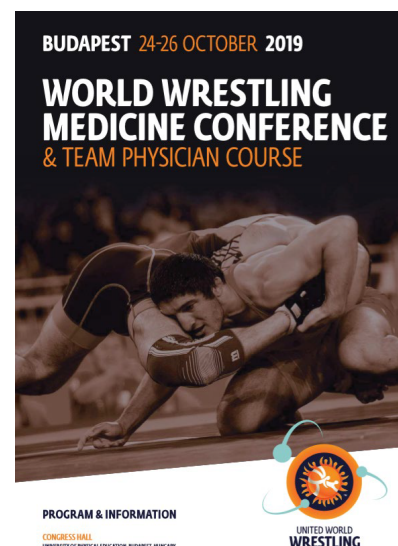




Special Section: Summaries of Presentations from the
Wrestling Medicine Conference & Wrestling Team Physician
Course, United World Wrestling, Budapest, October 24-26,
2019

SPINE INJURIES IN WRESTLING

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Published online: December 2019.

To cite this article: Johann Klaus (2019) SPINE
INJURIES IN WRESTLING. International Journal of
Wrestling Science, 9:2, 100-103.



INTERNATIONAL NETWORK OF WRESTLING RESEARCHERS (INWR)

ADVANCING OUR SPORT THROUGH KNOWLEDGE

FAIRE PROGRESSER NOTRE SPORT PAR LA CONNAISSANCE

ПРОДВИЖЕНИЕ НАШЕГО СПОРТА ЧЕРЕЗ ЗНАНИЕ

PROGRESO PARA NUESTRO DEPORTE MEDIANTE CONOCIMIENTO

SPINE INJURIES IN WRESTLING

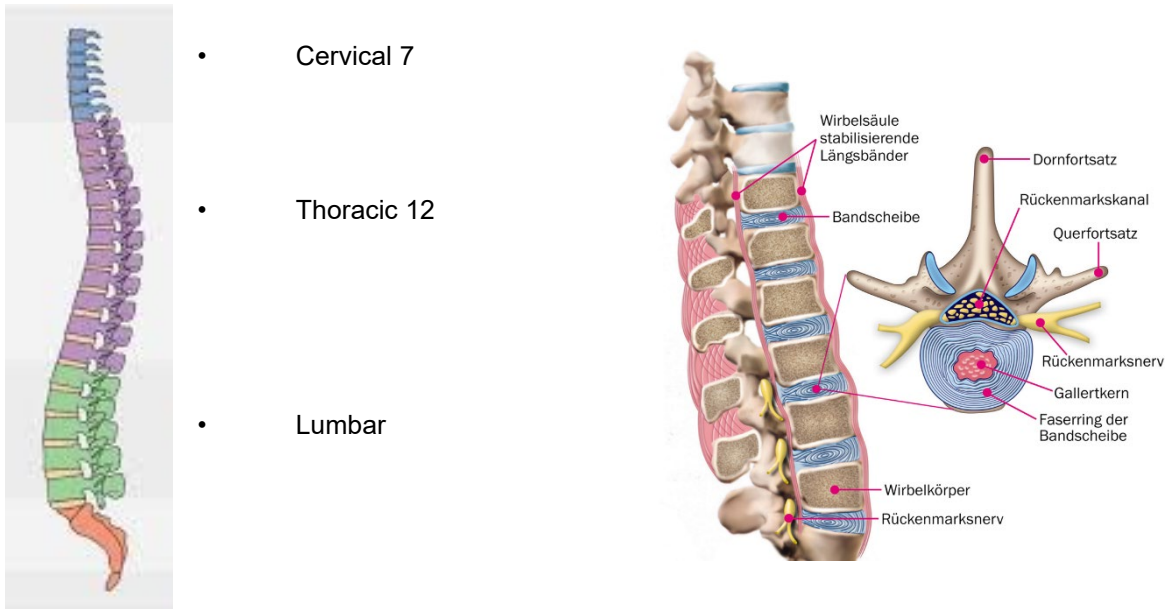
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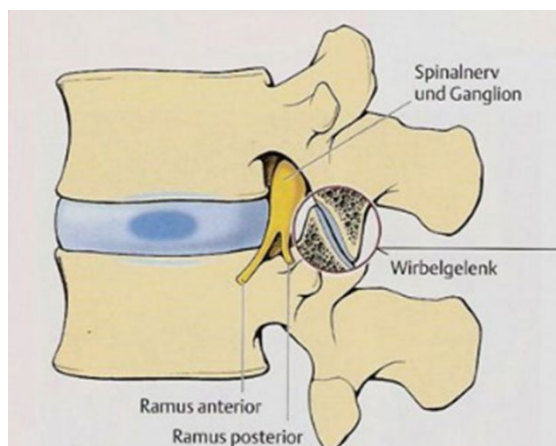
Spine injuries in wrestling, overview and prevention

Anatomy

In this picture you see the bone structure of the spine. The sagittal alignment shows us an double S, which helps to compensate shocks and give us more mobility.

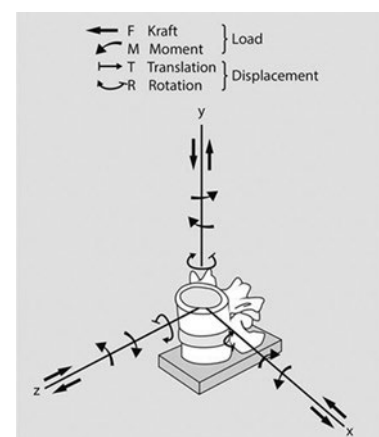


Between two vertebra we have the disc, a shock absorber, Holden by the anterior and posterior ligament. the passive and active dynamic stabilizer are the intervertebral ligaments and muscles, also the abdominal muscles. The intervertebral joints control the movement. All structures secure the spinal cord.

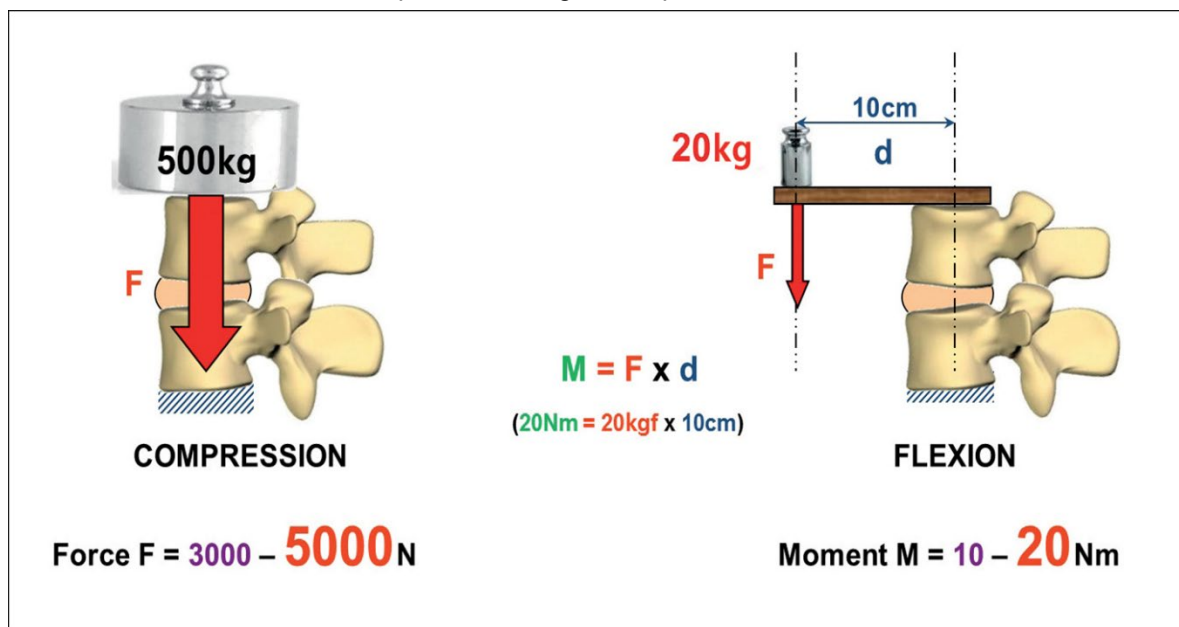


Two vertebrae with disc and the part of spinal cord and the nerve root such us the facet joint is called one motion segment of “Junghanns”

This diagram shows us the possibility of three-dimensional motion with extension, flexion torsion, also compression and distraction and lateral bending.



You see here the load of compression directly of the spine, how strong the spine segment is, but if you flex by eccentric compression, we can only stabilize an small part of this weight. This is the reason we need a good formed musculature around the spine stabilizing forced power from all directions.

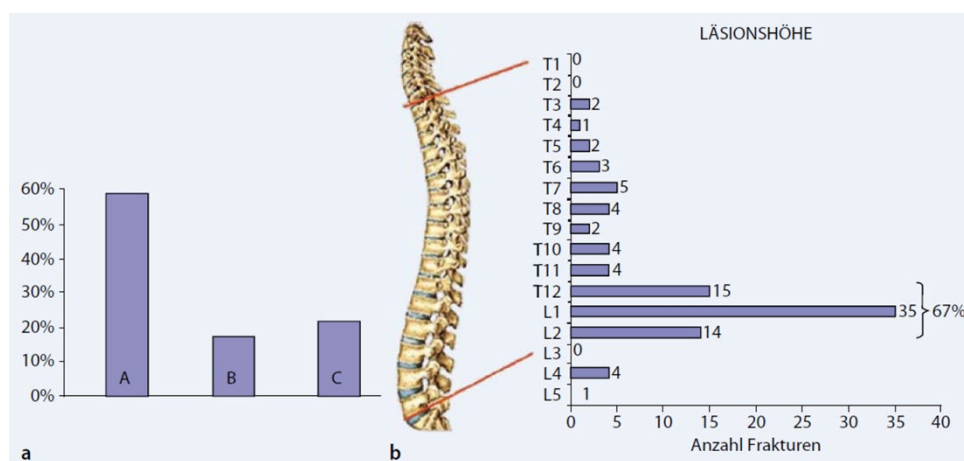


In Germany we see 1-1.5 million sport injuries per year. The part of peripheral nerve or spinal cord injuries moves between 23 and 43%. Spinal cord injuries are distributed 42% vertical, 31% thoracic and 27% lumbar. The newspaper Süddeutsche reports in 2015 1800 cases of cross section paralysis.

We have two big classification of fractures of the spine. The AO classification explains the type by grade of stability with participation of the structures, also the direction of instability. This classification shows you the formation of injury, so you can better comprehend, what can happen, in wrestling for example.

Takedowns with flexion can cause compression fractures ventral or ligament injuries dorsal. Takedowns or throws with hyperextension can cause disc ruptures, vertebral fractures or in combination with rotational load all of this with large dislocation and consequently with tear of spinal cord.

This picture shows you the distribution of sport injuries of the spine, 67% concerning the thoracolumbar area. There are approximately 75% stable.



The literature distinguishes in various risk of sports. Gym, row, judo and wrestling are high risk sports.

Neck Injury

- takedown with driving in his Opponent
- Tearing on the head
- Stand up from headlock (Opponent)
- hyperextending
- Hyperflexion

The risk of injury on the neck is very variable. All throw could be a risk, also standup from headlock as opponent, all throw from down position.



Lumbar Spine injury

- 4- or 5-point Throws
- takedowns
- Hyperextension
- Hyperextension and twisting
- Hyperflexion

All throws with hyperflexion or hyperextensions are able to tear the thoracic and lumbar spine, especially by additional twisting the body.



Catastrophic Injuries to cervical Spine

- rotational
- axial blow
- Twisting the neck without resistance



Therapy

- Clinical examination (don't move)
- Testing pulse and peripheral motion (neurological deficit)
- Stabilization in place
- Transport to hospital



Most of minor injuries of the spine based on muscle or tendon strains. The therapy is symptomatic with cool, compression, rest, analgesic drugs later physical therapy. Intervertebral blockade should be treated by chirotherapy physiotherapy, injections or symptomatic analgesic drugs.

- Mostly minor injuries of Muscle and tendon
Symptomatic Therapy
- Often invertebrate blockade
Chirotherapy, injection

Stable fractures of the spine should be treated by rest, analgesic drugs, corset, later physiotherapy. Return to wrestling maybe after 3 months. Unstable fractures need normally an operation with stabilization of the spine, also by neurological deficit decompression of the spinal cord.

In a variety of prospective and retrospective epidemiological studies of wrestling injuries, neck injuries were 0.8–14.9% of the total number of Trunk and Spine. Low back injuries have comprised from 1.2 to 18.6% of total wrestling injuries in prospective and retrospective studies.

Estwanik et al. [16] also noted that 25% of the wrestlers in his study presenting with back pain had spondylolysis or spondylolisthesis; 58% of his patients were diagnosed with lumbar strain. Rossi and Dragoni [36] reviewed the radiographs of 3,132 athletes aged 15–27 who were evaluated for low back pain over a 26-year period. Wrestlers with back pain had a 29.8% prevalence of spondylolysis (17 of 67 wrestlers).

Prevention

- Referee? Recognizing dangerous situations in their making
- Equipment? small effect
- Mat

attenuation
elasticity

The best prevention to protect the spine is a good trained musculature of the problem areas cervical. and lumbar spine. Neck muscles, trapezius altissimo, spinal erectors on the back side, abdominal muscles in the front has to be stabilized. This could be with calisthenics, weight training, core stabilization's by sling trainer and more. Also necessary is the education of flexibility of the spine with stretching, yoga, mobilization.

Case Studies

A young wrestler (15) complains neck pain. No x-ray, only mri would be primary done. Nothing found. By constant pain x-ray shows a spondylolytic pars interarticularis. Dorsoventral stabilization had to be made. Only 100 cases of cervical spondylolysis have been presented in the literature.

Zentralbl Neurochir. 2008 May;69(2):96-8. Cervical spondylolisthesis C6-C7 in a young wrestler: case report. Pitzen T, Johann K, Steudel Wl, Fritsch E.

Disc Prolapse: Young female wrestler complained about neck pain after successfully European championships with play and power deficit left hand. Disc prolapse was found. After stabilization and 8 weeks of rest she returned to sport, after 12 weeks to wrestling

Avulsion of the rear longitudinal ligament After attack two legs by German youth championships a young female wrestler complains about back pain and palsy in right leg. Prompt stop, clinical examination and transport to hospital in fixed position. We see an avulsion of the rear ligament with small spinal cord compression. By missing deficit of power conservative treatment with corset, rest, and physiotherapy.

Conclusion

- 0.8-18% of injuries by wrestling
- Mostly minor injuries
- Fixed first aid therapy
 - Prevention by stabilization of the spine and flexibility training needed

WORKSHOP: MAT-SIDE INJURY MANAGEMENT

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PURPOSE OF MAT-SIDE MEDICAL CARE

- Immediate medical care on FOP
- Identifying and acute management of serious issues
- Prioritisation of athlete safety
- Organising further care and hand-over
- Liaise with teams, referees, organizers, ...

FOLLOW A BASIC STANDARD WELL-REHEARSED APPROACH

PRINCIPLES OF ORGANISATION

Medical plan in coordination with local hospitals and emergency services:

- Level of Service provided Mat-side and at the venue
- Procedures for extrication and transfer
- Local Emergency Services, Local contacts, Hospital services available, Routes

Medical Team members:

- Numbers, Qualifications, Experience, Role specific
- Dr(s), Physio, Paramedic, First aider, Stretcher Crew, ...
- Others: Coaching and technical staff, Stewards, ...

Preparations:

- Medical room
- Equipment and Medications
- Team Briefing & Practice of acute scenarios
- Liaise with participating teams, technical staff, organizers, ...

PERSONAL CHARACTERISTICS

- Advanced Trauma and Resuscitation skills, and training
- Scope of practice and awareness of own limitations and capabilities
- Awareness of the team's capabilities & appropriate delegation of roles
- Teamwork / leading qualities & Communication skills

CHALLENGES

- Focused and confident in Decision making under pressure:
- Life, death, serious disability, career defining
- Athlete's safety over competition pressure, coaches and support staff
- Crowd, media, colleagues, ...
- Documentation

"A© BCDEFG" APPROACH!

Mechanism of Injury (MOI)

- Airway: Assessment, Secure, Airway modalities
- C-Spine: MOI, Assessment, Immobilize and secure
- Breathing: Assessment incl pattern, O2, ...
- Circulation: Assessment, Sources of bleed, stabilize,
- Disability: HI and LOC, Concussion,
- Exposure: limb injuries, secondary survey, pain management
- Don't Ever Forget Glucose!

POSSIBLE SCENARIOS

MSK & limb injuries:

- Sprains and strains
- Cuts, lacerations
- Dislocations
- Bony injuries and fractures

Assess, Acute management, Immobilization, Pain management

POSSIBLE SCENARIOS

Spine injuries:

- Mechanism of Injury (MOI)
- Immediate immobilization (MILS).
- On mat assessment (if in doubt proceed to full immobilization)
- Log roll, full immobilization, safe transfer

Cardiac Arrest:

- Collapse without contact/Blunt chest trauma (Comotio Cordis)
- Immediate assessment
- Immediate resuscitation
- Early defibrillation (AED)
- Reversible causes? (4Ts & 4Hs)

Head Injury & Concussion

- Significant chest trauma, Tension Pneumothorax
- Long bone fracture, pelvic fractures
- Organ injury, retroperitoneal bleed
- Fitting, Severe Asthma Attack, Anaphylaxis, ...

SPECIAL CONSIDERATIONS

“A© B C D E F G” Approach to organization, preparation, and management

- Airway kills First!
- Precedence over everything else
- O₂ always helps
- Ask / Shout for HELP early!
- You are not on your own, use and mobilize other people
- Call for ambulance early
- Don't be distracted by apparently more dramatic injuries
- Follow the steps

SPECIAL CONSIDERATIONS

Dynamic process

- Reassess progress after every intervention
- May need to go back to “A-B-C” again at any point
- If in doubt, choose the safest options
 - MILS
 - AED
- Communication
 - Clear, Firm and Assertive
- Lead or assign a leader in advance
- Debrief the team afterwards and give yourself time to recover!

PRACTICAL WORKSHOP

- Overview of Airway assessment, Airway maneuvers, Airway Adjuncts, breathing assessment, Use of Pocket Mask, Use of Bag Valve Mask
- Overview of BLS, Use of AED, principles of ALS
- Scenario Practice: Cervical Spine Injury; Cardiac Arrest; Limb Injury