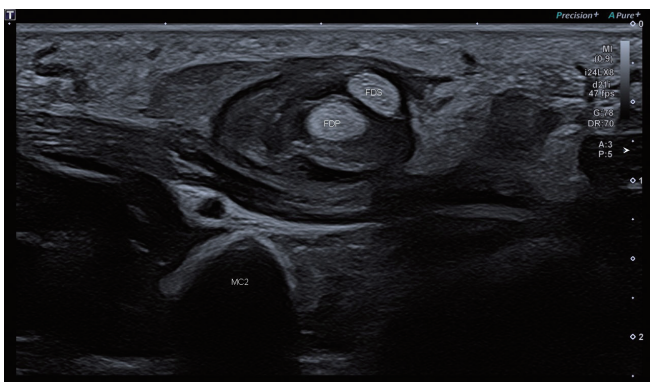


Figure 1 The FDP tendon in the longitudinal plane. Changes in echogenicity of the adjacent muscle are clearly demonstrated.

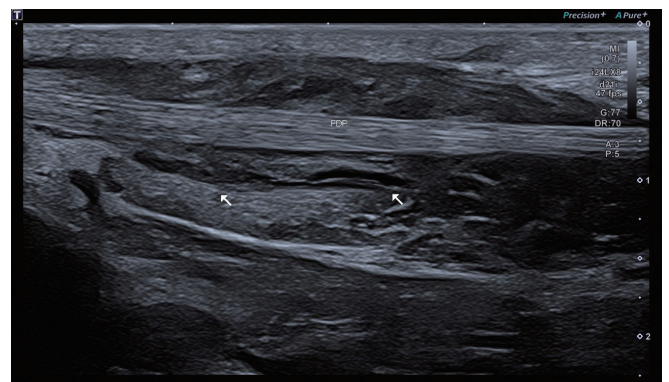


Figure 2 Transverse imaging of the same area shows the FDP and FDS in cross section with surrounding changes of the lumbrical muscle.

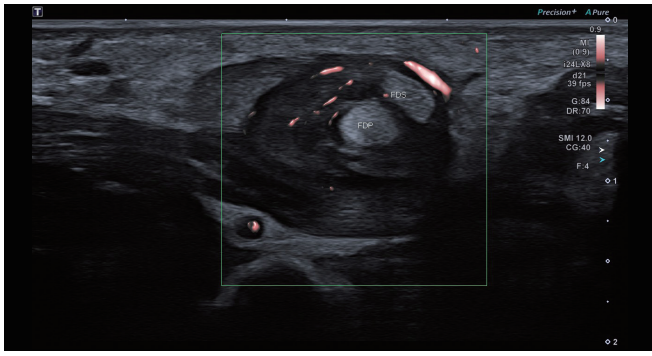


Figure 3 Increased vascularity was demonstrated. SMI helps to detect and demonstrate the detail of the fine vessels in the area of interest.

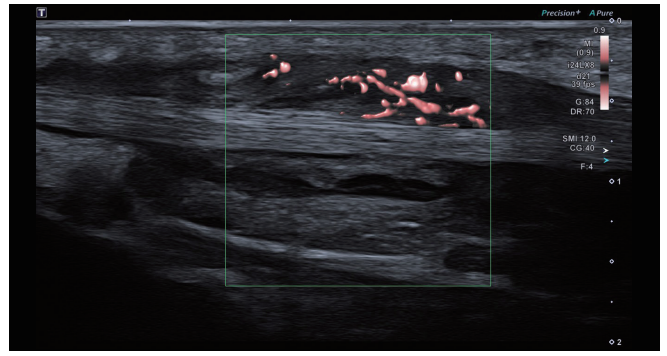


Figure 4 Longitudinal imaging with SMI shows marked hypervascularity to the injured region.

Discussion

An interesting case study of an uncommonly seen lumbrical injury. Multiple advanced technologies on the new Aplio i-series / Prism Edition were used to obtain high quality images and enable a definitive diagnosis.

iBeam+ technology provides improved spatial and contrast resolution and increased penetration capabilities while maintaining very high frame rates. Full focus technology was

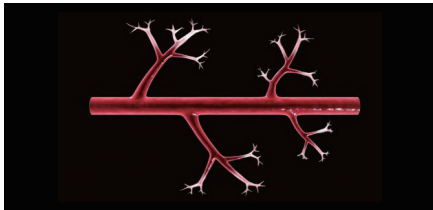
implemented, allowing the entire image frame to be in focus, without the need to use or adjust focal zones.

The Aplio i-series / Prism Edition features improved SMI technology. The new enhancements allow for less clutter, higher frames rates and improved visualization of slow and high flow states – with excellent resolution. Doppler Luminance was applied to SMI in this case to give the flow a 3D appearance, providing additional hemodynamic information by characterizing laminar flow patterns.



iBeam+ is the next level of ultra-fast and precise beam shaping, enhancing image depth and detail with clear, sharp, and distinct images.

Aplio's iBeam+ beamformer technology enables up to 4 times faster* image processing in real time to provide sharper images with better penetration and thus optimal, more robust results for higher clinical confidence.



Ultra-low flow imaging
Say hello to a new generation of SMI that significantly expands the range of visible blood flow from extremely low to high flow with low noise and good sensitivity.



Ultra-high resolution
Aplio's new iBeam+ architecture enables advanced B-mode image quality with higher frame rate for better visualization of the underlying anatomy.



Free breathing capability
With SMI Generation 4, users can experience fine flow even in difficult situations with less clutter and fewer motion artifacts.

*compared to the previous versions of Aplio i-series.

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Results may vary due to clinical setting, patient presentation and other factors.

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