ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

IMPROVEMENT OF THE TACTICS OF SURGICAL TREATMENT OF VICTIMS WITH INTRA-ARTICULAR FRACTURES OF THE DISTAL METAEPIPHYSIS OF THE TIBIA

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Abstract: According to domestic and foreign literature, a large number of unsatisfactory results (up to 40%) in the treatment of patients with intra-articular fractures of the distal metaepiphysis of the tibia are associated with massive destruction of the articular surface of the ankle joint. This leads to repeated surgical interventions aimed at correcting the orthopedic consequences of the trauma.

Currently, there is no clear algorithm for preoperative planning and operative technique. This is due to errors made during preoperative planning and surgical treatment.

For modern medicine, the problem of reducing the labor activity of patients with CRF and leading to disability in 26% of cases is very important.

Key words: fractures, distal metaepiphysis, catatravma,

Research objective. Increasing the effectiveness of surgical treatment of patients with intra-articular fractures of the distal metaepiphysis of the tibia.

The relevance of the diagnosis and treatment of patients with intra-articular fractures of the distal metaepiphysis of the tibia is determined, first of all, by the large proportion of unsatisfactory anatomical and functional results in this category of patients, according to various authors, from 15 to 28%.

High-energy fractures of the distal metaepiphysis of the tibia are usually caused by a fall from a height (catatravma) accompanied by a fall on straightened legs and are caused by forces directed in the cranial direction along the axis of the tibia [4, 6, 9]. The second most common cause of high-energy injuries under consideration is road traffic accidents [7, 2]. As a rule, during a car accident, the ankle joint is affected by a combination of forces, including compression, forced back flexion, and rotation [2.4]

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
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Materials and methods. On this topic, at the clinical base of the Department of Traumatology and Orthopedics of the DKTF, at the Samarkand branch of the Scientific and Practical Medical Center of Traumatology and Orthopedics, examination and treatment of patients with patellar instability are being carried out. From 2023 to 2025, an analysis of 126 patients' medical histories will be conducted: The majority of patients were men (97 victims or 77%). Female individuals were significantly fewer - 29 clinical observations, which constituted 23% of the study group. The age of the patients ranged from 19 to 64 years..

Table-1 Distribution of patients by age and sex.

Age	Sex				Total	
	Male		Female			
	Number	%	Number	%	Number	%
19 - 29	20	20,6	5	17,5	25	19,8
30 - 39	37	38,2	3	10,3	40	31,7
40 - 49	18	18,5	12	41,3	30	23,8
50 - 59	16	16,5	6	20,6	22	17,5
60 - 64	6	6,2	3	10,3	9	7,2
Total	97	100	29	100	126	100

The injured were divided into two groups depending on the tactics of surgical treatment. The main group consisted of 64 patients, the clinical and radiological parallels of which made it possible to improve the tactics of surgical treatment. The comparison group included 62 victims, in the treatment of whom only traditional modern surgical principles were applied.

A clinical, radiological, and CT assessment of the presence and severity of signs of degenerative-dystrophic damage to the ankle joint was conducted, and the patient's quality of life in terms of joint function was studied. For this purpose, the following questionnaires were used: AOFAS - American Orthopaedic Foot and Ankle Society Ankle - Hindfoot Scale, FAAM - Foot and Ankle Ability Measure, FAOS - Foot and Ankle Outcome Score, SF-36 - The SF-Health Survey.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

The developed surgical tactics were tested in the treatment of 64 patients who came for treatment in the period from 2016 to 2018. The comparison group consisted of 62 patients with similar fractures treated using traditional surgical tactics in the period from 2015 to 2016. This group was selected for the possibility of a comparative analysis of the clinical effectiveness of the improved surgical tactics for the treatment of the studied category of victims.

In general, the distribution of injuries in the studied area by the type of fracture under consideration is characterized by the predominance of fractures B2 and C2 - 23.8% and 23.1%, respectively. In both the general group (8.7%) and the comparison groups (7.8% and 9.7%), the most frequent type of injury was a type V1 fracture.

The American Orthopaedic Foot and Ankle Society Ankle - Hindfoot Scale (AOFAS) questionnaire, which was also used in this study, included 9 questions distributed among the indicators: pain (40 points), the patient's range of motion and physical capabilities (50 points), stickiness of the foot (10 points) - a general scale from 0 to 100 points (100 points correspond to the best score). This scale combines both subjective questions about the intensity of pain, the limitation of maximum range of motion activity during walking, and the results of clinical examination of the patient (walking, range of motion, sticking of the leg to the surface during walking, joint stability). Evaluation of the results of filling this scale was carried out by calculating the sum of the total points of answers to the questions of each section (from 0 to 100).

One of the most informative methods used in this study is the "The Foot and Ankle Outcome Score" (FAOS) scale (Institute of Sport Science and Clinical Biomechanics, University of Southern Denmark), which consists of 42 questions scored from 0 to 4 points (0 - no problem, 4 - extreme level of problem). This visual-analog scale includes a number of separately assessed sections: pain (9 questions), other symptoms - edema, joint block, immobility - (7 questions), the level of daily activity (17 questions), sports and active rest (5 questions), as well as the quality of life associated with the function of the foot and ankle joint (4 questions). Each of the presented questions can be assessed by the patient from 0 to 100 points (100 points - no problem, 0 points - extreme level of problem). The score (%) for each sub-scale is calculated by adding all scored answers to the questions that make up this sub-scale and subsequently dividing by the maximum score for this sub-scale. The maximum score on the "pain" subscale is 36, on the "symptoms" subscale - 28, "daily activity" - 68, "sports and active recreation" - 20, "quality of life" - 16.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

A. B.

B.

C. D.

Figure 1-2. X-ray images before and after surgery.

Most intra-articular distal fractures of the tibia are complicated by fractures of the fibula. In the first stage, in cases of simple closed fractures of the fibula, when it was impossible to place and hold the bone fragments closed, open repositioning and fixation of the third part - tubular or with a LCP plate - were used. Fragmented closed fractures of the fibula were fixed after reconstruction of the tibia. A minimally invasive access with subcutaneous insertion of a plate was used in the projection of the distal part of the fibula.

Table 2 Surgical sections in fractures of the lower third of the tibia

TYPE FRACTURE	Operational sections				Total (n=62)	
	Anterior -medial		Anterior-lateral			
	Number	%	Number	%	Number	%

www.academicpublishers.org Volume 5, July , 2025 , MEDICAL SCIENCES. IMPACT FACTOR:7,89

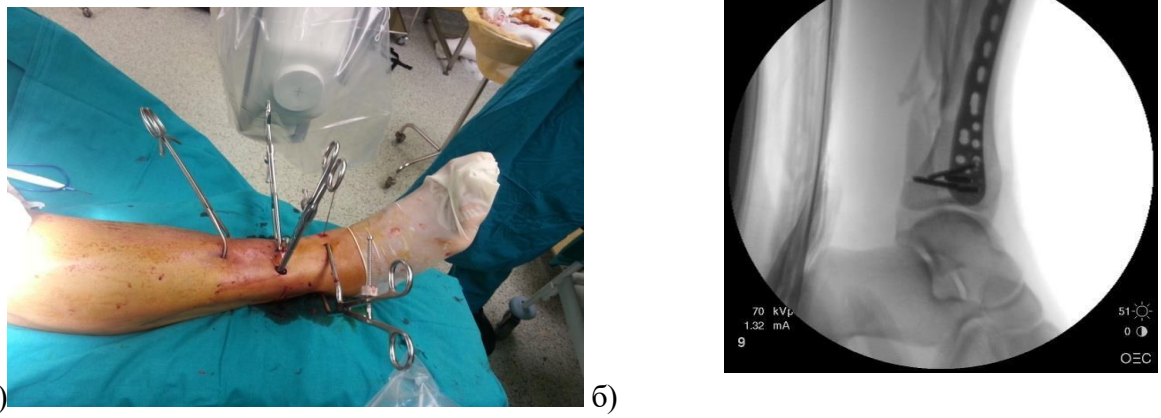
ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

TYPE B	B1	5	8,1	–	–	5	8,1
	B2	6	9,7	–	–	6	9,7
	B3	8	12,9	2	3,2	10	16,1
TYPE C	C1	12	19,4	1	1,6	13	21,0
	C2	14	22,6	1	1,6	15	24,2
	C3	11	17,7	2	3,2	13	20,9
Total		56	90,4	6	9,6	62	100

Results of a comparative study of methods of bone fragment repositioning and methods of periosteal osteosynthesis

In the treatment of patients in the second group, open repositioning of bone fragments was mainly used. This rule applied to the repositioning of intra-articular and extra-articular parts of the tibial fracture. The size of the surgical accesses used in all clinical cases allowed visualization of the fragments to achieve anatomical comparison, but this increased the trauma of the surgical intervention and undoubtedly worsened the blood supply to the fracture site.

After open repositioning of the intra-articular part of the fracture and closed indirect repositioning of the extra-articular part, osteosynthesis of TBMDE with a limited contact tibial distal medial plate: a) time of operation - the plate was inserted through an anterior-medial minimally invasive access; b) intraoperative EOP - placement of the plate and control of the quality of achieved reposition (Fig. 4).



а) б)

Figure 4. Osteosynthesis of the tibia: a) stage of insertion of the plate through an anterior-medial minimally invasive access; b) intraoperative EOP - control of the position of the plate and the quality of achieved repositioning.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

Control X-ray examination was performed in 100% of the victims (126 patients) of both compared groups. The tasks of radiological structural imaging of the TMJ and ankle joint were considered to be the search for post-traumatic deformities and degenerative changes that are the causes of pain and impaired ankle joint function.

The obtained data showed the best results among the victims in the main group. Thus, the average score in patients receiving improved treatment approaches was 80.8±10.8. Similar results for victims treated according to standard principles were 75.7±11.6 points. However, no statistically significant differences were found between the compared groups according to this criterion (p=0.38).

The number of unsatisfactory functional results, assessed on the basis of questionnaires, was 43.5% (27 victims) in the control group and 28.1% (18 patients) in the main group. The proportion of satisfactory functional results in the control group was 37.4% (23 victims), while in the main group the number of similar results was 42.1% (27 patients). Good results were the lowest in the control and main groups - 19.1% (12 victims) and 29.8% (19 patients) respectively. Excellent anatomical and functional results were not achieved in the compared groups.

At the same time, the worst functional results of surgical treatment in the first and second compared groups were observed in the victims who received complete impression-fragmented intra-articular fractures, which were prognostically unfavorable. Regardless of the approaches used in the surgical treatment of such patients, the results assessed by a set of parameters were statistically significantly worse than in patients with incomplete intra-articular fractures.

CONCLUSION

1. The main reasons for the unsatisfactory results of surgical treatment are the underestimation of anatomical and topographical features with the incorrect choice of fixation method, as well as the unjustified use of a standard anterior medial access without taking into account the type of fracture and the degree of impression of the articular surface.

2. The created computer program allows creating a database and, based on the developed algorithm, obtaining recommendations for optimal treatment tactics and prognosis. The use of the program made it possible to correct the treatment tactics in 17.7% of cases and achieved good results.

3. Within the framework of the developed algorithm for choosing treatment tactics, for the effective functioning of the computer program, it is advisable to introduce data from clinical and radiological examinations according to 23 parameters, including 13 radiological, 4 CT, and 6 physical examinations.

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ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
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