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Clinical and surgical outcomes of symptomatic para-articular osteochondromas knee

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Abstract
Introduction: Osteochondroma is a type of tumor that is not very common, and about 30% of these tumors are found in the lower part of the thigh bone. Most of these cases de not cause any symptoms, but when they do, surgery might be needed. This study aims to describe the clinical features and treatment results for people who had a single, painful bone growth near a knee joint.
Methods: This was an observational descriptive bicentric study over 12 years (January 2012 to December 2023) carried out in the department of orthopaedic and traumatology surgery of Cocody and Bouaké. Patients presented with knee pain in all cases. Radiographs confirmed the presence of a para-articular bony growth. The data studied were clinical and therapeutic results.
Result: There were 11 patients, including 9 men and 2 women, with an average age of 18.7 years (range, 10-35). Para-articular bony growth either sessile (n=9) or pedunculated (n=2). The average size of the growth was 3.6 cm (range, 4-6), with an average thickness of 0.9 cm (range, 1.3-2.1). All patients underwent surgical excision of the growth, and histopathology confirmed the diagnosis of solitary osteochondroma. No postoperative complications or recurrences were observed at an average follow-up of 37.5 months (range, 14-79). Post-treatment, the average Lysholm knee score was 98.2 (range, 97-100).
Conclusion: This study shows that surgery is an effective way to treat this type of tumor. The lack of recurrence and good function after treatment support this conclusion.

Keywords: Knee, osteochondroma, para-articular, surgical treatment

Introduction
Osteochondroma, also known as exostosis, is the most common benign bone tumor [1]. It is characterized by a bony outgrowth covered by a cartilaginous cap, typically located at the metaphysis of long bones. The distal femur is the site in approximately 30% of cases [1-4]. Non-articular locations around the knee are referred to as para-articular osteochondromas (PAOK), and they are relatively rare [1, 2]. The etiology remains unclear and is thought to be linked either to genetic causes or repetitive trauma. The incidence of malignant transformation is less than 1% [1-3]. Osteochondroma can present as solitary or multiple lesions. Diagnosis is guided by clinical and radiological examination and confirmed through histopathological analysis. Symptoms can vary in intensity and severity, though osteochondromas are typically asymptomatic. However, they can become symptomatic (localized pain, discomfort, limp, etc.) when the bony outgrowth compresses adjacent tissues or irritates nearby nerves. Several studies have reported symptomatic cases [8-11]. Symptomatic osteochondromas sometimes require surgical treatment, which involves complete or marginal excision. The functional prognosis is generally favorable [5-9]. Most of the studies in both African and Western literature are case reports or small case series [1-9]. In Ivory Coast, a case of giant para-articular osteochondroma of the knee was published in Bouaké [12]. There does not appear to be specific data on symptomatic para-articular osteochondroma of the knee (PAOK) in the local literature. This case series, which involves a larger sample size over a longer period compared to other authors, aims to describe the epidemiological, clinical, therapeutic, and outcome aspects of PAOK.

Methods

This observational descriptive study was conducted over a 12-year period (January 2012 to December 2023) in the department of orthopaedic and traumatology surgery of Cocody and Bouaké. This study was guided by ethical standards. Anonymity and confidentiality of information were respected. It included the medical records of patients treated for para-articular osteochondroma of the knee (PAO). Patients with other bone lesions (chondroma, malignant bone tumor) were excluded from the study. The diagnosis was established based on the patient's history, clinical examination, knee X-rays (Figure 1 and 2), and histopathological analysis (Figure 3).

Fig 1: Anteroposterior and lateral radiographs of the knee showing a solitary sessile bony outgrowth of the distal femur

Fig 2: Postoperative radiograph following excision of the bony outgrowth

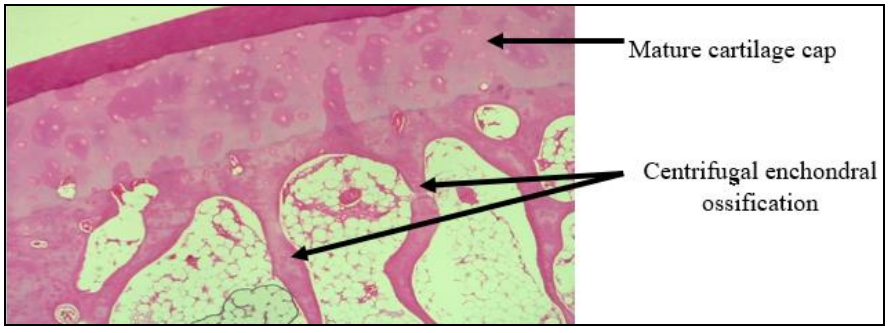

Fig 3 (HEx10): Mature cartilaginous cap overlaid by fibrous perichondrium. Beneath this cap, enchondral ossification is observed, consisting of anastomosing mature bone trabeculae delineating medullary spaces containing adipocytes. (Light microscopy of an osteochondroma)

Informed consent was obtained from all patients. On physical examination, all patients had a visible or palpable bone growth in the knee region, with no joint abnormalities. Knee X-rays in both anteroposterior and lateral views were the only imaging tests performed. No major diagnostic challenges were encountered, as X-ray imaging was sufficient to identify the osteochondromas. Access to imaging tests was adequate, and no further imaging modalities were deemed necessary. This was a simple, exhaustive random sample with consecutive patient recruitment. Information was obtained from hospital records and operating room registers. The demographic data collected included frequency, age, gender, occupation, reason for consultation, and type of osteochondroma. The therapeutic data collected included size

of the growth, histological findings, complications, recurrence, functional outcome of the knee). All patients were treated surgically with excision of the growths performed under regional anesthesia via an external Gernez approach. The growths were excised using bone-cutting forceps, and a histopathological examination was performed for all patients. An external Gernez approach was utilized. The bony outgrowths were removed using an osteotome or a saw, with a 1 cm margin from their base. Hemostasis during surgery, after excision, was achieved with bone wax. The diagnostic challenge in our practice during the operation was related to the absence of an intraoperative histological examination. Post-operatively, patients received either paracetamol (60 mg/kg/day) or tramadol (100 mg/kg/day) for 7 days, depending on their age. This was followed by a rehabilitation program aimed at restoring knee function. The evaluation and follow-up of the knee before and after surgery (at 1, 2, 3, 6, 12, and 24 months) were performed using the Lysholm score, rated from 0 to 100 points. Data processing was performed using SPSS version 25 software. For quantitative variables, the Wilk-Shapiro normality test was previously performed with a 5% margin of error and a 95% confidence interval. All quantitative variables followed the normal distribution. The distribution was symmetrical; the central tendency parameter was calculated as the mean, and the standard deviation was its dispersion parameter. Furthermore, categorical variables were expressed as absolute and relative frequencies. Descriptive statistics of the population were compiled using epidemiological, clinical, and therapeutic data. Tables were used to summarize selected results.

Results

PAOK represented 0.0002% of knee pathologies and 0.07% of bone tumours during the period. The table 1 summarises the study characteristics. The patients included had a mean age of 18.7 (range, 10-35) years, and the majority were male (9 males and 2 females), with a sex ratio of 3.5. Most of the patients (n=6) were students. The main reason for consultation was knee pain, often accompanied by a palpable bone growth. The average delay before consultation was 9.6 months (range, 7-23) months. No family history of bone tumors was reported, although four patients had a history of knee trauma. They had a low socioeconomic status and most of them came from areas remote from urban centers. They revealed sessile osteochondromas in 9 cases and pedunculated growths in 2 cases, with an average size of 3.6(range, 4-6) cm, and an average thickness of 0.9 (range, 1.3-2.1) cm. Clinical follow-up was conducted at a mean of 37.5 (range, 14-79) months, with no recurrences or post-operative complications observed. Functional knee assessment was performed using the Lysholm score, which evaluates various parameters of knee function, including instability, pain, locking, swelling, stair climbing, squatting, limping, and the use of a cane. The mean pre-treatment Lysholm score was 94.7, which improved to 98.2 after surgery, indicating excellent functional outcomes for all patients (score > 84). Additionally, the Visual Analog Scale (VAS) was used to assess pain before and after surgery. No adverse or unexpected events were reported.

Table I: Study characteristics of serie

Patient	Age	Sex	Profession	Symptom	Excrescence	Treatment	Histology	Résult	Lysholm Pre surgery	score Post surgery	Follow up
1	10	M	Pupil	Pain	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	94	98	79
2	17	M	Pupil	Pain	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	93	99	51
3	22	M	Student	Pain+swelling	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	95	97	47
4	14	F	Pupil	Pain+limp	Pédunculated	Excisional-biopsy	Ostéochondroma	Adequate	97	98	45
5	25	M	Student	Pain	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	94	99	32
6	11	M	Pupil	Pain	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	96	98	27
7	19	M	Pupil	Pain+limp	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	94	97	24
8	35	F	Secrétary	Pain	Sessile	Excisional-biopsy	Ostéochondroma	Adequate	92	98	19
9	16	M	Pupil	Pain	Pédunculated	Excisional-biopsy	Excisional-biopsy	Adequate	97	100	19
10	14	M	Student	Pain	Sessile	Excisional-biopsy	Excisional-biopsy	Adequate	96	98	14
11	17	M	Student	Pain	Sessile	Excisional-biopsy	Excisional-biopsy	Adequate	95	99	14

Discussion

This study aimed to describe the clinical and therapeutic outcome of PAOK. This benign tumor was rare, predominantly affecting male adolescents, with knee pain as the main symptom. The bony outgrowth was sessile in most cases. Surgical treatment resulted in satisfactory functional outcomes without osteochondroma recurrence. Osteochondroma represents the most common benign bone tumor, accounting for 10 to 15% of all bone tumors [1, 2, 14]. Its predominant location around the knee and its rare para-articular nature (0.0002%) were consistent with the literature [3, 9-14]. PAOK was first described by Jaffe in 1958, with most reported cases being clinical case studies [1-10]. Male adolescents were the most commonly affected, as observed in most studies [4-11]. Children and adolescents are prone to repeated limb trauma, often during play, which may predispose them to osteochondroma [1, 12-16]. Osteochondroma develops within the supra-, infra-, or para-patellar fat pad [1-5, 17]. The fat pad is also known to be a source of cytokines and growth factors, such as vascular endothelial growth factor and basic fibroblast growth factor [17]. Repeated trauma or microtraumas can induce pro-inflammatory and proliferative cytokine production, potentially leading to osteochondroma formation [17-20]. Malignant transformation is rare (<1%) and is often idiopathic, making it difficult to predict in cases of solitary osteochondroma [1-3]. Knee pain was the most frequent and dominant symptom, sometimes associated with knee swelling or limping. Kahouthar [17] observed similar symptoms in symptomatic cases of PAOK. The rapid development of bone within soft tissues, termed heterotopic ossification [17] occurred within the fat pads and around the knee joint [6-10]. This explained the onset of symptoms when the outgrowth caused conflict or pressure on the surrounding soft tissues. Clinical signs of PAOK may vary based on the location and size of the lesion. Notably, some signs may be present at birth, while others develop over time or are triggered by specific factors [7-11]. In most cases, the lesions developed slowly, which explained the long delay (>10 years)

before symptom onset, related to the patients' average age.16 Additionally, the knees were non-arthritic. Radiographic findings aligned with those reported in the literature [15-17]. The bony outgrowth was sessile in most cases, without continuity with the medullary canal [1, 7]. However, magnetic resonance imaging (MRI) of the knee was not performed due to the absence of signs of nerve compression or irritation [4-7]. Open surgical treatment provided satisfactory results, without complications or recurrence [1, 18-26]. This tumor generally has a favorable prognosis [21-26]. The bony outgrowth and adjacent tissues were fully resected [6-10]. However, knee arthroscopy could also be used to diagnose and treat smaller lesions (<1 cm) [21-24]. Arthroscopic resection is more frequently associated with recurrence [24]. A definitive diagnosis is made through histological examination [10-21]. Para-articular osteochondroma is primarily composed of bone tissue with relatively little cartilage [25]. Additionally, the bony outgrowth was located above the patellar fat pad [25]. These histological and radio-clinical characteristics help distinguish para-articular osteochondroma from similar osteochondral lesions, including patellar osteochondroma, intracapsular chondroma, para-articular chondroma, giant extrasynovial osteochondroma, Hoffa's disease, and giant intra-articular osteochondroma, which are part of the differential diagnosis [7-10]. This study is one of the first on the subject in the local context with a high number of cases.it is bicentric. The limits would be related to the biases of selection of the patients according to the services and including the lack of a control group.

Conclusion

PAOs are relatively rare but can lead to significant morbidity due to pain and functional impairment. Our case series highlights the importance of recognizing these lesions, as early diagnosis and surgical intervention can result in excellent functional outcomes. The findings suggest that a multidisciplinary approach involving clinical evaluation, imaging, and histopathological confirmation is essential for effective management. The results of the studies underscore the need for increased awareness of PAOs and further research to better understand their epidemiological and clinical characteristics in Ivory Coast and similar settings. Ultimately, this case series contributes valuable insights into the management of symptomatic osteochondromas and reinforces the generally favorable prognosis following surgical treatment

Conflict of Interest

Not available

Financial Support

Not available

References

1. Nishimura T, Saku I, Kanda S, Fukushima T, Akiyama T. Para-articular osteochondroma of the infrapatellar fat pad: A report of three cases. Int J Surg Case Rep. 2020;69:105-108.
2. Jaffe H. Tumors and tumorous conditions of the bones and joints. Philadelphia: Lea and Febiger; 1958:558-567.
3. Reith JD, Bauer TW, Joyce MJ. Para-articular osteochondroma of the knee: report of 2 cases and review of the literature. Clin Orthop Relat Res. 1997;334:225-232.
4. Evaniew N, Bayegan D, Popovic S, Parasu N, Ghert M. Infrapatellar fat pad osteochondroma: three cases and a systematic review. J Knee Surg. 2015;28:229-238.
5. Bombaci H, Bilgin E. Infrapatellar fat pad para-articular osteochondroma: a ten-year follow-up and review. Arch Trauma Res. 2015;4:283-288.
6. Oshiri T, Watanabe K, Otsubo H, *et al*. Arthroscopic resection of multiple ossifying tumors in the infrapatellar fat pad. Sports Med Arthrosc Rehabil Ther Technol. 2012;4:43.
7. Maheshwari AV, Jain AK, Dhammi IK. Extra-skeletal para-articular osteochondroma of the knee: a case report and tumor overview. Knee. 2006;13:411-414.
8. Ogura K, Goto T, Nemoto T, Imanishi J. Para-articular osteochondroma of the infrapatellar fat pad. J Knee Surg. 2011;24:209-213.
9. Steiner GC, Meushar N, Norman AD. Present intracapsular and para-articular chondromas. Clin Orthop Relat Res. 1994;303:231-236.
10. Rajkumar N, Soundarrajan D, Dhanasekararaja P, Rajasekaran S. Para-articular osteochondroma of patella with coexisting osteoarthritis. J Orthop Case Rep. 2019;9:87-89.
11. Mozella AP, Da Silveira Moller JV, Araujo Barros Cobra HA. Tumor formation in Hoffa's infrapatellar fat: Case report. Rev Bras Orthop. 2015;50:117-121.
12. Kouassi KJE, Akobe AJR, Yao LB, Toure I, Kouassi ANA, Krah KL, Kodo M. Giant para-articular osteochondroma of knee joint: a case report. Int J Case Rep Orthop. 2023;5(2):15-18.
13. Tata-Tsiahoana JF, Razafimahatratra R, Razafimahandry HJC, Solofomala GD. Les genoux flottants au CHU-JRA: résultats fonctionnels de prise en charge. Rev Chir Orthop Traumatol Malg. 2018;8:1-8.
14. Murphy MD, Choy JJ, Candor MJ, Fleming DJ, Gannon FH. Imaging of osteochondroma: Variants and complications with radio logic-pathologic correlation. Radiographics. 2000;20:1407-1434.
15. Nassar I, Semlali S, El Quessar A, *et al*. Une étiologie rare de la compression médullaire: l'exostose thoracique intra canalaire, à propos d'un cas. J Radiol. 2003;84:2020-2022.
16. Xu Zhang B, Chew D, Critchley I. Review of para-articular soft tissue osteochondromas of the knee. ANZ J Surg. 2012;82:878-884.
17. Kahouthar MD, Ferjani C, Mdimegh L, Zohd M, Ben Hmida R, Ben Ayeche M. Osteochondrome: à propos de 95 cas. J Radiol. 2008;89:1604-1614.
18. Ushiyama T, Chano T, Inoue K, Matsusue Y. Cytokine production in the infrapatellar fat pad: another source of cytokines in knee synovial fluids. Ann Rheum Dis. 2003;62:108-112.
19. González-Lois C, García-de-la-Torre P, SantosBriz-Terron A, Vila J, Manrique-Chico J, Martínez-Tello J. Intracapsular and para-articular chondroma adjacent to large joints: report of three cases and review of the literature. Skeletal Radiol. 2001;30:672-676.
20. Ratcliff JR, Naqvi A, de la Roza G, Strauss JA, Damron TA. Soft tissue osteochondroma: case report and immunohistochemistry for parathyroid hormone-related protein. Ann Diagn Pathol. 2006;10:222-229.
21. Rizzello G, Franceschi F, Meloni MC, *et al*. Para-articular osteochondroma of the knee. Arthroscopy. 2007;23:1-4.
22. Turhan E, Doral MN, Atay AO, Demirel M. A giant extrasynovial osteochondroma in the infrapatellar fat pad:

end stage Hoffa's disease. Arch Orthop Trauma Surg. 2008;128:515-519.
23. Carmont MR, Davies S, van Pittius DG, Rees R. Accelerated para-articular osteochondroma formation within the knee: a case report. Cases J. 2008;1:1-4.
24. Agha RA, Borrelli MR, Farwana R, Koshy K, Fowler A, Orgill DP, SCARE Group, the PROCESS 2018 statement: updating consensus preferred reporting of case series in surgery (PROCESS) guidelines. Int J Surg. 2018;60:279-282.
25. Sakai H, Tamai K, Iwamoto A, Saotome K. Para-articular chondroma and osteochondroma of the infrapatellar fat pad: a report of three cases. Int Orthop. 1999;23:114-117.
26. Panta U, Kumar TS, Paudel KP, Kandel M, Adhikari BR. Hoffa's osteochondroma para-articular extrasynovial infrapatellar fat pad osteochondroma: A Case Report. J Nepal Med Assoc. 2021;59:799-801.

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