

Traumatic spinal cord syndromes

It is decisive for the prognosis whether the spinal cord was primarily injured **completely** (transverse lesion) or only **partially**.

Transverse spinal cord lesion syndrome

- loss of all free motion (including sphincters) and all sensation distal to the lesion;
- it is also accompanied by vegetative symptoms - drop in blood pressure (sympathetic disorder -> relative hypovolemia, so-called traumatic sympathectomy), bradycardia, in men priapism;
- but does not lead to shock, when shock occurs, the source of bleeding must be investigated;
- **spinal shock** - condition 2-3 weeks after the injury, distal to the lesion there is muscle atony, areflexia (pseudoweak plegia);
 - only after it subsides does the image of central paresis (spasticity and hyperreflexia) appear;
- **cervical spinal cord injury** - paralysis and intercostal muscles, abdominal breathing, life-threatening respiratory insufficiency;
 - paralysis above C3 leads immediately to respiratory arrest (phrenic nerve) - if the patient is resuscitated, he is dependent for life on ALV or permanent phrenic stimulation;
- after 24 h duration of the lesion, when no signs of improvement appear, it is highly likely to be a definitive condition;
- we determine the height of the lesion according to the last segment that still has normal function.

Effect of neck intumescence

The clinical picture is: quadriplegia, plegia of the lower limbs and paresis of the upper limbs. Lesions of the motor neurons of the anterior horns of the spinal cord are also listed here - signs of peripheral impairment (hyporeflexia to atrophy). Other symptoms include the loss of all qualities of sensation (anesthesia distal to the lesion), autonomic dysfunction and involvement of the carotid sympathetic nervous system - Horner's syndrome.

Thoracic spinal cord injury

Paraplegia of the lower limbs is present, while the upper limbs are unaffected. The trunk erectors, intercostal and abdominal muscles are affected.

Effect of lumbar intumescence

Paraparesis of the lower limbs is present. Combined central and peripheral disorder.

Disability at the level of L5 - S2 (epiconus)

Flexion and adduction in the hip joint and the extension of the knee joint are preserved. Acral involvement predominates. Walking is possible without a cane or orthosis. The patient is wobbly with a tendency to recurve the knee.

Impairment of the spinal cord S3-S5

A saddle-shaped sensory loss is present. There is no anal or bulbocavernosus reflex. There is a sphincter disorder (incontinence of urine and stool). Patient may experience symmetrical pain in the perianogenital region or pain may be completely absent.

Incomplete spinal cord lesion syndrome

- an island of sensation or motion may be preserved distal to the lesion.

Anterior spinal artery syndrome

- it most often occurs when jumping into the water with the head hitting the bottom^[1];
- it is caused by occlusion of an artery or compression by a bone fragment or disc; the function of what goes in the front part of the spinal cord is lost - plegia (quadri- or para-), sensation (thermal, tactile, etc.);
- from sensation, conduction through the posterior cords is preserved - proprioception and discrimination sensation;
- the most common indication for decompression surgery (compression must be confirmed by imaging methods);
- of the incomplete syndromes, it has the worst prognosis.

Posterior spinal artery syndrome

- with a direct impact on the spine (most often during combat sports) ^[1];

- infrequent, in the foreground are pains and anaesthesia of the upper limbs and trunk;
- the patient has uncoordinated movement (thabic gait as in syphilitics), partially reduced perception of pain^[1].

Brown-Séquard syndrome - spinal cord hemisection syndrome

- transverse damage to half of the spinal cord, rare, often incomplete;
 - usually after penetrating injuries;
 - it also arises non-traumatically with extramedullary tumors, MS, bleeding, ischaemia, inflammation or iatrogenically;
 - has a relatively good prognosis;
 - after the spinal shock subsides, it manifests itself depending on the localization, typically according to the passage of the spinal pathways.
- **IPSILATERALLY**
 - **the amount of lesion**
 - radicular zone **of anaesthesia in all qualities of sensation** with **weak paralysis**;
 - **below the level of the lesion**
 - **spastic paralysis** (damage to the corticospinal tract);
 - **loss of deep** (proprioceptive) and **epicritic sensation** (damage to the path of the posterior cords);
 - **loss of surface** (tactile) **sensation** (damage to the anterior spinothalamic tract - it does not cross in the spinal cord);
 - **just above the level of lesion**
 - radicular zone of **paresthesia, dysethesia, pain**.
 - **CONTRALATERALLY**
 - **caudally below the level of the lesion** (2 to 3 segments lower for the oblique exit of fibers of the pathways);
 - **disorder of thermal sensation and analgesia** (damage to the lateral spinothalamic tract - crosses in the spinal cord);

Central cord syndrome

- it usually occurs after a hyperextensive injury to the cervical spine due to stenosis of the canal (congenital or acquired - osteophytes), caused by spinal cord contusion or hematomyelia;
- the spinal cord is damaged, the spine damaged only by degeneration, not by trauma! ^[1];
- similar to the symptoms of syringomyelia, motor deficits mainly in upper limbs, variable sensory deficits;
- the prognosis is relatively good, the lower limbs momentum is better adjusted, fine motor skills falter;
- if there are no concurrent unstable spinal fractures, they are treated conservatively.

Spinal commotion

- analogous to concussion, a more rarely occurring reversible injury;
- functions fail, they recover within hours.

Root syndromes

- compression of the spinal roots may also occur;
- segmental sensory and motor loss of varying degrees.

Traumatic syndrome of the cauda equina

- injury or compression of the cauda due to accidents;
- the injury is distal to L2.

Complete cauda equina syndrome

- injury below the level of the end of the spinal cord - most often L1, L2^[2]; sphincter disorder (S2-S4) with corresponding sensory disturbance in the perianogenital region (saddle hypoesthesia) ^[1];
- this is an urgent condition, the operation should follow within 2 hours - the sun should not "set" over the cauda;
- it is a lesion of a peripheral nerve, so if it is not interrupted, regeneration is possible.

Therapy

- principles of first aid - when it is an injury where we can assume damage to the spine, we must always treat

the victim as if he had an unstable fracture;

- it must be assumed - in the case of obviously severe injuries, polytrauma, head injuries, when abdominal breathing is found, if the affected person reports stiffness of the neck, paresthesia, anesthesia. etc.
- pre-hospital care - we immobilize the cervical spine with a collar, prevent large movements of the spine during transfer, intubation without neck movements, stabilize the drop in blood pressure with dopamine (not infusion), administer oxygen, perform an orientation examination of sensation and motor skills;
- hospital care- ensure the sequence of examinations so that it is not necessary to transfer the injured person from bed to bed unnecessarily, maintain blood pressure above 9- with dopamine, we will introduce a urinary catheter, perform a detailed examination of motor skills, administer methylprednisone, imaging examination.

Links

Related articles

- Spinal trauma/PGS/diagnosis
- Spinal medulla

External links

<http://mefanet.lfp.cuni.cz/clanky.php?aid=327>

Reference

1. HÄCKEL, Martin. *Poranění míchy a páteře* [lecture for subject neurosurgery, specialization general surgery, 1. LF UK]. Prague. 7.3.2012.
2. NÁHLOVSKÝ, Jiří. *Neurochirurgie*. 1. edition. Galén : Karolinum, 2009. pp. 344. ISBN 8072623192.

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