

Spinal Tuberculosis Treatment of Patients with Psychoemotional States

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Annotation: Spinal tuberculosis (TB) accounts for 1–2% of all cases of TB and is a common extrapulmonary form. The duration of the rehabilitation period in patients operated on in the IV stage of the tuberculosis process complicated by abscessing is twice as long as the duration of treatment of patients operated on in the I-II stages of spinal tuberculosis. The number of purulent-inflammatory complications in the early postoperative period in patients with spinal tuberculosis in stages III-IV with abscess reaches 22.2%. Although it is primarily a skeletal disease, secondary involvement of the nervous system may lead to diverse neurological disabilities.

Keywords: tuberculosis of the spine; extrapulmonary form; rehabilitation period.

Relevance. Tubercular involvement of the dorsal vertebral column poses a potential threat as the spinal canal in this region is narrow. Additionally, the physiological kyphosis at the thoracic level pushes tubercular tissue into the spinal canal causing compressive myelopathy. A tubercular abscess may enter the spinal canal also via the intervertebral foramen. In the lumbar region, the abscess tends to enter the psoas muscle. [5] Another uncommon issue is of multilevel noncontiguous involvement of the vertebrae by TB without the involvement of adjoining intervertebral discs or vertebral bodies[20] However, this condition has not been associated with drug resistance or HIV status or chronic disease duration. The treatment regimen also does not differ. The only additional caveat in this condition is that surgical planning may need care due to multiple levels of involvement. Timely chemotherapeutic and surgical treatment, undertaken at the stage of progressive osteitis with a local lesion of the vertebra, aimed at the rehabilitation of the tuberculous focus and plastic replacement of the postresection defect, prevent the desymination of the tuberculous process; exclude the likelihood of compression fracture, the development of kyphotic deformity. The cure is achieved in 99.0% of patients [4, 16,]. The detectability of the disease at the stage of primary tuberculous ostitis, despite the appearance of highly informative diagnostic methods, remains quite low, including due to the lack of alertness of specialists to identify a specific process [1]. As a rule, surgical care (with the primary task of rehabilitation of the tuberculous focus) is provided in the III-III clinical stages of progressive spondyloarthritis with damage to 1-2 vertebral-motor segments and in the IV stage of progressive destructive spondyloarthritis. Reconstructive repair operations in patients with posttuberculous spondyloarthrosis (V clinical stage) are undertaken in order to reduce spinal deformity, eliminate compression of the spinal cord, restore the ability to support the affected spine [2,19]. A wide arsenal of modern constructions for anterior fusion and posterior fixation allows, adequately to the clinical situation, to choose the optimal devices and methods of surgical treatment [1, 15]. Non-radical operations in stages II-IV of progressive spondyloarthritis, operations in patients with the consequences of tuberculous spondyloarthritis (stage V) achieve success only in 60% of patients [12, 14]. The purpose of the study: to analyze

the results of complex chemotherapeutic and surgical treatment of patients in stages I-IV of the tuberculous process of the spine. Spinal TB may be complicated by spinal tuberculoma, myelitis, myeloradiculopathy, syrinx, vertebral TB and spinal abscess. The upper lumbar and lower thoracic spine are most commonly affected. Paraplegia is the most dreaded complication of spinal TB. As per Hodgson's seminal paper, paraplegia may be classified as paraplegia of active disease and paraplegia of healed disease. [9] In an active disease, mechanical instability and inflammation (abscess, caseous or granulomatous tissue) results in cord compression. The spinal cord may also develop edema as well as myelomalacia. Tuberculous endarteritis affecting the spinal arteries may also lead to myelopathy. In healed disease, long-standing deformities, dural fibrosis, and constriction lead to mechanical changes in the spinal cord, contributing to myelopathy.

Materials and methods Imaging is of immense diagnostic value in spinal TB. Plain X-rays of the spine offer an overview. Computed tomography (CT) scan details skeletal involvement and magnetic resonance imaging (MRI) provides soft tissue and spinal cord involvement. Tuberkulezny ostitis was detected in 12 (27.9%) patients initially hospitalized in a neurosurgical clinic due to a compression fracture of the body of the patient. For surgical treatment of active progressing spondyloarthritis with a lesion of one vertebral segment of stage II-14 (32.6%) patients were hospitalized in the motor segment of stage III, including one patient with concomitant pulmonary tuberculosis. As a result of significant kyphotic deformation in 12 patients and in two patients with transverse ligament lesion and dislocation of the C1 vertebra anteriorly, compression of the spinal cord with neurological deficiency was observed. In addition to spinal cord compression, prevertebral or paravertebral abscesses were detected in 8 patients. The program of a comprehensive study of patients, in addition to standard biochemical, clinical blood and urine tests, included lung radiography, CT and (or) MRI of the spine. To determine the infection rate of *M. tuberculosis* complex, the phenomena of R-forms used the PCR method. The state of immunity was assessed according to immunograms, B- and T-lymphocyte testing, and an ELISA test system with HIV antigens. The timing of preoperative preparation of patients, the volume, methods of drug and surgical treatment correlated with the results of the study. As a preoperative preparation, 21 (48.8%) patients with purulent and purulent-neurological complications were prescribed detoxification therapy, transfusion of native plasma, blood (erythrocyte mass). Based on the results of a PCR study undertaken during hospitalization, all patients with local forms of tuberculosis (ostitis, damage to one vertebral-motor segment without purulent complications) were prescribed anti-biotic therapy, including intravenous administration of rifampicin (450-600 mg) once a day, isoniazid 0.6 g and pyrazinamide 250 mg once a day. Previously treated patients with a high risk of drug resistance and patients with purulent complications with lesions of two or more vertebral-motor segments in drug therapy included ethambutol (25 mg / kg) and a fluoroquinol-type drug (thiocetazone 1.0 mg/ kg). In the postoperative period, in accordance with the results of bacteriological research, including the sensitivity of microflora to antibiotics, the dynamics of the functional state of organs and systems, the immune status of the appointment was correlated. Surgical interventions in 30 (69.8%) patients with purulent and neurological complications were performed as soon as possible after hospitalization (after 1-3 days). The primary objectives of the operation were the elimination of a purulent focus with resection of the vertebral body, the inter-vertebral disc, if necessary, the part of the rib (ribs) adjacent to the vertebra, decompression of the spinal cord, plastic reconstruction of the post-resection defect of the vertebral body (bodies), stabilization of the affected spine. In 3 patients with C5 vertebral ostitis, Mech implants were used including one patient in a combination with a ventral plate and 2 patients with Th9 and L4 ostitis, porous cylindrical nitinol implants with through porosity were used. After surgery, until the appearance of signs of bone block formation, patients needed external immobilization. Combined spinal fusion was preferred in 7 (58.3%) patients with tuberculous ostitis, accompanied by compression of the spinal cord, and osteotic deformity from 15o to 24o. After necrectomy and anterior decompression of the spinal cord, anterior fusion was performed in 4 cases with a Mech implant

and in 3 patients with a porous cylindrical implant. After 10-14 days, posterior fusion was performed using dynamic braces with the effect of shape memory with fixation of the collarbones-grips for the arches above and below (from the damaged) vertebrae. For physical loads, immobilization was recommended. Combined spinal fusion was performed in 4 (9.3%) patients with progressive tuberculous spondylitis of stage II without functional impairment. Cylindrical porous implants were used for anterior fusion in 3 patients with a lesion of one spinal motor segment, with a kyphotic deformity of 18-20°, and dynamic braces with shape memory effect were used for posterior fusion. In a patient with renal tuberculosis and tuberculous spondylarthritis of the Th12-L1 and L3 -L4 vertebrae, posterior spondylodesis was performed using a transpedicular system. Surgical stabilization of the spine was sufficient. Patients were activated 1-2 days after anterior fusion. Additional fixation (with a corset) was recommended during physical exertion. In all patients with purulent and purulent-neurological complications, posterior fusion was performed 45 ± 2 days after anterior fusion with normalization of the functional state of the body, convincing results of studies confirming the absence of inflammation in the area of implants and after 12-14 days, posterior fusion was performed in patients with no abscesses. 2 (14.3%) of 14 patients with active progressive spondyloarthritis of stage III, due to dislocation of the C1 vertebra anteriorly and compression of the spinal cord, laminectomy and decompression of the spinal cord were performed according to emergency indications. Caseous necrotic masses were removed. After decompression and restoration of anatomical and topographic relationships, occipitospondylodesis was performed using a universal system of posterior stabilization of the cervical spine of the hook-shaped configuration with fixation of distal hooks for the arches of the C3 vertebra. In the second patient, occipitospondylodesis was performed using a lamellar brace with fixing grips for the occipital bone and the spinous process of the C2 vertebra. Clinical cure in patients with spinal tuberculosis, including with a combined form of tuberculosis, was recognized in the absence of signs of active tuberculosis, established by clinical, radiation and laboratory signs. The degree of correction of intraoperative kyphotic deformity and its preservation in the postoperative period, the quality and time of formation of arthrodesis between the vertebral bodies, the dynamics of regression of neurological deficit, the duration of the rehabilitation period at the hospital and outpatient stages of treatment were determined. In addition, the consequences of tuberculosis affecting the functional state of the organs and systems concerned were taken into account. The results of treatment of 16 (37.3%) patients with spinal tuberculosis in stages I-II were compared with the results of treatment in 27 (62.7%) patients with progressive tuberculosis spondyloarthritis in stages III-IV.

Results and discussion. Spine X-rays continue to be a screening tool although they may be normal in the initial stages of the disease. Initial X-rays may reflect changes in 70–99% of patients. The analysis of the results of complex treatment of 43 patients with spinal tuberculosis in stages I-IV confirms the conclusion of other authors. In 16 patients with spinal tuberculosis in stages I-II, timely hospitalization and surgical intervention (before the development of purulent complications) made it possible to significantly reduce the time of rehabilitation and in 15 (93.7%) patients to obtain good treatment results. Signs of bone block formation in 14 (32.6%) patients with stage III spondylarthritis were detected 7-8 months after surgery and in 13 (30.2%) patients with stage IV chronic destructive spondylarthritis - after 10-11 months. Thus, surgical treatment in combination with chemotherapy, undertaken in the I-II stages of spinal tuberculosis, allows in 93.7% of cases to completely restore the musculoskeletal function of the spine. Correction of kyphotic deformity in patients with chronic destructive spondyloarthritis with more than two vertebral-motor segments in stage IV is possible within 15°. The duration of the rehabilitation period in patients operated on in the IV stage of the tuberculosis process complicated by abscess is twice as long as the duration of treatment of patients operated on in the I-II stages of vertebral tuberculosis. The number of purulent-inflammatory complications in the early postoperative period in patients with spinal tuberculosis in stages III-IV with abscession

reaches 22.2%. Vertebral height may remain preserved till advanced stages of the disease. Spread to adjoining vertebral segments gives rise to multilevel disease.

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