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THE RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH ACTIVE TUBERCULOUS SPONDYLITIS

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The analysis of the treatment of 60 patients with active TS was performed. The main group (n=30) includes patients with lesions of the thoracic and lumbar vertebrae, operated using a telescopic titanium cage for ventral interbody spondylosis after necrosectomy. A feature of preoperative preparation of patients of the main group was the mandatory etiological diagnosis before treatment, the appointment of a short preoperative course of specific antibacterial therapy, taking into account the results of etiological diagnosis for 2–3 weeks, followed by surgery. The control group included patients (n=30) using traditional approaches to treatment – preoperative preparation using 3–5 specific antibacterial drugs without determining the sensitivity for 2–3 months, followed by surgery – decompressive necrectomy of the affected vertebrae and anterior spondylosis using an autograft. In the comparative analysis of short-term and long-term results of surgical treatment of patients of both groups, the results were obtained, which clearly showed the high clinical effectiveness of the proposed method of treatment of patients of the main group using modern advances in vertebralology.

Key words: specific tuberculous lesions of the spine, improvement of surgical treatment.

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РЕЗУЛЬТАТИ ОПЕРАТИВНОГО ЛІКУВАННЯ ПАЦІЄНТІВ ІЗ АКТИВНИМ ТУБЕРКУЛЬОЗНИМ СПОНДИЛІТОМ

Проведено аналіз результатів оперативного лікування 60 пацієнтів з активним туберкульозним спондилітом. В основну групу (n=30) включені пацієнти з ураженням грудних та поперекових хребців, оперовані із застосуванням телескопічного титанового кейджу для вентрального міжтілового спондилодезу після проведення некрсеквестрکتومیї. Особливістю передопераційної підготовки пацієнтів основної групи було обов'язкове проведення етіологічної діагностики перед початком лікування, призначення короткострокового передопераційного курсу специфічної антибактеріальної терапії з урахуванням результатів етіологічної діагностики протягом 2–3 тижнів з подальшим проведенням оперативного втручання. До контрольної групи увійшли пацієнти (n=30) із застосуванням традиційних підходів до лікування – передопераційна підготовка з використанням 3–5 специфічних антибактеріальних препаратів без визначення чутливості протягом 2–3 місяців з наступним оперативним втручанням – декомпресивна некректомія уражених хребців та переднім спондилодезом аутотрансплантатом. При порівняльному аналізі найближчих та віддалених результатів хірургічного лікування пацієнтів обох груп отримано результати, що достовірно підтверджують високу клінічну ефективність запропонованої методики лікування пацієнтів основної групи з використанням сучасних досягнень вертебралогії.

Ключові слова: специфічні туберкульозні ураження хребта, удосконалення хірургічного лікування.

The study is a fragment of the research project “Diagnosis of osteoporosis in infectious inflammatory diseases of the musculoskeletal system”, state registration no. 0120U102453.

In Ukraine, the share of extrapulmonary localizations of tuberculosis is approximately 10 % in the overall structure of tuberculosis cases. In the current epidemiological situation, osteoarticular tuberculosis ranks first in the incidence of extrapulmonary tuberculosis in our country and spinal tuberculosis ranks first in the structure of bone and joint lesions [2, 3].

The modern system of surgical treatment of spinal tuberculosis is based on the use of radical, radical-restorative and reconstructive operations [1, 7, 8]. It should be noted that the introduction of surgical methods of spondylitis treatment did not significantly reduce the duration of treatment and disability

reduce, primarily due to the duration of preoperative antibacterial therapy on bed rest for 3–6 months, insufficient radicalism of resection of centre destruction, postoperative mode duration up to 2–4 months [6, 11, 12].

With existing methods of treatment, the duration of patients stay with limited forms of tuberculous spondylitis (TS) in the hospital reaches 8–10 months, and the formation of the bone block between the resected vertebral bodies ends in 1.5–2 years [1, 3, 12, 13]. During this period, patients are disabled persons of I–II groups [4, 10, 13].

It is necessary to search for ways to reduce the duration of preoperative preparation of patients, as well as opportunities for their early activation after surgery, which will significantly reduce the inpatient stage of treatment. The question of the necessary and sufficient duration of preoperative treatment and the possibility of using modern techniques of anterior spondylodesis remain unresolved; the influence of modern specific antibacterial therapy (ABT) on the course of TS is not fully studied.

Instrumental stabilization of vertebrae is widely used in the arsenal of modern operative vertebratology for traumatic injuries and oncological diseases of the spine [4], but publications on these aspects of treatment for TC are insufficient and contradictory [7, 10, 12].

Along with this, in ABT pulmonary tuberculosis, the results of bacteriological examination of pathological material with extensive use of reserve antibacterial drugs are widely used. Studies of this aspect of treatment for TS are virtually absent.

The purpose of the study was to analyze and compare the results of surgical treatment of patients with active tuberculous spondylitis according to traditional methods and using modern advances in vertebratology.

Materials and methods. The clinical material of this study were the protocols of clinical and radiological examination, analysis of the treatment of 60 patients with active TS operated on the clinical bases of the Department of Traumatology and Orthopedics of KhNMU in the period from 2008 to 2018.

Depending on the approaches to preoperative preparation and the method of surgical stabilization of the destructive specific process of the spine, patients were divided into main and control groups.

Criteria for inclusion in the study: tuberculous spondylitis in the active phase (pathomorphologically and/or bacteriologically verified).

Exclusion criteria: age over 75 years; spinal surgery in history; the presence of decompensated concomitant (NOT tuberculous) lesions.

The average age of patients in the main and control groups was 38.2 ± 9.6 and 40 ± 10.8 years respectively ($p > 0.05$).

The main group ($n=30$) includes patients with active TS of the thoracic and lumbar vertebrae, operated using a telescopic titanium cage for ventral interbody spondylodesis after necrosectomy. The peculiarity of preoperative preparation of main group patients was the mandatory etiological diagnosis before treatment to determine the sensitivity of *Mycobacterium tuberculosis* (MBT) to antibacterial drugs (ABD), the appointment of a short-term preoperative course of specific antibacterial therapy, taking into account the results of etiological diagnosis within 2–3 weeks, followed by surgery. The bases for such a short-term period of preoperative preparation were the results of our experimental study. [2].

The control group included patients ($n=30$) with thoracic and lumbar vertebrae using traditional approaches to treatment – preoperative preparation using 3–5 specific first-line ABD without determining the sensitivity of MBT to ABD for 2–3 months, followed by surgery – decompressive necrectomy of the affected vertebrae and anterior spondylodesis by an autograft taken from a fragment of the rib (in the case of thoracic access) or from the wing of the iliac bone during surgery on the lumbar spine. The control group patients were analyzed in retrospect (based on the analysis of patient histories).

The fundamental differences in the treatment of patients in the main group were as follows:

1) mandatory examination of the pathological material of destruction focus to determine the sensitivity of MBT to ABD before treatment;

2) a short course of intensive ABT during 2–3 weeks, taking into account the sensitivity of MBT to ABD;

3) while performing surgery, a sliding telescopic titanium cage was used instead of an autograft.

The main difference in the volume of surgery in patients of the main and control groups was the method of intraoperative stabilization of resected vertebrae. The use of a telescopic titanium cage for interbody support in the main group (compared to a bone autograft in the control group) enabled activation of patients in the early postoperative period and created biomechanical conditions to prevent implant displacement and significant loss of deformation correction after in postoperative period.

In order to clinically evaluate the results of treatment of patients in both groups a score scale proposed by Ulrich E.V., Mushkin A. Y. was used [5].

Results of study and their discussion. Long-term results of TS treatment were studied in 26 patients of main group (87 %) and in 25 patients of control group (83 %) in the period from 1.5 to 10 years. The remaining patients were residents of remote regions of Ukraine and it was unable to trace the long-term results of their treatment. The results of clinical (as well as neurological), radiological (including, according to the indications, computed tomography) examination did not reveal recurrence of the disease in any case in each of the groups of patients.

Both objective and subjective evaluation of tuberculous spondylitis treatment results was higher in the main group compared with the control group. According to Ulrich E.V., Mushkin A.Y. scale, the average score of criterion 1 "Pain" in the main group was 7.8 ± 1.2 points (between "No pain" and "Infrequent pain, moderate in intensity, does not require taking painkillers"), in the control group – 5.4 ± 0.8 points (between "Requires periodic analgesics (NSAIDs)" and "Requires constant analgesics"). According to criterion 2 "Muscle spasticity", the average values reached: 8.2 ± 1.3 points (between "No spasticity" and "There is, but does not require special therapy") and 6.2 ± 1.1 points (close to "There is, requires periodic antispasmodics"), respectively. For criterion 3 "Movability", the mean values were as follows: 8.3 ± 1.4 points (between "Walking without restrictions" and "Walking without external support, but limited in time or distance, or with minimal additional support (cane)") and 6.5 ± 1.4 points (between "Walking without external support, but limited in time or distance, or with minimal additional support (cane)") and "Walking is possible only with significant external support (frame, crutches, Canadian sticks, splints for the knee joints)", respectively. According to criterion 4 ("Defecation"), the mean values reached: 6.9 ± 1.1 points (between "Independent, not regular, does not require cleansing enemas" and "Requires periodic cleansing enemas") and 5.1 ± 1.2 points, respectively (between "Requires periodic appointment of cleansing enemas" and "Requires appointment of permanent cleansing enemas"), respectively. Criterion 5 ("Urination") revealed mean scores 7.5 ± 1.4 points (between "Portion, independent, active" and "Portion, independent, active, with minimal dysfunction – dysuria") and 6.4 ± 1.2 points, respectively (between "Portion, independent, active, with minimal dysfunction – dysuria" and "Portion, independent, inactive, catheterization is not required – automatic bladder"), respectively. For criterion 6 ("Working capacity"), the average values corresponded to 5.3 ± 0.8 points (between "Significant work restrictions, part-time work at the previous job, the need to change jobs" and "Impossibility to work full time at a new job") and 3.0 ± 0.6 points ("Impossibility to work full time at a new job" and "Impossibility to perform any work"), respectively.

Patients' subjective assessment of treatment outcomes on the above scale averaged 8.8 ± 1.2 points in the main group (between "Condition has significantly improved" and "Condition has improved"); in the control – 6.3 ± 1.0 points (between "Condition has improved" and "Condition has not changed").

The overall score of the assessment of functional adaptation of patients with TS after surgery was on average 58.8 ± 4.2 points in the main group and 38.9 ± 4.3 points in the control group.

The indicator of treatment effectiveness of patients with TS in the long-term follow-up after surgery also showed the prevalence of positive results in the main group compared with the control one. Excellent results were obtained in 14 patients of the main group (47 %) and in 8 – control group (27 %); good – in 7 (23 %) patients of the main group and in 7 (23 %) patients of the control group; satisfactory – in 4 (13 %) patients of the main group and in 7 (23 %) of the control group, unsatisfactory – in 3 (10 %) patients of the control group, unsatisfactory results in patients of the main group were absent.

According to this scale, 77 % (20 observations) in the main group and 52 % in the control group (13 cases) showed good results in the treatment of patients with TS in the remote postoperative period. Satisfactory treatment results were registered in 23 % (6 patients) and 36 % (9 patients), respectively; unsatisfactory results – only 12 % in the control group (3 observations).

Thus, the analysis of long-term results conducted in the examined patients of the main group with intensive short-term (2–3 weeks) antibacterial therapy (taking into account the sensitivity of MBT to ABD) followed by surgery using a telescopic titanium sliding cage, showed that the given methodology allows to achieve high efficiency of treatment.

The frequency of complications observed in the postoperative period in patients of both groups was studied. Complications were divided into two groups (immediate and long-term).

The immediate complications include complications directly related to the operation, which developed within 2–3 months after it: 1) the surgical wound suppuration, discharge of silk and catgut ligatures; 2) postoperative pneumonia, exudative pleuritis; 3) exacerbation of the inflammatory process with the fistulas formation; 4) necrosis of the skin edges of the wound and its secondary suppuration. Distant complications of the postoperative period included fractures and displacement of the autograft or cage, the progression of deformation in the area of specific lesion of the spine. These complications were detected in 4–6 months and at a later date after surgery. Types of complications and their frequency are presented in table 1.

Table 1

The structure of complications in the immediate and distant postoperative periods in patients of the main and control groups

Features / Groups	Main (n=30; 100 %)		Control (n=30; 100 %)	
	abs.	%	abs.	%
Disease progression	–	–	2	7
Postoperative pneumonia	1	3	1	3
Exudative pleuritis	–	–	1	3
Fractures, autograft or cage sliding	–	–	3	10
Postoperative wound suppuration	1	3	1	3
Local serous inflammation	2	7	2	7

Four complications were stated in total or 13 % of the total number of operations in patients of the main group, and 10 complications (33 %) of the total number of operations in patients of the control group.

Thus, the generally accepted methods of preoperative management of patients, operations and postoperative treatment, involving a long bed rest, lead to a slowdown in the regeneration process in the area of the focus of destruction resection in the spinal segments. In this regard, osteoporosis of bone tissue develops, the formation of bone ankylosis of resected vertebrae is significantly slowed down.

Delayed formation of bone blocks, muscle atrophy due to prolonged hypodynamics, functional disorders of some organs and systems of the body do not allow early rehabilitation of patients, as a result of which they are forced to use corsets and crutches for up to 2–3 years. All this period they are disabled persons of I–II groups.

It should be emphasized that out of 30 patients of the main group only 5 (17 %) changed jobs, 7 (23 %) received disability of group III, 16 (53 %) patients – disability of group II, the other 2 (7 %) patients returned to their previous job after 6–8 months.

The analysis of the traditional approach to spondylitis treatment on the basis of the analysis of treatment results of the control group of patients allowed to conclude that the preoperative and postoperative periods on the background of strict bed rest, the total duration of which, depending on the localization of the process, caused long-lasting hypodynamia, which negatively affected the functional state of organs and systems, significantly slowed down reparative processes in bone tissue. Thus, the formation of bone callus between the resected vertebral bodies occurred in the period from 1.5 to 2 years.

It should also be noted that the average duration of inpatient treatment in patients of the main group (96±12 bed-days) was significantly shorter than in the control group (190±21 bed-days).

In our opinion, such a significant difference in duration of inpatient treatment is primarily due to the etiological diagnosis to identify the sensitivity of MBT to ABD, followed by the prescription of ABD, taking into account the study, short-term intensive preoperative preparation and use during surgery of modern structures for anterior spondylosis, which allows much earlier rehabilitation and verticalization of operated patients, significantly reducing inpatient treatment, and this technique allows to achieve high treatment efficiency.

To confirm this opinion, a correlation analysis was performed, during which the influence of some factors (age of the patient, duration of compression of spinal cord structures, duration of etiological diagnosis of TS, duration of bed rest, duration of preoperative preparation, instrumental method of intraoperative stabilization of resected vertebral bodies) on the result of surgical treatment of patients with TS was studied (table 2).

Table 2

The nature of the correlations between clinical parameters and the outcome of surgical treatment of patients with tuberculous spondylitis

	1	2	3	4	5	6	7	8
1	1.0	0.0	-0.2	0.4	0.3	0.0	-0.1	-0.8
2	0.0	1.0	0.1	0.4	0.3	0.4	0.2	-0.9
3	-0.2	0.1	1.0	0.1	0.7	1.0	0.9	-0.8
4	0.4	0.4	0.1	1.0	0.9	1.0	0.9	-0.9
5	0.3	0.3	0.7	0.9	1.0	1.0	0.7	-0.9
6	0.0	0.4	1.0	1.0	1.0	1.0	-0.1	0.7
7	-0.1	0.2	0.9	0.9	0.7	-0.1	1.0	1.0
8	-0.8	-0.9	-0.8	-0.9	-0.9	0.7	-0.8	1.0

Note: 1 – age of the patient, 2 – duration of compression of spinal cord structures in weeks, 3 – duration of etiological diagnosis of TS in weeks, 4 – duration of bed rest in weeks, 5 – duration of preoperative preparation in weeks, 6 – instrumental stabilization of resected vertebral bodies, 7 – stabilization of resected vertebral bodies by an autograft, 8 – good result of surgical treatment.

A good result of surgical treatment had strong and inversely proportional correlations with all studied clinical parameters: the patient's age ($r=0.8$; $p<0.001$), the duration of compression of the spinal cord structures in weeks ($r=-0.9$; $p<0.001$), the term of the etiological diagnosis of TS in weeks ($r=0.8$; $p<0.001$), duration of bed rest in weeks ($r=-0.9$; $p<0.001$), duration of preoperative preparation in weeks ($r=0.9$; $p<0.001$) and instrumental method of intraoperative stabilization of resected vertebral bodies ($r=0.7$; $p<0.001$).

In other words, the younger the patient, the shorter his neurological disorders, the faster the etiological diagnosis of TS and thus reduced the duration of preoperative preparation and duration of bed rest and used instrumental spondylodesis, the better the result of surgical treatment was. (fig. 1).

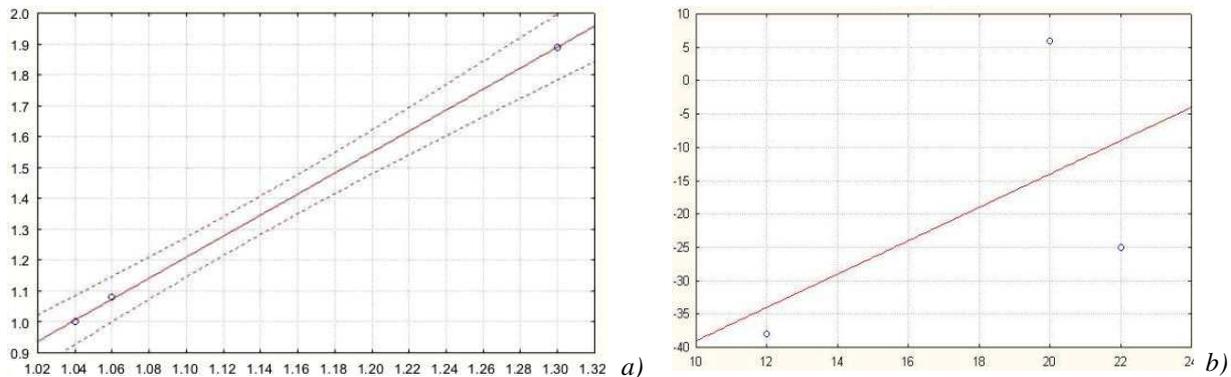


Fig. 1. The regression line of parameters 5 (duration of preoperative preparation in weeks) to 7 (good result of surgical treatment) (a) and 1 (age of the patient) to 4 (duration of compression of spinal cord structures in weeks) (b) – approximated curves.

Correlation analysis has also revealed some interesting interconnections. The duration of compression of spinal cord structures moderately depended on the duration of stay of the patient in bed ($r=0.4$; $p<0.05$) and the use of instrumental fixation of resected vertebral bodies ($r=0.4$; $p<0.05$). In its turn, the duration of neurological disorders was moderately affected by the age of patients ($r=0.4$; $p<0.05$). Direct strong correlations between the duration of etiological diagnosis of TS, stay in bed ($r=0.7$; $p<0.001$) and preoperative preparation ($r=0.9$; $p<0.001$) were quite expected.

Our treatment results in the main group of patients according to our proposed method showed significantly better results than in patients treated by traditional methods [10, 13], and give us reason to recommend the proposed method in the treatment of patients with TC.

It should be noted that as a result of treatment of patients in the control group correlate with data from other authors [4].

Conclusions

1. Thus, in the comparative analysis of short-term and long-term results of surgical treatment of patients of both groups with TS of thoracic and lumbar vertebrae, the results, which clearly showed the high clinical efficacy of the proposed method of treatment of patients of the main group using modern advances in vertebrology were obtained. The main confirming facts of improving treatment effectiveness of patients in the main group in the study were: reducing of the preparation stage for radical surgery, reducing the number of inflammatory complications, significant reduce of inpatient treatment duration, improving quality of life, significantly lower frequency of disability and significantly better treatment outcomes.

2. The method of treatment, used by us in patients of the main group with the appointment of a short course of intensive specific ABT, taking into account the sensitivity of MBT to ABD in the preoperative period, allows to compensate for the inflammatory process and perform surgery without the risk of generalization of the disease, and surgery using the post-sanitizing stage of the operation of spondylodesis with a sliding cage (instead of an autograft) permits early rehabilitation of patients in the postoperative period, which helps to normalize metabolic processes, accelerate the formation of spondylodesis in the area of specific inflammation, rapid recovery of patient's physical activity.

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PATHOGENETIC PREVENTION OF PROSTHETICS STOMATITIS IN PERSONS WITH INTERNAL DISEASES

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Primary and secondary prevention of prosthetic stomatitis in patients using removable dentures remains a topical and priority area of dentistry. The methods of prevention of chronic prosthetic stomatitis developed in the background of their internal diseases developed and tested by the authors of the article are effective, reduce the number of visits for prosthesis correction, are accessible and easy to perform for elderly and senile patients. They improve the adaptation of the oral mucosa to the basis of a removable prosthesis, adjust the general condition of the body and thus improve the quality of life of patients, as evidenced by the normalization of their psycho-emotional status. An individualized and differentiated approach to maintenance therapy prevents exacerbation of prosthetic stomatitis during the year in 78 % of patients.

Keywords: stomatitis, prevention, altan, thiotriazoline, biol, quertin

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ПАТОГЕНЕТИЧНА ПРОФІЛАКТИКА ПРОТЕЗНИХ СТОМАТИТИВ У ОСІБ ІЗ ВНУТРІШНІМИ ХВОРОБАМИ

Первинна та вторинна профілактика протезних стоматитів у пацієнтів, що користуються знімними зубними пластинковими протезами, залишається актуальним та пріоритетним напрямком стоматології. Розроблені та апробовані авторами статті методи профілактики хронічного протезного стоматиту, що виникає у пацієнтів на фоні їх внутрішніх захворювань, ефективні, скорочують кількість відвідувань для корекції протезів, доступні й легкі у виконанні для пацієнтів похилого та старечого віку. Вони покращують пристосування слизової оболонки порожнини рота до базису знімного протеза, корегують загальний стан організму і тим самим підвищують якість життя пацієнтів, про що свідчить нормалізація їх психоемоційного статусу. Індивідуалізований та диференційований підхід до підтримувальної терапії запобігає загостренню протезного стоматиту протягом року у 78 % випадків пацієнтів.

Ключові слова: стоматити, профілактика, альтан, тіотріазолін, біоль, квертин

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Primary and secondary prevention of prosthetic stomatitis in patients using removable dentures does not lose its relevance and continues to be a priority in orthopedic and therapeutic dentistry. In the pathogenesis of diseases of the oral mucosa, a significant role is played by internal diseases of the human body, which lead to violations of structural and functional changes in the oral cavity [2, 3, 8]. Studies show that microcirculation disorders are accompanied by the development of tissue hypoxia: thrombosis and