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Isolated acetabular osteochondroma of the hip

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ABSTRACT

We present a case of isolated intra-acetabular osteochondroma in a 21 year-old male who presented with history of right hip pain for 5 years and difficulty in walking. Patient was managed with excision of intra-articular exostoses through surgical hip dislocation. Intra-articular hip osteochondromas can be a rare cause of hip pain in patients with unexplained etiology, and their diagnosis and management can be challenging.

Introduction

Osteochondromas are common benign osteo-cartilaginous tumors which are commonly found around the knee joint. They are metaphyseal tumors which grow away from the joint line and mostly do not involve the joint.[1] Extra-articular osteochondromas are usually asymptomatic but may become symptomatic in case of fracture, bursitis, neural involvement or malignant transformation. In contrast, intra-articular osteochondromas become symptomatic much earlier due alteration of range of motion, abnormal gait and leg length discrepancy (if present in weight bearing joints).[1] Intra-articular location of these benign tumors has been rarely reported, especially in hip. Intraarticular acetabular osteochondroma have been reported in cases of multiple hereditary exostoses[1–3] but isolated intra-articular acetabular osteochondroma has been reported only twice before.[4,5]

Case report

A 21 year old male presented with complaints of right hip pain for 5 years which was insidious in onset and non-radiating in nature. He presented initially with history of increased pain on walking, which was relieved by rest. But at presentation, the patient had rest pain and difficulty in doing activities of daily living. There were no associated medical co-morbidities and no family history of similar complaints.

Physical examination showed an antalgic gait and painful restriction of the hip (flexion and internal rotation) in terminal range. Laboratory tests were within normal limits. X-ray pelvis showed bony growth in right hip region on medial aspect of femur and acetabulum with lateral subluxation (Fig. 1). CT scan confirmed an exophytic growth arising from right acetabulum with pedunculated stalk of 8–9 cm in long axis and measuring 3 cm along the acetabulum with marked peripheral ossification (Figs. 2 and 3). Further axial CT sections of the pelvis confirmed the origin of the lesion form the floor of the acetabulum (Fig. 4). The lesion was abutting the femur in the region of head and neck with cortical thickening without any erosive changes or attachment. The findings were suggestive of osteochondroma arising from acetabulum. There was also evidence of mild attenuation of right hip joint space suggesting early right hip joint arthritis. There was no history of bony swelling in other parts of the body. Generalized clinical examination also did not reveal any significant bony swelling in any other part of the body.

He was operated with excision of osteochondroma through surgical dislocation of hip with Ganz's approach (Fig. 5).[6] Excision was done piecemeal as the lesions were found as loose bodies as well as a large pedunculated mass inside the joint. All loose osteochondral pieces were removed from the acetabulum (Fig. 6). The fixation of osteotomized trochanteric fragment was done

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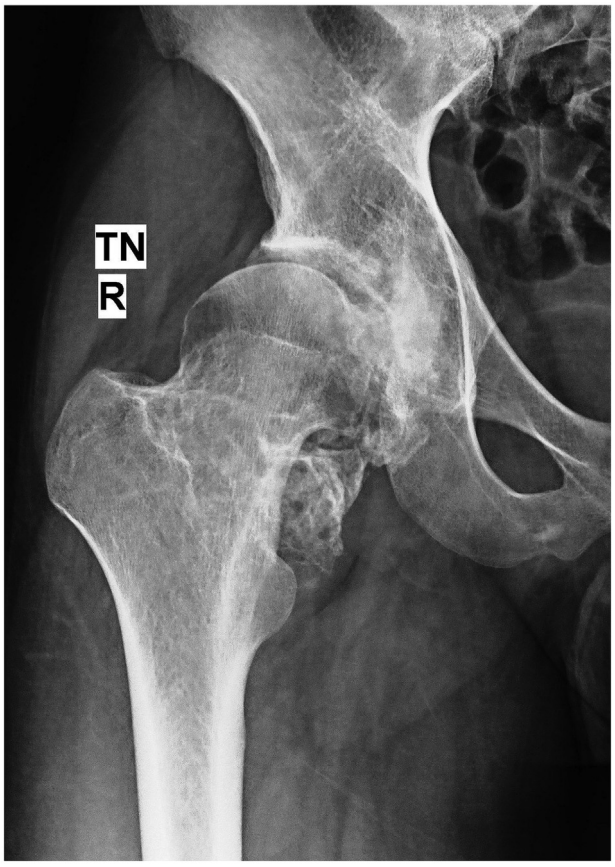

Fig. 1. AP radiograph showing bony mass in hip joint with lateral subluxation of hip.

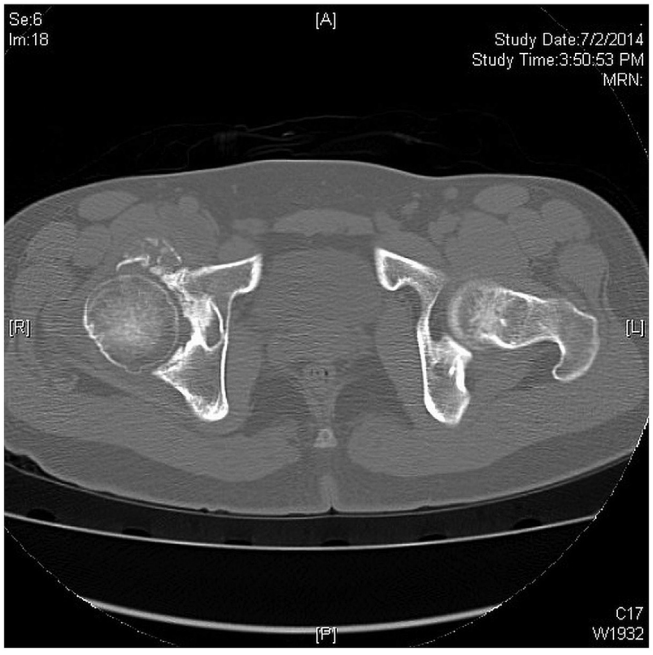

Fig. 2. CT scan showing intra-acetabular osteochondroma with extension to medial aspect of femur.

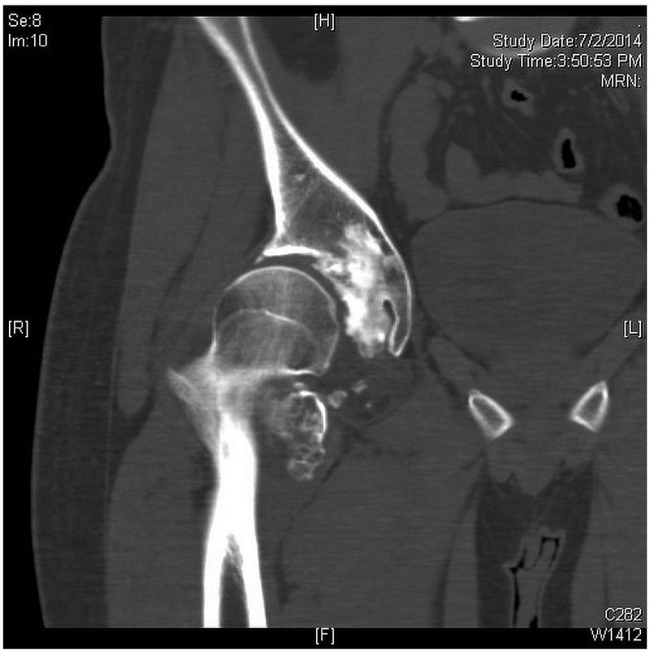

Fig. 3. CT scan showing origin of osteochondroma from right acetabulum with lateral subluxation of femur head.

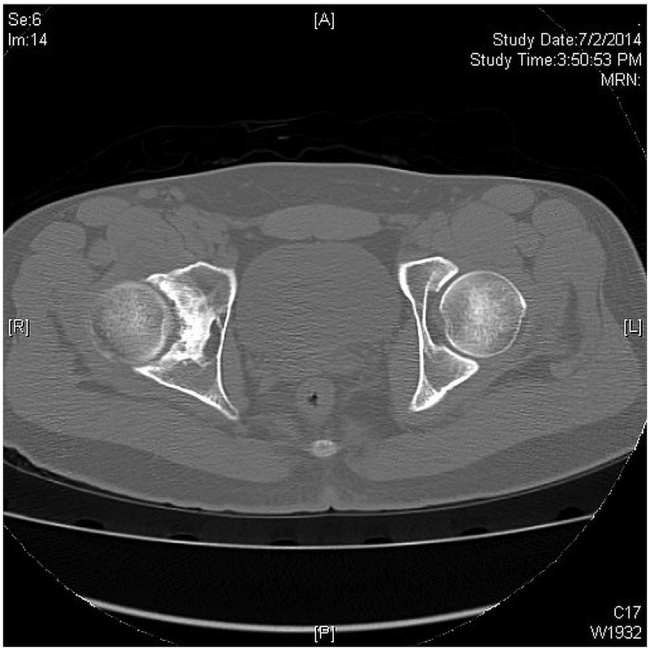

Fig. 4. CT scan with further axial sections showing origin of the lesion form the base of the acetabulum.

with two 4.0 mm cancellous screws. Histopathological examination of the removed osteo cartilaginous specimen showed cartilage thickness from 0.2 cm to 1 cm with cartilaginous cap with bony tissue beneath. Microscopically, the specimen showed cartilage cap of variable thickness made up of moderately cellular

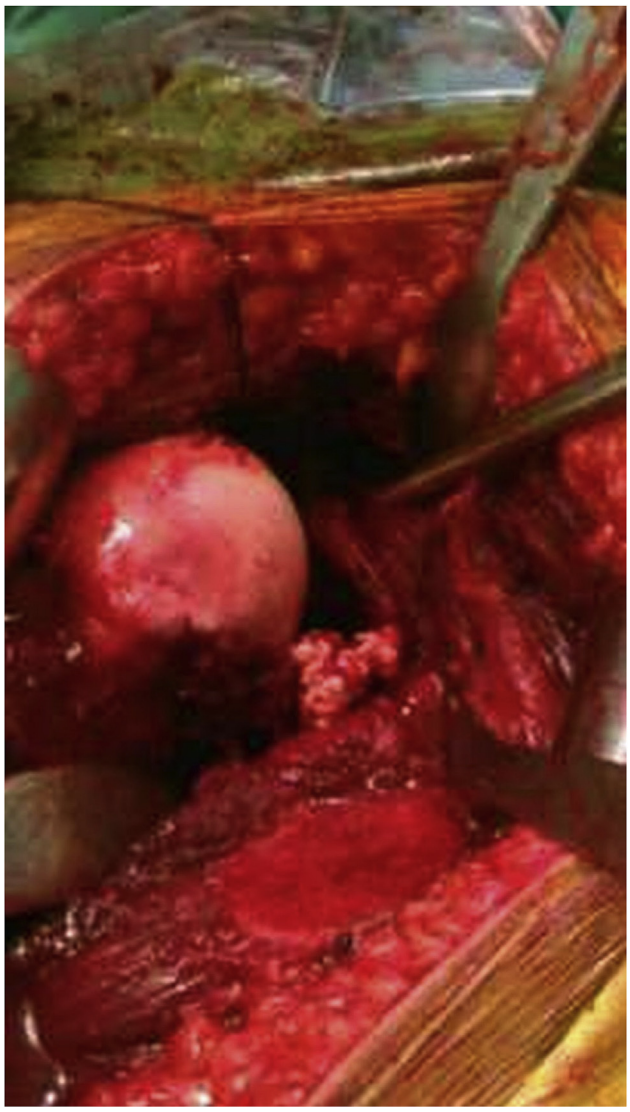

Fig. 5. Intraoperative photograph showing femur head and osteochondroma from the right hip.

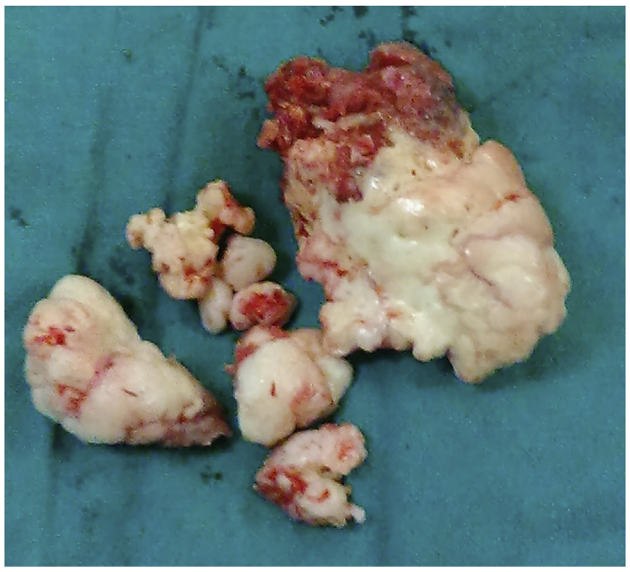

Fig. 6. Photograph of resected osteochondroma right hip with cartilaginous cap of variable thickness.

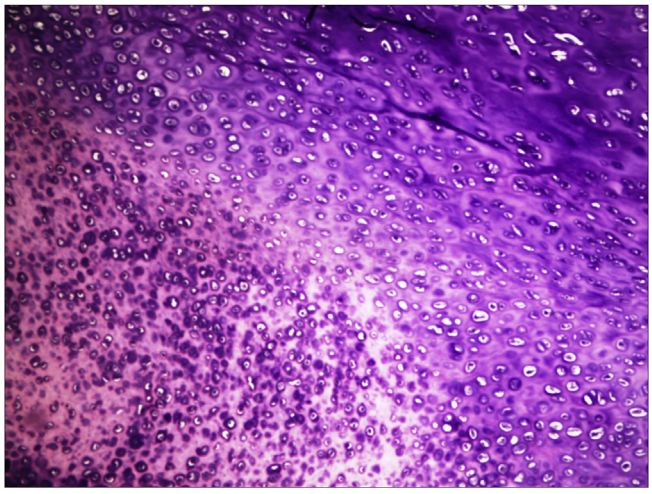

Fig. 7. Photomicrograph (H&E stain) showing moderately cellular hyaline cartilage.

hyaline cartilage. The deeper plane showed active enchondral ossification (Fig. 7). Beneath it were trabeculae of mature lamellar bone separated by poorly cellular vascular marrow (Fig. 8). The lower resolution images of the specimen revealed a covering of perichondrium around the lesion (Fig. 9). There was no evidence of malignancy noted.

The patient was kept non weight bearing for 6 weeks with gradual progression to full weight bearing. At a follow up of 2 years, Harris hip score increased in the right hip, from 62 to 96 and the osteotomy of the trochanter healed well (Fig. 10).

Discussion

Osteochondromas are one of the most common benign bone tumors which are thought to be developmental malformations and usually grow from growth plate of long bones with skeletal growth and ceases with skeletal maturity.[7] These metaphyseal lesions grow towards diaphysis (away from the joint) and arise from periosteum. They are most commonly found at distal femur, proximal tibia and proximal humerus, but may also arise from flat bones like pelvis

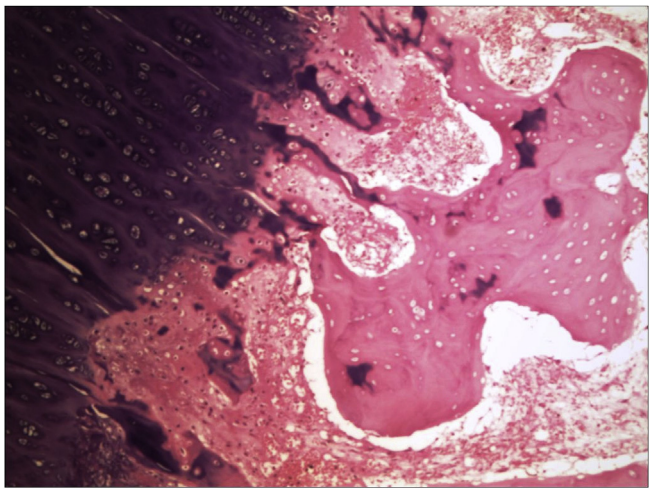

Fig. 8. Photomicrograph of biopsy specimen showing enchondral ossification.

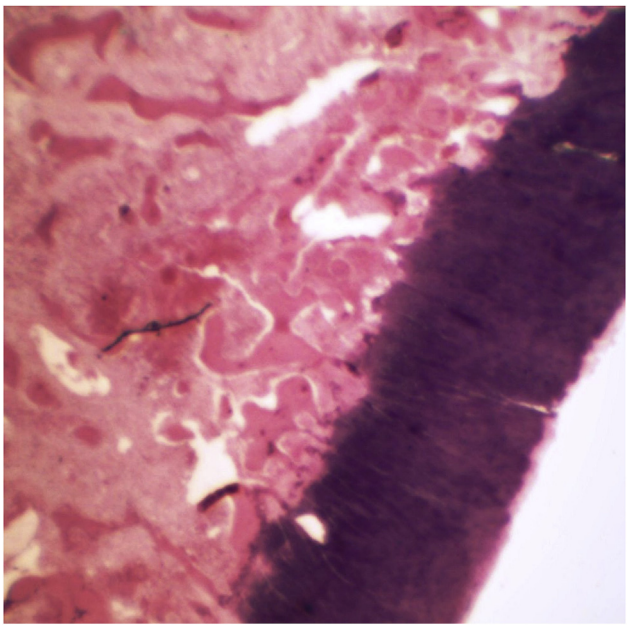

Fig. 9. A low resolution (10×, H&E stain) showing a covering of perichondrium around the lesion.

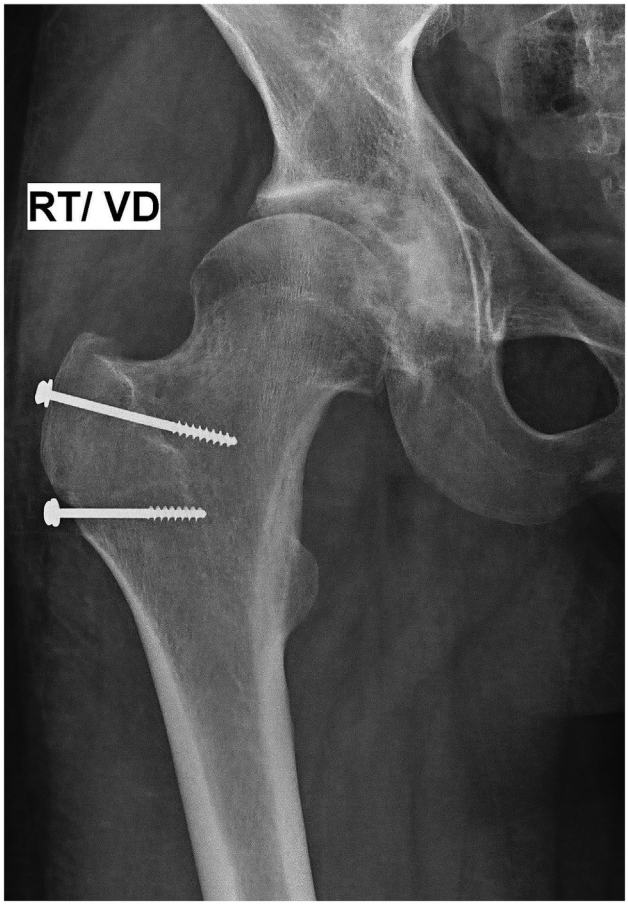

Fig. 10. Follow up radiograph of the patient with fixation of trochanteric fragment and complete removal of acetabular osteochondroma.

and scapula. These cartilage capped lesions have variable thickness of cartilage ranging from 0.2 cm to 1.5 cm and only develop from preformed cartilage.[7] Histologically they show cancellous bone capped with hyaline cartilage with presence of enchondral bone at interface.[5]

Osteochondromas may either present as solitary lesions or in form of multiple hereditary exostoses. These are proven pre malignant lesions with incidence of 1% malignant degeneration in single (isolated) osteochondroma which is usually of low grade chondrosarcoma, compared to hereditary multiple exostoses, where this incidence is many folds higher (about 5%).[7] Their unparallel continuous growth after skeletal maturity should raise the possibility of malignant chondrosarcoma[8] which is differentiated from benign lesion clinically by sudden changes in symptoms in a previously silent lesion and increase in size after skeletal maturity. Radiologically, CT scan shows punctuate calcification. The measurement of cartilage cap thickness has been traditionally used as a marker for malignant transformation. There are reports which suggest a cut-off of 1 cm[9] and 1.5 cm[10] for excision of osteochondromas for concern of malignant transformation. Recently, Bernard et al reviewed radiological and histo-pathological findings of 67 osteochondromas and suggested a specific method to measure the cartilage cap thickness and proposed a cut off of 2 cm to be used universally as a predictor of malignant transformation.[11] Histologically, malignant chondrosarcomas are differentiated by hypercellularity, plump nuclei, permeative pattern and entrapment of bony trabeculae.[12]

The presence of intra articular bony outgrowths in the present case raised a number of diagnostic possibilities like heterotopic calcification, chondrosarcoma, osteochondral fractures, synovial chondromatoses and, rarely, osteochondroma. Heterotopic calcification is usually secondary to an insult (trauma or surgery) and is encountered in the muscles and the soft tissues around the hip joint.[13] Osteochondral fractures may present with intra-articular loose bodies but again they are associated with history of trauma and would usually show a defect in the acetabulum or femoral head (due to detachment of the osteochondral fragment) on CT scan which was not evident in this case.

The closest differential of an intra-articular bony outgrowth is synovial chondromatosis. Although the gold standard for diagnosis remains histo-pathologic confirmation, there were certain features in this presentation in favor of osteochondroma.

Synovial chondromatosis is usually found in the third to fifth decade of life and the origin of the chondroma is the subsynovial cartilage.[14] Synovial osteochondromatosis is the possibility if the lesion is centered within a joint, bursa or tendon sheath while lesion with bony origin favors osteochondroma.[14] In the present case of a 21 year old patient, the CT scan suggested the origin of the lesion as the acetabular floor. Also the histo-pathological examination revealed that the synovium was clear from any pathology.

Another close differential of an isolated acetabular osteochondroma is dysplasia epiphysealis hemimelica (Trevor's disease). Trevor's disease is associated with the presence of osteochondroma of the epiphysis of the long bone. It usually presents in the younger age group [between 2 and 8 years].[15] Although, it is difficult to differentiate an acetabular osteochondroma with Trevor's disease on the basis of the clinical presentation and histopathology, the age at the time of presentation may provide a clue to diagnosis. In the present case, the onset of symptoms coincided with skeletal maturity and hence the diagnosis of acetabular osteochondroma was considered.

Intra-articular hip osteochondroma have been reported in the literature and mostly reported to be arising from the femoral

neck but isolated intra-articular acetabular osteochondroma have been rarely reported.[1–4] Being intra-articular, these lesions can cause mechanical irritation and restriction of hip motion. Osteochondromas, classically, have been described to be either sessile or pedunculated. There is a possibility of finding intra-articular pedunculated osteochondromas but the reported literature has described these lesions as either sessile masses or loose bodies.[4] The reason to this could be that these lesions are under constant shear and strain due to rubbing motion between the two articular surfaces and hence may present as intra-articular loose bodies.

The complications of hip osteochondroma could be malignant transformation, fracture, neurovascular compromise due to mass effect, risk of premature secondary osteoarthritis.[7] Mechanical irritation and restriction by intra-articular hip osteochondroma may cause damage to the underlying cartilage and acetabular labrum causing pain and restriction of range of motion.[16]

Treatment of acetabular osteochondroma should be aimed at removing intra-articular growth thereby relieving mechanical block. At surgery, the condition of underlying cartilage and labrum and repositioning of femoral head should be observed carefully. These lesions have been surgically treated either with an open surgical approach or by arthroscopy.[5,16] We found Ganz's surgical dislocation approach to be very useful and effective. Ganz et al[6] in their series of 213 cases described surgical hip dislocation as a method for approaching hip joint with preserving blood supply of femur head by protecting deep branch of medial circumflex femoral artery. On the other hand, Felly et al[17] reported arthroscopic removal of hip osteochondroma from femoral neck as a minimally invasive approach.

Treatment should consist of complete removal of lesion including cartilage and perichondrium covering it. Inadequacy of removal can lead to recurrence of lesion.[7]

Conclusion

Intra-articular osteochondroma can be cause of unexplained hip pain especially in a young patient. These lesions become symptomatic much earlier than their extra-articular counterparts and may require excision. Surgical hip dislocation (Ganz technique) is a useful procedure for removing intra-articular osteochondroma, which can preserve the vascularity of femoral head. Complete removal of osteochondromas is mandatory to prevent recurrence.

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