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**THE ROLE OF OSTEOREPLACEMENT MATERIALS IN RECONSTRUCTIVE SURGERY FOR  
SPINAL TUBERCULOSIS****Usmonov I. Kh.***Bukhara State Medical Institute, Bukhara Regional Center For Phthisiology And Pulmonology,  
Uzbekistan***ABOUT ARTICLE****Key words:** Tuberculous spondylitis, joint tuberculosis, surgical treatment.**Received:** 07.03.2023**Accepted:** 12.03.2023**Published:** 17.03.2023**Abstract:** The study is based on data from a survey of 658 patients with osteoarticular tuberculosis, which was performed in 482 (73.3%) cases of radical reconstructive surgery (RVO) of the spine. Of 482 patients with spinal tuberculosis, in 461 (95.6%) cases, RVO was using a titanium mesh cage (Piramesh), and in 21 (4.4%) patients using the traditional-classical method with autobone fusion.

To fill the lumen of the titanium mesh cage, it is rational to use autologous crumbs, collapAn and hydroxyapatite compounds. In case of tuberculosis of large joints, to restore the function and defect of bones, total joint arthroplasty is a solution to a serious problem.

**INTRODUCTION**

the relevance of this problem is due to the prevalence of infectious lesions of the spine, which range from 2 to 8% of all bone infections. Moreover, the incidence of spondylitis and dicitis ranges from 0.5 to 5.9 cases per 100,000 people per year. Despite the current level of development of medicine, the observation of late diagnosis reaches 75%, and the mortality rate from spondylitis and dicitis is 5–12% [1]. The share of extrapulmonary localizations of tuberculosis accounts for 4 to 17% in the overall structure of tuberculosis incidence. The proportion of tuberculosis of the osteoarticular apparatus among extrapulmonary localizations ranges from 5 to 52% [7; 14]. Tuberculous lesions of the bone structures of the spinal motion segments in the general structure of osteoarticular tuberculosis, according to different authors, range from 45 to 90%. Therefore, in the vast majority of cases, mycobacterium tuberculosis is also the cause of spondylitis [3; 4; 6; 9].

"Bone grafts" was considered the "gold standard" in the 20th century, however, undesirable results are often observed:

-40% of cases, pseudarthrosis is formed in the zone of bone fusion; -reducing the size of grafts by 25%–75%;

-Resorption of grafts - 16%;

- Suppuration of grafts - 3% [2].

Tuberculous lesions of the spine, spondylitis, have always occupied an important place in the problem of osteoarticular tuberculosis, attracting the attention of researchers and doctors due to the particular severity of the disease and the difficulties of their treatment. At present, interest in spinal lesions has increased significantly due to the introduction of radical surgical methods of treatment [7; 8; 16].

Tuberculosis of bones and joints remains a very urgent and complex problem, since the disease lasts a long time, at first it is asymptomatic, difficult to diagnose, and then rapidly, with severe complications.

Materials and research methods. The effectiveness of surgical treatment was analyzed in 658 patients with osteoarticular tuberculosis, which was performed in 482 (73.3%) cases of radical reconstructive surgery (RVO) of the spine and total hip arthroplasty - in 162 (24.6%), knee joint - in 14 (2.1%) cases, performed at the clinic of the Republican Specialized Scientific and Practical Medical Center for Phthisiology and Pulmonology and the Bukhara Regional Center for Phthisiology and Pulmonology in 2014-2021.

The age of the patients ranged from 17 to 82 years, with a mean age of 47.2 years.

**Table number 1.**

**Distribution of patients by sex and age**

Floor	Number of patients	17-29 years	30-39 years	40-49 years	50-59 years	60 years and older
Men	267 (40,6%)	32 (4,9 %)	86 (13,1%)	81 (12,3%)	46 (7,0%)	22 (3,3%)
Women	391 (59,4%)	61 (9,3%)	105 (16,0%)	113 (17,2%)	68 (10,3%)	44 (6,7%)
<b>Total:</b>	<b>658</b> <b>(100%)</b>	<b>93</b> <b>(14,2%)</b>	<b>191</b> <b>(29,1%)</b>	<b>194</b> <b>(29,5%)</b>	<b>114</b> <b>(17,3%)</b>	<b>66</b> <b>(10,0%)</b>

As can be seen from table No. 1 - women were 1.5 times more than men, 72.8% of patients were aged 17-49 years (the most able-bodied age), it should be noted that after 30 years the incidence was more common - in 85.8%, and in older 60 years in 10.0% of cases.

Table No. 2 shows that frequent localization of tuberculous lesions of the spine was noted in the thoracic and thoracolumbar spine - in 36.5% and the lumbar spine - in 20.7% of cases. Most often - in 24.6% of cases, the hip joint is affected. In 23.2% of cases, a bilocal lesion was observed, and in 4.2% of cases, a three-local lesion.

**Table number 2.**

**Localization of spinal tuberculosis lesions**

<b>Process localization</b>	<b>Number of patients</b>
Cervical spine	32(4,9%)
Thoracic spine	146(22,2%)
Thoracic spine	94(14,3%)
Lumbar spine	136(20,7%)
Lumbosacral spine	74(11,2%)
Hip joint	162(24,6%)
Knee joint	14(2,1%)
<b>Total:</b>	<b>658(100%)</b>

The disease developed slowly - in 51.8% of patients, more than a year, with a characteristic progression of pain in the spine, rare temperature rises to the subfebrile border, sometimes with the addition of radicular pain. A subacute course of the disease with progression within 6 months, pain in the spine with irradiation, subfebrile temperature and sweating in the evenings was noted in 27.4% of patients, in 22.6% - the clinical course of the disease was acute, with a temperature rise of more than 38 00C, with intoxication, weight loss of more than 10% of the total body weight, with a strong growing pain symptom, dysfunction of the spinal cord. At the same time, there was a deep destruction of more than 2 bodies of the spine - in 27.9% of patients, instability, epidural, para- and prevertebral abscesses.

The duration of complaints of patients before diagnosis ranged from 4 months to 4.5 years, on average - 9.6 months. The main complaints of the patients were as follows: fever, sweating - in 51.8%, pain in the affected area with irradiation - in 100%, weight loss - in 55.9%, increased pain during movement - in 96.4%.

57.7% of patients had concomitant diseases, of which: cardiovascular - in 45.4%, diseases of the hepatobiliary system - in 17.5%, urinary and genital organs - in 16.5%, diabetes mellitus - in 4, 1%, HIV-infected - 1.1%, other diseases - 14.4%.

At the same time, 7.1% of patients were diagnosed with a (multi-resistant) form of tuberculosis (MDR), in which MBT is resistant to the first line of anti-TB drugs. Given the resistance to antibacterial drugs,

these patients were prescribed second-line drugs: capreomycin, kanamycin, cycloserine, PAS, proteinamide, fluoroquinolones: levofloxacin, ofloxacin.

The severity of neurological disorders in spinal tuberculosis was assessed before surgery according to the scale of H.L. Frankel (1969) and A.Yu. Mushkin et al. (1998) as follows:

- degree A - patients with anesthesia and plegia below the level of the lesion - 2 (0.4%);
- grade B - with incomplete sensory impairment below the level of the lesion, no movements - 7 (1.5%);
- degree C - with incomplete sensory impairment, there are weak movements, but muscle strength is insufficient for walking - 11 (2.3%);
- degree D - with incomplete sensory impairment below the level of the lesion, there are movements, muscle strength is sufficient for walking with assistance - 312 (64.7%) patients;
- degree E - without violation of sensitivity and movements below the level of the lesion. There may be altered reflexes - in 48 (10.0%) patients;
- degree R - the presence of radicular syndrome - in 102 (21.2%) patients. The severity of the pain syndrome according to the F.Denis method was 0 points - no; 1 point - 16 (2.5%), 2 points - 149 (22.6%), 3 points - 493 (74.9%), 4 points - no patients who need to take drugs to relieve pain.

**Table number 3.**

**Distribution of patients by phases (P.G. Kornev)**

<b>Phases of the disease</b>		<b>Number patients</b>	<b>%</b>
<b>Prespondylitis (prearthritic)</b>		-	-
<b>Spondylitis (arthritic)</b>	Start period	46	<b>7,0</b>
	peak period	324	<b>49,2</b>
	Quiet period	78	<b>11,9</b>
<b>Postspondylitis (postarthritic), torpid course</b>		210	<b>31,9</b>
<b>Total:</b>		<b>658</b>	<b>100%</b>

The table shows that in the main 448 (68.1%) cases, patients were hospitalized and operated on in the spondylitis phase of the disease, and total joint replacement was performed in the post-arthritis phase of the disease.

All patients underwent radical reconstructive surgery (RRS) of the spine and joint after appropriate preparation and anti-tuberculosis therapy in terms of an average of up to 3.2 weeks. Out of 482 patients with spinal tuberculosis, in 461 (95.6%) cases, RVO was performed using a titanium mesh cage (Piramesh), and in 21 (4.4%) cases, by the traditional classical method with autologous bone fusion. Total joint arthroplasty was performed in 176 (100%) patients, including total hip arthroplasty in 162 (92.1%) and knee joint arthroplasty in 14 (7.9%) cases.

In 296 (61.4%) cases, the lumen of the titanium mesh cylinder of the shaped cage was filled with autologous crumbs, in 26 (5.4%) cases with a mixture of autologous bone + hydroxyapatite with ossein

compound + bicillin-5, in 6 (1.2%) cases filled - hydroxyapatite with ossein compound + bicillin-5, and in 133 (27.6%) cases the cage was installed without filling.

In order to improve the results of surgical treatment and minimize surgical trauma, in 265 (40.3%) cases, an autologous graft in the form of bone chips was taken from the area of the operated segment of the healthy part of the spinal body.

Results and discussion: The effectiveness of operations was studied in the early (up to 30 days) and late postoperative period (from 6 months to 4 years). The results of PVO, the advantages and disadvantages of grafts or implants depend on the structure, strength and biochemical inertness.

All operations were performed without any complications and positive results were obtained.

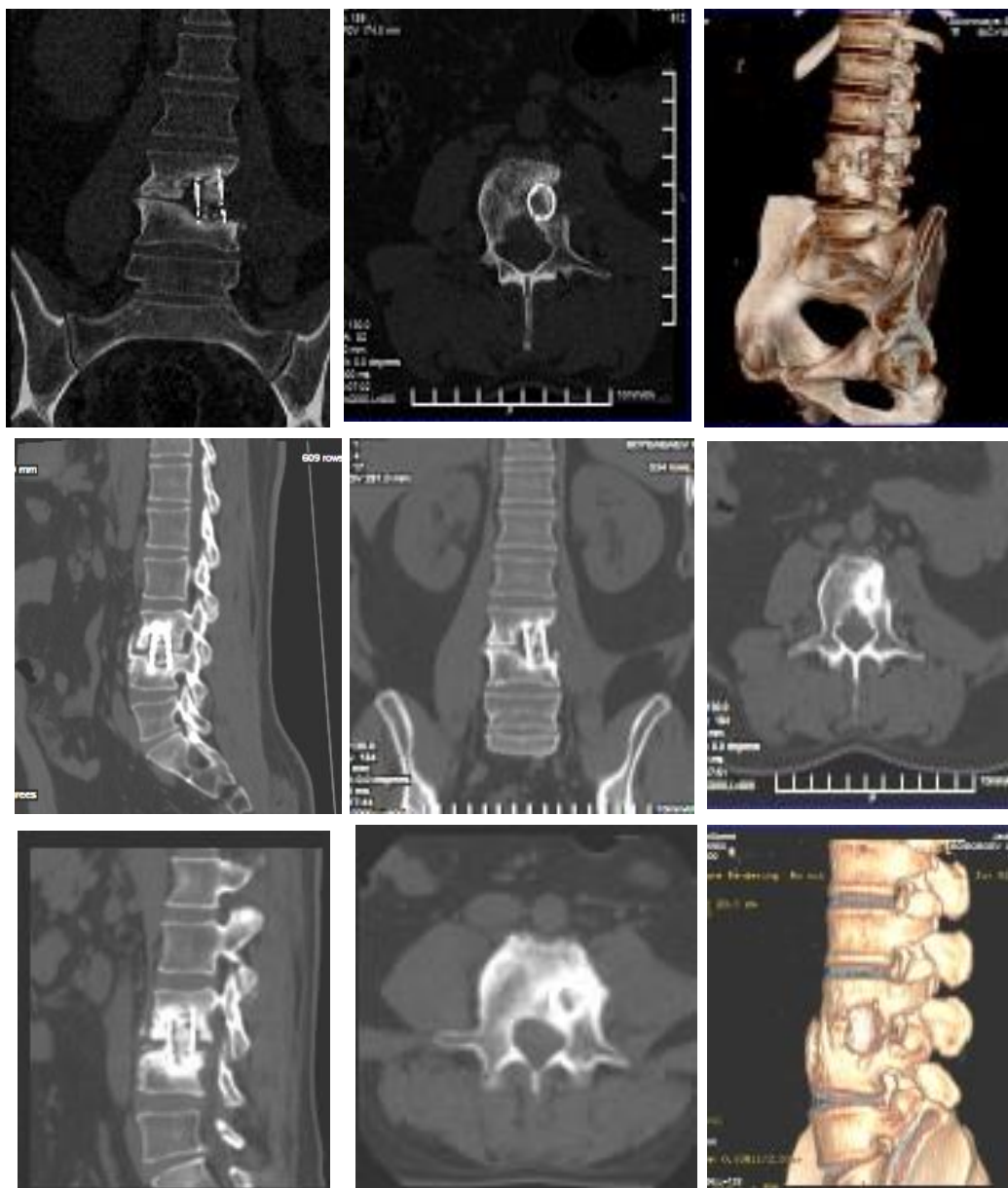
The severity of neurological disorders after spinal surgery was based on the scale of H.L. Frankel (1969) and A.Yu. Mushkin et al. (1998) as follows:

- degree A, B, C - not observed;
- degree D - 9 (1.9%) patients;
- degree E - without violation of sensitivity and movements below the level of the lesion. There may be altered reflexes - in 11 (2.3%) patients;
- degree R - the presence of radicular syndrome - in 16 (3.3%) patients.

Out of 482 operated patients with spinal tuberculosis, 446 (92.5%) cases had no neurological disorders, and 36 (7.5%) patients had mild neurological disorders of the degree - D, E, R. complete restoration of joint function - in 173 (98.2%) cases, in 3 (1.8%) cases, shortening of the operated limb by 2-3 cm was noted, which shortened the affected limb by more than 6 cm before the operation.

The severity of pain syndrome according to the F.Denis method was 0 points - 618 (93.9%); 1 point - 24 (3.7%); 2 points - 16 (2.4%); 3 points - 0 and 4 points - no patients.

Clinical example: The diagnosis was tuberculous spondylitis VL3-4 of the lumbar spine. A radical reconstructive operation was performed and a combined spinal fusion with a titanium mesh cage + autobone crumb + ossein hydroxyapatite compound + bicillir-5 was performed (assessment of fusion of the operated segment A - after 6 months, B - after 9 months and C - after 1 year).



**Fig.1. MSCT gram: tuberculous spondylitis VL3-4 of the spine, condition after surgery (fusion of the operated segment)**

The analysis showed that all operated patients showed an improvement in their general condition and quality of life.

### CONCLUSIONS

1. In case of tuberculosis of bones and joints, the use of carbon-carbon, collapAn, hydroxyapatite compounds and titanium implants for the replacement of bone defects has no contraindications.
2. In case of spinal tuberculosis, the use of a titanium mesh cage is the best way to restore function.
3. To fill the lumen of the titanium mesh cage, it is rational to use autologous crumbs, collapAn and hydroxyapatite compounds.

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