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MODERN OPERATIVE TREATMENT OF FRACTURES OF THE PROXIMAL PART OF THE HUMERUS

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Annotation: The problem of diagnosis and treatment of acetabular fractures has been the subject of many works, at the same time; the currently existing methods of conservative treatment are insufficiently effective and have many disadvantages. In recent years, there has been an increase in car injuries, and the proportion of acetabular fractures continues to grow steadily. There are also shortcomings in the diagnosis of acetabular fractures and there are no clear indications for the use of modern diagnostic methods.

Key words: acetabulum, arthroplasty complications, trauma.

According to O. S. Buachidze (2003), diagnostic errors occur in 12.6% of patients and most often in patients with multiple injuries.

The frequency of acetabulum fractures has been steadily increasing recently due to an increase in the number of severe injuries, including multiple and combined injuries [3]. With a relatively low specific weight of pelvic bone fractures among all skeletal bone fractures, the presence of a pelvic injury in the victim, and in particular a fracture of the acetabulum, significantly complicates treatment and worsens the prognosis [6]. The previously used conservative method of treatment, in addition to the impossibility of early mobilization of the patient, often does not completely eliminate the displacement of fragments, which in 40-60% of cases leads to unfavorable results [9]. The rapidly developing coxarthrosis dictates the need to use such expensive and time-consuming methods of treatment as hip replacement [7]. In this regard, indications for surgical treatment of acetabulum injuries are increasingly being put forward. This is also due to the introduction and development of such high-tech diagnostic methods as computed tomography (CT). Conducting it greatly facilitates the determination of therapeutic tactics and planning of surgical treatment [7].

The works of many scientists have been devoted to determining the nature of post-traumatic changes in explosives, the conservative treatment of which does not have a significant risk of complications [2]. The search for rational tactics was carried out taking into account the general principles of treatment of intra-articular fractures: anatomical reposition, stable fixation, early mobilization, late loading [3].

Knight R. (2018), noted the need to restore the loaded BB arch ("weight-bearing vault") [3]. Soon, Rowe S. and Lowell J. (2011), based on the analysis of the treatment of 93 patients, identified factors that affect the result: 1) destruction of the load arch of the BB ("weight-bearing doum" or WBD); 2) discongruence of the femoral head and WBD; 3) instability of the joint TBS in the early or late post-traumatic period; 4) impression fracture of the femoral head [7]. The important role of preserving the VA vault is confirmed in the studies of other authors [10].

Olson S. and Matta J. (2003) developed criteria for selecting patients for conservative treatment, the validity of which was later confirmed by clinical data: 1) the vault of the BB with a depth of up to 10 mm is not damaged; 2) the congruence of the articular surfaces of the hip joint in the projections of Judet R. (2004) is preserved after the removal of skeletal traction; 3) more than 50% of the posterior wall is preserved, the posterior instability of the hip joint is absent [13].

Analyzing the available specialized modern literature, we could not find any evaluation scale that could be applied only to assess the results of treatment of acetabulum injuries [3]. Apparently, this is due to the fact that many experts do not focus on the allocation of the acetabulum into a separate segment, but refer to it as a part of the pelvis, although according to the AO classification, the cavity is a segment number 62 [16]. This approach cannot be considered rational, since the priority functions of the pelvic ring and the acetabulum (support and movement) differ [6]. Of the existing assessment scales and systems (15), most of them provide either an assessment after endoprosthetics, or an assessment in comparison before and after reconstructive operations [15]. Therefore, in our opinion, the most interesting is not the fact of joint replacement itself, but the data on post-traumatic changes in the joints in patients in subsequent years, which lead to total joint replacement. It is this contingent of patients that can most clearly characterize the results of treatment in the long-term period [1].

According to numerous literature data, the opinions of scientists are contradictory in understanding the causes of the development of such complications of trauma as coxarthrosis and aseptic necrosis of the femoral head (ANGBC). Some believe that after a perfect reposition (less than 1 mm of residual displacement), long-term results are much better than after a bad one (5 mm or more). And if post-traumatic arthrosis occurs, it occurs much later, and it progresses more slowly than after a bad reposition. Others note that this is a situation in which the accuracy of the joint reposition does not seem to correlate with the outcome, which is determined by the severity of the injury: the degree of destruction of anatomical structures and decompensation of the blood supply to the joint. But, one way or another, the frequency of unsatisfactory results remains high. Patients with post-traumatic coxarthrosis make up from 17 to 80 %, with ANGBC due to dislocation make up to 10-26 %. At the outpatient stage, post-traumatic changes of the hip joint are detected in 60-90% of patients, and a third of them need endoprosthetics [8].

Injuries of the acetabulum range from 7 to 25 % in relation to all pelvic fractures [11] and in most cases are the result of high-energy trauma and a component of polytrauma [12]. In recent decades, there has been an increase in the number of patients who have suffered damage to the acetabulum as a result of road accidents [9]. The consequences of severe pelvic injuries significantly reduce the quality of life and are often the cause of disability [14]. Treatment of patients with traumatic injuries of the acetabulum is a complex orthopedic task. Due to the significant traumatic force characteristic of this type of damage, life-threatening conditions requiring emergency intervention (traumatic shock, damage to internal organs, bleeding) are corrected [9]. There is no consensus on the choice of the time of surgical intervention, the method of reposition, the type of osteosynthesis and surgical access [13]. Transosseous and open-joint osteosynthesis, as well as their combinations, are actively used [3], in some cases it is possible to perform hip replacement in the late post-traumatic period [10]. Even an adequately performed osteosynthesis does not always allow to achieve the desired result.

In most cases, one of the limited anterior or posterior accesses can be used in case of a BB fracture [16]. The use of extended or combined approaches is associated with an increase in intraoperative trauma, surgery time, blood loss, the risk of infectious and neurological complications, the development of TBS contracture and heterotopic ossifications [14].

Characteristics of possible surgical approaches for various types of fractures in accordance with the classification of Judet and Letournel (1964)

№	Fracture type	Tile M.	Mayo K.	Matta J.	Jimenez M.
1	Back wall	K-L*	K-L		K-L
2	Back column	K-L	K-L	K-L	K-L
3	Front wall	Л***	11	И	И
4	Front column	I1 / I1 f	И	И	Il/Ilf
5	Transverse	K-L	K-L	K-L/11	
6	Back wall and back column	K-L	K-L		
7	Cross and back wall	K-L	K-L	K-L	
8	Front column and rear semi-transverse	I1 / I1 f	И	11	11
9	T-shaped	K-L/Il, K-L + л**** /E-I1P*	K-L / И	K-L + 11 / E-Ilf	K-L /11
10	Fracture of both columns	11 / E-Ilf / E-Tr	11		И
11	Fracture ten days or more ago, fracture of the ilium with damage to the ilio-sacral joint.			E-Ilf	E-Ilf/ E-Tr

Notes: * K-L - Kocher-Langenbeck; ** E-Ilf - Extended iliofemoral; *** I1 - Ilioinguinal; **** K-L + H - combined access (Kocher-Langenbeck + Ilioinguinal); ***** E-Tr - Extended triradiate.

However, the reposition of complex fractures with damage to both columns, performed 2, 3 weeks after injury, requires the use of wider access to the area of damage [18].

The anterior ilio-inguinal approach was developed by Letournel E. in the early 60s of the last century [13] to restore damage to the anterior wall, column, pelvic regions located distal to the pectineal eminence. Through three operative windows (lateral, middle, medial), access to the internal iliac fossa, the anterior surface of the ilio-sacral joint, tetrahedral surface, posterior column, superior branch of the pubic bone, symphysis is possible. Reposition of IV fragments begins from the periphery to the articular surface of the IV and ends with provisional stabilization.

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