Case report

Solitary osteochondroma of the capitate, in a child

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ABSTRACT

Osteochondromas, are the most common tumors of the long bones in children. Osteochondromas are extremely rare in the carpal bones. They are diagnosed in adult life, in almost all cases in the literature. We report a 7 year old boy, who presented with a hard mass on the dorsum of his hand, with decreased wrist movements. Radiological examination showed a calcified tumor of the second row of the carpal bones, with spherical shape and covered with cartilage. He was surgically treated with removal of a cartilaginous mass that was arising from the capitate. Pathology confirmed the diagnosis of an osteochondroma.

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1. Introduction

Osteochondromas, although being the most common tumors of the musculoskeletal system, are extremely rare in carpal bones. Only sporadic cases have been reported for solitary osteochondromas arising from carpal bones. Lesions involving the scaphoid, the capitate, the lunate, the hamate and the trapezoid have been reported.^{1–9} Although osteochondromas are benign tumors of children, in almost all cases in the literature, osteochondromas of the carpal bones are discovered in adult age. There is only one, recently published, case report of an exostosis of the hamate, in a child.¹⁰

We report a 7 year old boy, with a solitary osteochondroma of the capitate. He was surgically treated, after a thorough clinical and radiological investigation. We want to draw attention for an extremely rare condition, a benign tumor in the hand of a child.

2. Case report

A 7 year old boy presented with a hard swelling on the dorsum of his left hand. The patient had noticed a difference in the range of movements of his left wrist compared to the right one, while training in swimming. The restriction of wrist movements had occurred during the last year, but the patient and his parents noticed the difference in the shape of his hand just a few weeks

before examination. The boy had never complained of pain in the wrist.

On clinical examination, a distinct prominence, on the dorsal aspect of the left wrist, was palpable. The mass was hard and with a well contoured shape. The overlying skin had normal appearance with no signs of thinning or irritation. The palpable mass appeared immobile, both with the hand at resting position and on wrist dorsal and palmar movements. There was marked limitation of dorsal extension of the left wrist. Movement in radial and ulnar direction was normal, always compared with the ipsilateral hand.

No other prominence was found in his skeleton, and the family history was negative for osteochondromas or other skeletal abnormalities.

Plain radiographs revealed a clear calcified round mass on the dorsal aspect of the second row of the carpal bones Fig. 1A, B.

In order to clarify the origin and precise position of the mass, a CT scan was ordered. The scan showed a well circumscribed mass, arising from the dorsal aspect of the capitate, formed from calcified tissue Fig. 2A, B. No periosteal reaction was observed. MRI was also performed, which showed an area of oedema both to capitate and hamate. After gadolinium injection, no increased uptake was observed around or within the tumor Fig. 3A, B.

The Tc-99 bone scan also revealed positive uptake at the affected wrist.

After clinical and imaging investigation, differential diagnosis included benign tumors like osteochondroma, parosteal chondroma, or atypical Trevor disease.

The patient was surgically treated. A longitudinal dorsal incision was performed over the wrist, through the fourth extensor tendon compartment, with preservation of the extensor

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Fig. 1. A AND B: Initial radiograph AP and lateral, with the round calcified tumor of the 2nd row of carpal bones.

retinaculum and the dorsal wrist capsule. During surgery a solitary chondral lesion was identified arising from the capitate, with a clear basis on the dorsal area of the capitate. Its size was 2 cm by 2 cm and all carpal bones and ligaments appeared intact [Fig. 4](#).

The lesion was excised from its base, and macroscopically appeared as of chondral substance. The specimen consisted of cortical and medullary bone, with overlying hyaline cartilage. Pathology confirmed the diagnosis of osteochondroma.

The boy had an uneventful recovery, with immediate improvement in the arc of wrist motion. One year after operation, there is

Fig. 2. A and B: CT scan with 3D reconstruction.

Fig. 3. A and B: MRI scan of the osteochondroma.

no recurrence, as confirmed with radiological examination Fig. 5A, B. The boy has recovered normal wrist movements.

3. Discussion

Osteochondromas or exostoses are benign bone tumors. Usually they present as painless hard mass near joints, on the metaphyseal region of long bones.

Very few cases of solitary osteochondromas of the carpal bones have been reported in the literature. They describe solitary

Fig. 4. Appearance of the tumor during surgery.

Fig. 5. A and B: xray of the hand, 1 year postop.

osteochondromas of the scaphoid, the lunate, capitate, hamate and the trapezoid.^{1–9}

Decreased range of motion and a hard mass on the wrist are the main symptoms from such lesions of the carpal bones. It is

uncommon to present with pain. Carpal tunnel syndrome and superficial radial nerve compression by a carpal osteochondroma, have been reported.^{11,12} Painful snapping from osteochondroma of the trapezium, rupture of tendons or signs of carpal coalition has also been referred.^{13–18}

Even though osteochondromas are tumors that develop and expand during the period of skeletal growth, osteochondromas of the wrist were diagnosed in adult life. In a series of epiphyseal osteochondromas diagnosed in children, affecting and carpal bones, decreased motion, pain and angular deformities were the main symptoms.¹⁹

To the best of our knowledge, no solitary capitate exostosis in a child has been reported. Only recently, a solitary osteochondroma of the hamate of a child has been described, which was successfully treated with a 3-year follow-up.¹⁰ Previously, an osteochondroma in the scaphoid, was also reported in a 10yrs old child.²⁰

Excision of the lesion is the gold standard for the treatment of osteochondromas. Marginal excision is sufficient, although recurrence may appear for solitary osteochondromas of long bones.²¹

Differential diagnosis include parosteal osteochondroma that is a subtype of exostosis with absence of direct communication with the host bone.²² Osteocartilaginous loose bodies are easily radiologically diagnosed. Enchondromas are lesions with central expansion of the bone, in the hand. Chondroblastomas affect mainly the epiphysis of long bones and appear with calcification.

Children with multiple osteochondromas often have exostosis in the hand. They are usually affecting the phalanges and the metacarpals, but they are also rare in the carpal bones.^{22,23} It is a different entity than solitary osteochondroma.

4. Conclusion

Solitary exostoses of the carpal bones are very rare and usually identified in adult life. We present a unique case of a child with a painless swelling on the dorsal aspect of the wrist, that was a solitary osteochondroma of the capitate. Surgical treatment with excision of the lesion resulted in full recovery of the patient and complete restoration of the patient's arc of wrist motion.

Conflict of interest

None.

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