Case Study

NEUROPATHIC ULCER – X-RAY vs. HIGH RESOLUTION ULTRASOUND

Patient Age / Gender . . 58 y/o white male
Ulcer / Wound Type . . . Neuropathic due to ETOH abuse
Location . . . . . . . . . . . . Left Plantar Forefoot
History . . . . . . . . . . . . . Patient has a history of a neuropathic ulcer 2nd to alcohol abuse. Has had previous amputation of digits due to frost bite. Patient has been treated with various off-loading shoes and numerous topical wound medications. Ulcer has failed to respond to traditional standard of care treatment.

RADIOLOGICAL IMPRESSION
Large ulcer at the plantar aspect of the forefoot identified. However, there is no radiographic evidence to suggest osteomyelitis. Otherwise, diffuse deformities of the left foot are present which may be secondary to chronic neuropathic arthritis versus chronic trauma. Clinical correlation is recommended.

CLINICAL CORRELATION
A Wound Mapping Ultrasound scan of the neuropathic ulcer revealed disruption of the cortical surface of the 4th metatarsal and associated cuneiform. The irregular cortical surface along with bone fragments were also noted and are consistent with osteomyelitis. This was diagnosed using the Wound-Mapping® scanning method.

CONFIRMATION
A second scan was performed whereby a needle guided biopsy was obtained. Ultrasound guidance enabled a route of needle entry through healthy tissue rather than the wound bed, preventing the sampling of bacteria that were present at the wound’s surface but not present at the site of the osteomyelitis. The sample was then send to the lab for C & S of the obtained tissue.

DISCUSSION
Where radiographs provided no evidence of irregular erosions of the cortical surface or osteomyelitis, the non-invasive scanning technique of ultrasound provided discovery of the infection and subsequent treatment. The patient was admitted for IV therapy and then was discharged on oral antibiotic therapy for 6 weeks. The wound went on to full closure without recurrence of infection.
The Hitachi Aloka Noblus is a premium portable ultrasound system that supports multiple applications over a wide range of clinical environments. All circuits related to image quality are fully digital which allows for high spatial resolution, high contrast resolution and a wide dynamic range. The removable console contains an internal battery allowing examinations to be performed even when an external power source is not available. Noblus also supports wireless LAN for DICOM communication.

A full complement of linear, convex and phased array transducers are available for Noblus allowing the ultimate in clinical flexibility.

**CLINICAL USES**
- Shared Services
- Emergency Medicine
- Pain Management
- Wound Care

**APPLICATIONS**
- Radiology
- Interventional Radiology
- Obstetrics
- Gynecology
- Abdominal
- Peripheral Vascular
- Urology
- Musculoskeletal
- Pediatrics
- Cardiology
- Small Parts

**POWER REQUIREMENTS**
- Input: 240/120 V @ 60 Hz
- Power Consumption:
  - (Standard Components): 250W
  - (Using Cart): 550W

**ENVIRONMENT**
- Temperature: 10 ~ 35°C
- Relative Humidity: 30 ~ 85%
- (No Condensation)
- Atmospheric Pressure: 700 ~ 1060 hP

**PHYSICAL DIMENSIONS**

**CONSOLE**
- Weight: 19.9 lbs (9kg)
- Dimensions: 13.8" x 20.2" x 15.0"
- Display: 15" Non-interlaced HD LCD
- Pixels: 1,024 x 768
- Display Range of Motion:
  - Swivel Angle: +/-90 deg.
  - (Horizontal direction)
  - Tilt Angle: -90 ~ +30 deg.

**CONSOLE WITH CART, PROBE EXTENSION UNIT AND B&W PRINTER**
- Weight: 88.2 lbs (40kg)
- Dimensions:
  - 20.5" x 20.4" x 44.3" (Height is 52.2" in fully raised position)

**STANDARD IMAGE QUALITY FEATURES**
- **Hi Definition Tissue**
- **Harmonic Imaging (HdtHi)**
  Extends penetration and increases resolution by transmitting a wide band pulse and receiving the second harmonic and sub-harmonic signals across the entire spectrum of the probe bandwidth.
- **Hi Compound Imaging (Hi Com)**
  Is especially beneficial for improving the visibility of luminal structures. HI Com transmits and receives ultrasound beams in various directions and superimposes the resultant images in real time.
- **Adaptive Imaging (Hi REZ+)**
  Utilizes Hitachi Aloka’s high speed digital processing engine to extract structures and emphasize tissues without reducing frame rate.
- **Fine Flow**
  Displays high-definition, high frame rate color doppler images down to fine vessels with minimal blooming.

**STANDARD WORKFLOW EFFICIENCY**
- **Hi Support**
  Reduces examination time by allowing time gain compensation, B mode gain, base line, pulse repetition frequency and doppler gain, etc. to be adjusted with a single touch.
- **On-Board User Manual**
  User Manual Is integrated with the application allowing for convenient user guidance.
- **Examination Data Management and Storage**
  Noblus stores full-fidelity images, measurements, and other data internally and can also copy information to USB and USB HDD.
- **Auxiliary Monitor Support**
  Noblus includes a DVI-D connector for auxiliary monitor attachment.

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**General Specifications**

Ultrasound Solutions Clearly Defined™

Hitachi Aloka Medical America, Inc.
10 Fairfield Blvd., Wallingford, CT 06492
www.hitachi-aloka.com | 800.872.5652

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