

**** ailment not to be treated ****

Egyptian Physician 2500 BC

F. Selmi

Northwest Regional Spinal Injuries Centre
Southport

1 year post injury survival

1st World War 10 %
2nd World War 90%

Sir Ludwig Guttmann
Stoke Mandeville Hospital



- 1. Systemic Disorder
- 2. Specialist Centres

Incidence:

World wide 10 - 20 / million

Age: 20- 30 & 70 years

Sex: 4 : 1 male/ female

Causes:

Traumatic 75%

RTA 45%
Accidental falls 34%
Sporting injuries 15%
Assaults 6%
Other 5%

Non Traumatic 25%

Congenital - Spina Bifida
Neoplastic - Met s tases
Infectious - Tr Myelitis,
TB, Abscess
Vascular - AVM
Iatrogenic - Aortic Aneur ysm
Degenerative- Disc

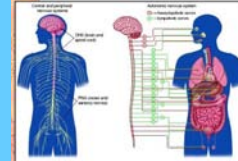
Outcome of Spinal Injury:

Vertebral Column Damage



Spinal Cord Damage

Somatic
Physical Disability



Autonomic (Systemic)
Visceral Disability

Spinal cord injury:

Spinal shock
(Complete loss of, power, sensation and reflexes)

Complete / Partial loss Sensation & Power

Damage at cord level above L1 (Upper Motor lesion)	Damage to Nerves below L1 (lower Motor Lesion)
<ul style="list-style-type: none"> Increased tone Spinal / Autonomic reflexes exaggerated 	<ul style="list-style-type: none"> Flaccid paralysis Spinal / Autonomic reflexes absent

Affects most visceral systems in the body
Higher the level of injury more profound the effects

Management of spinal cord Damage :

Spinal cord injury

Primary Damage	Time of Impact
Secondary Damage	Immediately following injury

Due to;

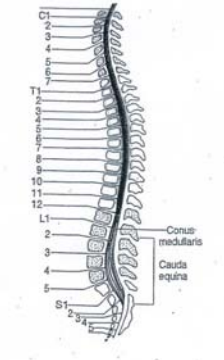
- 1 Increased oedema /swelling
2. Further disruption of the cord

Causes:

- Hypo tension
- Hypo-oxygenation
- Excessive movement of fracture
- Compression of the cord
- Bone fragments,
- Disc or Haematoma
- Infections
- Electrolytic balance


Salient Features:

Vertebral Column	24 Vertebrae 05 Sacrum 01 Coccyx
Spinal cord	30 segments Ends L1 Cauda Equina
Sympathetic Nervous System	Thoracic spine



Evaluation of Spinal cord Injury

Level of Injury	Severity or Grade of Injury
Quadriplegia (Cervical) paralysis in all 4 limbs	Complete ASIA A Loss of all Power/Sens.
Paraplegia (Thoracic&Lumbar) Paralysis of trunk and lower limbs	Incomplete ASIA B,C,D,E Preservation of some power and sensation Brown squard Central cord Anterior cord Cauda Equina
Cauda Equina(Lumbar & sacral) loss of visceral and lower limb reflexes	



Long term complications

Vertebral Damage:

1. Implant failure
2. Kypho- scoliosis
3. Adjacent degenerative changes

Spinal cord damage

Syringomyelia

25% incidence

Au tonomic / Systemic Problems

- Respiratory
- Urinary
- Bowel
- Skin
- Musculoskeletal
- Cardiovascular
- Sexual and fertility
- Endocrine changes
- Electrolytic changes

Respiratory system :

Impairment depends on:
 Level of Lesion
 Associated injuries
 Pre-morbid chest diseases
 Smoking

Effect
 Inability to maintain ventilation
 Impaired cough, retained secretions and infections

Therapeutic measures
 1. Maintain an open airway
 chest care
 2. Artificial airway (tracheostomy)
 3. Mechanical ventilation
 4. Chest Physiotherapy
 Assisted coughing, breathing exercises
 5. Prompt treatment of infections

Urinary System _____ Acontractile Bladder > urinary retention

Spinal shock

Indwelling / Intermittent catheter

UMN (reflex bladder)
 Sheath drainage

LMN (Areflexic Bladder)
 Intermittent catheters

Complications
 1. **Urinary tract Infections**
 2. **Urinary calculi**
 3. **Renal impairment**

Cardiovascular system

Neurogenic hypotension **Venous thrombosis**
 Unopposed vagal effect

Effect
 1. Hypo tension
 Systolic 90-110
 2. Bradycardia
 Pulse 50-70/ min

40% Deep vein thrombosis
 5% Pulmonary embolism

Prophylaxis
 Passive limb exercises
 TED stockings
 Warfarin / Heparins

Gastrointestinal system
 Autonomic Dysfunction / Paralytic ileus

Onset 0 - 48 hours after injury

Early/ Spinal shock
 Nil by mouth

Parental nutrition


UMN(reflex bowel) Bowel stimulants

LMN (areflexic Bowel) Manual evacuation / enema

Complications
 Stress Ulceration
 Gastric protection
 Omeprazole, Ranitidine

Skin

1. Pressure sores:



Poor skin perfusion
 Lack of sensation
 Unrelieved Pressure

Sacrum, Ischium, Trochanter
 Occiput, heels, scapulae, Groin

Prevention
 Avoid prolonged pressure
 Frequent turning every 2 hrs

Treatment
 Prolonged bed rest
 Expensive dressings

Complications
 Infection
 Death

2. Cellulitis

Sexual & Fertility.

1. Erectile Dysfunction
 Reflex
 Psychogenic

2. Loss of orgasm

3. Reduced Fertility
 Sperm retrieval and preservation
 In Vivo Fertilisation

Musculo-skeletal System.
Increased Tone and Spasms.

Upper motor neuron lesion
Below the level of injury

Management:
Physiotherapy
Anti spasticity medication e.g Baclofen, Dantrium
Intrathecal Baclofen

Skeletal/Joint Problems

Shoulder joints-- rotator cuff injuries

Limb fractures Surgical approach


Heterotopic Ossification

Rehabilitation

Goal is to make maximum use of the remaining functions to achieve the highest degree of independence permitted by the neurological lesion and reintegrate into the community.

Multidisciplinary Team:

- Medical team
- Physiotherapist
- Occupational therapist
- Nursing team
- Psychologist
- Social Services team



**** Successful rehabilitation is one where an individual is admitted as a patient and discharged as a taxpayer.****

Sir Ludwig Guttmann