

Musculoskeletal

Rajul Rastogi

Consultant Radiologist, Yash Diagnostic Center, Yash Hospital and Research Center, Civil Lines, Kanth Road, Moradabad - 244001, (UP) India

Correspondence: Dr. Rajul Rastogi, C-002, Upkari Apartments, Plot no 9, Sector 12, Dwarka, Delhi - 110078, India.
E-mail: eesharastogi@gmail.com

A 30-years-old man presented with a seven to eight months history of a painless, progressively increasing hard mass on the palmar aspect of the right middle finger, located at the level of the PIP joint, causing mild restriction of the movement at the same joint. There was no history of trauma.

The radiograph of the middle finger in the lateral projection is shown [Figures 1 and 2].

What is your diagnosis?



Figure 1: Lateral radiograph of the middle finger of the hand

Diagnosis: Bizarre Parosteal Osteochondromatous

The radiograph shows a well-defined, oval bony mass with smooth margins, just adjacent to the ventral cortex of the shaft of the middle proximal phalanx, with no evidence of corticomedullary continuation. The longitudinal axis of the mass is parallel to the middle of the proximal phalanx. There is no evidence of any underlying periosteal reaction [Figure. 2]. These findings are diagnostic of bizarre parosteal osteochondromatous proliferation (BPOP), also known as



Figure 2: Lateral radiograph of the middle finger of the hand shows a well-defined, oval, osseous mass on the ventral aspect of the middle phalanx at its base (white arrow) with neither any obvious attachment nor periosteal reaction of the underlying cortex (black arrow)

Nora's lesion.

Nora *et al* first described BPOP in 1983, when it came to be known as a Nora's lesion or disease.^[1] Many benign lesions like osteochondroma, florid reactive periostitis, myositis ossificans and periosteal chondroma mimic this lesion.^[1-3]

BPOP is a rare lesion commonly affecting the hands and feet of young adults, in the second and third decades, without

any sex predilection. The most common sites in decreasing order of frequency, are the proximal and middle phalanges followed by the metacarpal and metatarsal bones,^[4] though it can also arise in other tubular bones and the skull and jaw bones. BPOP arising from the sesamoid bone of the great toe has also been reported.^[5]

BPOP typically presents with a painless or occasionally a mildly painful mass that grows over a period of few weeks to months. Stiffness of the adjacent joint or other mechanical symptoms may be seen. On plain radiographs, it appears as a well-defined bony mass,^[4,6] like an osteochondroma, except that it lacks the characteristic orientation away from the nearby physis seen in the latter.^[2] The lesion may be sessile or pedunculated. There is absence of continuity between the cortex and medullary cavity of the parent bone and the lesion^[1,4] and this can be better delineated by a CT scan, which helps to distinguish BPOP from osteochondroma. Also, the well-formed cartilage cap, characteristic of osteochondroma,^[2] which on T2W MRI images, appears hyperintense to bone, is absent in BPOP. On MRI images, BPOP appears as a hypointense lesion on T1W images and hyperintense lesion on T2W images, similar to other neoplastic lesions. However, in contrast to malignant lesions, BPOP exhibits no periosteal reaction and has normal underlying bone and adjacent soft tissue.

Despite the high rate of recurrence, BPOP is considered a benign lesion. Metastases have never been reported in the literature.^[4,7] Histologically, the lesion contains highly cellular, disorganized and irregular cartilage, a proliferation of bizarre fibroblasts and disorganized bone with spindle shaped fibroblasts in the intertrabecular spaces. There is no "columnation" of the cartilage as in osteochondroma.^[4]

No treatment is required, if a BPOP is asymptomatic, as the lesion is benign. If the patient is symptomatic (pain or compromised function), definitive treatment is by surgical excision with wide margins to minimize recurrence. When surgery is contemplated, nuclear bone scan must be performed prior to surgery, since recurrence typically

occurs in lesions that have increased uptake.^[8]

Florid reactive periostitis is similar in appearance to BPOP, but there is a history of trauma and it is mostly seen in the hands. Plain radiographs show the lesion adjacent to the bone rather than arising from it. Soft tissue swelling is seen as well as marked periosteal reaction. There may be new bone formation in the soft tissues and subtle cortical thinning.^[9,10]

References

1. Nora FE, Dahlin DC, Beabout JW. Bizarre parosteal osteochondromatous proliferations of the hands and feet. *Am J Surg Pathol* 1983;7:245-50.
2. Resnick D, Kyriakos M, Greenway GD. Tumors and tumor-like lesions of bone: Imaging and pathology of specific lesions. In: Resnick D, Kransdorf MJ, editors. *Bone and joint imaging*. 3rd ed. Elsevier Saunders, Co: 2005. p. 1146-51.
3. Soejima O, Isamaya T, Ogata K. Extensor pollicis longus tendon rupture caused by a bizarre parosteal osteochondromatous proliferation of the wrist. *J Hand Surg* 1998;3:277-81.
4. Meneses MF, Unni KK, Swee RG. Bizarre parosteal osteochondromatous proliferation of bone (Nora's lesion). *Am J Surg Pathol* 1993;17:691-7.
5. Harty JA, Kelly P, Niall D, O'Keane JC, Stephens MM. Bizarre parosteal osteochondromatous proliferation (Nora's lesion) of the sesamoid: A case report. *Foot Ankle Int* 2000;21:408-12.
6. Smith NC, Ellis AM, McCarthy S, McNaught P. Bizarre parosteal osteochondromatous proliferation: a review of seven cases. *Aust N Z J Surg* 1996;66:694-7.
7. Soon JL, Chang HC, Sim CS, Teoh LC, Low CO. A case of bizarre parosteal osteochondromatous proliferation of the hand. *Singapore Med J* 2003;44:27-30.
8. Ly JQ, Bui-Mansfield LT, Taylor DC. Radiologic demonstration of temporal development of bizarre parosteal Osteochondromatous proliferation. *Clin Imaging* 2004;28:216-8.
9. Landsman JC, Shall JF, Seitz WH, Berner JJ. Florid reactive periostitis of the digits. *Orthop Rev* 1990;19:828-34.
10. Howard RE, Slawski DP, Gilula LA. Florid reactive periostitis of the digit with cortical erosion: A case report and review of the literature. *J Hand Surg Am* 1996;21:501-5.

Source of Support: Nil, **Conflict of Interest:** None declared.