



Corset for the treatment of vertebral fractures in children

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Abstract

In the treatment of 195 children and adolescents aged 3 to 18 years who received uncomplicated compression fractures of bodies thoracic and lumbar vertebrae, we used special extension plaster corset. The use of the corset in clinical practice eliminates strain on anterior vertebral body, helps to do physical therapy, to receive physiotherapy.

Keywords: children, fractures of the vertebral bodies, conservative treatment, corset.

Introduction.

The problem of treatment of uncomplicated compression fractures of the vertebral bodies in children continue to apply [1,3,5]. This is, above all, with different approaches to treatment and the lack of uniform criteria for evaluating short-term and long-term results of treatment [4,6].

Material and methods.

We have experience of monitoring and treatment of 199 children and adolescents aged 3 to 18 years who received uncomplicated compression fractures of the vertebral bodies. Among the victims were 110 boys (52,27%) men, girls - 89 (47,73%). For the diagnosis of vertebral fractures in children have used the analysis of complaints, medical history, results of clinical studies and Radiology (radiography, rentgentomografi, computed tomography, magnetic resonance imaging). All children in the emergency department, except for orthopedic, trauma, examined pediatrician, clinical indications - related specialists.

The degree of compression fractures of the vertebral body of only one measured by the index of H. Vinz [7]. For fractures of the bodies of two or more vertebrae to establish the degree of severity, used an index Compression ratio of the height of the anterior vertebral body, compressed to the rear [2].

Results.

The most common - 86 (43,21%) of victims - vertebral fractures received children aged 8 to 12



years. Least likely to injure the spine in children age 5 - 17 (8,54%) patients.

Affected mainly received fractures of the vertebral bodies in the street and at home. Thus, the share of street and domestic mechanisms injuries was 94 (47,23%) and 81 (40,70%) cases, respectively. Fractures of the spine during exercise were 12 (6,03%) children. Road traffic injury was the cause of vertebral fractures in 7 (3,51%) of the victims. School mechanism of injury as the cause of uncomplicated compression fractures of the vertebral bodies, registered for 5 (2,53%) patients. Isolated fractures of the cervical vertebrae were diagnosed in 10 (5,02%) children, infants - in 134 (67,33%), lumbar vertebrae - in 34 (17,08%) patients. In 21 (10,57%) the cases mentioned associated injuries of thoracic and lumbar vertebrae.

A total of 199 children received 411 vertebral fractures. Most frequently diagnosed vertebral compression body ThVI - 47 (11,43%) cases. Least frequently injured vertebra CII - 1 (0,24%) clinical observation. In the course of the study were reported compression bodies CI, CIII, CIV and ThI vertebrae.

One was, compressed vertebrae in 80 (40,2%) children, two vertebrae - in 58 (29,14%), three vertebrae - in 45 (22,61%), four or more vertebrae - in 16 (8,05%) victims. For the treatment of 195 (97,98%) of the children used the conservative method. In 4 (2,02%) the cases affected children were operated on the spine.

Conservative treatment of uncomplicated compression fractures of the vertebral bodies in children is the leading, as these injuries are usually localized only in their bodies and are not accompanied by the formation of a mechanical or neurological instability. The volume of medical treatment is, as a rule, in traction on the vertebral column with simultaneous reclamation injured spinal motion segments, employment physical therapy, physiotherapy, use of removable prosthetic reklinators and corsets.

All of these stages of treatment are important, but the most important of them, in our opinion, are the spine immobilization brace and physical therapy sessions. We have provided an original ekstenzionny plaster corset (positive decision to grant a patent for utility model, the application № 2012124372). Removable spine immobilization ekstenzion plaster corset patient performed immediately after relief of pain in the projection, compressed vertebrae. Up to this point, children get traction on the axis of the spine to the pelvis inclined plane with reclamation, compressed spinal motion segments, medical therapy (analgesics age dosage), physiotherapy, master the complex physical therapy.

Immobilization with a plaster corset is done so that the top edge of the corset on the front surface of the body of the child is at the sternal notch and the lower end rests on the iliac wing (Fig. 1). On the back of the victim's body corset top edge is located at the spinous process of the vertebra following, compressed, and the lower edge of the corset is also based on the iliac wing. Described ekstenzion Minerva jacket eliminates the burden on the body, compressed vertebrae, so it does not give the victim an



opportunity to tilt the body forward, you can practice physical therapy, receive physiotherapy in the projection, compressed vertebrae, prevents axial load on the spine, as the children in the cast uncomfortable to sit. An important feature of the corset is that it is not removable, and even in the absence of pain in the back of his child will not be able to remove it yourself, even for a time, as is often the case with various designs of removable orthopedic products in the absence of direct supervision by the adults. Key physiotherapy directed to hyperextension of the affected body through the upper edge ekstension plaster corset that helps reposition the displaced as a result of cranial trauma and pineal body height restoration, compressed vertebra. Therapeutic exercises are performed in patients standing and lying on the abdomen (Fig. 2).

Period spine immobilization brace in each case calculated individually and ranged from 6 to 16 weeks. All this time, patients were engaged in physical therapy, if necessary, by a doctor, endocrinologist, reduced bone mineral density appropriate diet and medication, and some, prolonged immobilization, received a second course of physiotherapy in the projection, compressed vertebrae, because the construction of the corset without labour allowed to do it.

It is known that pain in the projection, compressed vertebrae children are concerned only for a few hours or days and the younger the child's age, the severity of the syndrome algic smaller in nature and duration. Due to this, it is difficult to do to keep the child on strict bed rest for a long time if he has no pain. Most clearly seen in the evenings and weekends, when the medical supervision of the staff of the decreases in the wards and children sit, draw, play computer games, view videos, social networking with peers, etc. Attempts to discipline them and bring to the orthopedic treatment compliance regime effective in not all the victims, especially for pre-school children and adolescents.

In this regard, it is relevant improvement of methods of treatment. For this purpose we use the removable ekstension plaster corset. In curative treatment respecting the basic principles of emergency trauma - a reliable and adequate immobilization of injury the injured segment in combination with functional therapy - the opportunity to engage in physical therapy, receive physiotherapy, excluding the axial load on the spine. All children immobilizing plaster corset moved well. None of the clinical observations were reported any negative side of the corset in clinical practice.

Conclusion.

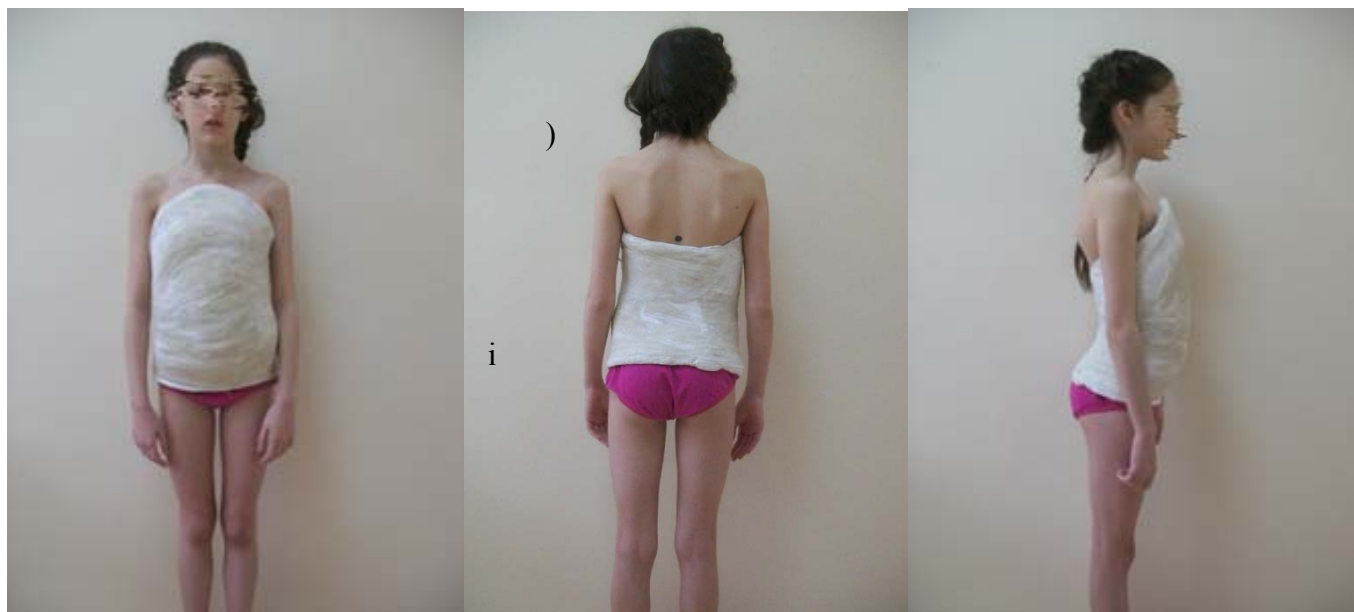
Problem of diagnosis and especially treatment for compression fractures of the vertebral bodies in children and adolescents continues to be relevant. Thus, if a relatively small number of heavy traumatic spinal motion segments in children tactics developed and successfully used modern operational technology, as applied to the more numerous injuries - fractures of the vertebral bodies with low



compression - used different variants of conservative treatment. Pursued conservative therapy must meet the functional principle of the constant maintenance of normal muscle tone, especially the exclusion of the load on the front parts of the vertebral bodies and the creation of conditions for their consolidation in a physiologically correct position. Employment of children in physical therapy individually produced extension plaster corsets can successfully implement it. Material costs of medical institutions with the minimum, the parents of traumatized children as it does not bear any financial burden, because the treatment is part of the mandatory health insurance.

References

- Skryabin E.G. Fractures of the vertebral bodies in the structure of child injury / E.G. Skryabin, A.G. Smirnyh // *Traumatology and Orthopedics of the Russia*. – 2012. - № 3. – P. 106-110.
2. Tsivyan Y.L. Spine Surgery / Y.L. Tsivyan. // Novosibirsk, 1993. – 363 p.
- Benzagmout M. Unstable spinal fractures in children / M. Benzagmout, A. Moussaoli, M. Maaroufi // *J. Orthopaedics*. – 2007. – Vol. 4 (2). – P. 2.
- Newton P.O. Fractures in children / P.O. Newton // Chapter 19. 6th Edition. – Rockwood & Wilkins, 2006. – 980 p.
- Kraus R. Fractures of the thoracic and lumbar in children and adolescent / R. Kraus, J.P. Stalh, U. Horas // *Unfallchirurg*. – 2011. – Nov.18. – P. 983-987.
- Muniz A. Lumbar vertebral fractures in children: four cases and review of the literature / A. Muniz, S. Liner // *Pediatric Emergency Care*. – 2011. – Vol. 27. – P. 1157-1162.
- Vinz H. Frakturen im Bereich von Brust und Lenden wirbelsaule bei Kindern / H. Vinz // *Zbl. Chir*. – 1964. – Bd.89, № 22. – S. 817-827.



Photos patient A., 9 yares (case number 3331). Diagnosis: Compression uncomplicated fracture ThVIII vertebral (the projection spinous process, compressed vertebra marked marker). Kind of girl in a plaster brace front (a), rear (b), side (c).



a)



b)



c)

Fig. 2. Photos patients A., 9 yares (case number 3331). Diagnosis: Compression uncomplicated fracture ThVIII vertebral. Moment physiotherapy standing (a, b) and prone (c)



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