

Surgical difficulties of osteochondroma excision. Review of 4 cases

Trudności operacyjne resekcji wyrosła chrzęstno-kostnych.
Opis 4 przypadków

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CASE REPORT

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Abstract

Osteochondromas constitute one of the most common benign bone tumours. They can grow in different bones. Surgical difficulties result from osteochondromas located in the pelvis or spine. Sometimes, however, osteochondromas located in long bones can cause surgical issues. The objective of the study was to present surgical difficulties of excising osteochondromas in long bones. Between 2016-2019, 53 patients with osteochondromas were treated, including 41 in long bones. Difficulties occurred when osteochondromas grew in the area of the neurovascular bundle and caused pressure - one patient experienced damage to the brachial artery. Problems occurred with the excision of osteochondromas growing between the tibia and the fibula.

Key words: osteochondroma, surgical difficulty.

Streszczenie

Wyrosła chrzęstno-kostne są jednym z najczęstszych nowotworów łagodnych kości. Mogą wzrastać się w różnych kościach. Trudności operacyjne stwarzają wyrosła zlokalizowane w miednicy lub kręgosłupie. Czasami jednak te zlokalizowane w kościach długich mogą sprawiać problemy operacyjne. Celem pracy było przedstawienie trudności operacyjnych wyrosła chrzęstno-kostnych kości długich. W latach 2016-2019 leczono 53 chorych z wyrosłami chrzęstno-kostnymi, w tym 41 w kościach długich. Trudności występowały, gdy wyrosł rośla w okolicy pęczka naczyniowo-nerwowego i powodowała jego ucisk – u jednej chorej doszło do uszkodzenia tętnicy ramiennej. Kłopoty wystąpiły przy wycinaniu wyrosła rosnącej między piszczelą a strzałką.

Słowa kluczowe: osteochondroma, wyrosła chrzęstno-kostne, trudność chirurgiczne.

Introduction

An osteochondroma is one of the most common benign bone tumours. It comes in two forms: single or multiple. Multiple osteochondromas are congenital constitutional bone diseases. They are mainly revealed in the second-third decade of life. They are most often located in the metaphyses of long bones, especially in the femur, tibia, humerus, and in the case of multiple osteochondromas also in the forearm. Less frequently in flat bones or the spine [1-5]. An indication for surgery is a palpable or even visible tumour. Moreover, they may cause conflict with tendons, for example, goose's foot, fibular muscle tendons and exert pressure on nerves or vessels [6,7]. Such a location results in pain. They can also cause bone deformation. This mainly affects the forearm and shin bones, where two bones are adjacent to each other. An osteochondroma in one of them

deforms the other. This results in disturbance of the limb axis and deformation of adjacent joints. They become malignant in 1-2% of cases [1].

Osteochondromas are treated surgically. It involves excision of the entire tumour at the base with a characteristic cartilage cap. In some cases, surgical difficulties occur. They depend on the tumour location. Difficulties are caused by those that grow in the vertebrae, the inner surfaces of the scapula or the hip bone. They are less common in long bones.

Objective

The objective of the study was to present the cause of surgical difficulties occurring during the excision of osteochondromas in long bones.

Material

Between 2016-2019, fifty-three patients, i.e. 26 women and 27 men, aged 14 to 61, were operated on at the Orthopaedics Department of the Lublin Region Oncology Centre due to osteochondromas. They were located in the femur – 18 cases (proximal metaphysis – 8, distal – 10), the tibial – 17 cases (proximal metaphysis – 15, distal – 2), proximal part of the shoulder – 3 cases, the forearm – 3 cases, the pelvis – 5 cases, the scapula – 3 cases, the foot – 3 cases, the patella – 1 case. The diagnosis and treatment plan were established on the basis of X-ray and computed tomography.

Results

The study included forty-one patients, whose osteochondromas were located in long bones. The indications for surgery involved pain in thirty-two patients, restriction of knee or hip movements in four patients, symptoms of nerve compression in four patients, damage to the vessel in one patient.

We had difficulties during the excision of osteochondromas in the tibia in four patients, including three in the proximal metaphysis, the proximal femur in two patients, the proximal part of the shoulder also in two patients.

The tibia

In three patients, multiple osteochondromas grew in the proximal metaphysis, mainly to the back and to the side, pushing the vascular nerve bundle tightly adjacent to the cartilage cap. All patients experienced symptoms of compression of the peroneal nerve. The bundle was exposed

from the posterolateral approach and moved to the medial side. This allowed us to reveal the base of the osteochondroma and excise it (Fig. 1). In one patient, a single osteochondroma grew from the tibia to the fibula, causing its impression. In this case, the tumour was reached by a lateral incision, revealing the fibula, and after sliding the muscles, the base of the osteochondroma was exposed.

In one patient, the tumour grew from the tibia towards the lateral side of the fibula, tightly adjacent to it and causing its impression. The surgical difficulty was to shift a lot of muscle mass and venous plexuses to expose the base of the osteochondroma.

The humerus

In one 20-year-old female patient with multiple osteochondromas, one of them on the medial side of the proximal part of the humerus, damaged the brachial arteries. The damage occurred as a result of a sudden jerking of the limb while dancing. A large tumour has formed. MRI showed a “fluid cyst” in contact with the artery. After exposure, a large hematoma was found. A vascular surgeon excised the damaged part of the artery and inserted a saphenous vein insert. Then, the osteochondroma was cut out. The vascular connection works well. After a year, this patient had an osteochondroma excised from the proximal metaphysis of the tibia located on the medial side.

Another 26-year-old female patient had a large, broad basal osteochondroma on the medial side of the shoulder, causing pain and symptoms of compression of the median nerve. The neurovascular bundle ran in a depression in the upper part of the osteochondroma. It was necessary to isolate the bundle, mobilize it over a large section and shift it to the posterior side (Fig. 2).

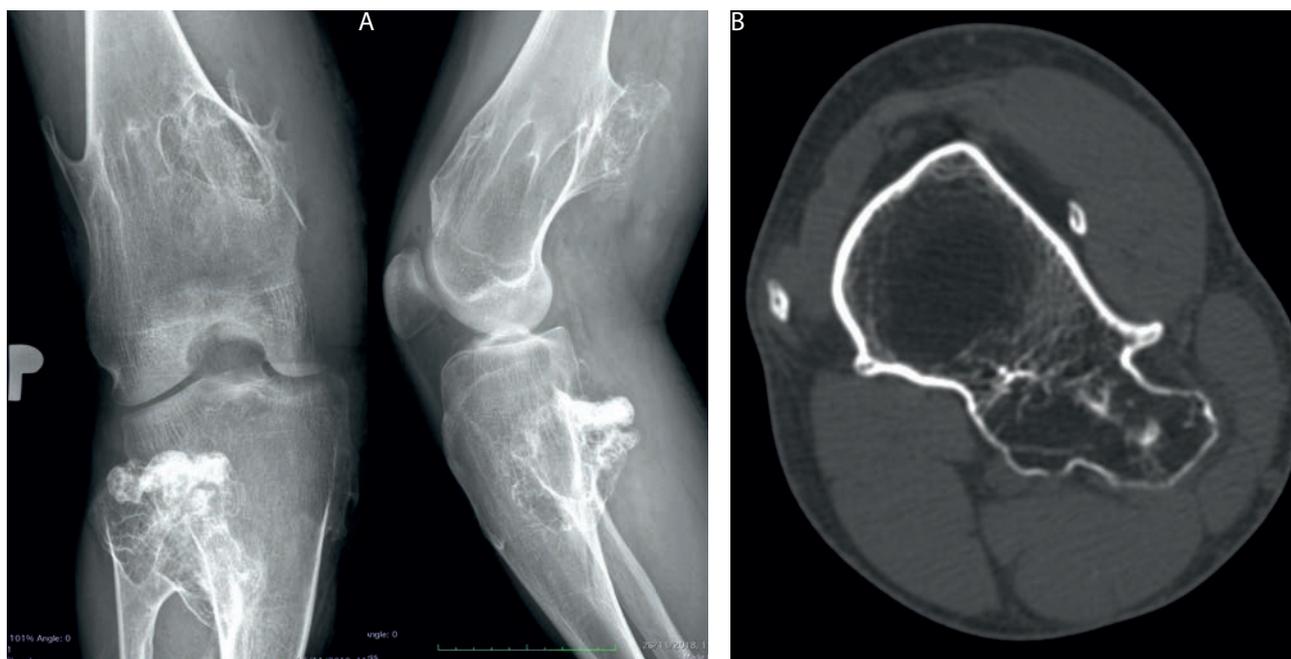


Fig. 1A-B. A – Patient, aged 28, multiple osteochondromas, a large osteochondroma in the tibia that grows posteriorly and to the side. B – CT reveals a dislocation of the neurovascular bundle.

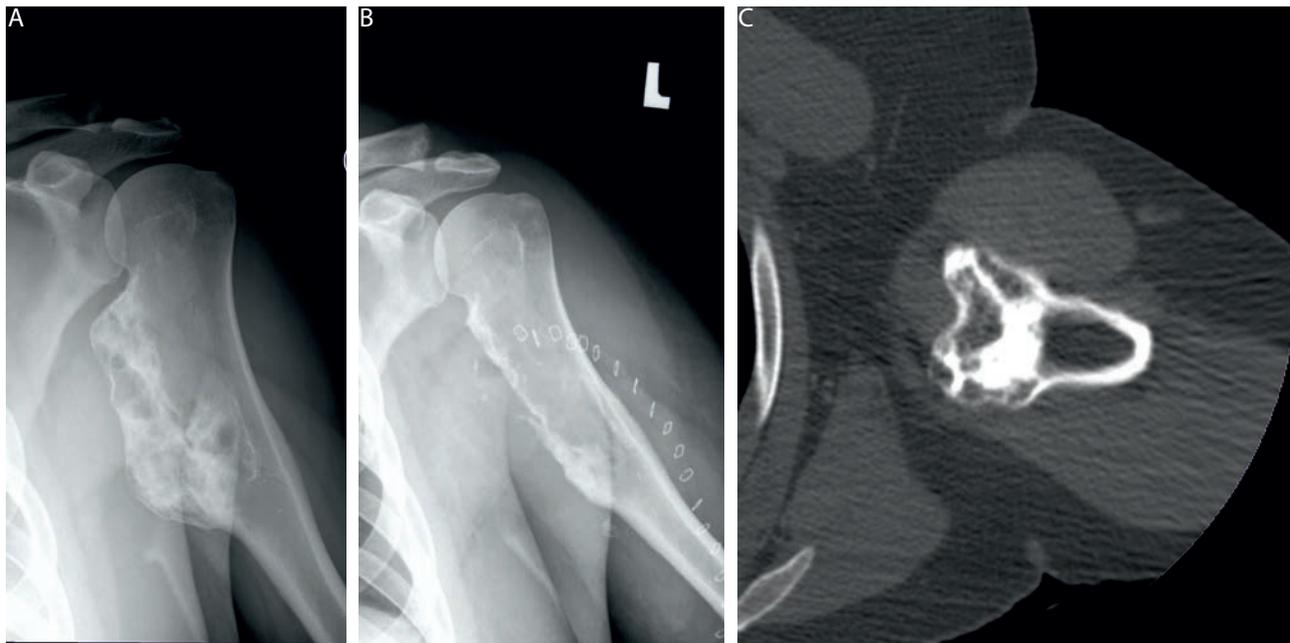


Fig. 2A-C. A-B – Patient, aged 37, a broad basal osteochondroma of the arm. C – CT reveals a depression in the superficial layer of the osteochondroma in which the vessels and nerves lay.

The femur

In two patients, the osteochondromas were located at the base of the neck and the lesser trochanter. They restricted hip movements. In this location, great care is needed to expose the base of the tumour without damaging the posterior branch of the artery surrounding the hip (Fig. 3).

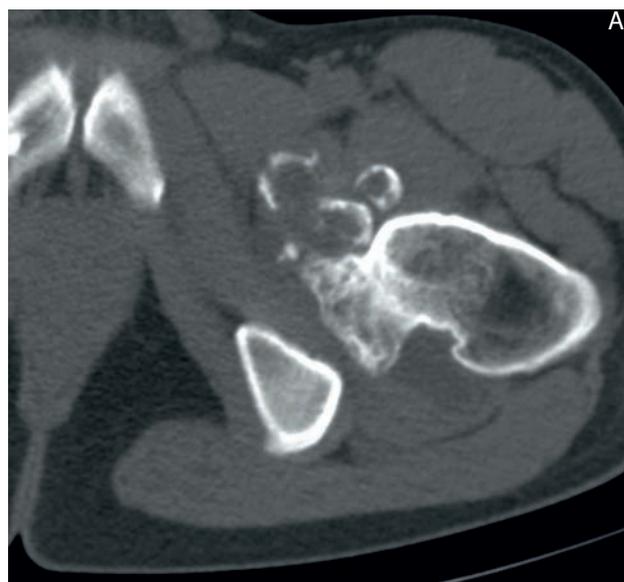


Fig. 3A-B. A-B – Patient, aged 35, an osteochondroma of the femoral neck and lesser trochanter. C – After osteochondroma excision surgery.

Discussion

Osteochondromas are typically located in the metaphysis of long bones. In individual cases, they grow in the pelvis, scapula, or spine. Treatment at this location is difficult due to the extensive scope of surgery and the proximity of vital organs.

The excision of osteochondromas from the area of the metaphyses of long bones is usually not difficult. They occur when the tumour compresses or lies in close proximity to nerves or vessels. We observed pressure on the peroneal and gluteal nerves in four patients out of 41 – 9.7%. Battner et al. found such symptoms in 7% of cases.

The most commonly observed compression of the peroneal nerve is when an osteochondroma grows in the area of the knee. Less often, such symptoms are observed in the arm. In our material, we observed compression of the brachial artery and the gluteal nerve.

Bac et al. observed compression of the arm nerves in 16% of patients. In one case, they observed compression on the brachial artery.

In such cases, surgery requires nerve or vessel isolation, mobilization, and only then excision of the osteochondroma. In some cases, the help of a surgeon of another specialty is needed.

In one of the described case, we had assistance of a vascular surgeon to repair the brachial artery.

Excision of osteochondromas from the hip area is associated with the risk of damage to the sciatic nerve.

Separation of osteochondromas growing from the base of the femoral neck also requires care. There is a risk of damaging the artery surrounding the hip in this location. Other difficulties arise when excising osteochondromas growing between the tibia and the fibula. It is surrounded by a large mass of muscles that needs to be moved close to the venous plexuses.

Summary

Surgical difficulties occur when excising osteochondromas that grow in the vicinity of vessels and nerves, especially in the knee, arm and hip. Another type of difficulties occur when excising osteochondromas that grows between two bones.

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