Case Report

Cytological Diagnosis of Enchondroma: Report of Three Cases

Abstract

Enchondroma is a benign hyaline cartilage neoplasm arising in the medullary region of the bone. Most commonly involves short tubular bones. Most of the lesions are asymptomatic slow-growing lesions detected accidentally on the radiological examination or presents with pain secondary to pathological fracture. Fine-needle aspiration (FNA) is a quick, less invasive procedure and is of help in diagnosing these lesions. We report three cases of enchondroma, two involving phalanges of hand, one in humerus diagnosed by FNA and confirmed by histopathological study. The triad of clinical, radiological and cytological evaluation is imperative for the cytodiagnosis of this well-established entity.

Keywords: *Enchondroma, fine needle aspiration, radiology, small bones*

Manoj Kumar Patro, Tummidi Santosh[1], Atanu Kumar Bal, Bandana Mishra

Department of Pathology, MKCG Medical College, Berhampur, Odisha, [1]Department of Pathology, Seth GSMC and KEMH, Mumbai, Maharashtra, India

Introduction

Enchondroma is a benign hyaline cartilage neoplasm of medullary bone. Most tumors are solitary; however, they occasionally involve more than one bone or site in a single bone. Enchondroma's are usually asymptomatic lesions; thus their true incidence is unknown.[1] Most enchondroma's in a surgical series consist of lesions involving the small bones of the hands and feet with pain being the most common complaint. Enchondroma's of larger bones may be incidental findings on radiography.[2] Fine-needle aspiration cytology (FNAC) of these lesions is not much in vogue. The clinical and radiographic features of cartilaginous lesions must be correlated with the morphologic findings in FNA for optimal diagnostic accuracy.[3] We report 3 cases of in whom FNAC was diagnostic for enchondroma along with clinicoradiologic correlation.

Case Reports

Case 1

A 22-year-old male attended the orthopedic outpatients with the complaints of gradually increasing swelling and pain in the left middle finger for 4 months. An X-ray revealed a radiolucent lesion of middle phalanx of the left little finger [Figure 1]. Based on the clinical presentation and radiology, the presence of an epidermal inclusion cyst or benign tumor, possibly enchondroma, was considered.

Case 2

A 26-year-old male presented to the orthopedic outpatients with the complaints of swelling increasing gradually and pain in the finger for the last 5 days. An X-ray revealed a well-defined osteolytic lesion with thinning of the cortex of proximal phalanx of the left middle finger [Figure 1]. Clinicoradiological possibilities considered were tubercular osteomyelitis/enchondroma.

Case 3

A 12-year-old male patient came to orthopedic outpatient with the complaints of pain in the left arm, swelling, and tenderness for the last 3 months. X-ray revealed an osteolytic lesion in the shaft of the humerus with a thinned rim of the cortex [Figure 1]. Possibility of bone cyst/chondroblastoma was made based on the clinicoradiological correlation.

Cytology pictures all 3 cases

FNAC was performed in all 3 cases using a 23-gauge needle & 5-ml syringe. The aspirate was thick mucoid-like material. Smears were then stained with May-Grunwald-Giemsa stain (MGG) and Hematoxylin and Eosin (H & E). Microscopy revealed numerous fragments of cartilage with dispersed cells being uncommon. The fragments stain strongly

How to cite this article: Patro MK, Santosh T, Bal AK, Mishra B. Cytological diagnosis of enchondroma: Report of three cases. Clin Cancer Investig J 2017;6:258-60.

Address for correspondence:
Dr. Tummidi Santosh, Department of Pathology, Seth GSMC and KEMH, Mumbai, Maharashtra, India.
E-mail: born_vss@yahoo.co.in

Access this article online

Website: www.ccij-online.org

DOI: 10.4103/ccij.ccij_54_17

Quick Response Code:

violet or blue with MGG and faintly pink with H and E. Within fragments the chondrocytes were round to oval with small dark nuclei and ill-defined cytoplasm. There were no mitosis and atypia; however occasional binucleated chondrocytes were also seen [Figures 2 and 3]. Cytology and clinicoradiological findings were diagnostic of enchondroma. The lesions were subjected to curettage. The curetting's on histopathology showed increased cellularity of the mature hyaline cartilage fragments. Pleomorphism, multiple nuclei, and mitoses suggestive of malignancy were not seen [Figure 4]. One case was lost on follow-up, the remaining two cases had curettage and bone grafting done at the local site and asymptomatic within the 6 months of follow-up.

Discussion

Enchondroma's are relatively common, accounting for 10%–25% of all benign bone tumors. The true incidence is actually much higher since many tumors are detected incidentally and never biopsied. They appear between the 2nd and 4th decades of life although they have wide age distribution and both sexes being equally affected. They may be solitary or multiple. Later benign commonly associated with syndrome like Ollier's disease and Maffucci syndrome.[1,4] The hand and wrist are the most frequent sites for enchondromas accounting for 54% of cases, where it most often affects the small tubular bones, i.e., proximal and middle phalanx followed by metacarpals. They are much less frequent in the distal phalanx. The long tubular bones, especially proximal humerus and proximal and distal femur are next in frequency. The lesion is commonly asymptomatic and is detected when a fracture occurs or as an incidental radiologic finding.[1,5]

Enchondromas in the small bones of the hands and feet typically present as palpable swellings, with or without pain. Long bone tumors are more often asymptomatic and many are detected incidentally in radiographs or bone scans taken for other reasons. Tumors other than those located

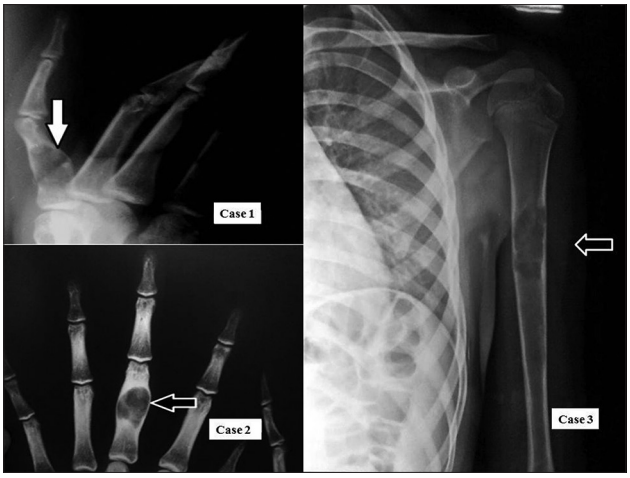

Figure 1: Case 1-Lateral view hand showed a radiolucent lesion of middle phalanx of the left little finger. Case 2-anteroposterior view hand showed a well-defined osteolytic lesion with thinning of the cortex of proximal phalanx of left middle finger. Case 3-Chest X-ray revealed an osteolytic lesion in shaft of humerus with thinned rim of cortex

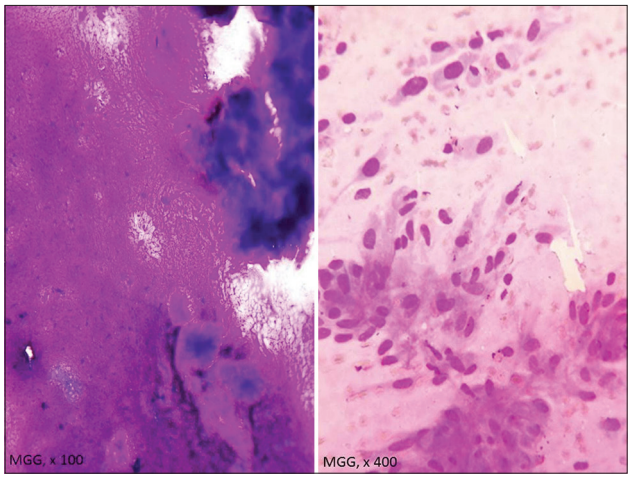

Figure 2: Cytology of enchondroma showing fragments of cartilage with dispersed cells, fragments stain strongly violet or blue (MGG, ×100, ×400)

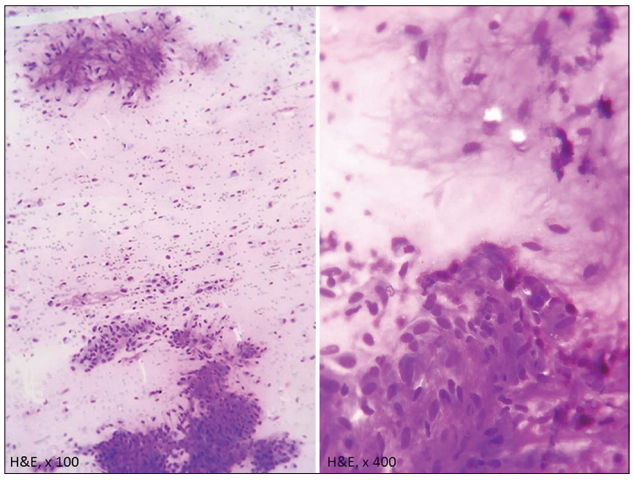

Figure 3: Cytology of enchondroma with few binucleated chondrocytes seen and fragments stain faintly pink (H and E, ×100, ×400)

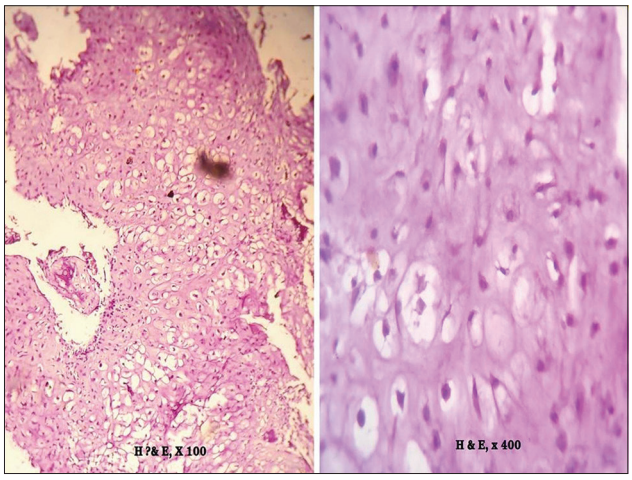

Figure 4: Histopathology showed lobules of mature hyaline cartilage, conforming the diagnosis of enchondroma (H and E, ×100, ×400)

in small bones are usually painless unless aggravated by stress. Because they often expand these small bones and attenuate the cortex, they frequently present with pathological fractures. This feature in a cartilage tumor of a larger bone might be worrisome. However, in a small bone, unless the tumor permeates through the bone into soft tissue the diagnosis of chondrosarcoma should not be made.[1] Based on the appearance on X-Ray, Takigawa[6] classifies as: Central (58%), eccentric (19%), combined (21%), polycentric (11%), and giant enchondroma (3%). Enchondromas are usually "hot" on bone scan.[1]

Diagnosis is often suggested by radiology which usually demonstrates a small (<5 cm) cartilaginous lesion with intramedullary calcifications without cortical involvement or soft-tissue extension. However, radiologically enchondromas can be difficult to differentiate low-grade chondrosarcoma, epidermoid cyst, osteomyelitis, bone cyst as was in our cases.[7] FNAC of the above mentioned lesions is quite distinct. Smears in the case of epidermoid cyst composed of debris with anucleate squames, inflammatory cells and foreign body giant cells. Chondrosarcoma of low-grade malignancy usually >5 cm radiologically, present in long bones, yields tumor cells in fragments of variable size and cell dissociation being infrequent. The fragments are of variable cellularity, with some cells lying in lacunar spaces. A myxoid background matrix is not prominent and individual tumor cells display a slight-to-moderate atypia. Some tumor cells are binucleated.[8]

Enchondroma cytology smears usually show clumps of hyaline cartilage which is often very thick. The metachromatic material may be abundant. It can be difficult to discern the cellular or lacunar outline. The cells have a single round nucleus without obvious nucleoli and binucleation is unusual. Mitosis should not be seen in chondromas and if present may suggest a more aggressive lesion. Fluid and degenerated material and debris may be obtained when these tumors are aspirated, especially when located in soft tissue. Binucleation may also be seen at extraskeletal sites.[3,8]

Enchondromas are successfully treated by intralesional curettage in most cases and local recurrences are uncommon. Occasionally, an enchondroma will recur many years later and rarely, recur as a low-grade chondrosarcoma.[9]

Conclusion

Due to their slow growth and asymptomatic nature, enchondromas rarely require clinical attention for which there are very few literatures available. The triad of clinical, radiological and cytological evaluation is imperative for the cytodiagnosis of this well-established entity. FNAC along with the clinical and radiologic findings can help in the proper diagnosis of enchondromas and even early management.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Lucas DR, Bridge JR. Chondromas: Enchondroma, periosteal chondroma, and enchondromatosis. In: Fletcher CD, Unni KK, Fredrik M, editors. Pathology and Genetics of Tumors of Soft Tissue and Bone (WHO). 4th ed. Lyon: IARCPress; 2002. p. 237-40.
2. Lichtenstein L, Goldman RL. Cartilage tumors in soft tissues, particularly in the hand and foot. Cancer 1964;17:1203-8.
3. Oscar L, Maureen FZ. Cytology of soft tissue, bone and skin. In: Bibbo M, Wilbur DC, editors. Comprehensive Cytopathology. 3rd ed. China: Saunders Elsevier; 2008. p. 492-3.
4. Schajowicz F. Cartilage-forming tumors. In: Tumors and Tumor-Like Lesions of Bone. New York: Springer; 1994.
5. Unni KK. Dahlin's Bone Tumors General Aspects and Data on 11,087 Cases. 5th ed. Philadelphia: Lippincott-Raven; 1996.
6. Fernández JM Ayala GU, Camacho GJ, Sánchez AC. Enchondroma of the distal phalanx. Acta Ortop Mex 2011;25:375-8.
7. Murphey MD, Flemming DJ, Boyea SR, Bojescul JA, Sweet DE, Temple HT, *et al.* Enchondroma versus chondrosarcoma in the appendicular skeleton: Differentiating features. Radiographics 1998;18:1213-37.
8. Henryk AD, Akerman M, Jan S. Soft tissue and musculoskeletal system. In: Gray W, Gabrijela K, editor. Diagnostic Cytopathology. 3rd ed. China: Elsevier; 2010. p. 769-70.
9. Marco RA, Gitelis S, Brebach GT, Healey JH. Cartilage tumors: Evaluation and treatment. J Am Acad Orthop Surg 2000;8:292-304.