

Ministry of Health Protection of Ukraine
Poltava State Medical University

Approved
at a meeting of the department
pediatric surgery
with traumatology and orthopedics
Protocol №1 August 27 2021
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Methodical instructions
for independent work of students
in preparation for the practical training and in the classroom

Academic discipline	Traumatology and Orthopedics
Module № 1	Traumatology and Orthopedics
Content module № 2	Damage to the spine, pelvis, bones and joints of the upper and lower extremities
The topic of the lesson	Damage to the spine
Course	5
Faculty	Medical

1. Actuality of theme:

The damage of backbone belongs to the heavy traumas that present from 1,7% to 17,7% from data of different authors. Frequency of damages depends on the terms of work and often is for miners, builders, spider-men of and other In the last few years the amount of breaks of backbone increased in age from 18 to 40 from accidents. Not looking on development of vertebrosurgery, the indexes of disability remain high (63,9%) at breaks with the damage of spinal cord, especially neck department. Many errors are assumed at helping on the before hospital stage.

Thus, frequency of damages, weight of clinical motion, difficulty of diagnostics, complication of treatment, and the considerable percent of various complications is determined actuality of this pathology in preparation of doctor.

2. Educational aims:

➤ To acquaint students with clinical and X-ray presentation of damages of backbone.

➤ To know about principles of diagnostics, treatment and prophylaxis of damages of backbone.

➤ To know clinical and X-ray presentation of damages of backbone in neck, thoracal and lumbar departments.

➤ To master the methods of conservative holiatry of damages of backbone. To define testimonies and facilities of surgical treatment of damages of backbone, and also to know and able to use a transport immobilization.

➤ Able to conduct the differential diagnosis of damages of мягкотканых structures, breaks, breaks and dislocation of backbone.

➤ To capture the methods of diagnostics of the complicated damages of backbone. To estimate the common state of patient and choose tactics of treatment depending on the state of patient and complications. To define a testimony and facilities of surgical treatment of damages of backbone.

3. Base knowledge, abilities, skills necessary for the study of theme:

Discipline	To know	Able
Normal anatomy	Structure of backbone	To use knowledge of structure of backbone at implementation of practical skills
Topographical anatomy and operative surgery	Topographical correlations of elements of backbone	To use knowledge of topographical correlations for implementation of toponarcosis
General surgery	Principles of immobilization of backbone	To fix a backbone depending on the type of damage
Medicine of catastrophes	Sequence of executions on the before hospital stage at the damages of backbone	To execute anaesthetizing, stop of bleeding

Radio therapy	X-ray picture at the survey sciagram of organs of backbone	To diagnose the damage of organs of backbone
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4. Materials for before auditorium of independent work

4.1. Reference map for independent work with literature on the topic
«Damage to the spine»

Basic tasks	Pointing
To learn:	
Etiology	To name basic etiologic factors.
Clinic	To make classification of clinical displays.
Diagnostics	To give the list of basic methods of diagnostics.
Differential diagnostics	What differential diagnostics is conducted with?
Treatment	To diagrammatize treatment.

4.2. Professional algorithms in relation to a capture by skills and abilities:

Task	Pointing	Notes
To inspect sick with a damage backbone	To interpret these inspections, choose the method of treatment	To pay attention to circumstances of trauma, mekhanogenesis, weight
To execute immobilization of backbone	To fix a backbone depending on the level of defeat	To pay attention to prophylaxis of damage of spinal cord
To mount the system of counterextesion	To impose a counterextesion the loop of Glisson	To pay attention to prophylaxis of bedsores
To work out a plan treatment at the complicated break of backbone	To appoint necessary inspections, anti shock therapy	To pay attention to prophylaxis of festering- septic complications

4.3. Table of contents of theme

Damage of component elements of backbone behave to the difficult traumas, that not only result in the parafunction of backbone but also to disability of patients.

Classification of damages of backbone.

1. Group: the uncomplicated damages of backbone.
2. Group: the complicated damages of backbone.
3. Hurt
4. Distorsii.
5. Breaks.
6. Dislocations and subluxation.
7. Breaks with dislocations.

Damage of backbone in a peace-time, as a rule, are closed, in a war-time open (wound). There are they because of direct trauma (injuries, breaks of spinous and lumbar sprouts) and indirect from the excessive bending and rotary press of backbone, sometimes are unbending (compression and comminuting breaks of bodies of vertebrae, breaks of handles, breaks with dislocations). At an indirect trauma vertebrae or their ligamentary vehicle are more often damaged in the places of transition of the fixed part of backbone in more movable – low neck, low thorax, low backache.

Coming from anatomical and functional features, distinguish the stable and unstable breaks of backbone.

The breaks of bodies of vertebrae belong to stable, when the back ligamentary complex of backbone is stored. At the damage of back «supporting» complex (breaks of arthral sprouts and handles with the break of ligamentary vehicle, break with dislocation) there are unstable breaks there is a threat or presence of damage of spinal cord at that.

The unstable breaks of backbone belong to the very heavy traumas; therefore a large value has quality of grant of the first aid to the victims. A patient is carefully laid on hard loads with underlaying under knees a roller. At breaks and break with dislocation in a cervical spine yet additionally immobilization backbone and head by means of tires of Cramer. 2 mls of a 1% solution of misdelivering enter a patient, and if necessary conduct anti shock therapy and transport in the specialized separation of hospital.

Damage of cervical spine.

There are they, as a rule, because of indirect trauma - excessive bending, unbending or bend-rotary turn of head. Damage of copulas it is diagnosed only after a X-ray inspection, when other possible damages of backbone are eliminated.

Treatment consists in application of fixative collar during 10-14 days, and in future physiotherapy.

Extraordinarily rarely the breaks of first and second neck vertebrae happen and diagnosed. Basic in diagnostics is a X-ray inspection. An aiming sciagram is done in a fascial projection through the open mouth of patient.

At breaks without displacement apply a counterextesion by means of loop of Glisson with a small load (2-3 kg), in 4-5 weeks lay on a gipseous thorax-cranial bandage within 2,5-3 months, whereupon appoint a massage, thermal procedures.

The breaks of tooth of II of neck vertebra with displacement of fragment often treat an operative method. Mostly apply back spondylosis vertebrae with a spondylophyneacion wire.

In connection with that surgical access at these operations is difficult, often there are complications with high lethality. The technique of osteosynthesis is difficult, therefore he is executed in the conditions of the specialized vertebrosurgery clinics.

Breaks of bodies and break with dislocation of neck vertebrae.

Arise up at the sharp bending or unbending of neck. Diagnostics is based on data of anamnesis, or active inspection and X-ray research.

Treatment: at compression breaks a counterextension is used by means of loop of Glisson. In a month a counterextension is replaced by a fixative collar, and in 4-6 weeks a collar is taken off and appoint CPhE, massage of muscles, thermal procedures. The term of disability makes 2-5 months. At the compression breaks of II-III stad. and break with dislocations of neck vertebrae apply a skeletal counterextension for a skull. A counterextension through the loop of Hydroplane not always is succeeded. The device of Klepach, drawing out, is sometimes used for zygomatic arcs. In the last few years development of vertebrosurgery of wideuse in practice was attained by the operative methods of treatment of traumas of backbone.

Breaks of pectoral and lumbar department of backbone.

The first place on frequency is occupied by the compression breaks of bodies of vertebrae that arise up from the excessive bending of backbone and extraordinarily rarely - from unbending (during falling from a height, falling on the back of load etc.). Is there, as a rule, a wedge-shaped compression of body of one vertebra, and for children often a few vertebrae.

A degree of compression can be small (I item), on the half of height of body (II item), or anymore (III item).

At the compression breaks of bodies of T - 12, there are stomach-aches with sharp tension of muscles of front abdominal wall, that clinically show up as a "sharp stomach". Such pseudoabdominal syndrome is conditioned by both the compression of counterfoils and extraperitoneal haematoma in the area of break with the irritation of abdominal (sunny) interlacement, an additional inspection (laparocentesis, laparoscopy) is needed in these cases, not to skip the real damage of organs of stomach.

Decision in diagnostics of break of bodies of vertebrae are data of sciagrams (especially in a lateral projection).

Treatment: sick with a compression bodies of low thorax and lumbar vertebrae without neurological disorders treat, as a rule conservatively, by means of permanent replicon by a counterextension. A neurocentrum falls out during a counterextension and reclenation. It is necessary to straighten a vertebra not later 4-5 days. The complete restructuration of vertebra lasts 10-12 months.

From the first days begin curative physical education. In 3 weeks conduct the massage of muscles of trunk.

At the compression breaks of vertebrae of II item - a III item is conducted one moment replicon (in default of neurological complications), and then lay on well modally gipseous corset on 5-6 months. There is a one moment replicon contra-indicated at unstable breaks.

In latter days widely different metallic constructions began to be used for the internal and external transpedicular fixing of backbone.

Breaks and break with dislocation backbone with the damage of spinal cord.

The traumas of backbone in 20% cases are accompanied by the damage of spinal cord and his counterfoils. Every year in Ukraine there are almost 2 thousand traumas of backbone with the damage of spinal cord. At the damage of spinal cord a neurological symptomatology is always expressed.

In diagnostics of degree of narrowing of spinal channel and compression of spinal cord matter liquor dynamic test: test of Kvekanshtenda and test of Stukea (in a norm 100 - 200 mls of water column or 60 drops are for 1 minute). Liquor dynamic of test are the reliable indexes of conductivity of subarachnoid space at the level of the damaged vertebra.

Violation over of trophism of patients with the damages of spinal cord is quickly brought to bedsores, sepsis, from infecting a cystitis, ascending pyelocystitis, pyelonephritis with an urosepsis, can develop through a catheter. The compression of spinal cord not removed in good time can result in irreversible organic changes in a spinal cord. It is necessary immediately to appeal to the operation - decompression laminectomy.

Breaks of handles of vertebrae.

The isolated breaks of handles happen rarely, as a rule, team up with the breaks of other components of vertebra.

There are important sciagraphy and computer tomography in diagnostics. For treatment of breaks of handles without displacement assign the bed mode for 4-5 weeks, and then lay on a gipsous corset on 3-4 months. Term of disability 8-10 months. At the break of handles of vertebrae with neurological disorders conduct an urgent operation.

Traumatic spondylolistesis.

Mostly spondylolistesis IV happens on V of lumbar vertebra. Crawling together of upper neurocentrum forward arises up at the bilateral break of handles of the displaced vertebra. At traumatic spondylolistesis, because and at congenital - operative treatment is shown – corpectomy.

Materials for self-control

A. Questions for self-control:

- Mechanogenesis of damages of backbone.
- Clinic of different breaks of backbone.
- Classification of breaks of backbone.
- Providing of the first aid.
- Treatment of damages of backbone.
- Prophylaxis of early and late complications of damages of backbone.

B: Tests for self-control: see an appendix

C: Tasks for self-control: see an appendix

Recommended literature

The main literature:

1. Traumatology and orthopedics : textbook for students of higher medical educational institutions / edited by Golka G. G., Burianov O. A., Klimovitskiy V. G. – Vinnytsia : Nova Knyha, 2018, – 400 p. : il.
2. Venger V. F. Serbyuk V. V. Rashed Mochammad. Traumatology and orthopedics. – Odessa: Druk, 2006. – 248 c.
3. Bur'yanov O. A. Traumatology and Orthopedics. K.: Medicine, 2007. – 216 c.

Background Information:

1. David J. Dandy, Dennis J. Edwards Essential Orthopaedics and Trauma, Churchill Livingstone Elsevier, 2009, - 490 p.
2. David L. Hamblen, A. Hamish R. W. Simpson Adams's Outline of Orthopaedics, Churchill Livingstone Elsevier, 2010, - 485 p.
3. Ronald McRae, Max Esser Practical fracture treatment, Churchill Livingstone Elsevier, 2008. – 447 p.
4. Ronald McRae Clinical orthopaedic examination, Churchill Livingstone Elsevier, 2010. – 323 p.
5. David J. Dandy, Dennis J. Edwards Essential Orthopaedics and Trauma Churchill Livingstone Elsevier, 2009, - 490 p.
6. Borland WA. Illustrated Medical Dictionary. - 29th edition. -Philadelphia, 2003.

Internet resources:

<https://www.4tests.com/usmle#StartExam>
http://goto.grockit.com/kaplan/quizzes/medical.php?utm_source=kaptest&utm_medium=kaptest&utm_term=us-med&utm_content=try-us-for-free-us-med&utm_campaign=usmle-step1-qzzer
<http://www.nejm.org/multimedia/interactive-medical-case>
<http://www.roadto10.org/ics/>
http://www.medscape.com/index/section_1436_0
<http://www.webmd.com/a-to-z-guides/quizzes/>
http://www.medicinenet.com/quizzes_a-z_list/article.htm
<https://medlineplus.gov/surgeryvideos.html>
<http://www.bidmc.org/yourhealth/bidmcinteractive/quizzes.aspx>
<http://hardinmd.lib.uiowa.edu/index.html>
<https://www.youtube.com/user/nucleusanimation/videos>
<http://www.medicalstudent.com/>
http://www.thestudentroom.co.uk/wiki/Resources_for_Medical_Students
<http://www.nucleuscatalog.com/>

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