

A Multiple Osteochondromas of Lower Limbs, Treatment with Total Hip Arthroplasty

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1. Abstract

Osteochondromas also known as an osteocartilaginous exostosis, or simply as an exostosis, represent the most common bone tumor accounting for 20-50% of benign bone tumors and 9% of all bone tumors [1-3]. We report a 52-year-old case of multiple osteochondromas with hip dysplasia and subsequent degenerative arthritis. This is the first report of total hip arthroplasty (THA) for osteoarthritis secondary to multiple osteochondromas in China.

2. Background

Most osteochondromas are solitary, but approximately 15% of the patients have multiple tumors [4]. Multiple osteochondromas are developed in the context of multiple hereditary exostoses (HME), a rare genetic disorder.

There is not an exact incidence of osteochondromas since many of these patients are asymptomatic. Most commonly occurring in adulthood, this is preceded by sudden growth, swelling, or increased pain about the osteochondromas. The most commonly affected site is the knee, followed by the ilium and scapula. Solitary lesions are rarely located at the spine [5], but 68% of patients with HME have spinal osteochondromas [6].

The most dangerous complication of osteochondromas is malignant transformation [7]. It is estimated that malignant transformation occurs in approximately 1% of solitary osteochondromas and 10% of HME cases. A cartilage cap thickness evaluated by MDCT and MRI greater than 3 cm in children or 2 cm in adults is a sign malignant transformation [8-10].

Nowadays, the mainstay of conservative treatment is observation for asymptomatic osteochondromas. Indications for surgical therapy include pain, complications, cosmetic reasons, increased risk of malignant transformation, and uncertain diagnosis. Complete

resection by removing exostoses at the normal bone base is the recommended intervention. The reported local recurrence after surgical therapy is less than 2%, and thus the prognosis is excellent. In the future, some biological therapies such as retinoid acid receptor gamma (RAR γ) agonists are emerging as a potential treatment for HME.

3. Case Report

A 52-year-old man with a history of pain in bilateral hip with prolonged walking and sporting activities. He denied any injury or family history of similar complaint. The physical examination revealed the range of joint motion was restricted in terms of hip abduction and flexion.

Pelvic radiographs showed both hip dysplasia (acetabular dysplasia and subluxation of the femoral head) and a large number of osseous protuberance were found around the femoral neck, particularly for the left (Figure 1). Both the femoral neck and intertrochanteric area are wide not only anteroposteriorly but also mediolaterally (Figure 2). In addition, there was bilateral space narrowing in both hip, indicated the premature osteoarthritis (OA). For further examination, radiography (full length of lower extremities) showed a large number of osteochondroma found in the right pubis, distal femur, proximal and distal tibia. Bone fusion can be seen between the tibia and fibula. Both the femoral metaphysis and tibial metaphysis are wide noticeably (Figure 3).

In consideration of the asymptomatic in knee and ankle, bilateral total hip arthroplasty decision was made for simultaneous procedure and patient agreed. Surgery was performed in the lateral decubitus position through posterolateral approach. Intraoperatively, tumorous lesions were removed as much as possible and some portion of the remnant femoral neck was removed using an

osteotome and a rongeur when it caused impingement limiting the range of hip motion. TOP Acetabular Cup and LCU cementless stem (Link, Waldemar, Germany), which has proven its good long-term survival with low revision rates were used. After surgery, ordinary postoperative protocols were applied in maintaining hip

position and gradual weight-bearing using crutches was initiated. On the first day after surgery, the pelvic radiographs showed both hip prosthesis were in good position (Figure 4). At one-year follow-up, the range of motion in bilateral hip improved significantly and the patient reported no pain.



Figure 1: Anteroposterior pelvic radiograph. Acetabular dysplasia, subluxation of the femoral head and a large number of osseous protuberance around the femoral neck was noted.



Figure 2: Mediolateral radiograph of hip. Both the femoral neck and intertrochanteric area are wide, particularly for the left.



Figure 3: A teleradiograph of full length of lower extremities. A large number of osteochondroma in the right pubis, distal femur, proximal and distal tibia was noted.

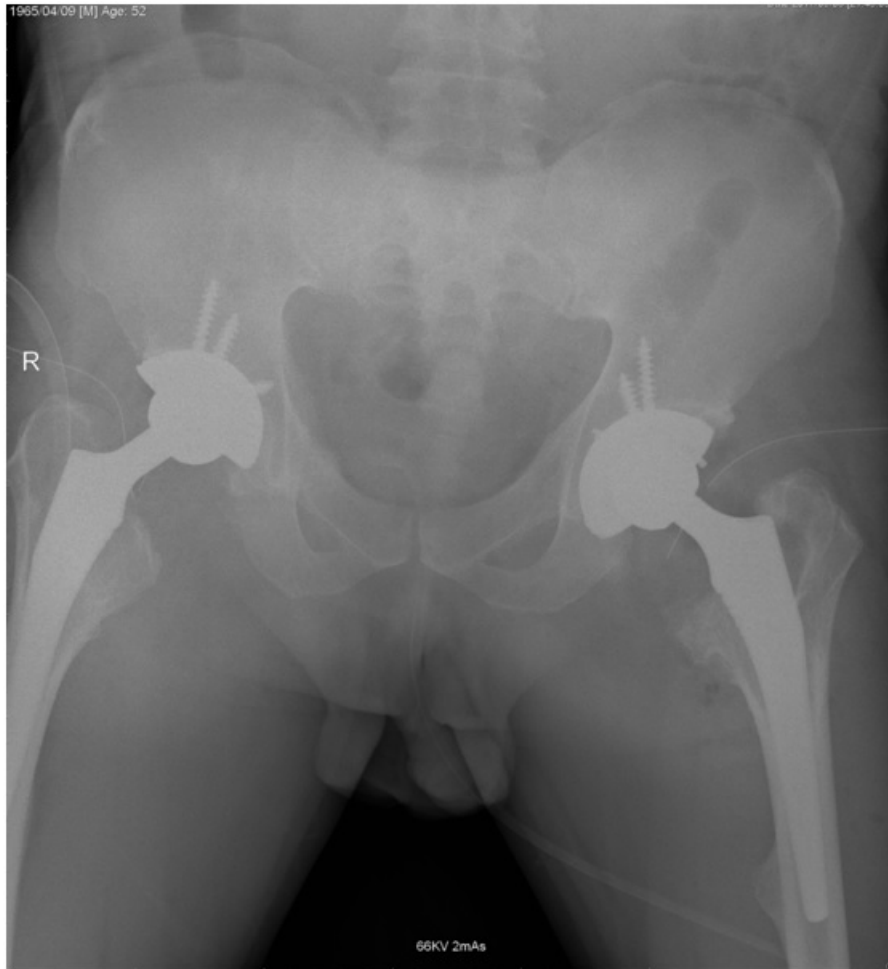


Figure 4: Anteroposterior pelvic radiograph of this patient after THA.

4. Discussion and Review of the Literature

Almost half of osteochondromas are located around the knee, particularly distal femur and proximal tibia, but in this case presented, the proximal femur is also involved. Unlike other superficial joints, hip osteochondromas are deep-seated and hardly palpated in the early. In the literature, the overall average age at the first diagnosis of osteochondromas was 20.63 years and showed a male predominance in China [11], However, in this case the patient was a 52-year-old man. Analyzing the reasons, it is suggested that osteochondromas affects the function of hip as increased with patient's age. Some papers reported that approximate 25% of patients with HME in the hip joint had various degrees of acetabular dysplasia and coxa valga [12-14]. Yoon et al also suggest that acetabular dysplasia, subluxation of the femoral head, coxa valga, and wide metaphyses are deformities frequently seen with an exostosis in the proximal femur [15]. In our case, radiography showed all of these skeletal dysplasias. It is indicated that osteochondromas can result in biomechanical alterations and abnormal mechanical forces in the hip joint that may drive the skeletal dysplasias. For young

patients of hip osteochondromas without OA, successful excision of femoral neck lesion and treatment of acetabular dysplasia were help to release the pain and prevent the occurrence of acetabular dysplasia [16]. Besides, for patients with hip OA, good results can be achieved in THA. But quite remarkably, selection of femur prosthesis and adjusting the leg length intraoperatively were much more difficult than others hip disease because of the lower extremity skeletal dysplasias in multiple osteochondromas.

5. Conclusion

In conclusion, although osteochondromas was the most common bone tumor, it rarely appears in the hip joint. On one hand, early diagnosis and completely excision of lesion was very important for young patients to prevent the occurrence of hip dysplasia and subsequent degenerative arthritis. On the other hand, patients of multiple osteochondromas with hip OA could have satisfying results undergoing THA. Our results suggest the need for a large size sample and multi-institutional prospective study for the treatment of hip joint osteochondromas surveys in the future.

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