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Case Report

Chondrolipoma of the knee in a child: A case report

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ABSTRACT

Chondrolipoma is a rare benign mesenchymal tumor characterized by the presence of cartilage and mature adipose tissue. Typically affecting adults in regions like the buccal and breast, chondrolipomas in pediatric patients are exceedingly uncommon. This case presents a unique instance of a 15-year-old boy diagnosed with a chondrolipoma in his knee joint, marking the first reported case of such a tumor in a child's knee. Given the rarity of this presentation and the absence of similar reports in the literature, this case report holds significant clinical importance.

The patient, a 15-year-old boy, presented with a benign tumor in his knee joint, a location not previously associated with chondrolipomas. The decision to forego further follow-up testing was made based on the benign nature of the tumor and the absence of immediate clinical concerns. The patient was discharged with instructions for monitoring and to report any signs of recurrence. This case highlights the atypical manifestation of chondrolipoma in a pediatric knee, emphasizing the need for vigilance in diagnosing uncommon benign lesions in younger patients.

Reporting the second documented case of a chondrolipoma in a child's knee underscores the diagnostic challenges posed by rare tumors with non-typical presentations. The difficulty in diagnosing such lesions based solely on radiological findings is highlighted, emphasizing the importance of histological examination for accurate diagnosis. While acknowledging the limited follow-up period at the time of publication, this case report aims to raise awareness among clinicians regarding the potential occurrence of chondrolipomas in pediatric populations. By shedding light on this unusual diagnosis, this report contributes to the broader understanding of benign mesenchymal tumors and underscores the significance of considering rare entities in the differential diagnosis of pediatric joint tumors.

1. Introduction

Rare benign mesenchymal tumor that contains cartilage and mature adipose tissue is called a chondrolipoma. It usually affects adults, and the buccal and breast are where it was first reported.[1,2] To the best of our knowledge, there has been two case reported of childhood chondrolipoma in past but our case is first to be reported in the suprapatellar space of the knee joint. A child's knee-originating chondrolipoma is described, which is an uncommon case. The differential diagnosis of this tumor is also covered.

2. Case Presentation

A male patient, aged 15, was referred to our hospital after noticing a palpable, painless mass in the anteromedial

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aspect of his left knee joint for three months. The child had no previous history any trauma or surgery. A physical examination revealed an elastic-hard, non-tender, poorly mobile mass that measured about 9 X 6 X 2.5 cm. Other than that, the knee was stable and had a decent range of motion with pain in movements. The results of the vascular and neurologic tests were not particularly noteworthy. The patient did not provide any medical history. A slightly calcified soft tissue mass was visible on plain radiographs, and there was no sign of bone erosion. In our case, An MRI was done from a outside location and was suggesting of hemangioma which was proved to be chondrolipoma by histopathological examination. Later, marginal excision of the mass was taken and a benign fat containing soft tissue tumor was suggested, such as lipoma with metaplastic cartilage and/or bone, lipoblastoma, or chondroid lipoma. On Gross examination it showed a well delineated, encapsulated, and multilobulated. Cut surface revealed yellowish tan, gelatinous with area of haemorrhagic foci (Figure 1). Microscopically, the tumor was made up of fully developed adipocytes interspersed with islands of fully developed hyaline cartilage (Figures 2, 3 and 4). There were no signs of mitotic figures or cellular atypia. The tumor was identified as a chondrolipoma based on these characteristics. The recovery from the surgery went smoothly. During the 6-month follow-up exam, the patient showed no clinical signs of a local recurrence.

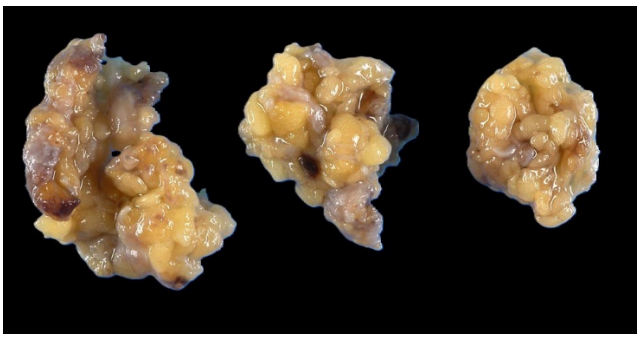

Figure 1: Cut surface revealed yellowish tan, gelatinous with area of haemorrhagic foci.

3. Discussion

The cartilage-containing variant, chondrolipoma, is extremely rare, especially in infants and children, in contrast to the high frequency of lipoma.[3–5] Large, long-lasting lipomas are the most common cases of it. Chondrolipoma pathogenesis is still unknown, although two theories have been put forth. First, the cartilage deterioration seemed to have been eventually caused by chondral metaplasia of the adipose tissue, which was most likely brought on by trophic changes or mechanical stress.[6] Second, multipotent cells may be the source of cartilage.[7]

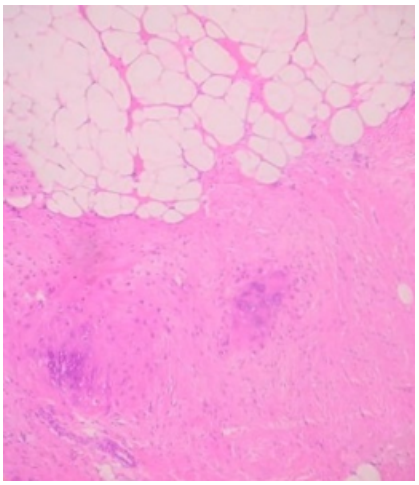

Figure 2: The tumor was composed of mature adipocytes beaded with islands ofmature hyaline (original magnification 10X Hematoxylin and Eosin stain).

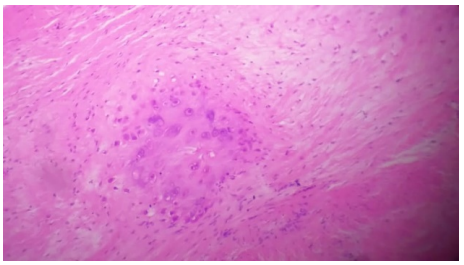

Figure 3: Lobules of adipose tissue with surrounding cartilage (original magnification 20x Hematoxylin and Eosin stain).

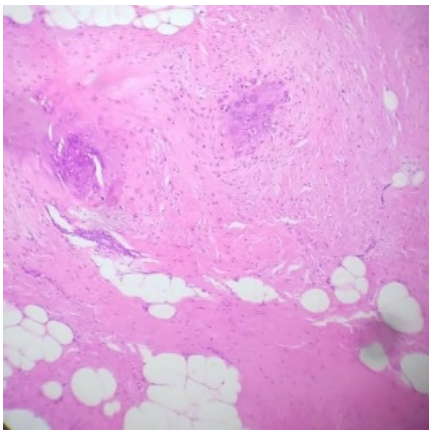

Figure 4: Mature chondrocytes. (original magnification 40x Hematoxylin and Eosin stain).

The first explanation of chondral metaplasia makes sense in context of the clinicopathologic findings of this particular case. Besides this, transforming growth factor-b, latent transforming growth factor-b–binding protein-1, and bone morphogenetic protein expression patterns may be important in the pathophysiology of chondrolipoma, according to a previous immunohistochemical study.[8] Three cases of osteolipoma have been found to have a reciprocal translocation t(3:12) (q27; q13-15), which is consistent with normal lipomas.[9] The contemporary latest results add to the body of evidence supporting the theory that osteolipoma is a lipoma variant. However, a cytogenetic investigation has not yet been carried out for chondrolipoma.

It is commonly known that on T1- and T2-weighted images, fat tissue exhibits high signal intensity, with full signal loss following fat suppression. When compared to fat tissue, hyaline cartilage often shows higher signal intensities on T2-weighted images and intermediate-signal intensities on T1-weighted images. When comparing the histologic features and MRI results in this particular case, it was found that cartilage tissue constituted the major part of the focal areas with high signal intensity on short tau inversion recovery images and intermediate signal intensity on T1-weighted images. The imaging results for chondrolipoma have been described in several reports.[3,10–14] Although it was not evident in our patient, Hwang et al.[13] suggested that a rosary pattern of either the calcification or cartilage tissue could be a characteristic finding of chondrolipoma. Gadolinium contrast enhancement can be seen, especially in the nonfatty areas. One can observe enhanced gadolinium contrast, particularly in the non-fatty regions.

The lesion in the current case was differentially diagnosed as an atypical lipomatous tumor (ALT), chondroid lipoma, and lipoblastoma. Mostly affecting newborns and young children, lipoblastoma is an uncommon benign mesenchymal tumor of embryonal white fat that has a minor male predominance. It usually manifests as a painless, gradually expanding lump in the extremities.[15] Calcification is rarely observed, in contrast to chondrolipoma. A mostly fatty mass with variable signal strength on all pulse sequences will typically be seen on an MRI.[16] Chen et al.[17] proposed that lipoblastoma in children might be distinguished from other benign lipomatous tumors by MRI findings of enhancing soft tissue nodules and nonenhancing cystic alterations. Histologically, lipoblastoma will demonstrate a lobular architecture and be composed of an admixture of mature and immature fat cells separated by fibrovascular septa. The matrix can be myxoid with a plexiform vascular pattern. Cytogenetically, lipoblastoma is characterized by rearrangements of 8q11-13 involving the *PLAG1*.[15] Chondroid lipoma is a rare benign adipocytic tumor that usually occurs in young adults, with a strong female predominance. It typically presents as a slow-growing, painless mass in the proximal extremities and limb girdles.[18] Calcification can be seen on radiographs.[16] MRI will usually reveal a well-defined mass with a heterogeneous signal intensity on T1-weighted images and heterogeneous high-signal intensity on T2-weighted images.[19] (19). From a histological perspective, a lobular-patterned chondroid lipoma is made up of spherical cell nests and strands embedded in a myxoid or hyalinized chondroid matrix. These characteristics may mimic myxoid liposarcoma. There is no developed hyaline cartilage, in contrast to chondrolipoma. Cytogenetically, chondroid lipoma is defined by a balanced translocation of t(11;16) (q13;p13) that fuses MKL2[18] and C11orf95. With a peak frequency in the sixth decade, ALT is a mesenchymal neoplasm that is predominantly found in middle-aged individuals and is locally aggressive but not metastatic. Usually, it manifests as a painless, slowly expanding mass in the retroperitoneum and lower extremities. In 10% to 32% of instances, calcification or ossification is seen.[16] A mainly fatty mass with irregularly thickened and/or nodular septa is typically seen on MRI.[16] On T1-weighted images, nonfatty areas will show a nonspecific drop in signal, while on T2-weighted images, there will be variable increases in signal. Variations exist in the nonfatty areas gadolinium contrast enhancement. Because the MRI results can mimic benign lipomatous tumors like chondrolipoma, a histologic diagnosis is frequently necessary. Cytogenetically, supernumerary ring chromosomes or large marker chromosomes will be present in ALT. Amplified sequences from the 12q13-15 region will make up the majority of the ring and large marker chromosomes.[15]

Based on our assertions, lipomas do not usually recur, so a lengthy follow-up regimen is probably not required for this benign lesion. Furthermore, our experience has shown that the majority of local recurrences following surgery for soft tissue tumors of the extremities are detected by the patient prior to a doctor's diagnosis during a routine examination. Furthermore, routine, prolonged review following surgery is usually unnecessary because common lipomas do not merit the classification of a well-differentiated liposarcoma.[20] As Ishibashi's et al. stated in their study that the non-lipomatous makes it difficult without histopathological reporting and alone radiological evidence is not sufficient to diagnose this condition.[21] In our case the suspicion of hemangioma was ruled out only because of H/P examination and importance of this method helped us to diagnose this precious case for reporting for its rare occurrence in childhood. Given these factors and the fact that our goal was to report an uncommon benign lesion in a pediatric patient, we felt that further follow-up testing was not necessary. As a result, the patient was released from our care, with instructions for the parents to notify us if any symptoms or indications of a recurrence were ever noticed. To sum up, we have covered the Second

instance of a chondrolipoma in a child's knee as best as we can. Due to its rarity and non-lipomatous components, this illness can be difficult to diagnose with radiological findings alone. Although we are aware that the follow-up period is brief at the time of publication and that more follow-up is planned, our goal in publishing this information was to highlight the patient's uncommon diagnosis.

4. Conclusion

In conclusion, this case report describes a rare occurrence of chondrolipoma in a child's knee joint, which is an uncommon and non-lipomatous tumor. The diagnosis was made through histopathological examination, highlighting the importance of this method in confirming the diagnosis of such rare cases. The patient showed no signs of recurrence during the follow-up period.

5. Conflict of Interest

None.

6. Source of Funding

None.

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