

UGEO PT60A

# Portable Ultrasonography

: The Experience during 2014 Paralympic Winter Game

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*"Measuring and planning the safe depth to inject rhomboid muscle, UGEO PT60A, a portable ultrasound system of Samsung Medison, was used in the locker room just before the starting whistle. The athlete was dressed except his upper body wear to enable him to enter the match right after the injection."*

## Introduction

Portable ultrasound system has been used in the hospital for bedside examinations when patients cannot be moved to the examination room. However, portable ultrasound can also be useful outside the hospital.

One of the most commonly used area would be during competitive sports games especially in sports with frequent physical contact. When an athlete gets injured during their game, a medical doctor who attends the game as a team physician takes the responsibility to decide whether the athlete should continue to play or not. The decision on the return to play of the athlete is essentially based on the severity of the injury. Portable ultrasound can provide a general review of the injury, and eventually assist the team physician on making the decision on whether the injured player should return to the match.

During 2014 Sochi Winter Paralympic Games which I had attended as a team physician for Korea, I faced numerous occasions which I had to make a quick, yet precise decision on the severity of player's injury during ice sledge hockey matches, and found that portable ultrasound could give me an excellent guidance in making a decision.

Portable ultrasound was helpful in the management of the athletes who suffered pain originating from musculoskeletal problems.



**SAMSUNG MEDISON**

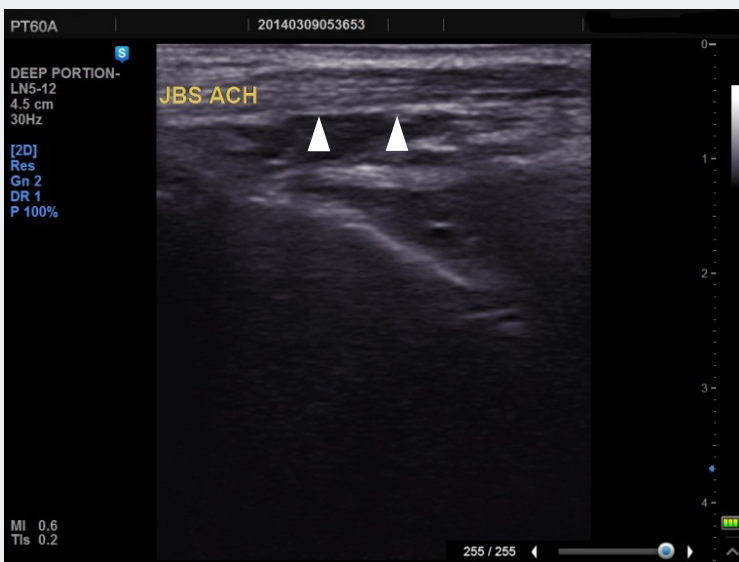
## Case Descriptions

Here are 3 cases describing that PT60A on the sports scene was valuable not only in the diagnosis of sports-related injuries (case 1 and 2) but also in the treatment (case 3).

### 1. Case 1 (Figure 1)

This 29-year old gentleman is paraplegic caused by spinal cord injury during a traffic accident. Usually he does not have any feeling in his lower leg because of the injury. During an ice sledge hockey game, he had an incident of colliding with the opponent front to front of his sledge and stated that he felt sudden stretch of his Achilles in the collision. The collision was so intense to cause his sledge to be broken into two pieces. Although he did not feel any pain he wanted to know his Achilles tendon was fine to continue to play.

Diagnosis of torn Achilles in a usual case during such intense collision might not be difficult. Severe pain with sensation of popping would have been enough to make a diagnosis. However, it is hard to make diagnosis without any imaging when the accident victim is paraplegic whose pain sensation is completely lost. With the help of UGEO PT60A, I could easily make the diagnosis and determine whether to have him return to play or not in the locker room. His Achilles was intact and I could let him play the rest of the game with his spare sledge.



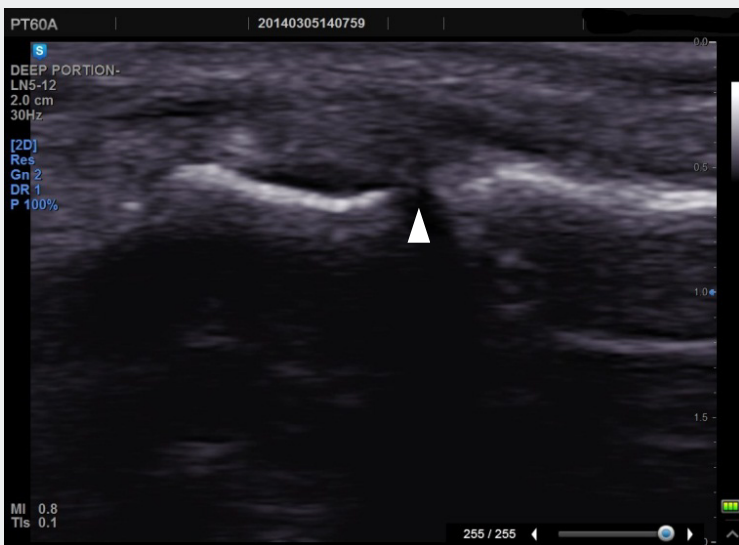
**Figure 1.**

An PT60A image of Achilles tendon (arrowheads) of the injured athlete during the game revealed intact to give him assurance and keep on playing.

### 2. Case 2 (Figure 2)

A 39-year old male, ice sledge hockey player with incomplete spinal cord injury, had his finger slapped between the doors during the game. He completed to play although he had pain and swelling in his finger. After the match, he visited the clinic to see what happened. Usually in this situation without ultrasonography, I would have to take him to a poly-clinic which is a small hospital inside the residential area for the athletes for an X-ray image of his fingers. This would have taken 30 minutes to be imaged, and another 30 minutes to receive the images.

With PT60A in the office, I scanned his finger to make the diagnosis of stable fracture of phalangeal bone. I prescribed him with splint to secure the fracture. However, this tough guy decided to keep participating in the game even though he had some discomfort when moving.



**Figure 2.**

Scan of a phalangeal bone showing fracture line (arrowhead).

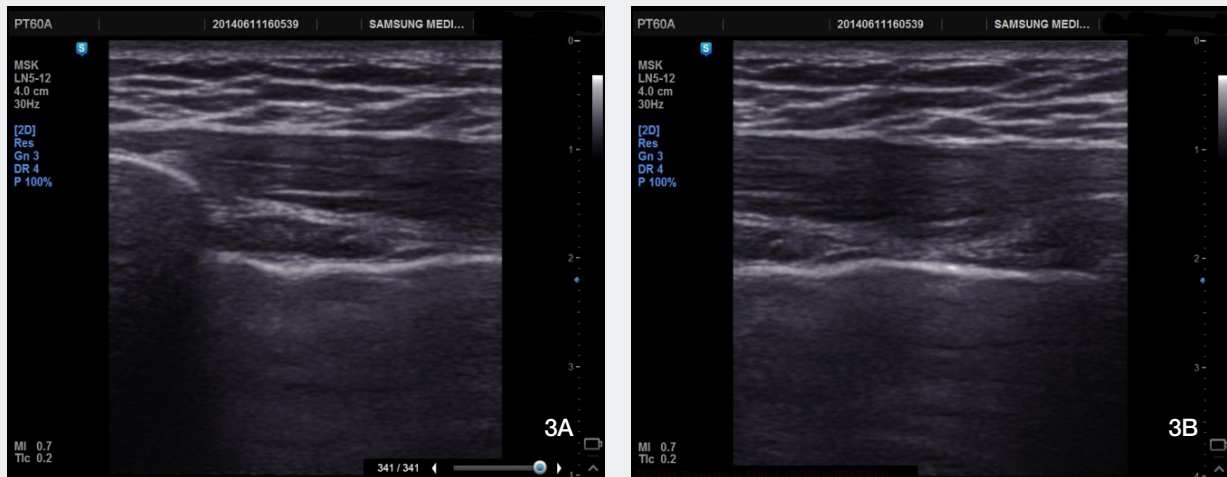
### 3. Case 3 (Figure 3, Figure 4)

A 28-year old male ice sledge hockey player was injured in his chest during the match. The opponent brutally tackled him and he was hit so hard that he could hardly breathe after the incident. Possible injury to the rib causing pneumothorax was suspected. With PT60A on the scene, I was able to scan him, and was relieved to see that his ribs were not fractured (Figure 3A, B).

I gave him some pain medications that I brought and he returned to the ice link and kept playing to score a goal that night! He told me that he was able to do his best in spite of the pain because I assured him that his ribs were not broken.

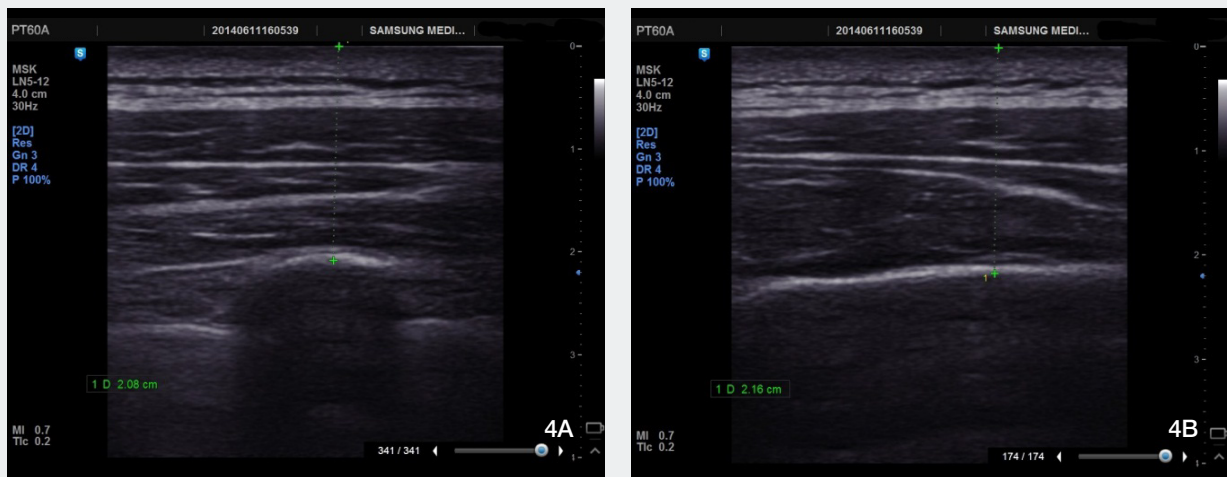
However, this is not the end of the story. On the night after the match, he came to my office complaining of severe upper back pain. The rhomboid muscles might have been sprained during the game. On the ultrasonography, the rhomboids were fine. I prescribed him with pain killers and had him put some ice. On the next day during another game, he called me that he could not push his sledge because of severe pain on the rhomboids. As he insisted to continue to play, I decided to block his pain with local anesthetic injection on the muscle.

Injection into the rhomboids is not an easy procedure even by experts. The muscle lies adjacent to the lung and the muscle itself is very thin. Slight deeper insertion of the needle could cause lung penetration and pneumothorax. With the help of PT60A, I measured the depth of the muscle and safe zone of depth to penetrate the needle (Figure 4A, 4B). With this information, I was able to inject the muscle without any harm. To get the maximal effect of the injection, I had to inject the local anesthetics just before the starting whistle. To do this, I had the athlete lie down on the massage table in the locker room and measured the depth with PT60A. I injected quickly right before the starting whistle because I knew where and how deep to inject (cover photo). The injection was effective enough to enable the athlete to continue the game. Furthermore, after this experience, the athlete wanted to get an injection on every game to relieve the remnant pain and maximize his playability. I easily was able to help him every time, and all it took were some local anesthetic solution, instead of narcotics, and the guidance of PT60A.



**Figure 3A, 3B.**

Scanning along from the sternum (A) to the rib, the bony structures were intact.



**Figure 4A, 4B.**

Scanning for the safe injection of rhomboid muscles. Images of parasagittal (A) and oblique longitudinal (B) plane measuring the depth to rib bone are showed.

## Conclusion

Portable ultrasound system, PT60A, was one of the most frequently used equipment that our team Korea brought for the Sochi Paralympic Games and I would strongly recommend to utilize it during and between the sport competition.

## Supported System

(1) PT60A