(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue1, Page No:88-91
January-February2026

IJMSCR

Unusual Presentation of Fibrous Dysplasia in an Elderly Female Presenting as Pathological Peri-Implant Femoral Fracture: A Case Report

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Type of Publication: Case Report
Conflicts of Interest: Nil

Abstract

Fibrous dysplasia is a benign fibro-osseous disorder that typically presents in childhood or early adulthood. Presentation in elderly patients is rare and often mimics metabolic or malignant bone diseases. We report a case of a 62-year-old female with a long-standing femoral lesion who presented with a pathological peri-implant fracture. Radiological evaluation raised the possibility of fibrous dysplasia or Paget disease. Histopathological examination confirmed fibrous dysplasia. This case highlights the importance of histopathology in establishing diagnosis in atypical age groups and avoiding misdiagnosis.

Keywords: Fibrous dysplasia, fibro-osseous lesion

Introduction

Fibrous dysplasia (FD) is a non-neoplastic developmental disorder of bone characterized by replacement of normal lamellar bone with fibro-osseous tissue containing immature woven bone. It accounts for approximately 5–7% of benign bone tumors and is usually detected in the first three decades of life[(1,3)]. Late presentation in elderly individuals is uncommon and may pose significant diagnostic challenges due to overlap with Paget disease, metastatic bone disease, and low-grade sarcomas.[(5,7)]

Case Report

A 62-year-old female presented with pain in the left thigh following a trivial fall one month prior to admission. She had a history of left femoral fracture 20 years earlier, treated surgically with internal fixation. The patient was posted for implant removal due to suspected pathological peri-implant fracture. She was a known case of hypothyroidism for six years, not on medication for the past one year. There was no history of malignancy, metabolic bone disease, or similar complaints in the family .Plain radiographs of the left femur showed an expansile intramedullary lesion involving the shaft with cortical thinning and peri-implant fracture. CT scan revealed a ground-glass appearing intramedullary lesion. Differential diagnoses included fibrous dysplasia and Paget disease. Microscopy revealed moderately cellular fibrous stroma composed of spindle-shaped fibroblasts with irregular, curvilinear trabeculae of immature woven bone arranged in a Chinese letter pattern (Figure 1).Osteoblastic rimming was absent (Figure 2). No atypia, mitotic activity, or necrosis was identified.(Figure 3). These features were diagnostic of fibrous dysplasia. Biochemical evaluation revealed normal serum alkaline phosphatase levels.

Histopathology Figures

Figure 1: Low power photomicrograph (H&E, 40X) showing irregular curvilinear trabeculae of immature woven bone in a fibrous stroma (Chinese-letter pattern).

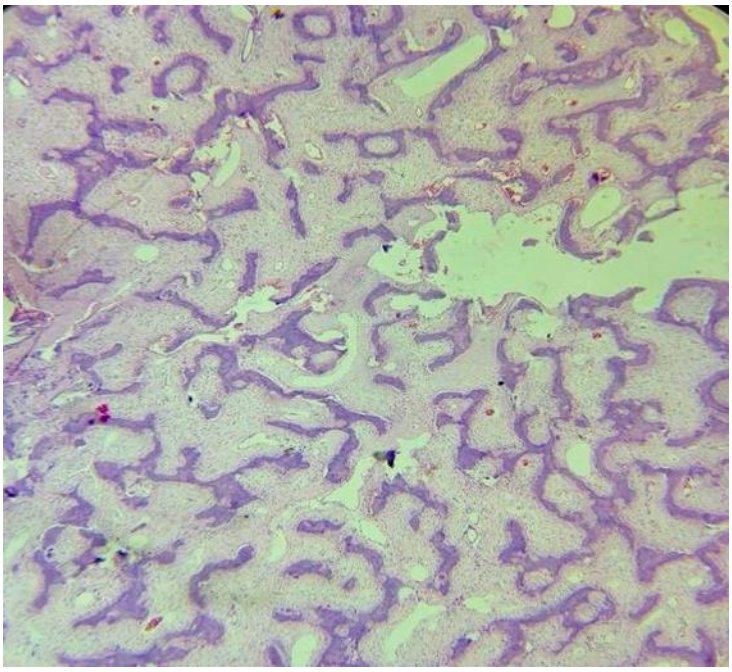

Figure 2: (H&E, 100X) demonstrating immature woven bone lacking osteoblastic rimming embedded in moderately cellular fibrous stroma.

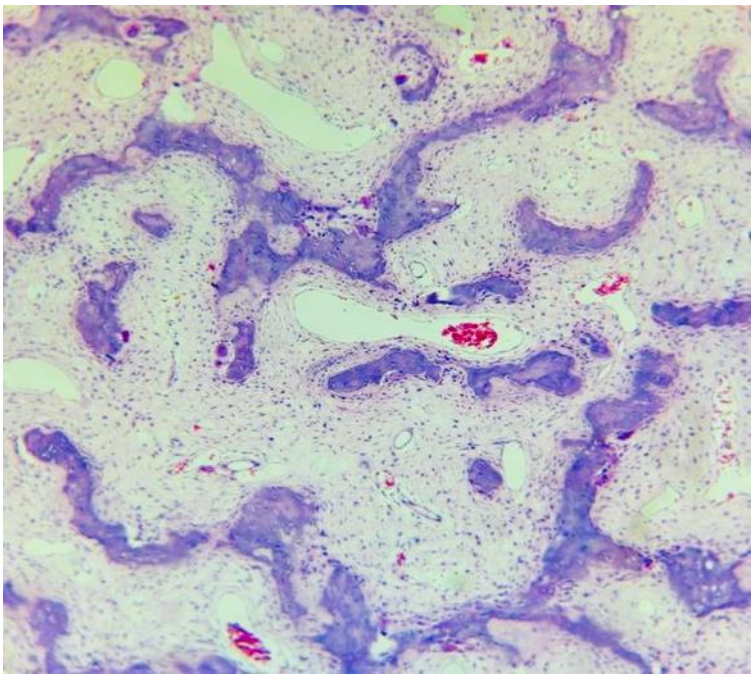

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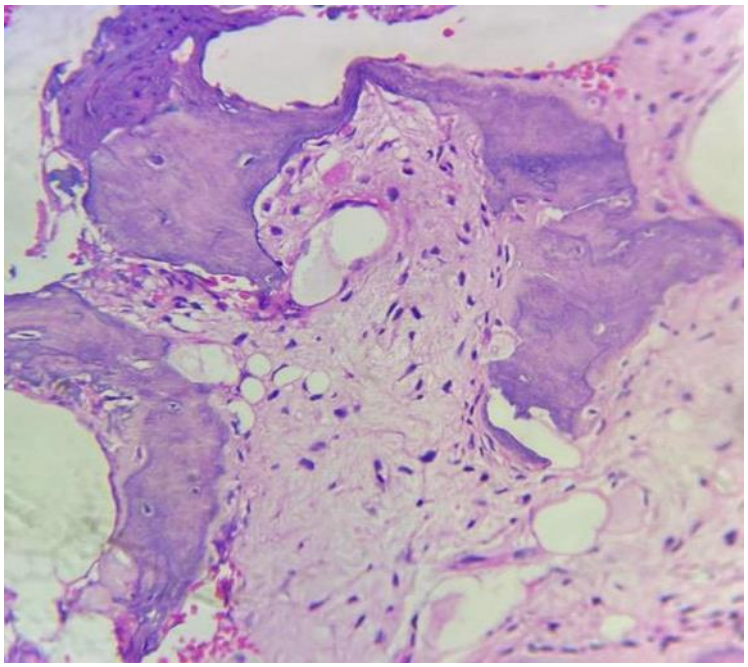
Figure 3: High power view (H&E, 400X) showing spindle-shaped fibroblasts with absence of cytological atypia or mitotic activity.



Management and Follow-up

The patient underwent implant removal and stabilization. Post-operative recovery was uneventful. She was managed conservatively and advised regular follow-up.

Discussion

Fibrous dysplasia is a benign, non-hereditary fibro-osseous disorder resulting from post-zygotic activating mutations of the GNAS gene.[3]The disease typically manifests in childhood or early adulthood, with most lesions becoming clinically evident within the first three decades of life.[1,2,9]Long-term studies have shown that lesion activity usually stabilizes after skeletal maturity, and new lesion development in later life is uncommon.[1,9]DiCaprio and Enneking, as well as Harris et al., described fibrous dysplasia as a disease with a relatively stable course in adulthood, with symptoms in older patients usually related to secondary complications such as fractures or deformities rather than active disease progression.[1,9]In contrast, the present case demonstrates symptomatic disease in a 62-year-old patient, emphasizing that clinically significant fibrous dysplasia may still present late in life[.1] Radiologically, fibrous dysplasia characteristically presents as an intramedullary expansile lesion with a ground-glass matrix and cortical thinning.However, in elderly patients, these findings may overlap with Paget disease of bone, metastatic bone disease, and low-grade osteosarcoma, leading to diagnostic uncertainty.[5–7]Paget disease typically shows cortical thickening, bone enlargement, and a mixed lytic–sclerotic appearance, features not observed in the present case.[5,6]Several authors have emphasized that radiological findings alone may be insufficient for definitive diagnosis in atypical age groups.[5,7]Histopathology remains the gold standard for diagnosing fibrous dysplasia.The presence of irregular, curvilinear trabeculae of immature woven bone arranged in a Chinese-letter pattern within a fibrous stroma, along with absence of osteoblastic rimming, is characteristic of fibrous dysplasia. The absence of atypia, mitotic figures, and necrosis in our case helped exclude malignant transformation.[8,10]Although pathological fractures are a recognized complication of fibrous dysplasia, particularly in weight-bearing bones such as the femur, peri-implant fractures associated with fibrous dysplasia are rarely reported.Chapurlat and Orcel noted that fracture risk correlates with lesion extent, cortical thinning, and altered biomechanical stress. In the present case, the presence of a long-standing lesion combined with a retained implant likely predisposed

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the bone to fracture following trivial trauma.[2]This case highlights the importance of considering fibrous dysplasia in the differential diagnosis of pathological fractures in elderly patients and underscores the crucial role of histopathological examination in avoiding misdiagnosis and overtreatment.[8,10]The absence of a marked elevation in serum alkaline phosphatase in the present study favors fibrous dysplasia over Paget's disease.

Conclusion

Fibrous dysplasia should be considered in elderly patients presenting with pathological fractures. Histopathological confirmation is essential to avoid misdiagnosis and overtreatment.

Ethical Approval

Written , informed consent was obtained from the patient for her information to be included in our manuscript. Her information has been de-identified to the best of our ability to protect her privacy.

Author contribution

Each author participated in writing the manuscript, and all agreed to accept equal responsibility for the accuracy of the content of the paper.

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