

# CONSERVATIVE TREATMENT OF UNCOMPLICATED COMPRESSION FRACTURES OF THE BODIES OF THE VERTEBRALS IN THE LOWER CREW AND LUMBAR SPINE

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***Summary: The frequency of uncomplicated spinal fractures in the lower thoracic and lumbar spine, according to modern statistics, ranges from 0.5 to 17.7% of the total number of injuries of the musculoskeletal system. The lower thoracic and lumbar spine are most susceptible to damaging effects and are prone to the development of post-traumatic deformities. The aim of our study was to optimize the methods of conservative treatment of uncomplicated compression fractures of the lower thoracic and lumbar vertebrae. As a material for the study, the data of 65 patients who were treated at the Samarkand Regional Trauma Hospital for 2020 with uncomplicated stable fractures of the lower thoracic and lumbar spine were analyzed. The method of using the device was described and shown in detail, as well as the results of our research.***

***Key words: compression fracture, reclinations, kyphotic deformity.***

The problem of treating victims with uncomplicated compression fractures of the spine has not lost its relevance so far. Over the past decades, there has been a clear trend towards an increase in its importance throughout the world.

The frequency of uncomplicated spinal fractures in the lower thoracic and lumbar spine according to modern statistics ranges from 0.5 to 17.7% of the total number of injuries of the musculoskeletal system [1,2]. Most often, victims have uncomplicated fractures of one vertebra

(61.6 - 79% of the total number of fractures of the thoracic and lumbar vertebrae). Fractures of two or more vertebrae are much less common: in 1.6 - 35% of the total number of patients with injuries of the thoracic and lumbar spine [5, 6]. According to I.P. Ardashev, in 18.2 - 21.7% of all patients, uncomplicated vertebral fractures are a component of multiple or combined trauma.

In the structure of injuries to the musculoskeletal system, spinal fractures occupy the third place (after injuries of the lower leg and hand) in terms of the incidence of disability in victims [3,7]. According to S.S. Tkachenko, G. D. Nikitin, various degrees of disability are observed in 4.9 - 50.4% of patients who have undergone uncomplicated compression fractures of the thoracic and lumbar vertebrae. In the work of R.M. Lyba, E.A. Vasilivkin provides somewhat different information. According to the authors, during the initial examination of VTEK, 63.9% of victims with uncomplicated compression fractures of the thoracic and lumbar vertebrae are recognized as disabled, of which group 1 - 0.2%, group 2 - 65.3% and group 3 - 34.9%. A particularly high level of disability is observed with multiple vertebral fractures - 83.7% and penetrating - 70.5% fractures of the vertebrae [10,11].

With injuries to the lower thoracic and lumbar spine, a high level of severe consequences is noted. Thus, with uncomplicated fractures of these parts of the spine, the percentage index of disability among all fractures of the musculoskeletal system is 14.3% of cases [9,14]. K. Grazieretal claims that the incidence of injuries to the lower thoracic and lumbar spine in the United States is 162 thousand cases per year, with the share of vertebral body fractures accounting for 70%. In 75-80% of patients with these injuries, there are no neurological disorders [4,13].

The lower thoracic and lumbar spine are most susceptible to damaging effects and are prone to the development of post-traumatic deformities. This is due to the anatomical and physiological features of the spinal column. The ribs with ligamentous apparatus, attaching to the thoracic spine, provide the "frame" principle, increasing stability and limiting the mobility of the thoracic spine, in contrast to the mobile lumbar spine. There is a reorientation of the facets of the facet joints in the caudal direction from the frontal to the sagittal plane, which leads to limitation of rotational movements, with a simultaneous increase in the volume of flexion and extension, as well as lateral inclination of the vertebrae relative to each other [8,12]. Of great importance is the transformation of thoracic kyphosis into lumbar lordosis, when the thoracolumbar region is borderline in the sagittal plane and is subject to the shear forces of R.L. Gally. et al. Until now, the modern surgeon faces the problem of choosing between conservative and surgical methods of treatment.

Conservative methods of treatment of uncomplicated vertebral body fractures, until now, are the main methods in the arsenal of therapeutic measures in most practical health care institutions, thus requiring the patient to stay in the hospital for 6 to 10 weeks under bed-rest and prolonged immobilization plaster corset. In addition, these methods, as a rule, do not sufficiently eliminate the deformity of the spine, do not ensure its reliable fixation, do not prevent secondary compression of the vertebral bodies, the progression of kyphosis and the development of post-traumatic degenerative changes.

Treatment for uncomplicated fractures of the vertebral bodies of the lower thoracic and lumbar spine is carried out both with and without the use of corsets. Corsets (plaster, made of polymer

materials from pneumatic cushions) are used after a one-stage reduction or after a stage-by-stage reduction, on the 15-20 day of injury, with a period of 4-6 months.

Corset V.G., Elizarova, A.N. Koroleva, V.V. Klyuchevsky, O.R. Gerasimov consists of three pneumatic cushions. The front, upper and lower air bags are rigidly interconnected by telescopic rods. The back cushion is connected to the rods of the front cushions with a waist belt. That is, there is no rigid connection between the anterior and posterior elements of the corset of the aforementioned authors, which reduces the ability of the corset to create reclination.

All this contributed to the development of methods for conservative treatment of uncomplicated compression fractures of the lower thoracic and lumbar vertebrae.

Objective of the study: optimization of methods for conservative treatment of uncomplicated compression fractures of the lower thoracic and lumbar vertebrae.

Material and research methods. As a material for the study, the data of 65 patients who were treated at the Samarkand Regional Trauma Hospital for 2020 were analyzed. with uncomplicated stable fractures of the lower thoracic and lumbar spine. There were 41 men and 24 women. The age ranged from 15 to 24 years. Patients were admitted to the hospital with injuries of different duration: 35 patients were admitted on day 1, 25 patients were admitted on days 2-5, 2 patients were admitted on days 6-10, 3 patients were admitted 15 days later.

**By localization, fractures were most often observed in the area of Th12 and L1 (Table 1).**

**Table 1**

Distribution of patients by levels of vertebral injury, n (%)	
Damage level	Patients
Th11	8 (12,3%)
Th12	26 (40%)
L1	21 (32,3%)
L2	6 (9,2%)
L3	4 (6,2%)
Total	<b>65 (100,0%)</b>

We consider it interesting to note that despite the presence of pain, 16 patients went to the hospital loading the spine in an upright position on their legs. For 19 patients, the device was applied in 1-3 days in the hospital, for the rest of the patients - in 4-5 days or more. The average length of hospital stay was 6-8 days.

**Treatment method.** The indications for treatment with the device are as follows:

- 1) Fractures of the anterior-superior edges of the vertebral bodies, both in combination with compression and without it;
- 2) Fracture of the upper endplates with or without compression.

The device consists of three frames: thoracic, lumbar, and pubic. The pneumatic chamber is located in front of the lumbar frame. It is equipped with a rubber flexible tube with a nipple for inflation. The frames are connected to each other by means of 6 rods with threaded grooves, nuts. In the position of the patient lying on his back after local anesthesia, a lumbar frame with an empty pneumatic chamber is placed under the lumbar region, a thoracic frame is placed above the handle of the sternum, and a pubic frame is placed above the pubic articulation. With the help of rods, the frames are connected, in the reclination position of the trunk, they are rigidly fixed, by inflating the pneumatic chamber is filled and a slight hypercorrection is created. The device is designed to hold (immobilize) the trunk in the overextension position in the lower thoracic, upper lumbar spine. The corset design is a closed device, i.e. when the pneumatic chamber is inflated, the frames do not shift, but, on the contrary: the action of the force is enhanced, which ensures the fixation of the trunk and reclination.

The degree of reclination in the corset seems to be possible to regulate: increase or decrease by changing the distance between the frame and inflation of the pneumatic chamber.

The novelty of the method is as follows: the patient is put on the device from the first day of injury and given a reclination position to the spine until the pain in the fracture area disappears and the patient is allowed to walk on the third day. For three days, they teach him to use the device independently, control the rigidity of the corset, prescribe pain relievers for 1-3 days (Fig. 1).

From 4-8 days the patient is discharged for outpatient treatment (Figure 2). By the end of the second week, the patient is prescribed physiofunctional treatment to strengthen the muscles of the back. Patients receive a massage on the back area, therapeutic exercises, electrophoresis with Novo-Cain, diadynamic current of 10-15 procedures. In general, the patient is in the device for 1.5-2 months. Subsequently, the patient continues therapeutic exercises, receives massage and stimulation of reparative regeneration.

Treatment results and their discussion. To reveal the effectiveness of the method, X-ray studies were carried out as follows.

The height of the anterior column of the bodies above and below those lying from the injured vertebra was measured, and the restored height of the damaged vertebral body was compared with the average value. The analysis showed that in 8 (12.3%) patients, the compression of the vertebral body was completely eliminated, in 8 (12.3%) patients a significant recovery of height was obtained, in 5 (7.7%) - a slight recovery of the vertebral body height.

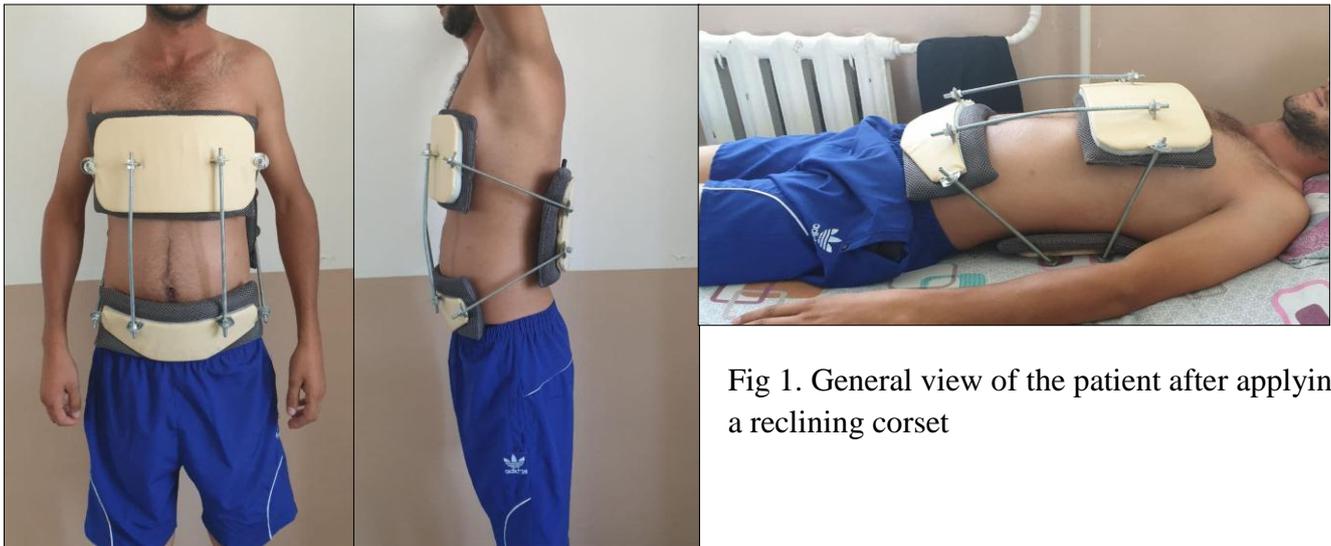


Fig 1. General view of the patient after applying a reclining corset

In the remaining 44 (67.7%), whose degree of compression ranged from 5 to 18%, it was possible with the help of the device to stabilize the compression of the body, to prevent an increase in kyphotic deformity



Fig 2. Radiography of the patient with the imposition of the device.

**Conclusion:** For fractures of the thoracic and lumbar vertebrae not complicated by compression of the spinal cord structures, the correction technique using staged reclination with a corset with a pneumatic chamber can be effectively used to eliminate local kyphotic deformity and restore the height of the fractured vertebral body.

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