



# **MODERN APPROACHES TO OPTIMIZING THE TREATMENT OF UNCOMPLICATED COMPRESSION FRACTURES OF THE VERTEBRAL BODIES OF THE LOWER THORACIC AND LUMBAR SPINE.**

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<b>Article history:</b>	<b>Abstract:</b>
<b>Received:</b> September 20 <sup>th</sup> 2024 <b>Accepted:</b> October 14 <sup>th</sup> 2024	The lumbar spine is the most frequently injured part of the spinal column. According to an epidemiological study in the United States in 2020, spinal injury was 253 per 1 million population, in Israel this figure was 370 people per 1 million inhabitants. Damage to the lumbar spine has an important social significance, representing a high percentage of disability and social maladjustment, to which young and working-age people are most susceptible.
<b>Keywords:</b> Fractures of the vertebral bodies of the spine, transpedicular fixation (TPF), anterior-posterior fusion (APF), percutaneous kyphoplasty (PKP).	

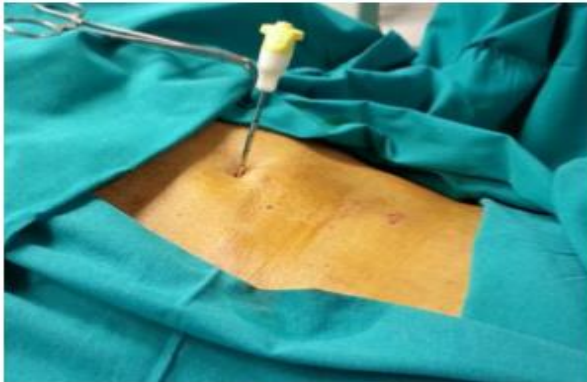
**OBJECTIVE OF THE STUDY:** Improving the treatment outcomes of patients with uncomplicated lumbar spine injuries based on the development of differentiated approaches to choosing adequate surgical intervention tactics.

## **MATERIALS AND METHODS:**

As the object of the study, we had 157 patients with uncomplicated lumbar spine injuries who were treated in the inpatient department of the 1-traumatology Republican Clinical Hospital No. 1, 2 - clinics of the Tashkent Medical Academy, the Republican Specialized Scientific and Practical Medical Center of Neurosurgery for the period from 2016 to 2020. The subject of the study is the results of clinical and laboratory studies, radiographic, MSCT, MRI and X-ray - densitometric changes in uncomplicated lumbar spine injuries. As a research method, clinical, radiographic, MSCT, MRI and statistical research methods were used on a Pentium-IV personal computer using the Microsoft Office Excel 2012 software package, including the use of built-in statistical processing functions. Methods of variational parametric and nonparametric statistics were used with the calculation of the arithmetic mean of the studied indicator (M), the standard deviation, the standard error of the mean (m), relative values (frequency, %), the statistical significance of the measurements obtained when comparing the mean values was determined by the Student's criterion (t) with the calculation of the probability of error (P) when checking the normality of the distribution (by the excess criterion) and the equality of general variances (F - Fisher's criterion).

## **RESULTS AND DISCUSSION:**

In our study group of 157 patients, 106 (67%) were men and 51 (33%) were women, while the average age was  $40.5 \pm 4.1$  years with uncomplicated fractures of the lumbar spine, who received treatment at the RCH - 1, in the neurosurgery department of the 2nd clinic of the TMA and the Republican Specialized Scientific and Practical Medical Center for Neurosurgery (RSSPMCN) in 2016-2020. We mainly used such types of surgical treatment of uncomplicated injuries of the lumbar spine as the treatment of uncomplicated injuries of the lumbar spine, which were carried out surgically and conservatively. As surgical treatment, we performed methods of transpedicular fixation (TPF) - 93 (59%) patients, anterior-posterior fusion (APF) - 20 (13%) patients and percutaneous kyphoplasty (PKP) - 18 (11.5%) patients. Conservative treatment was performed in 26 (16.5%) patients. It is necessary to take into account that the difference in the incidence of uncomplicated lumbar spine injuries with a predominant distribution among the male sex is associated with the risk of injury in the conditions of professional activity. All cases of uncomplicated lumbar spine injuries in the studied patients (n = 157) were classified as uncomplicated isolated compression fracture of the lumbar vertebral bodies. Of the patients studied (n=157), 20 (13%) patients were treated in the II TMA Clinic, 107 patients (68%) in the RSSPMCN, and 1-30 (19%) patients in the RCH in the period from 2016 to 2020. To assess and compare the clinical condition of patients, taking into account the severity of pain syndrome in the preoperative and postoperative periods, we used the "BALL" pain assessment scale.



**Pic 1.** External image of a needle inserted into the body of a vertebra. The assessment of the severity of pain on the "BALL" scale is reflected in points. As instrumental methods of examination, the patients underwent: X-ray of the spine (157 studies), magnetic resonance imaging (MRI) of the spine (68 studies), computed and multispiral computed tomography (CT/MSCT) of the spine (132 studies), X-ray densitometry (RD) of the spine (29 studies). A total of 386 instrumental studies



were performed.

**Pic. 2** MRT image Compression fracture of the lower thoracic spine VTh12 II degree, the presence of a compression fracture is noted

All patients, according to our recommendations, were registered with a traumatologist at their place of residence. In addition, according to our recommendations, patients periodically visited the polyclinics of the II TMA clinic, RSSPMCN, RKB-1 for dynamic monitoring of their condition.

### CONCLUSION:

Thus, uncomplicated lumbar spine injuries are clinically manifested by local pain syndrome, reaching 8 points according to VAS in 66% of cases.

When comparing the effectiveness of treatment with surgical methods (TPF, APF, PKP), the most effective method is the TPF method of the spine, with which the restoration of the spinal axis to 20 ° was achieved in 87.5% of patients.

A comparative assessment of the results of surgical and conservative treatment shows that an excellent treatment result was achieved by the TPF method in 77.5% of cases, by the APF method in 29% of cases, by the PKP method in 32% of cases and by the conservative treatment method in 20% of cases.

Based on the obtained clinical data, the most effective method for treating uncomplicated lumbar spine injuries is the transpedicular fixation method of the spine, with which a high regression of the pain syndrome and restoration of the spinal column axis were achieved.

### REFERENCE:

1. Alimov I, Khujanazarov I, Abdusattarov Kh, Alihodzhaeva G, Eshkulov D. Minimally invasive surgery of traumatic vertebral fractures // European science review. 2017. №9-10.-P. 18-21 (14.00.00; №19)
2. Epstein O, Ludwig S, Gelb D, Poelstra K, O'Brien J. Comparison of computed tomography and plain radiography in assessing traumatic spinal deformity. J Spinal Disord Tech. 2009 May;22(3):197–201. DOI: <http://dx.doi.org/10.1097/BSD.0b013e31817e6fa8>. [PubMed] [Google Scholar]
3. Alimov I., Abdusattarov K. Percutaneous Vertebroplasty as a Treatment for Osteoporotic Vertebral Compression Fractures // J Head Neck Spine Surg. 2018.P. 001-005; 3(1): 555597. DOI: 10.19080/JHNSS.2018.02.555597 (Impact Factor: 1.8).
4. Zhan Y, Jiang J, Liao H, Tan H, Yang K. Risk Factors for Cement Leakage After Vertebroplasty or Kyphoplasty: A Meta-Analysis of Published Evidence. World Neurosurg. 2017 May;101:633-642. [PubMed]
5. Saracen A, Kotwica Z. Complications of percutaneous vertebroplasty: An analysis of 1100 procedures performed in 616 patients. Medicine (Baltimore). 2016 Jun;95(24):e3850. [PMC free article] [PubMed]
6. Abdusattarov K., Alimov I., Khujanazarov I., Karimov M., Alihodzhaeva G. Efficacy of Posterior Short-Segment Pedicle Fixation in Management of Incomplete Thoracolumbar Burst Fractures without Neurological Impairment. Ortho & Rheum Open Access J. 2020; 17(3): P.001-006. 555961. (ISI Impact Factor: 1.118).
7. Wardlaw D, Cummings SR, Van Meirhaeghe J, et al. Efficacy and safety of balloon kyphoplasty compared with non-surgical care for vertebral compression fracture (FREE): a



- randomised controlled trial. *Lancet*. 2009 Mar 21;373(9668):1016–24. DOI: [http://dx.doi.org/10.1016/S0140-6736\(09\)60010-6](http://dx.doi.org/10.1016/S0140-6736(09)60010-6). [PubMed] [Google Scholar]
8. Abdusattarov K, Khujanazarov I, Alimov I, Alihodjaeva G. Posterior Long Segment Instrumentation Beyond A Failed Percutaneous Vertebroplasty. *J Head Neck Spine Surg*. 2020; 4(2): 555633.-P.0018-0020. DOI: 10.19080/JHNSS.2020.04.555633. (ISI Impact Factor: 1.042).
  9. Kochkartaev S, Abdusattarov Kh, Danilova E, Osinskaya N. The Assessment of the Essential Trace Elements Concentration by the Instrumental Neutron Activation Analysis in Patients with Degenerative Lumbar Disc Disease. *Journal of Spine Research and Surgery* 3 (2021): P.010-016. (ISI Impact Factor: 3.123).
  10. Xiong J, Dang Y, Jiang BG, Fu ZG, Zhang DY. Treatment of osteoporotic compression fracture of thoracic/lumbar vertebrae by kyphoplasty with SKY bone expander system. *Chin J Traumatol*. 2010 Oct 1;13(5):270–4. DOI: <http://dx.doi.org/10.3760/cma.j.issn.1008-1275.2010.05.003> Erratum in: *Chin J Traumatol* 2010 Dec;13(6):382. [PubMed] [Google Scholar]
  11. Abdusattarov H.A., Alimov A.P., Khuzhanazarov I.E. Program for measuring the degree of deviation of the spinal axis // Certificate of the Intellectual Property Agency of the Ministry of Justice of the Republic of Uzbekistan No. DGU 08123 dated 03/13/2020. Hoyt D, Urits I, Orhurhu V, Orhurhu MS, Callan J, Powell J, Manchikanti L, Kaye AD, Kaye RJ, Viswanath O. Current Concepts in the Management of Vertebral Compression Fractures. *Curr Pain Headache Rep*. 2020 Mar 20;24(5):16. [PubMed]
  12. Zaretskov V.V., Sumin D.Yu., Arsenievich V.B., Likhachev S.V., Zueva D.P., Artemov L.A., Norkin A.I., Titova Yu.I. Vertebroplasty for lumbar vertebral body injuries in patients with osteoporosis // *Spine surgery*. 2011. No. 3. P. 26-30.
  13. Abdusattarov, Kh, Khujanazarov I, Alimov I, Alihodjaeva G, Kosimov A. Posterior Short Segment Pedicle Screw Fixation For The Treatment of Thoracolumbar Burst Fractures Without Neurological Deficit // *EFORT Open Rev* 2020; (P) 2711.
  14. Abdusattarov Kh.A., Khujanazarov I.E., Dulaev A.K. Diagnostics and treatment of uncomplicated lumbar spine injuries // *Traumatology, orthopedics and rehabilitation (makhsus son)*, 2021.-№4.-P. 148.
  15. Flors L, Lonjedo E, Leiva-Salinas C, et al. Vesselplasty: a new technical approach to treat symptomatic vertebral compression fractures. *AJR Am J Roentgenol*. 2009 Jul;193(1):218–26. DOI: <http://dx.doi.org/10.2214/AJR.08.1503>. [PubMed] [Google Scholar]
  16. Khuzhanazarov IE, Abdusattarov HA, Khamraev Sh.F., Abdullaev MM. Optimization of the quality of life of patients with osteoporotic vertebral fractures using surgical methods // *Traumatology, orthopedics and rehabilitation (makhsus son)*, 2021.-№4.- P. 236. Ilkom E. Khujanazarov, Khurshid A. Abdusattarov, Shoxaydar Sh. Shotursunov, Nigora Dj. Bakhranova. Diagnosis and treatment of uncomplicated lumbar spine fractures // 21 Dubai international spine conference, 2022.- P.39-40.
  17. Xiao H, Yang J, Feng X, Chen P, Li Y, Huang C, Liang Y, Chen H. Comparing complications of vertebroplasty and kyphoplasty for treating osteoporotic vertebral compression fractures: a meta-analysis of the randomized and non-randomized controlled studies. *Eur J Orthop Surg Traumatol*. 2015 Jul;25 Suppl 1:S77-85. [PubMed]