Timing of Surgery in Incomplete Cervical SCI

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Disclosures

Consulting
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Board
  Cervical Spine Research Society

Editorial Board
  Contemporary Spine Surgery, Surgical Neurology International,
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2015: Goals of Treatment

- Neurological Preservation
- Spinal Stabilization
- Neurological Improvement
Current Interventions

• Surgical decompression
• Optimizing spinal cord perfusion
• Steroids
Decompression

- Surgical
- Traction/Closed Reduction
Timing of Surgery

Neurologic Recovery

When do we operate?

Now

Later
Past – Timing of Surgery

• No urgency in treatment
  – “Early treatment” 3-5 days

• Early treatment = risk!
  – Neurological decline
  – Cardiopulmonary
  – Polytrauma

Animal Data

• Primate
  – Kobrine et al 1978, 1979
• Feline
  – Brodkey et al 1972
  – Croft et al 1972
• Canine
  – Bohlman et al 1979
  – Delamarter et al 1995
  – Carlson et al 1997, 2003
• Rats
  – Guha et al 1987
  – Zhang et al 1993
  – Dimar et al 1999
Human Models

We operated right away and by the next morning she was moving her legs!
The plural of anecdote is not evidence
Clinical Data

- Clinical Studies
  - Levi Neurosurg 1991
  - Wagner JNeurosurg 1992
  - Cotler Spine 1993
  - Duh et al 1994
  - Schlegal J Orth Trauma 1996
  - Vaccaro Spine 1997
  - Gaebler Spinal Cord 1999
  - Papadopoulos et al J Trauma 2002
• Multicenter, Non-randomized
• 2002 to 2009
• Acute Cervical SCI – 313 patients
  – 182 Early (<24 hours): mean 14.2 hr
  – 131 Late (>24 hours): mean 48.3 hr
STASCIS

- SAFETY: Equivalent
- RECOVERY (p<0.05)

1 Grade Improvement

2 Grade Improvement
Prospective, Nonrandomized, Single Center (Slovenia)

22 patients (8hrs); 20 patients (8-24 hrs)

Complications similar

AIS grade improvement better in 8 hour group
Analysis of Delays to Surgery for Cervical Spinal Cord Injuries

Andre M. Samuel, BBA, Daniel D. Bohl, MPH, Bryce A. Basques, BS, Pablo J. Diaz-Collado, MD, Adam M. Lukasiewicz, MSc, Matthew L. Webb, AB, and Jonathan N. Grauer, MD

- National Trauma Data Bank
- N=2,636 patients
- Ave Time to Surgery
  - Complete SCI (803 pts) = 51.1 hrs
  - Incomplete SCI (950 pts) = 55.3 hrs
  - Central Cord (883 pts) = 83.1 hrs

- <24 hours: 44% of all SCI, 49% of Incomplete SCI
Delays After Admission

- Co-morbidities
- Upper Cervical Spine
- We can hypothesize:
  - Resources
  - Polytrauma
  - Elderly Patients

NEED TO CREATE AND SUPPORT PROTOCOLS FOR SCI CENTERS
Elderly Patients with SCI

- Morbidity higher
- Mortality higher
- Current Risk/Benefit analysis may not apply
SCI Evidence

Now

Later

REQUIRES: Surgeon experience, Hospital capacity, Anesthetic capability, ICU availability
Conclusions

• Incomplete SCI – Early (<24 hours)
  – SAFE
  – EFFECTIVE
  – INCREMENTAL BENEFIT (Level II evidence)

• Delays need to be assessed and minimized

• Additional data on elderly patients needed
Thank You