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THE PRINCIPLE OF TREATMENT OF FRACTURES OF DISTAL METAEPIPHY- SIS OF THE FOREARM BONES AND THEIR CONSEQUENCES IN PERSONS OF GERONTOLOGICAL PROFILE

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The paper presents data on the treatment of distal metaepiphysis of the forearm bones (beam in the "typical place") and their consequences in persons of gerontological profile. A retrospective analysis of 500 medical records of elderly and senile patients with fractures of the radius in the "typical place", who sought emergency medical care, was also used in the work of clinical material for the treatment of 57 patients with developed neuroischemic disorders after fracture of this localization. A significant amount of clinical material revealed the main errors and complications in the treatment of fractures of this localization in this category of patients. The reasons of their occurrence and ways of overcoming are analyzed.

Keywords: distal metaepiphysis bones of the forearm, persons of elderly and senile age, neuroischemic complications.

According to the UN, people over the age of 60 will make up one third of the world's population [7]. According to leading sociologists, Russia is one of the countries where the share of people of older age groups is increasing and approaching 20% of the total population; the number of older people (60 years and older) today is 29 million people and is projected to continue to increase, reaching 39.5 million people by 2021 (i.e. more than a quarter-26.7% - of the total population of the country) [2]. At the same time, it becomes relevant to create conditions and preserve the potential of older generations, the leading dominants of which are health, independent living and the possibility of professional activity.

It should be noted that injuries among elderly and senile citizens do not decrease. According to European research-

ers, the proportion of people in this age group is 40% of all those seeking emergency trauma care [9].

Injuries in the area of the distal metaepiphysis of the radius and forearm bones (the so-called "beam fracture in a typical place") are the most common among all injuries of the adult population: the proportion of this damage in older age groups is more than 25% [6]. At the same time, the percentage of unsatisfactory treatment results, exceeding 50%, remains high [4]. If we take into account the presence of orthopedic chronic pathology in this population group in the form of osteoporosis and osteoarthritis, osteochondrosis, which accompany the aging process of the body, then improving the care of elderly and senile people with fractures of the distal metaepiphysis of the radius and forearm bones is the most important task of the traumatological and orthopedic service.

The aim of the study: a comprehensive analysis of the conditions for optimal treatment of fractures of the distal metaepiphysis of the radius and forearm bones in elderly and senile people. To achieve this goal, the following tasks are solved in the work: 1) to identify age-related features that determine the course of the traumatic process in fractures of the distal metaepiphysis in elderly and senile people; 2) to consider the best ways to treat fractures of this localization in people over 60 years of age; 3) to determine the specifics and causes of adverse outcomes in the treatment of fractures of the distal metaepiphysis of the radius in persons over 60 years of age; 4) based on the analysis of the data obtained, to clarify and summarize the clinical recommendations for the treatment of the distal metaepiphysis of the

radius and forearm bones in elderly and senile people.

Materials and methods: the study was conducted on the basis of the city Clinical Hospital No. 1 named after N. I. Pirogov and the Russian Gerontological Research and Clinical Center in Moscow. The data of 240 computed tomographic studies of the distal metaepiphysis of the radius and forearm bones in persons over 60 years of age were analyzed; a retrospective analysis of 500 case histories of patients of the specified age with fractures of the radius in a "typical location", who sought emergency medical care in and 57 patients treated in for neuroischemic complications after a fracture of the distal metaepiphysis of the radius in the period 2015-2018. The study included patients over 65 years of age, the average age was 76.6 ± 0.5 , the majority of 81.5% were female.

The results of the study and their discussion: according to the data of a large hospital of the megalopolis of the N. I. Pirogov State Clinical Hospital No. 1, Moscow, in 2015-2018, the number of elderly and senile people was more than 41.9% of all those seeking emergency trauma care. Among them with fractures of the distal metaepiphysis of the radius and bones of the forearm - 21.4%, which accounted for 43.7% of all fractures of the upper limb. In 81.5% of cases, they were female. Analysis of the data of 240 tomograms of the distal metaepiphysis of the forearm bones in elderly and senile individuals indicates a bone-destructive reconstruction of this part of the forearm, expressed in sclerotic changes in the trabeculae of the bone matrix, which was revealed in 98% of cases, in 32% of cases with the formation of "voids" in the form of cystic rearrangement of the bone tissue

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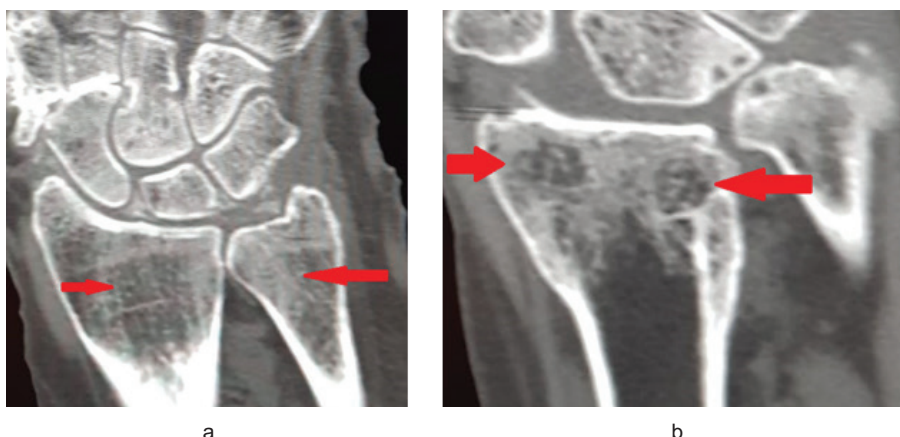


Fig. 1. Spiral computed tomography of the wrist joint in persons over 70 years of age, bone-destructive reconstruction of the distal metaepiphysis of the forearm bones, sclerotic changes in the bone matrix trabeculae (a), the formation of "voids" in the form of cystic bone tissue rearrangement (b) - indicated by arrows

(Fig. 1 a, b), as a result of which, in fractures of the distal metaepiphysis, the articular surface is "crumpled" and its subsidence even after adequate traction and reposition [1]. Kneading of the spongy bone is the cause of shortening of the radius during the fusion of fragments. As a result, the protruding head of the ulna is located distal to the articular surface of the radius, and the wrist joint expands significantly against the background of this displacement (Fig.2). Often, in addition to damage to bone structures, there is a complete rupture of the ligaments of the lower radiolocular joint and, as a result, displacement of the distal end of the ulna, which leads to repeated displacement of fragments and deformation of the forearm [5].

A retrospective analysis of 500 medical records of patients over 60 years of age with fractures of the distal metaepiphysis of the radius and forearm bones indicates that the main method of treatment for this injury is conservative. However, in 246 (48.9%) cases, the occurrence of secondary displacement of fragments was noted, which in 142 cases (28.4%) was accompanied by the development of persistent pain syndrome and in 64 cases (12.8%) by neuroischemic complications of varying severity. The main reasons for the secondary displacement of fragments, as already noted above, are not only the rough compression of the spongy bone tissue against the background of osteosclerosis, which leads to the destruction of bone beams, causing the "subsidence" of the distal fragment in the process of regeneration, but also a violation of the algorithm of conservative treatment, which was revealed in 83 cases (16.6%): refusal of primary reposition in the presence of a slight displacement



Fig. 2. Features of changes in fractures of the distal metaepiphysis in individuals of the gerontological profile: a- "creasing" of the articular surface; b – standing of the head of the radius; c-increase in radioulnar diastasis-indicated by arrows

of fragments, the use of a "bespodkladnoy" plaster splint during primary immobilization, refusal to "band up" the longuette as the edema subsides and the plaster longuette is replaced with a circular plaster cast, and, finally, the untimely termination of immobilization. Analysis of the results of treatment of patients with advanced neurotrophic disorders after fractures of the distal metaepiphysis of the radius and forearm bones allowed us to determine the main causes of these terrible complications: significant displacement of fragments; pronounced edema in the fracture area; rough reduction of fragments during reposition; the use of a "non-lining" plaster splint, its tight bandaging; compression of soft tissues with a circular plaster cast; exceeding the terms of immobilization by more than 2 times; violation of the patient's management in the rehabilitation period. We have

identified and determined the indications for surgical treatment of fractures of the distal metaepiphysis of the radius and forearm bones in elderly and senile people, the main of which are: open nature of the damage, pronounced displacement of fragments (including secondary), accompanied or threatened by a violation of the function of the hand, compression of nerve trunks, damage to tendons. At the same time, it is important to strictly control the operational risk, since almost 100% have severe somatic diseases that can worsen in the process of both injury and treatment. Surgical treatment for osteoporosis requires a special approach to the choice of the method and technique of surgery in order to avoid the development of instability, non-fusion of the fracture, as well as drug therapy using drugs that accelerate the consolidation processes [3]. Taking into account the above, 23 patients (4.6%) were operated on for emergency indications: 7 of them had open injuries, 20 had a rough displacement of the fragments during manual reposition. At the same time, as the primary method of immobilization, an external fixation device was used, on two half-rings, which allowed not only to adequately treat the wound in the case of open damage, but also to carry out the traction of fragments in order to reduce the "creasing" of the articular surface. Subsequently, pre-modeled plates with angular stability were used.

With the development of neurotrophic complications, the most acceptable option is a step-by-step surgical treatment: the first stage is performed neurolysis, then after the rehabilitation period (4-6 weeks) - surgery on bone structures. In this way, 57 patients over 65 years of age with a good clinical result of treatment were treated at the Research Institute of Gerontology in Moscow.

Preoperative planning was carried out on the basis of clinical and anamnestic examination and additional diagnostic methods: computed tomography (to clarify and objectify the degree of displacement of bone structures) and ultrasound (ultrasound) for the study of soft tissue structures (tendons and nerve trunks [9].

The analysis of the results showed that in 25 cases (43.8%), the operated patients had polypodal combined nerve compression in several zones. Carpal tunnel syndrome was most common – in 45 cases (78.9%). Guyon canal syndrome was detected in 28 patients (49.1%), of which isolated Guyon canal syndrome was detected in only 5 (8.8%) cases. In 22 (38.9%) cases, a combination of carpal canal and Guyon canal

syndrome was observed, and in 3 (5.3%) - a combination of the cubital canal and Guyon canal. Relatively rarely, cubital canal syndrome was detected – in 11 cases (19.3%), Wartenberg syndrome (compression of the superficial branch of the radial nerve) – in 4 cases (7%).

Clinical example: patient P., 74 years old, who continues to work as a jeweler, as a result of a fall, received a fracture of the flexor distal metaepiphysis of the right radius with a displacement of fragments (according to the Smith type) (Fig.



Fig. 3. Radiographs of patient P., 74 years old at admission

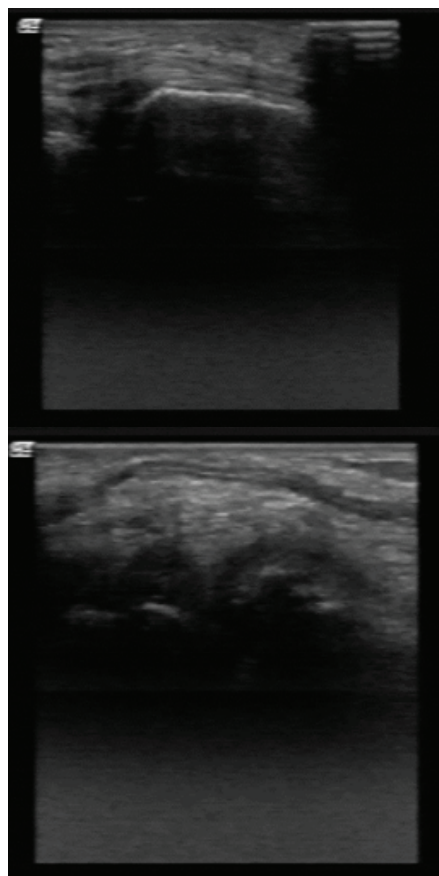


Fig. 4. Ultrasound of the right wrist joint of patient P., 74 years old: carpal tunnel syndrome. Synovitis

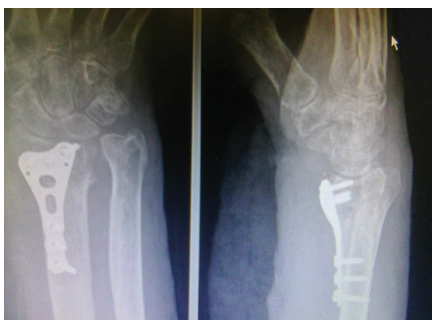


Fig. 5. Radiographs of patient P., 74 years after surgical treatment



Fig. 6. Functional result 6 months after the surgical treatment

3). Within 6 months after removing the plaster immobilization, he was treated conservatively for severe pain and limited movement in the fingers of the hand. He turned to the Research Institute of Gerontology with clinical signs of neuroischemic complications in the form of neuropathy of the median nerve. Ultrasonography revealed signs of compression of the median nerve in the area of the carpal canal, which were expressed in the unevenness of its diameter: an increase in the diameter of the nerve at the entrance to the bone-fibrous canal (before compression) and a decrease inside the canal (after compression) (Fig.4). At the same time, the nerve section with an increased diameter (for 0.5 cm) had an

undifferentiated hypoechoic structure. In addition, in the proximal part of the canal (before the compression zone), a thickening of the nerve was determined by the type of edema syndrome of the nerve trunk and a decrease in its diameter in the canal (the place of compression). Surgical treatment included 2 stages. At the first stage, neurolysis of the median nerve was performed. In the postoperative period, the patient received drug therapy aimed at improving microcirculation and stimulating the restoration of nerve function. A month later, the 2nd stage of surgical treatment was performed: osteotomy, bone osteosynthesis of the radius with bone autoplasty (bone graft from the iliac crest) (Fig. 5). The functional result was evaluated as excellent after 6 months (Fig.6).

Conclusions: the analysis of the conducted studies suggests that in patients over 60 years of age, it is necessary to take into account the type of fracture of the distal part of the forearm bones and all components of the damage, the features of the structure of bone structures associated with age-related changes. Thus, in open fractures, as the primary method of stabilization, it is advisable to use an external fixation device, followed by submerged osteosynthesis; in case of incorrectly fused fractures – osteotomy with the use of a premodeled plate and bone-plastic material, in case of incorrectly fused with the development of neuroischemic complications-step-by-step treatment of neurolysis with the imposition of an external fixation device, followed by bone osteosynthesis and the use of bone-plastic material.

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MANDIBULAR ANESTHESIA BY THE GOW-GATES METHOD

Despite the extensive study of local anesthesia in dentistry, problems of safe and anaesthesia quality improving remain unsolved. At the same time, one of the important aspects of adequate local anesthesia is knowledge of the anatomical-topographic features of the maxillofacial area, which have their own age and gender differences. In this regard, researches improving local anesthesia with anatomical features is of important theoretical, scientific and practical importance. **The research aim** is to increase the accuracy of determining the topography of the target point in condylar process neck by Gow-Gates mandibular anesthesia method. **Materials and methods.** A total of 91 lower jaws (49 males, 42 females) were studied, and 108 CT scans were analyzed. Statistical processing was carried out with the SPSS software package, version 22. Correlation and factor (by Varimax method) analyses were performed with Pearson coefficient (r). **Results.** Individual anatomical and topographic features of the mandibular ramus were obtained, which influence on the exact determination of the target point and needle immersion depth during Gow-Gates mandibular anesthesia. Thus, we have developed Ushnitsky-Chakhov's device for mandibular anesthesia using the Gow-Gates method. Discussion. The advantages of this device are the precise determination of the injection needle direction in the area of the mandibular condylar process outer surface, which eliminates the use of complex and difficult-to-remember anatomo-topographic points for the dentist, which are used in the standard mandibular anesthesia by Gow-Gates method. **Conclusion.** Determination of target point topography by Gow-Gates mandibular anesthesia method is carried out by the device that promotes more accurate delivery of the injection needle tip to the inner surface of the condylar process neck of mandibular ramus, which increases the safety and effectiveness of anesthesia. Traumatic injuries of maxillary artery, tissues of temporomandibular joint, mandibular neuro-vascular bundle and lateral pterygoid muscle are excluded or minimized as much as possible.

Keywords: anatomy and topography, mandible, local anesthesia, safety, effectiveness.

Introduction. Today the priority tasks of health care development are the quality improvement of medical and preventive care with the introduction and application of innovative technologies, which will directly have a positive impact on the preservation and improvement of public health [18, 32]. In practical dentistry, one of the important factors is qualitative anesthesia in the medical care provision, which is accompanied by effective methods search [1, 4, 12, 17, 19, 20]. It should be noted that the effectiveness and safety of anesthesia conductor methods and quality of medical interventions depend on anatomy and topography knowledge of the maxillofacial region, which have

age and gender features [2, 3, 5-17, 21-27, 29, 30]. In Researches improving the quality of local anesthesia, taking into account the anatomical and topographic features of the maxillofacial area, have important scientific, theoretical and practical significance [17, 28, 31, 33].

The research aim is to increase the accuracy of determining the target point topography in condylar process neck by Gow-Gates mandibular anesthesia method.

Materials and methods. A craniometric study by V.P. Alekseev, G.F. Debets methods was conducted to identify the anatomical and topographic variability of the lower jaw data (1964). Determina-