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Osteoblastoclastoma of the acromial end of the clavicle

The aim of the work: to familiarize surgical doctors with the atypical localization of osteoblastoclastoma (OBC) in a child who simulated an aneurysmal bone cyst for the purpose of early diagnosis and treatment of this rare disease.
Materials and Methods. The survey was carried out on the basis of the municipal non-profit enterprise "Ternopil Regional Children's Clinical Hospital" of the Ternopil Regional Council. The patient's outpatient and inpatient documentation has been carefully studied. X-ray examination is standard equipment. Magnetic resonance imaging – Hitachi AIRIS Mate Open-Bore 0.2 MRI device. Histological examination – staining with hematoxylin-eosin, eyepiece x300. We did not find data on clavicle OBC in the available literature, so we consider it necessary to share our clinical observation.
Results. A rare case of osteoblastoclastoma of the acromial end of the right clavicle was described in a patient aged 11 years. X-ray and clinical symptoms were more characteristic of an aneurysmal bone cyst. Histological examination of the removed tumor showed numerous foci of bone destruction with a large number of large spindle-shaped, multinucleated cells, which is characteristic of the lytic stage of osteoblastoclastoma. Five months after the operation, no functional disorders were detected in the patient, the X-ray clearly shows bone regeneration at the site of segmental resection of the clavicle.
Conclusions. Osteoblastoclastoma of the clavicle in childhood is very rare. Clinical and radiological symptoms are not always reliable, the final diagnosis is possible after histological examination. A radical method of treating this disease is surgery. The high ability to regenerate bone tissue in children allows for oxidative resections over a considerable length.

Key words: bone; clavicle; tumor; child; treatment; diagnosis.

Problem statement and analysis of recent research and publications. Osteoblastoclastoma (OBC) is a single, aggressive tumor that most often affects long tubular bones. The tumor is rare, with a frequency of approximately 1.2–1.7 per million person-years, which is 4–5 % of all primary bone neoplasms. 80 % of cases of OBC are diagnosed between the ages of 20 and 50 with a peak of disease between 20 and 30 years [1, 2].

The causes of the appearance and development of the tumor are not completely known. The most common point of view is a polyetiological disease that occurs as a result of the coincidence of adverse internal and external factors. It is believed that this is the result of excessive activity of the RANK/RANKL signaling process by neoplastic mononuclear stromal cells, which cause excessive proliferation of osteoblasts. The molecular criterion is cells with the H3.3pGly.34 mutation. The OBC consists of two types of cells: multinucleated, giant and small, mononucleated, which are located in the middle of the bone [3, 4].

In almost 75 % of cases, OBC is localized mainly in the epimetaphysis. The most common areas in descending order are the distal metaphysis of the femur, the proximal end of the tibia, the distal end of the radius and the sacrum. In almost every second patient, OBC is localized in the knee joint [3-5].

The aim of the work: to acquaint surgical doctors with the atypical localization of osteoblastoclastoma in a child who simulated an aneurysmal bone cyst for the purpose of early diagnosis and treatment of this rare disease. We did not find data on clavicle OBC in the available literature, so we consider it necessary to share our clinical observation.

Materials and Methods. The survey was carried out on the basis of the municipal non-profit enterprise "Ternopil Regional Children's Clinical Hospital" of the Ternopil Regional Council. The patient's outpatient

and inpatient documentation has been carefully studied. X-ray examination is standard equipment. Magnetic resonance imaging – Hitachi AIRIS Mate Open-Bore 0.2 MRI device. Histological examination - staining with hematoxylin-eosin, eyepiece x300.

Results. *Description of clinical observation.* Boy L. is 11 years old. He grew and developed normally, did not get sick. Two months ago, a thickening formed in the area of the distal end of the right clavicle. There was no injury. The tumor gradually increased, which caused discomfort, soreness when wearing a backpack. There was no increase in temperature. At rest, the pain in the clavicle did not bother.

The general condition of the child is satisfactory. Examination revealed an oval thickening of the acromial end of the right clavicle, painless when pressed, with clear contours. The skin over the tumor is of normal color. Peripheral lymph nodes are not enlarged. The abduction of the right shoulder above the horizontal line is limited due to pain.

On a comparative radiograph of the shoulder girdle in direct projection, there is a spindle-shaped thickening of the acromial end of the right clavicle up to three cm in diameter, there is no periosteal reaction. Severe osteoporosis. The cortical layer above the tumor is greatly thinned, swollen, and outlines an elongated single-chamber cyst (Fig. 1).

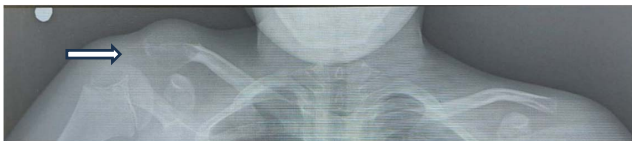

Fig. 1. Patient L., aged 11 years. X-ray of the shoulder girdle. Tumor of the acromial end of the right clavicle.

MRI of the right shoulder joint with a contrast enhancer. A spindle-shaped thickening of the acromial end of the right clavicle, a bone defect, thinning of the cortical layer over the tumor without a periosteal reaction was revealed.

Preliminary clinical diagnosis. Clinical signs, radiograph data and MRI are more likely to be characteristic of an aneurysmal cyst of the acromial end of the right clavicle with manifestations of reactive periarthritis of the shoulder joint.

Operation. Under general anesthesia, suboxidatively, within healthy bone tissue, a tumor of the acromial end of the right clavicle was removed (Fig. 2).

The cavity is treated with antiseptics. The wound is sewn up in layers. The arm is fixed with a Deso bandage.

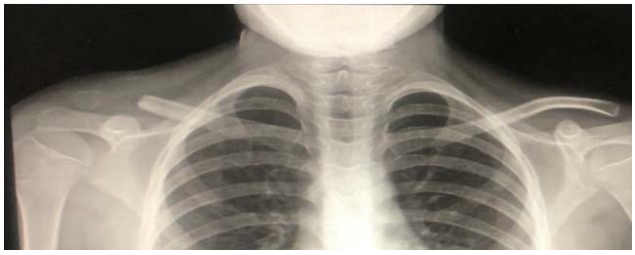

Fig. 2. Patient L., aged 11 years. X-ray of the shoulder girdle. The condition after removal of the tumor of the acromial end of the right clavicle.

Macropreparation. The tumor looks like a bloody clot, is fragile, tuberous, contains small cystic formations filled with blood.

Histological examination. Staining with hematoxylin-eosin, eyepiece x300. The structure of bone tissue with foci of destruction containing a large number of large spindle-shaped, multinucleated cells. Massive hemorrhages. *The conclusion* is a giant cell tumor (osteoblastoclastoma).

Definitive clinical diagnosis. Osteoblastoclastoma of the acromial end of the right clavicle, lytic stage. Reactive periatritis of the right shoulder joint. Painful, adductor contracture of the right shoulder joint.

The wound healed with the initial tension. He was discharged for outpatient observation at the place of residence. The right arm is fixed with a Deso bandage. Five months after segmental resection of the clavicle, the radiograph clearly shows the regeneration at the site of the removed tumor, the axis of the clavicle is correct (Fig. 3).

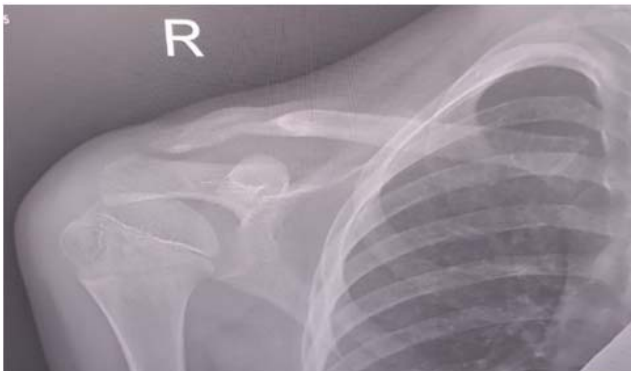

Fig. 3. Patient L. aged 11 years. X-ray of the right clavicle five months after surgery.

Discussion. Previously, OBC was considered a benign formation. Recent scientific studies have shown that the development of the tumor is unpredictable, there is a high probability of its malignant transformation, therefore it is classified as an aggressive neoplasm [1-4].

In most patients, the first signs of OBC do not appear immediately, but several years later, by chance, during an X-ray examination for trauma and pain. Often the first sign of the disease, especially in children, is a pathological fracture that occurs as a result of the destruction of a significant part of the bone. In the process of tumor growth, restrictions on movement in the joint appear, pain during physical exertion increases, which disappear at rest, thickening, and deformation of the bone [3, 4].

Depending on clinical and radiological data, the following main types of OBC are distinguished: 1. *Cell* type. On the radiograph there is a spindle-shaped focus of bone destruction, which has a cystic-trabecular structure, resembling soap bubbles, honeycombs.

2. *Cystic* type. The tumor resembles a large cyst with a small number of septa. The cortical layer above the tumor is thinned, there is no periosteal reaction.

3. *Lytic* type. The tumor is in the form of a structureless enlightenment, there are no septa. The cortical layer above the tumor is thinned, there is no periosteal reaction. This type of tumor was in our patient and simulated an aneurysmal cyst [1–5].

Treatment. Depending on the size and stage of OBC, the tactics will be different. Small OBCs are removed by curettage (curettage). The cavity is treated with antiseptics, liquid nitrogen, acrylic cement. Medium-sized tumors (smaller than half of the diameter of the bone) are removed by marginal resection, followed by bone allo- or autoplasty. Large tumors are removed within healthy bone tissue (segmental resection), and the resulting defect is filled with bone auto-, homo- or heterograft [1-5].

Prognosis: there is a probability of recurrence (from 20 to 30 %) and sometimes its malignant transformation [2–5].

After 5 months of observation of the child, there were no complaints, there were no functional disorders. He is under dispensary supervision.

Conclusions. 1. Osteoblastoclastoma of the clavicle in childhood is very rare.

2. Clinical and radiological symptoms are not always reliable, the final diagnosis is possible after histological examination.

3. A radical method of treating this disease is surgery.

4. The high ability to regenerate bone tissue in children allows for oxidative resections over a considerable length.

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Authors' contribution. Protsaylo M. D. – concept and design of the study, final approval of the manuscript. Fedortsiv O. E. – analysis and interpretation of data; Shulgai O. M. – data collection and ordering. Horishnyi I. M. – provision of research data. Protsaylo O. M. – literature review, manuscript writing.

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ОСТЕОБЛАСТОКЛАСТОМА АКРОМІАЛЬНОГО КІНЦЯ КЛЮЧИЦІ

Мета роботи: ознайомити лікарів хірургічного профілю з нетиповою локалізацією остеобластокластоми (ОБК) у дитини, що симулювала аневризмальну кісту кістки з метою ранньої діагностики та лікування цього рідкісного захворювання.

Матеріали і методи. Обстеження здійснено на базі комунального некомерційного підприємства «Тернопільська обласна дитяча клінічна лікарня» Тернопільської обласної ради. Ретельно вивчено амбулаторну та стаціонарну документацію пацієнта. Рентгенологічне обстеження – стандартне обладнання. Магнітно-резонансна томографія – апарат Hitachi AIRIS Mate Open-Bore 0,2 MRI. Гістологічне обстеження – забарвлення гематоксиліном та еозином, окуляр х300. У доступній літературі даних про ОБК ключиці ми не знайшли, тому вважаємо за потрібне поділитися нашим клінічним спостереженням.

Результати. Описано рідкісний випадок ОБК акроміального кінця правої ключиці у пацієнта віком 11 років. Рентгенологічні та клінічні симптоми були більш характерними для аневризмальної кісти кістки. Оперований – сегментарна підокісна резекція акроміального кінця правої ключиці в межах здорової кісткової тканини. Гістологічне обстеження видаленої пухлини показало численні вогнища деструкції кістки з великою кількістю крупних веретеноподібних, багатоядерних клітин, що характерно для літичної стадії ОБК. Через п'ять місяців після операції функціональних розладів у пацієнта не було, на рентгенограмі чітко видно кістковий регенерат на місці сегментарної резекції ключиці.

Висновки. Остеобластокластома ключиці у дитячому віці є великою рідкістю. Клінічні та рентгенологічні симптоми не завжди є достовірними, остаточний діагноз можливий після гістологічного обстеження. Радикальним методом лікування даного захворювання є операційне. Висока здатність до регенерації кісткової тканини у дітей дозволяє здійснювати підокісні резекції на значному протязі.

Ключові слова: кістка; ключиця; пухлина; дитина; лікування; діагностика.

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