

- Abstract -

## New Diagnostic Clues of Non-ossifying Fibroma and Fibrous Cortical Defect

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This study was performed to document the morphologic relationships between non-ossifying fibroma (NOF) and fibrous cortical defect (FCD), as well as to determine any new diagnostic clues. Eighteen patients with 21 NOFs and 14 patients with 15 FCDs found incidentally on radiography were included. The authors prospectively performed CT, MRI, or both on all subjects. The study included size, location, sclerotic property and contour of the periphery, as well as calcification of the matrix of the lesions and the distance from the lesion to the growth plate. The morphologic characteristics were thoroughly reviewed focusing on the presence of the cortical tract in the lesions. The size of the lesion and the distance from the growth plate were not correlated with the patient's age. The presence of the cortical tract was noted in 18(85.7%) out of 21 NOFs, and 10(66.7%) out of 15 FCDs. The presence of the cortical tract was correlated with the longitudinal length of the lesion and the distance from the growth plate. The presence of the cortical tract may be one of the important characteristics in NOF and FCD, and if the diagnosis of bony lesions is obscure by radiologic finding, its existence may be a good indicator of diagnosis for NOF or FCD.

**Key Words** : Non-ossifying fibroma, Fibrous cortical defect, Cortical tract

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18 4 , 12

가 가

, 2

(non-ossifying fibroma:  
NOF) (fibrous cortical

defect: FCD)

14 7

가 가 , 7

가

6 2

(bone algrism) 3mm

가

가 가

6).

가 (cortical tract)

가

가

(opening tract)

21

가 10 가 , 가 6 ,

18 21 (6~30 ,  
12.7±5.5 , : =15:6) ,

2 , ,  
가 1 . 10 7

14 15 (3~35 , 13.5±  
10.2 , : =6:8)

, 3 , 6 , 5

(GE highspeed advantage,  
Milwaukee, WS)

1 .  
5 ~ 45mm( 19.8±12.8mm),  
4 ~ 29mm( 12.1±6.1mm) ,

2

가

3 ~ 76mm( 19.8±25.8  
(r=

(cortical irregularity syndrome)

mm) ,  
0.33).

12).

3

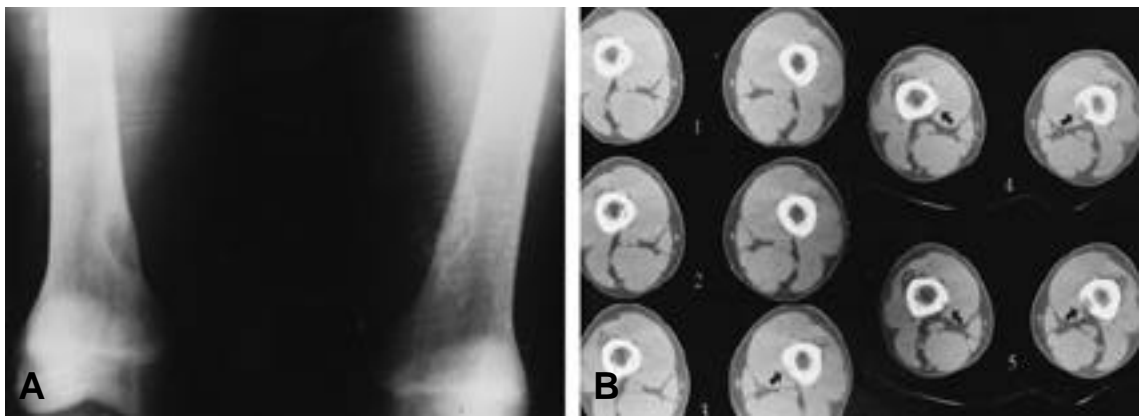
, 1

18 3

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가 21 , 18

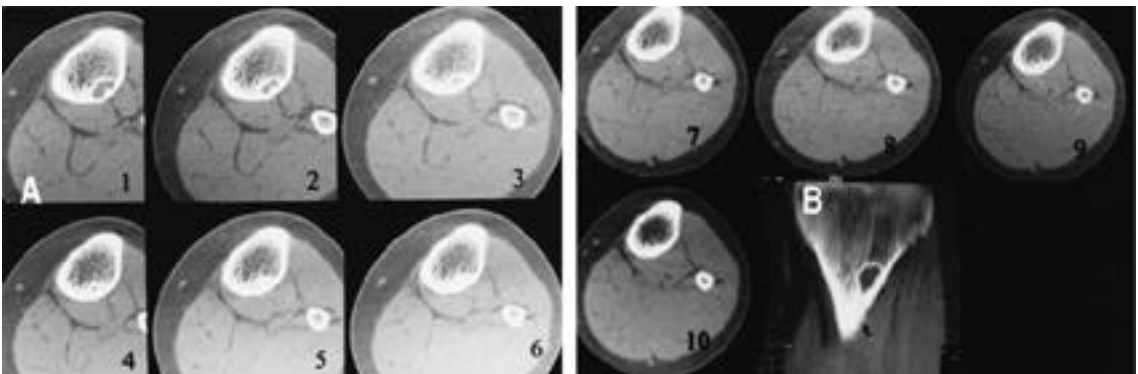
(85.7%), 12



**Fig. 1.** Sixteen-year-old patient.

**A.** Plain radiograph of both distal femurs. Note eccentrically located, well-defined sclerotic rim of osteolytic lesion in both femurs in symmetrical manner, with minimal cortical ballooning, suggesting typical appearance of NOF.

**B.** From above (1) to below(5): On the left side, the lesion shows cortical transition and cortical opening as it extends downward. On the right side, cortical opening is noted in upper portion of the lesion, and transits into cortical location.



**Fig. 2-A.** There is eccentrically located, osteolytic lesion in the proximal tibia, which transits into intracortical portion(1-10).

**B.** Coronal reconstruction image shows opening tract toward outside of the cortex.

**Table 1.** Relationships of cortical tract in non-ossifying fibroma.

|                             | Presence of tract | Average            | Standard deviation | p value |
|-----------------------------|-------------------|--------------------|--------------------|---------|
| Distance from growth plate  | y*<br>n†          | 33.43mm<br>53.0mm  | 18.45mm<br>20.74mm | 0.04    |
| Longitudinal length of NOF‡ | y<br>n            | 35.5mm<br>18.43mm  | 8.86mm<br>13.22mm  | 0.002   |
| Age                         | y<br>n            | 11.21yr<br>15.14yr | 3.60yr<br>8.03yr   | 0.13    |

y\*: yes

n†: no

NOF‡: non-ossifying fibroma

(cortical violation)

2 (Fig. 3). (metaphyseal fibrous defect), (histiocytic fibroma)

가 (Fig. 3). 가 3cm

3 (Fig. 3). 9 (intramedullary eccentric location) 가 3 ~ 6cm 8).

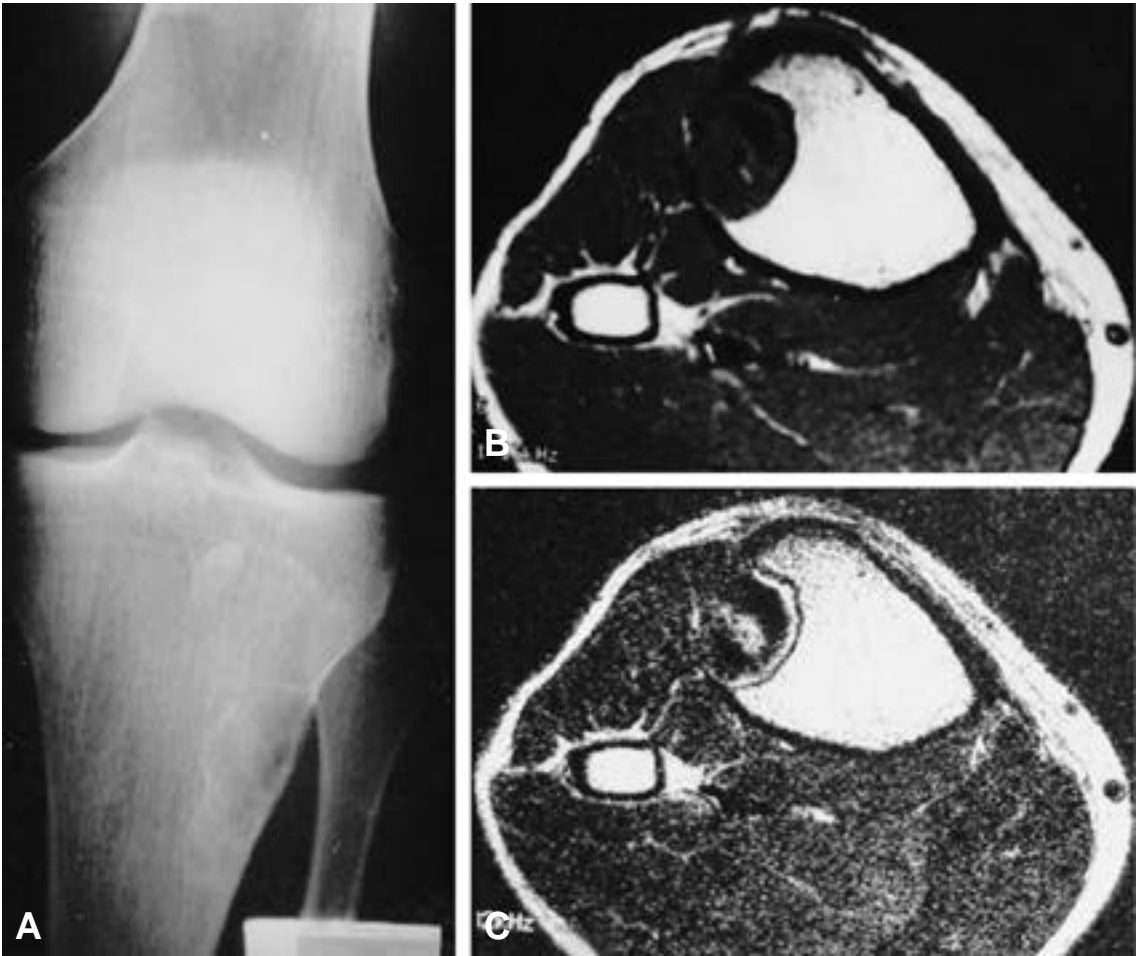
5 ~ 29mm( 10.7±6.6mm), 4 ~ 11mm( 8±2.33mm), 0 ~ 18mm( 8.3±5.5mm) 40%

가 (overhanging edge) 가 15 7 (self limitation) (autonomy) 가 (46.7%), 15 3 (20%) 11), 가

(Fig. 4). 10 9 1,10). Hatcher 4).

(WHO) (overlying cortex)

가 (storiform pattern) (Fig. 2). 가 (xanthoma cell) (hemosiderin), (lucent area) 가 (segmental sclero-



**Fig. 3.** Eighteen-year-old patient.

- A.** AP view of proximal tibia. There is a typical form of NOF in anterolateral aspect of the proximal tibia.
- B.** T1 weighted axial image shows eccentric lesion with isosignal intensity to the adjacent muscle.
- C.** T2 weighted axial image shows mixed low and high signal matrix nature, surrounded by high signal rind along the inner aspect of the sclerosis. Note no medullary edema.

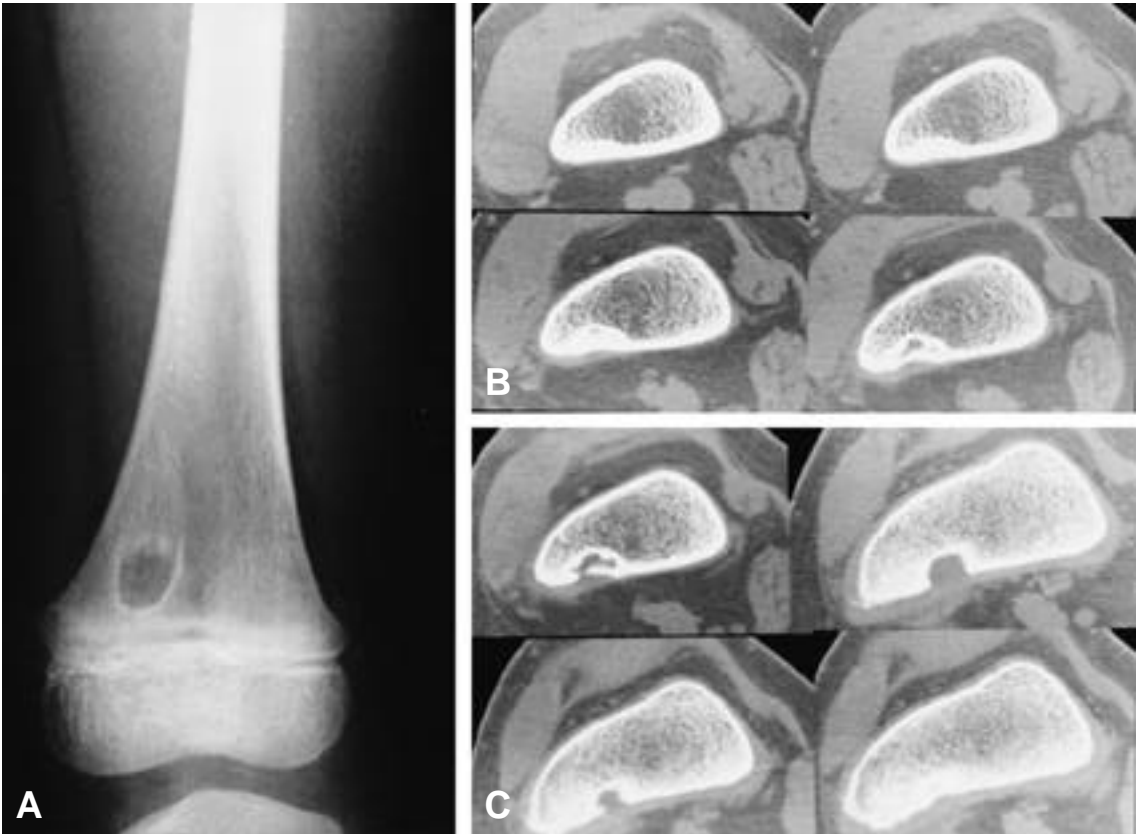
sis)

7).

가 . 가 ,  
(85.7%),  
가 ,

가 가 가 가

가 가



**Fig. 4.** AP radiograph of distal femur of 6 year-old patient.

- A.** There is small radiolucency in medial aspect of the distal femur, with well demarcated sclerotic border.
- B.** Main portion of the lesion shows typical appearance of FCD: smooth based cortical defect, small sized, posteromedial location.
- C.** Upper portion of the lesion shows cortical coverage, and eventually eccentric medullary location.

(cortical covering) 가 (bubbly appearance)  
 가, 25 ~ 30  
 (blister like periosteal reac- (trabecular bone)  
 tion) 1). (sclerotic rind)  
 가 가  
 가 5).  
 (fibroxanthoma) 6).  
 , 1)  
 , 2)  
 가 , 3)  
 3). (lobulated outer contour), 4)

5) 가 가 (small incipient osteosarcoma) 가 (parosteal malignant tumor) (overlying cortex) (cortical perforation), (cortical tract), (opening tract),

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