Proceedings of the
9th International Congress of World Equine Veterinary Association

Jan. 22 - 26, 2006 - Marrakech, Morocco

Reprinted in IVIS with the permission of the Conference Organizers http://www.ivis.org/
ULTRASOUND AIDED ORTHOPEDIC SURGERY IN THE HORSE

Tnibar A. DVM, PhD, Dipl. ECVS (Equine)
Senior Veterinary Surgeon, Surgical Department,
Charles River Ltd. Ballina, Co. Mayo, Ireland

Introduction

Image guided surgery refers to any surgical procedure involving the intraoperative use of a representation of patient anatomy obtained via imaging techniques or computerized methods. These representations are used for real-time visualization of targeted tissues and structures, as well as physical alteration with surgical tools and instruments (Chen et al, 2005).

In the last decades, there is a continuing shift toward less-invasive interventional and surgical protocols and the associated increase in demand for imaging and computerized guidance/navigation technologies. There is also an increasing availability of sophisticated imaging tools specifically designed for intraoperative use, with the advent of more user-friendly surgical navigation technologies.

Ultrasound imaging is a non-invasive imaging technique, which makes use of ultrasound to image the patient body.

Ultrasound aided surgery is the technique of performing surgical procedures within the body by using ultrasound guidance (Lutz, 1984). This technique enables the surgeon to guide the surgical blade accurately to the desired anatomical structure with a minimum of trauma to the surrounding structures (soft tissues, cartilage, and bone).

Ultrasound aided surgery was first reported in human medicine then adapted in veterinary medicine for procedures such as liver and kidney biopsies and for location of abscesses.

In equine orthopedic surgery, this technique is currently used for joint surgery, tendon and ligament surgery, foreign body removal and other procedures (Allen, 1992; Henninger, 1992; White, 1998; Tnibar, 2001-2005).

Ultrasound aided surgery requirements

- Understanding of two-dimensional imaging
- Appreciation for the visualization of instrument movement on a sonogram
- Equipment needed:
  - 7.5 MHz or a focused 5 MHz real-time sector or linear ultrasound probe
  - Sterile, non irritant contact gel

Ultrasound aided orthopedic surgical procedures in the horse

Joint surgery
Pre-operative:
- may avoid diagnostic surgery
- precise location and size of fragments or foreign body
- arthroscopy vs. arthrotomy
- Optimal surgical approach (avoid neurovascular structures)
Per-operative :
- Fragments removal (embedded in synovial membrane, intra-capsular)
- Ultrasound-guidance:
- Deep joints injection (hip.)
- Deep structures

Tendon and ligament surgery

Tendon splitting (core tendonitis)
Ligament splitting:
Medial patellar ligament
Suspensory ligament
Inferior check ligament

**Desmotomy:**
Inferior check ligament
Annular ligament

**Tenotomy:**
Deep digital flexor tendon
Enthesopathy
Foreign body removal (limbs, head)
Per-operative fistula tract location

**Others:**
post-operative wound follow up

**References**


