International Journal of Health Sciences and Research
Vol.12; Issue: 5; May 2022
Website: www.ijhsr.org
Case Series *ISSN: 2249-9571*

Arthroscopic Marginal Excision of Osteochondroma around the Knee: A Case Series

I Gede Eka Wiratnaya, Putu Astawa, Komang Septian Sandiwidayat, Nyoman Gede Bimantara, Hans Kristian Nugraha, Agus Suarjaya Putra

Department of Orthopaedic and Traumatology, Sanglah General Hospital / Faculty of Medicine, University of Udayana, Denpasar, Bali, Indonesia

Corresponding Author: I Gede Eka Wiratnaya

DOI: https://doi.org/10.52403/ijhsr.20220518

ABSTRACT

Osteosarcoma is the most common bone tumor. These tumors are usually asymptomatic and show clinical symptoms as a result of trauma and pressure from the surrounding muscles, joints, nerves, and blood vessels. Treatment from this tumor varies from patient to patient. In this case report, we describe 3 cases of osteochondroma around knee. The cases were boys 17 years old, 15 years old, and 38 years old patient. The diagnose was confirmed by imaging such as plain radiography and histology. All three patients were treated with arthroscopic marginal excision of knee.

Keywords: arthroscopic marginal excision, osteochondroma, knee

INTRODUCTION

Osteochondroma is a benign bone tumor composed of trabecular bone covered by a cartilage covering.[1] This disease is the most common bone tumor. These tumors are the result of malformations from the formation of the periosteum from cartilage nodules. As children with osteochondroma get older, there is chances of these tumors getting bigger and stopping when they reach the growth limit in the child's bones. Long bones in the lower extremities, especially the distal femur and proximal tibia are the predilection sites for osteochondroma.[2,3] These tumors are usually located outside the joints and in rare cases osteochondromas can occur in the pelvis and ankles. These tumors are usually asymptomatic and show clinical symptoms as a result of trauma and compression of the surrounding organs.[4]

Operative treatment is one of the options for osteochondroma which is accompanied by symptoms.[5] Symptoms that can arise are pain due to pressure from the muscles, joints, nerves, and surrounding blood vessels or even a sign of a change towards malignancy if accompanied by a change in size suddenly. In addition to relieving pain complaints, operative action is also able to improve the limitations of joint motion, cosmetic abnormalities that arise due to osteochondroma and prevent changes towards malignancy, where osteochondroma has a tendency to change by 0.5-5%. One of the operative actions that can be done is marginal excision.[5]

CASES

We performed 3 cases of osteochondroma around the knee. From the cases, all of them are male aged 15-38 old. The most common location of pathology is in the knees (2 left knee, 1 right knee). The time of surgery of the patients are varies. Arthroscopic marginal excision was done in all 3 patients. Though the functional outcome varies, most patients result in satisfactory outcome postoperatively after re-evaluated by the surgeons.

Our first case was a seventeen-year-old male with lump on his left proximal tibia whom came to our hospital after his parents has serious concern with the growth of the lump which they felt was considerably faster in the last 1 year. He had no history of trauma. On physical examination there was a palpable, non-tender 4x4 mass at the medial side of the left proximal tibia, with well-defined and smooth edge. The lump was immobile and has solid consistency with no sign of inflammation. On plain radiograph, there was a solitary, pedunculated exophytic cortical mass protruding from the metaphyseal-diaphyseal junction of the medial side of the left proximal tibia. These features were consistent with a pedunculated osteochondroma.

After comprehensive discussion and obtaining informed consent from his parents, therefore we proceed with a novel, minimally invasive technique for this patient. Under general anesthesia, a stab incision was made first made above the lesion to clearly visualize the tumor. Next, similar nick-and-spread technique was used at below the lesion for the instrumentation. With an osteotome, the osteochondroma was resected and removed with a grasper through the portal, and the remaining bony surface was abraded by a motorized shaver. Both portals were used interchangeably to ensure complete visualization and removal of the lesion. Histopathological examination confirmed the diagnosis of osteochondroma.

Figure 1: xraygenu AP/Lateral pre-operative

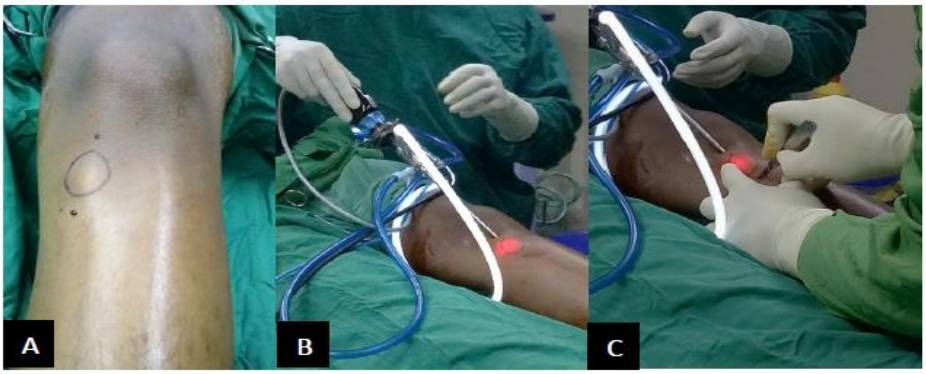

Figure 2: (A) site marking of the osteochondroma, (B) insertion of arthroscopy, (C) incision

Figure 3: (A) visualization of the tumor, (B resection of the tumor with gaspar

Our second case involved a fifteen-year-old male with painless lump on his right distal femur. He personally noted that it grew larger in the last year, and his parents preferred to have it removed rather just treated conservatively. Sometimes he complained of pain at his knee when he ran, sat and climbed stairs. Physical examination revealed a palpable, non-tender 3x5 mass at the medial side of the right distal femur, with smooth and well-defined edge. It has solid consistency, immobile, and without any sign of inflammation. On plain radiograph, there was a solitary, pedunculated exophytic cortical mass protruding from the metaphyseal-diaphyseal junction of the medial side of the right distal femur. These features were consistent with a pedunculated osteochondroma, therefore similar techniques were used as the previous patient. Under general anesthesia, arthroscopic portals were made. The tumor was then excised and the postoperative histopathological investigation also confirmed the diagnosis of osteochondroma.

Figure 4: x-ray genu AP-Lateral pre-operative

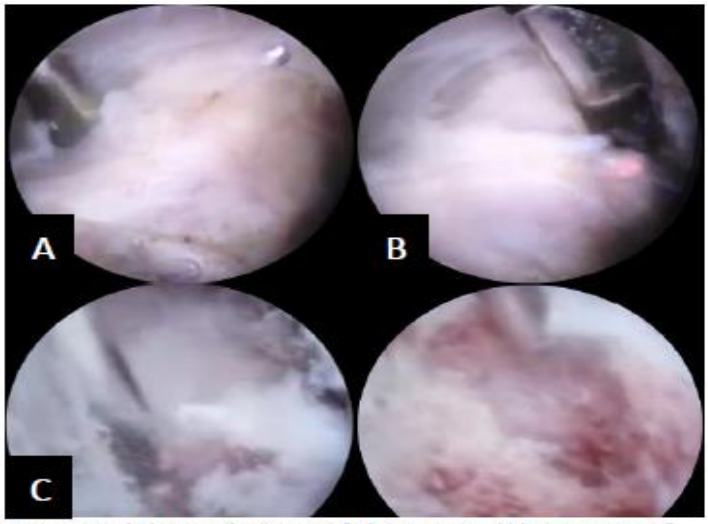

Figure 5: (A) visualization of the tumor, (B)resection of the tumor, (C)visualization of the tumor after resection and removing

Our third case was a thirty-eight-year-old male with chief complaint of growing lump on his left distal femur in the last 1 year. On physical examination there was a palpable hard mass, non-tender, size5x4 cm at the anterior side of the left distal femur, well-defined and smooth edge. It was immobile with solid consistency. There was also no sign of inflammation. On plain radiograph, there was a solitary, sessile exophytic cortical mass protruding from the metaphyseal-diaphyseal junction of the anterior side of the left distal femur. These features were consistent with a sessile osteochondroma.

Figure 6: (A) clinical appearance of the patient, (B) xray genu AP/Lateral pre-operative

DISCUSSION

Osteochondromas are the most common bone tumors of all benign bone tumors, with a range of 20 to 50%. Osteochondromas are surface bone lesions consisting of both medullary and cortical bone with hyaline cartilage caps.[1] It may cause clinical symptoms due to traumatic contusion in contact sports, inflammation within the tendon sheath, or effusion of associated joints. The pathognomonic feature of this lesion is existence of the tumor cortical and medullary continuity with the underlying bone.[6] The tumors are usually occur during childhood and adolescence and found in extraarticular part of the bone whether it is a solitary or multiple lesion. Therefore, it is rare that osteochondroma is located intra-articular of the joint in an adult.

Solitary osteochondromas is the most common form (85%) and usually asymptomatic. About 1 to 2% of patients that underwent radiographic examination will have incidental finding of this lesion.[4] This tumor usually found in childhood, 75 to 80% before 20 years of age, with younger patients are symptomatic in most cases. Patients with hereditary exostoses (HME) are more severely affected and expected to be symptomatic, hence presenting at a more youthful age. Male is affected more than female for both the solitary and hereditary forms. The hereditary form is autosomal dominant with incomplete penetrance in females with an incidence of 1 per 50000 to 100000 in Western populations. Osteochondromas, although generally asymptomatic, occasionally come to clinical attention for various reasons. Symptoms may result from exostotic impingement on adjacent neural, vascular, or periarticular structures. Pain may result from the traumatic contusion or the fracture of an osteochondroma. The presence of a visible mass may create a cosmetic problem. The exostotic cartilage cap may rarely undergo malignant degeneration, giving rise to chondrosarcomas.[5,7]

Radiographic examination have an essential role in osteochondroma diagnosis, as it is based on preoperative X-ray and MRI findings combined with medical record and clinical manifestation[8]. Even though diagnosis may be attained at preoperative, surgical excision and histopathological assessment is essential to exclude malignant tumor, cellular atypia and mitotic activity [9].

While open surgical excision is the treatment of choice for extra-articular osteochondromas and arthroscopy for intra-articular osteochondromas, most intra-articular lesions have been treated through open surgery. Surgery with approach near to or into the articular joint bring higher risk of joint infection; an arthrotomy may cause joint stiffness, postoperative pain and delay to return to activity. In 2019, a case report about arthroscopic resection in knee osteochondroma present that demanded arthroscopically resection of extra- articular osteochondroma offers many advantages, such as better result cosmetically, less postoperative pain and faster recovery [5]. Another study in 116 cases of osteochondroma also found that the

indications for surgical excision included cosmetic problem in 38 patients, pain (on hitting some object or continuous due to bursitis) in 50 patients, pressure on adjacent nerves in 18 patients, limitation of joint movements in 8 patients, pathological fracture of the tumor in 1 patient and malignant change in 1 patient [10].

After surgery, the improvement of the symptoms in our patients are significant, while the patients could return to normal activity immediately after the surgery. Furthermore, this technique has better cosmetic results compared to the traditional open approach. In our experiences, there was no other drawback of this novel technique other than the steep learning curve for the surgeon as well as the availability of the equipment.

CONCLUSION

Osteochondromas represent the most common bone tumor accounting for 20 to 50% of all benign osseous tumors. Imaging plays an essential role in osteochondroma diagnosis, from these cases, the diagnosis is based on preoperative X-ray findings combined with medical record and clinical symptoms. Arthroscopic resection of an osteochondroma was proven to be a safe, novel choice to eliminate those symptoms, with the main advantage of faster recovery and better cosmetic results.

Acknowledgement: None

Conflict of Interest: There are no conflicts of interest in connection with this paper.

Source of Funding: None

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How to cite this article: Gede Eka Wiratnaya, Putu Astawa, Komang Septian Sandiwidayat et.al. Arthroscopic marginal excision of osteochondroma around the knee: a case series. *Int J Health Sci Res.* 2022; 12(5):153-157. DOI: *https://doi.org/10.52403/ijhsr.20220518*

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