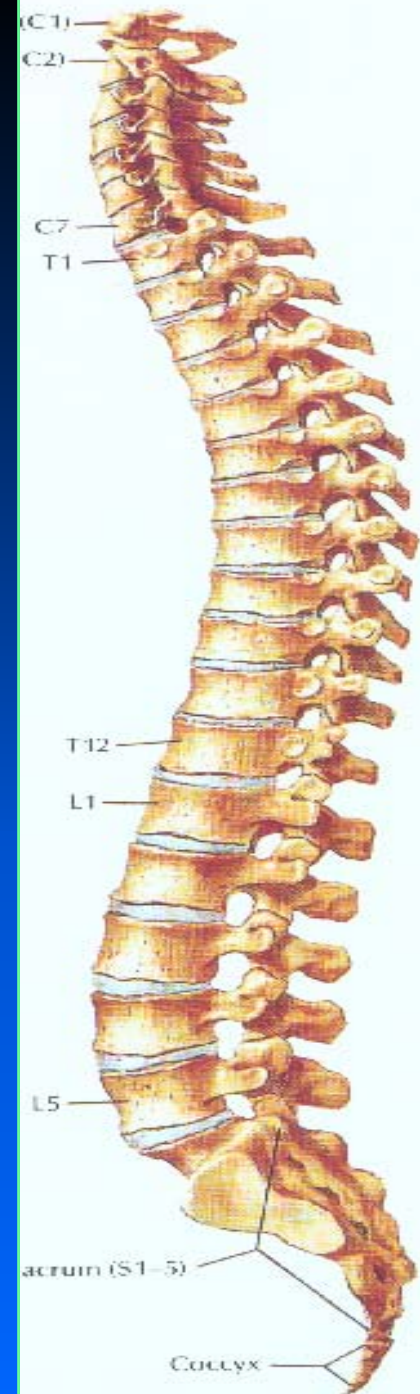


Principles of Management of Acute spinal cord injury



HISTORICAL INTRODUCTION

Imhotep(2686-13BC): original author of papyrus

- 48 spinal cases, 3 on cervical spine, 1 #dislocation
- Vertebra crushed, paraplegia in limbs, dribbling of urine-**not be treated**
- Hippocrates(460-377BC): cervical traction; association of spinal injury in head trauma



A BRIEF HISTORY OF
NEUROSURGERY

Edited by
DR. P.S. RAMANI



Contributors:
Dr. T. Hegde,
Dr. A. Sharma,
Dr. C. Stevens,
Dr. P.S. Ramani

THE MILESTONE

- ❖ 24th Oct 1892 Victor Horsley 6th laminectomy on 20 yrs old boy
- ❖ Trauma-paralysis in rt.upper limb;para in lower limbs, dribbling urine.
- ❖ By Sept 1893 he had completely recovered



A BRIEF HISTORY OF
SPINAL SURGERY

DR. P.S. RAMANI
DR. ALOK SHARMA

PRINCIPLES OF TREATMENT

- Targetting secondary SCI mechanism to prevent aggrevation of primary injury



MANAGEMENT

- ▣ Preventive measures
- ▣ Conservative care (last century)
- ▣ Pharmacological treatment
 - MP administered gives modest improvement
 - Role of surgery (resent)
 - Reduction, decompression and fusion

Important : sufficient data is available to promote overall treatment standards.



IMAGING



MRI FINDINGS

n=100

	Cervical	Dorsal	DL	Lumbar 2 Sacrom
• Oedema	5	0	0	0
• Contusion	11	0	11	8
• Transection	13	7	17	0
• Haematomyelia	2	0	1	0
• Normal	13	2	3	7



PRINCIPLES OF MANAGEMENT

surgical

- ✚ Reduction
- ✚ Early decompression
- ✚ Stabilisation
- ✚ Rehabilitation



CLASSIFICATION OF EVIDENCE

Study Design

Class of Evidence

Well-designed and executed
randomized controlled clinical trials

I

Prospective, nonrandomized studies

II

Case series; retrospective studies; expert opinion
(evidence based medicine)

III



METHYL PREDNISOLONE

MP

- Nascis II (92) - within 8 hours upto 24 hrs.
- What is 8 ? Close to median time of starting the treatment
- Nascis III (97) - within 3 hrs. upto 24 hrs.
- 3 to 8 hrs. upto 48 hrs.
- MP gives 5.1% improvement in motor score in 45.9% when administered in time.



MP

- ❖ Prevents lipid peroxidation
- ❖ Prevents destruction of neuronal and microvascular membrane
- ❖ Improves neurological function



MP DOSAGE

- Bolus:- 30 mg/kg in 30 mls of water – 15 min
- Maintenance:- 5.4 mg/kg/ per hour for 23 hours or 47 hours. Total 23 hour dose to be mixed in 100 ml of water and administered at 5 ml/hr.

Not useful if administered after 8 hrs.

MP given for any purpose is 30 mg/kg and can be repeated after 6 to 8 hrs.



COMPLICATIONS OF MP

(up to 6 weeks)

- ✚ Immunosuppression lasting 12 to 14 days has been reported.
- ✚ Delayed wound healing; wound infection; GI bleeding; pneumonia; pulm.embolism; DVT; avascular necrosis; decubitus ulcer; hyperglycaemia arrhythmias and sudden death.



CONSERVATIVE MANAGEMENT

- Past : philosophy of Guttman followed and practised by Frankel (612 pts)
- Postural techniques and bed rest to achieve reduction and spontaneous fusion
- 29% with complete motor and sensory paralysis improved at least 1 grade (gold standard)
- Laminectomy was only surgical procedure
- Today's opinion: **Laminectomy without fusion is contraindicated.**



ROLE OF SURGERY

belief of some

- ✚ Early surgery increases the rate of complications
- ✚ Many patients critically ill with cardio pulmonary compromise



MODERN SURGERY

- Techniques have advanced tremendously in last 2 decades
- Early Surgery – Safe & efficacious
- No evidence of high complication rate
- Surgery done within 24 hours has lower complication rate.



CONSERVATIVE CARE

- ❖ When surgery is indicated conservative care has no place
- ❖ 10% worsening in patients with incomplete injury when treated conservatively



TIMING OF SURGERY

US Multicentre study – 1999- (585 pts).

- 23.5% operated within 24 hours
- 40% operated late after 5 days.



COMPARISON

NASCIS II

Mortality

- ❖ Operative 6.1%
- ❖ Conservative 15.2%
- ❖ Thrombo embolism:- Higher in operated group.
- ❖ Improved outcome in surgical group but no difference between less than 25 hours or more than 200 hours



COMPRESSION OF SPINAL CORD

- ✚ Potentially reversible sec. inj.
- ✚ Severity of injury in animals depend on
 - Force of compression
 - Duration
 - Displacement
 - Kinetic energy
- ✚ Neurological recovery depends on timing of decompression in all animals



REDUCTION OF DISLOCATION

- ❖ Early decompression by traction
- ❖ Sig. neurological improvement
- ❖ Closed reduction:- Useful but be cautious
8.1% deterioration (Multicentric study)
- ❖ Surgical reduction 75% recovery in patients
reduced early (6 hours)

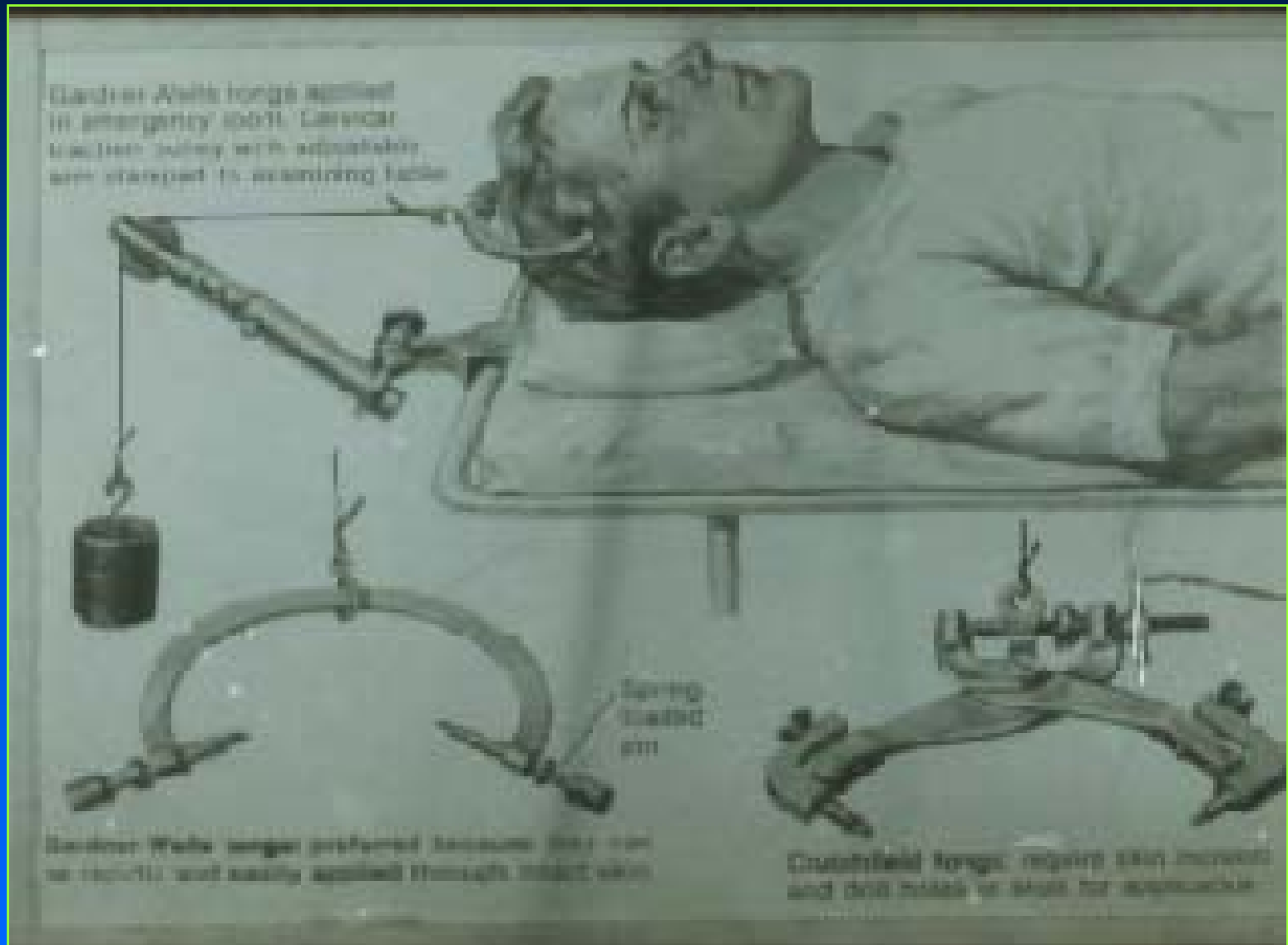


DISLOCATION

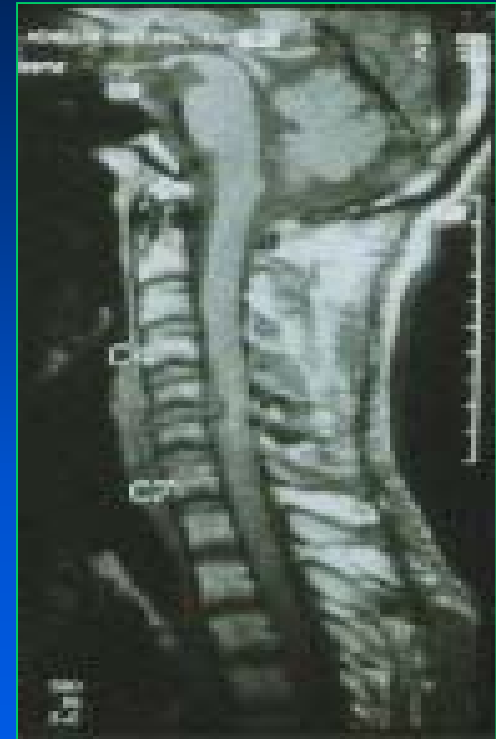
COMMON INJURY



DISLOCATION REDUCTION



COMPRESSION BY DISC TISSUE AFTER REDUCTION





INDICATIONS FOR SURGERY

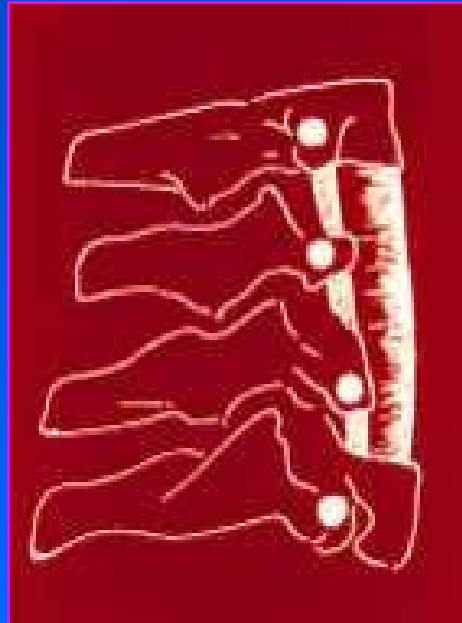
- Irreducible facet lock
- Instability (Ligamentous injury)
- Deformity > 15 degrees
- Body compression 40% or more
- Subluxation 20% or more



HANGMANS FRACTURE

n=7





LATE DECOMPRESSION

(>4 weeks)

- ❖ Surgical procedure produces accelerated neurological recovery
- ❖ Late surgery plays an important role in significant neurological recovery



RECOMMENDATIONS FOR MP

- ◆ MP in acute SCI is not a standard of care. It is a treatment option
- ◆ When MP is administered in acute SCI it should not be administered again during Surgery
- ◆ High dose MP to be administered after considering the risk of associated complications.
- ◆ MP has not caused statistically significant increase in complications.
- ◆ There is no contra indication to its administration.



PROPHYLAXIS

- NASAS II has demonstrated that pretreatment in cats with 30 mg per kg bolus protected spinal cord from lipid peroxidation
- Prophylactic use of MP in surgery for neuro protection has not been addressed so far.



RECOMMENDATIONS FOR SURGERY

- Early reduction of # dislocation
- Decompression, reconstruction and fusion to be done early if compression is focal and anterior
- Instability to be treated early
- There is a role for early surgery in central SCI





THANK YOU