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DEVELOPMENT OF MINIMALLY INVASIVE TREATMENT METHODS FOR BENIGN CANCER AND TUMOR-LIKE DISEASES OF LIMB BONES IN CHILDREN AND ADULTS

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Cancer is the second leading cause of death after cardiovascular disease. According to various data, in the general structure of neoplasms , bone tissue tumors account for 1-4.5% of cases [7]. Tumors and tumor-like diseases of the bone tissue are common both in Uzbekistan and abroad. The World Health Organization (WHO) reports that the incidence of benign tumor diseases of the musculoskeletal system is 2.5-5.2% of all tumor diseases [10]. According to the Lyon International Agency for the Study of Cancer, lesions of the bones of the forearm range from 2 to 10%, tumors of the bones of the hand - 7-13%, the humerus is affected in 0.6%, the scapula in 3.0%, the ilium in 10.6%, femur in 28.5% of cases, tibia in 12.8% of cases, fibula in 2.7% of cases [4, 8]. Over the past decade, the growth of bone pathology has increased by 1.5 times, which led to an increase in the number of disability due to the loss of a limb, which proves the relevance of research conducted in recent years [6].

Methods of minimally invasive surgical manipulations are actively developing with the development of high-tech equipment with the possibility of using it in children [3, 5]. This will help decide how safely for patients to allow diagnostic and surgical procedures [2]. X-ray control during diagnostic and surgical procedures makes it possible to find out how safe the access is [1, 9].

Considering that minimally invasive techniques are not widely used in onco -orthopedics , the development of minimally invasive surgical methods of treatment is an urgent task today .

Purpose of the study: development of a minimally invasive surgical method for the treatment of benign tumor and tumor-like diseases of the bones of the extremities.

Materials and methods of research:

In 2015-2022, 112 patients hospitalized for tumor and tumor-like diseases of the bones of the limbs were examined in the Department of Traumatology of the Republican Clinical Hospital No. 1, the Department of Orthopedics of the Multidisciplinary Clinic of the Tashkent Medical Academy and the Department of Adolescent Orthopedics of the Republican Specialized Scientific and Practical Medical Center for Traumatology and Orthopedics c The mean age of patients was 38.5 years. There were 60 men (53.4%), 52 women (46.6%). Of these, children were 49 patients 43.7%), adults - 63 (56.3%).

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The number of patients in accordance with the nosological forms of pathology and gender are shown in Table 1, where it can be seen that the bulk of the patients were patients with enchondroma and cystic formation. At the same time, in patients with enchondroma, the frequency of lesions in men and women was relatively the same.

Table 1.

Distribution of patients by nosology and gender (n =112)

Names of nosology	Total		Female		The male	
	n	**%**	N	%	n	%
Bone cyst	49	43.8%	25	22.3%	24	21.4%
fibrous dysplasia	12	10.7%	7	6.3%	5	4.5%
Enchondroma	47	42.0%	17	15.2%	thirty	26.8%
Olier 's disease	4	3.6%	3	2.7%	one	0.9%
Grand total	112	100%	64	57.1%	58	51.8%

The patients were divided into 2 study groups. 57 patients were operated on according to our proposed minimally invasive technique and entered the main group, and the control group consisted of 55 patients who received surgical treatment using traditional methods.

This technique involves the use of navigation CR-X-ray arch, with the aim of intraoperative determination of the level of the focus and the implementation of a minimal incision. The proposed technique is atraumatic , while its implementation is technically simple.

The method is carried out as follows:

The cystic tumor localized in the bone is removed from the patient, with the formation of an intraosseous canal and the preservation of the cortical layer, the cavity is coagulated, treated with hydrogen peroxide and bone wax, and then filled with osteoplastic material.

The technique for performing the developed method is as follows: a cystic tumor localized in a long tubular bone was removed using X-ray navigation using a CR arc, (Fig . 1-a) while before performing a skin incision, using a sterile injection needle, we noted the localization of the pathological focus in the bone under the control of the CR arch (Fig. 1 - b , 3 - b), thus the focus is "marked" (Fig. 1 -c.) After which we made an incision at the level of the needle, 2-4 cm long , then, in a blunt way, with the help of a mosquito, the soft tissues were moved apart in layers. Having reached a long tubular bone, we made an intraosseous canal with a diameter of 1.5-2.0 cm using a drill (Fig. 3-c) , we scraped pathologically altered tissue from the cystic cavity through the intraosseous canal using a surgical spoon.

This process was again controlled using a CR -arc. After removal of the cystic formation, the cavity was treated with a solution of 3% hydrogen peroxide, as well as with an electrocoagulator, repeating this algorithm 2 times. To be sure that all walls after removal of the pathological focus were treated with an electrocoagulator with a special curved tip, X-ray control is again performed using a CR -arc . The cleaned

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cavity was filled with plastic material - granules of the valve or auto-bone (Fig. 1 - d), after which the wound was protected in layers.

We present the following clinical observations:

Example #1. Patient R., born in 1990 case history No. 722/2729 Diagnosis: Bone cyst of the navicular bone of the left hand. The patient underwent a two-projection radiograph and an MRI study of the left wrist joint, where a cystic formation was determined at the level of the navicular bone on the left with signal characteristics characteristic of a cyst. The operation excochleation of the pathological area with the replacement of Kollapan L with granules (Fig . 1, 2).

Figure 1 a, b , c , d . Patient R., born in 1990, case history No. 722/2729. Stages of the operation (description in the text).

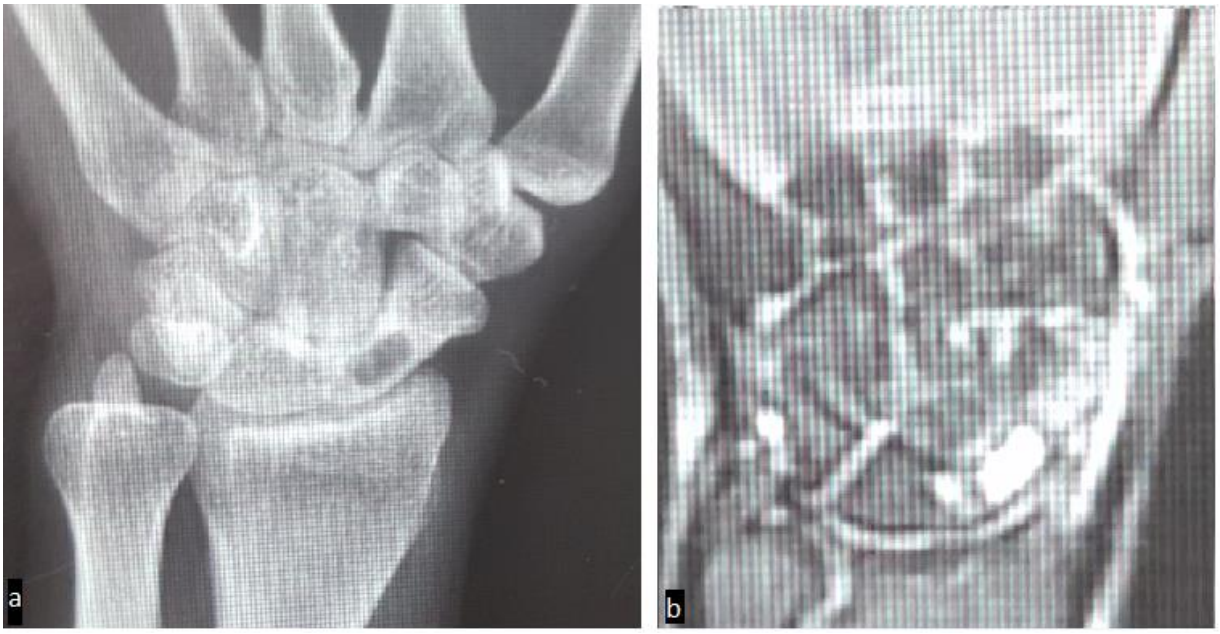

Figure 2. Photoroentgenogram of the left hand (a) and MRI scan (b) of patient R., born in 1990. No. 722/ 2729 (description in the text)

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Example #1. Patient H., born in 1988 Case history No. 5699/1225. Diagnosis: cyst distal epiphysis of both humerus. (Fig. 3.).

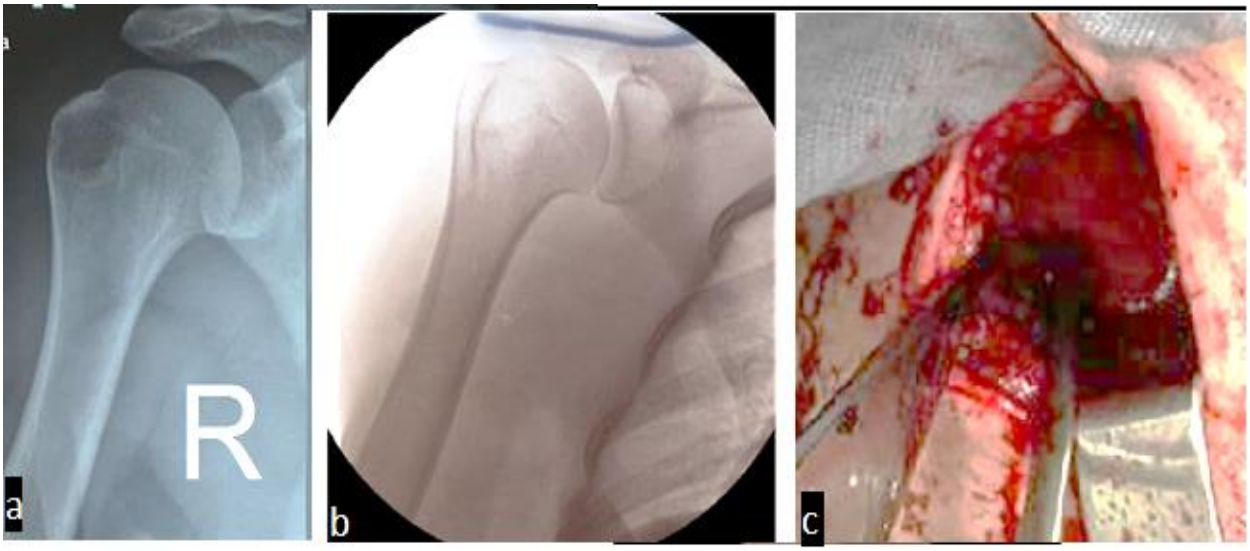

Figure 3. Photoroentgenogram of the shoulder joints in direct projection (a), the stage of the operation for visualizing the shoulder joint using the C R -arm (b), the stage of exposing the bone and forming the perforation channel (c) patient X., born in 1988. Case history No. 5699/1225 .

Intraoperative use of the CR-arc for X-ray navigation during surgical intervention made it possible to reduce the operation time, reduce the size of the incision to 2 cm. Under the control of the X-ray CR-arc, a mark was placed at the level of the lesion using a sterile injection needle. At the level of the needle mark, an incision was made in the skin and fascia, followed by blunt spreading of the soft tissues and exposing the bones. This procedure was more used in the superficial location of the focus of the pathological process (in the region of the lower leg, forearm, hand and foot). When located at the level of the thigh and shoulder, where soft tissues are more massive, an incision was first made above the level of the focus, then the lesion was determined under the control of the CR-arc.

In our proposed method, an intraosseous canal is formed at the site of localization of the cystic formation of the long bones of the limbs, which reduces the traumatization of the surrounding tissues, preserves the surrounding bone tissues to improve regeneration.

Coagulation of the cavity allows the removal of residual tumor tissue to prevent recurrence. After coagulation, hydrogen peroxide treatment is carried out with its fixation for 30-60 seconds. Next, the cavity was treated with bone wax. Treatment with hydrogen peroxide and bone wax avoids prolonged bleeding, which reduces soft tissue trauma.

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The method developed by us for the treatment of cystic formations of long tubular bones with the method of treating the bone cavity after excochleation of the tumor with 3% hydrogen peroxide by electrocoagulation of all internal walls at the level of the pathological focus under X-ray control allows the removal of residual tumor tissues and prevents the development of relapse. If additional hemostasis is required, the cavity is treated with bone wax.

Based on this technique, we have developed a “Method for the treatment of cystic formations of long tubular bones”, for which a patent of the Uzbekistan Intellectual Property Agency for a utility model No. FAP 01415 dated 28.08.2019 was obtained).

Thus, based on the above, we can assume that the minimally invasive method of surgical treatment that we have developed allows for minimally invasive access to the pathological focus in the bone under the control of the CR-wire, is technically simple and atraumatic , the method reduces the time of the operation, which helps to reduce the number of postoperative complications and accelerate the recovery of limb function, prevents the development of relapse.

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