

Distal Femoral Cortical Irregularity :

1

2

3

: distal femoral cortical irregularity(DFCI)

DFCI

25

120 (25-62)

5

DFCI

, DFCI

1 , 가

2 , 가

3

: 116 (97%)

DFCI가

. DFCI

3.7mm

,

(4.1mm)

(

3.1mm)

.

75 (65%),

41

(35%)

.

1

45

(39%)

31

, 2

52

(45%)

38

, 3

19

(16%)

47

,

가

. DFCI

가

: DFCI

DFCI

(long bone)

Keats

metaphyseal cor-

58

DFCI

(5).

tical irregularity

DFCI

DFCI

(1). 가

distal femoral

cortical irregularity(DFCI)

(2-5),

(medial

head of gastrocnemius muscle)

1996 8

1998 7

25

120 (

68

,

52

, 25-71

,

40

)

, 5

(31-52 ,

42)

5

DFCI가

¹ 가
² 가
³ 가

1998 11 4

1999 6 4

1.5T

(Signa Horizon;General Electrics,

Milwaukee, WI, U.S.A.)

(TR/TE/ETL = 2000/14msec/5) T2 (TR/TE/ETL = 3500-4000/85-102 msec/12-16)

18 × 18cm, 16 × 16cm
512 × 256 matrix size, 4.5mm, 2 excitation

T2
(true cortex)
DFCI (Fig. 1).

DFCI
DFCI
DFCI

‘1’
‘2’
‘3’
t-test
DFCI

120 116 (97%) DFCI가

4
T1 T2
(Fig. 1). DFCI 3.7mm
2-5 mm
(p<0.05), 5
(Table 1).
(Fig. 1, 2B) 75 (65%), (Fig. 2A) 41 (35%)
3 47
(Table 2).
가
가

Table 1. Thickness of Distal Femoral Cortical Irregularity

Thickness (mm)	Male (n= 66)	Female (n= 50)	Total (n= 116)
2	4	12	16
3	15	22	37
4	29	16	45
5	13	0	13
6-9	5	0	5
Mean thickness	4.1 mm	3.1 mm	3.7 mm

Table 2. Three Types of Inner Cortex (N= 116)

Type	Cases(%)	Mean age
Type 1	45(39%)	31
Type 2	52(45%)	38
Type 3	19(16%)	47



A



B

F1g. 1. Sagittal MR images reveal double cortical line (arrows) at attachment site of the medial head of gastrocnemius muscle. The intervening area shows same signal intensity to adjacent bone marrow on both proton density-weighted (A) and T2-weighted images (B).

가

(Fig. 3).

regularity

cortical desmoid, avulsive cortical ir-
, CT

가

DFCI

DFCI

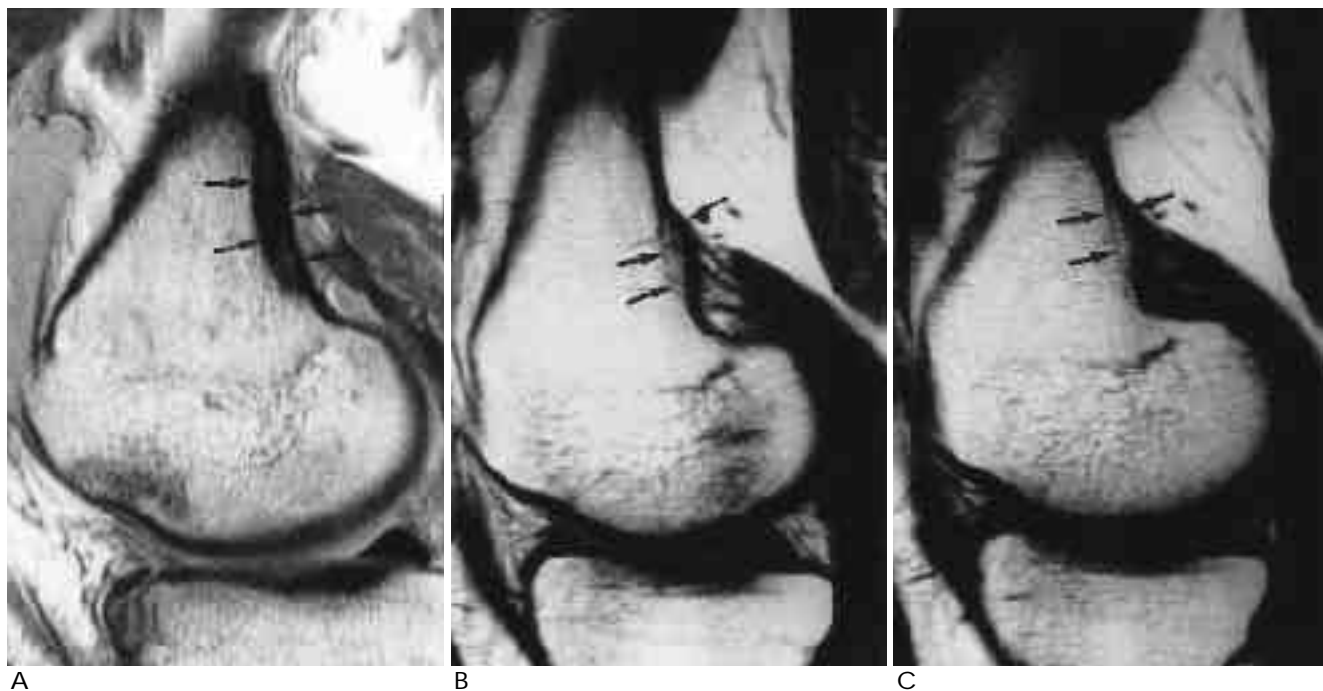


Fig. 2. Proton density-weighted sagittal MR images.
A. Thick-continuous inner cortex and flat outer cortex.
B. Thin-continuous inner cortex and convex outer cortex.
C. Thin-discontinuous inner cortex and convex outer cortex.

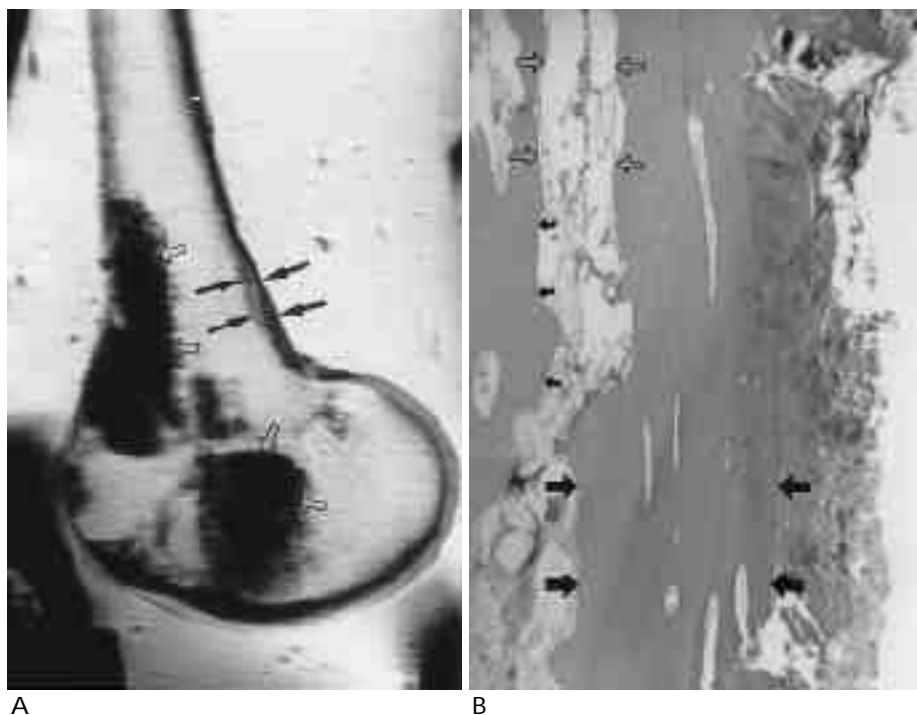


Fig. 3. A . Proton density-weighted im-
age of cadaveric femur reveals double
cortical line (arrow). Areas of dark sig-
nal intensity represent postmortem
change (open arrow).
B. Microscopic finding show outer
compact bone (true cortex) (large ar-
row), inner compact bone (small ar-
row), and intervening normal marrow
(open arrow) (H & E, x 100)

Suh 100 58 9mm DFCI가 , 2-
 89 Suh 10 DFCI (concave) 10 Suh DFCI 5 43 (convex) 5 6mm
 가 DFCI 가 가
 가 58% FCI가 512 x 256 2 3
 DFCI 가 , , ,
 DFCI T1 가
 , T2 DFCI , , ,
 CT (4,6). DFCI DFCI 가 (9)
 , T1 T2 DFCI 가 DFCI
 DFCI (2,4), DFCI 가
 DFCI 가
 DFCI (2), 가
 가 DFCI 가
 가 가
 DFCI (7,8),

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Distal Femoral Cortical Irregularity in Adult : MR Imaging and Pathologic Correlation¹

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Purpose : To correlate the pathologic and MR findings of distal femoral cortical irregularity(DFCI) in adult.

Materials and Methods : We retrospectively reviewed knee MR images of 120 adult patients(25-62 years old) without infection, tumor, or fracture. Five femoral specimens of adult cadaver were used to correlate pathologic and MR findings. A 'double cortical line' on MR images was interpreted as DFCI, and MR findings were analyzed to determine the thickness, internal signal intensity, location of the DFCI, shape of the external cortex, and clarity of the inner cortex. The outer cortex was classified as either convex or flat, and the inner cortex was classified according to its thickness and continuity as one of three types.

Results : One hundred and sixteen patients(97%) had DFCI, which in all cases was observed at the attachment site of the medial head of the gastrocnemius muscle. Mean thickness was 3.7mm and DFCI was thicker in men than in women($p < 0.05$). The outer cortex was convex in 75 cases(65%) and flat in 41(35%). The inner cortex was thick and continuous in 47 cases(41%, mean age 31), thin and continuous in 54(47%, mean age 38), and thin and discontinuous in 19(16%, mean age 47). Clarity tended to diminish with age. The internal area of DFCI showed signal intensity equal to that of adjacent bone marrow and was pathologically proven to be normal marrow tissue.

Conclusion : DFCI was observed in most adults and was considered to be a normal variation. Its MR and pathologic findings were different to those observed during periods of growth.

Index words : Bones, abnormalities

Femur, MR

Bones, MR

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