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:

가 ,

: 1992 4 1998 8

가 53

Garden

1

, Garden ,

Singh index ,

Lunceford

가

: Lunceford

가 40 (75%)

16.3

가 10 (19%),

6 (11%),

2 (4%)

(P<0.01), 7

(P<0.05)

가

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가 가 ,

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가

가

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가

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가 , , 1 . 13 (25%) 5 가
 , , , ,
 . .

4.

Garden¹³⁾, Garden¹³⁾

1992 4 1998 12 10 (19%), 13 (25%), 25 (47%),
 53 5 (9%) 가 ,
 12 (,) 30 (56%) (,
 84 28.6 . 53) 23 (44%) .
 , , 24 (45%) 가 ,
 , Garden¹³⁾ 21 (40%) 8 (15%) .

Garden

Singh index

가 Luncford¹⁷⁾

5.

가 . 24 가 25 (47%),
 48 9 (17%), 3 7 12 (23%), 7
 7 (13%) . 3

1.

20 81 , 25 (47.2%),
 49 1:1.12 . 50
 28 (52.8%) 27 가 16
 (59%), 50 26 가 17 (65%)

6.

가 24 80

2.

가 24 (45%) 가 16
 (30%), 13 (25%) 50
 27 14 (52%), 7 (26%)
 78% , 50
 26 가 18 (69%)

Garden

20

6.5mm 7.0mm

가

, 3

2

(Fig. 1) 4

6 (11%)

1 가

3.

18 (34%) 26
 , 6 (23%) 가
 4 , 3 ,
 3 , 3 ,
 2 , ,

7.

2 , 4

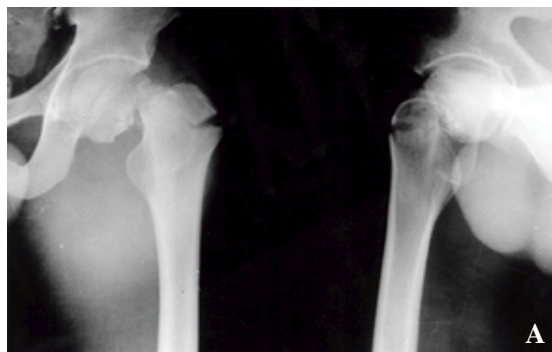
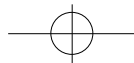


Fig 1A. Preoperative radiograph of a 30 years old male shows Garden stage IV fracture and greater trochanteric fracture.

B. Postoperative 4 months radiograph shows complete bony union.

C. 20 months after operation, screws were removed and the clinical result was excellent.

6-8	.	30	20 (67%)	
8. 가		. 6		47 (89%)
				16.3
		53	18 (33%)	가
			10 (19%),	6 (11%),
		2 (4%)	.	
		23	6 (26%),	30 12
		(40%)		

($P>0.1$)(Table 2).

53	Lunceford ¹⁷⁾	가	24	12 (50%),	21	4
24 (45.3%),	16 (30.2%),	6 (11.3%),	(17%),	8	2 (25%)	
7 (13.2%)	40 (75%)					
	(Table 1),					
23	20 (87%)	,	25	8 (32%)		24

($P>0.05$)(Table 3).

**Table 1.** Clinical Results according to Garden 's Classification

Garden 's classification/Results	Excellent	Good	Fair	Poor	No.(%)
I	2	7	0	1	10(19)
II	7	4	2	0	13(25)
III	14	5	3	3	25(47)
IV	1	0	1	3	5(9)
Total(%)	24(46)	16(30)	6(11)	7(13)	53(100)

Table 2. Complication Rate and Garden 's Classification

Garden 's Classification(No.)	Complication`			Total(%)
	*AVN	Nonunion	Malunion	
Non-Displaced : I(10) + II(13)	3	1	2	6/23(26)
Displaced : III(25) + IV(5)	7	5	0	12/30(40)

*AVN : Avascular necrosis of femoral head

Table 3. Relationship between Anatomic Classification and Complication

Anatomic Classification(No.)	Complication			Total(%)
	*AVN	Nonunion	Malunion	
Subcapital(24)	6	5	1	12/24(50)
Transcervical(21)	3	1	0	4/21(17)
Basicervical(8)	1	0	1	2/8(25)

*AVN : Avascular necrosis of femoral head

Table 4. Relationship between Time Interval and Complication

Time interval(No.)	Complication			Total(%)
	*AVN	Nonunion	Malunion	
Within 24 hours(25)	6	2	0	8/25(32)
24-48 hours(9)	1	1	1	3/9 (33)
5-7 days(12)	0	2	0	2/12(17)
over 7 days(7)	3	1	1	5/7 (71)

*AVN : Avascular necrosis of femoral head

48 9 3 (33%), 3 가 가

7 12 2 (17%), 7 7 5 (P<0.01)(Table 5).

(71%) 7 Singh index 3 18 7 (39%)

, 4 35 11 (31%)

(P<0.05)(Table 4).

Garden

41 8 (20%) , 12 (P>0.1)(Table 6).

10 (83%)

**Table 5.** Relationship between Accuracy of Reduction and Complication

Accuracy of reduction(No.)	Complication			Total(%)
	*AVN	Nonunion	Malunion	
Acceptable(41)	7	1	0	8/41(20)
Poor(12)	3	5	2	10/12(83)

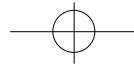
*AVN : Avascular necrosis of femoral head

Table 6. Relationship between Degree of Osteoporosis and Complication

Singh Index (No)	Complication			Total(%)
	*AVN	Nonunion	Malunion	
>4(35)	7	2	2	11/35(31)
<3(18)	3	4	0	7/18(38)

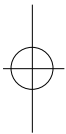
*AVN : Avascular necrosis of femoral head

Gallagher¹¹⁾ 50
 , 50
 16)
 1970
 ,
 , 가 2/3
 53 24
 (45%), 13 (25%)
 70% , 50 27
 1,2,15) 68- 21 (78%)
 75 , 75%-81%가 , 50 26 19 (73%)가
 16)
 1:1.12 50
 1:1.6 50
 , 50 35%
 10%-48%
 16,21) 53 26 (49%)
 6
 50 53 27 가 , 50 27 23
 (51%) 25
 17 (68%)가 50
 17 (61%)가 50
 16)
 Garden¹³⁾
 Banks³⁾
 50
 가



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, 1976 Protzman Burkholder¹⁹⁾,
86.4%, 59%
Garden 155°-180° , 155° 7-15% 1,2,15,16), 10-25%,
180° 19%, 11%
가 . Asnis²⁾
24 50%, 25 60 35%,
60 15% 5
가
1850 Von Langenbeck , 28
, Knowles , 가 (Fig.2).
Clark⁸⁾ 3 , ,
가 , Springer²⁰⁾ 3 , ,
Knowles 6.5mm 가 4,6,14,15),
16) 23 6 (26%), 30 12 (40%)
(P>0.1).
Crowell 12 (50%), 4 (17%),
9) 가 2 (25%)
(P>0.05).
Asnis²⁾
Massie¹⁸⁾ 24
30%, 48 40%, 7 100%
가 , Brown Abrami⁶⁾ 24
80% ,
50% , 24
Barnes⁵⁾ Homberg¹⁵⁾ 7
, 7
가
가 24
32%, 24-48 33%, 3-7 17%, 7
1,10,12) 53 47 71% , 7
(89%) , 7
80 가
(P<0.05). 가
가 24



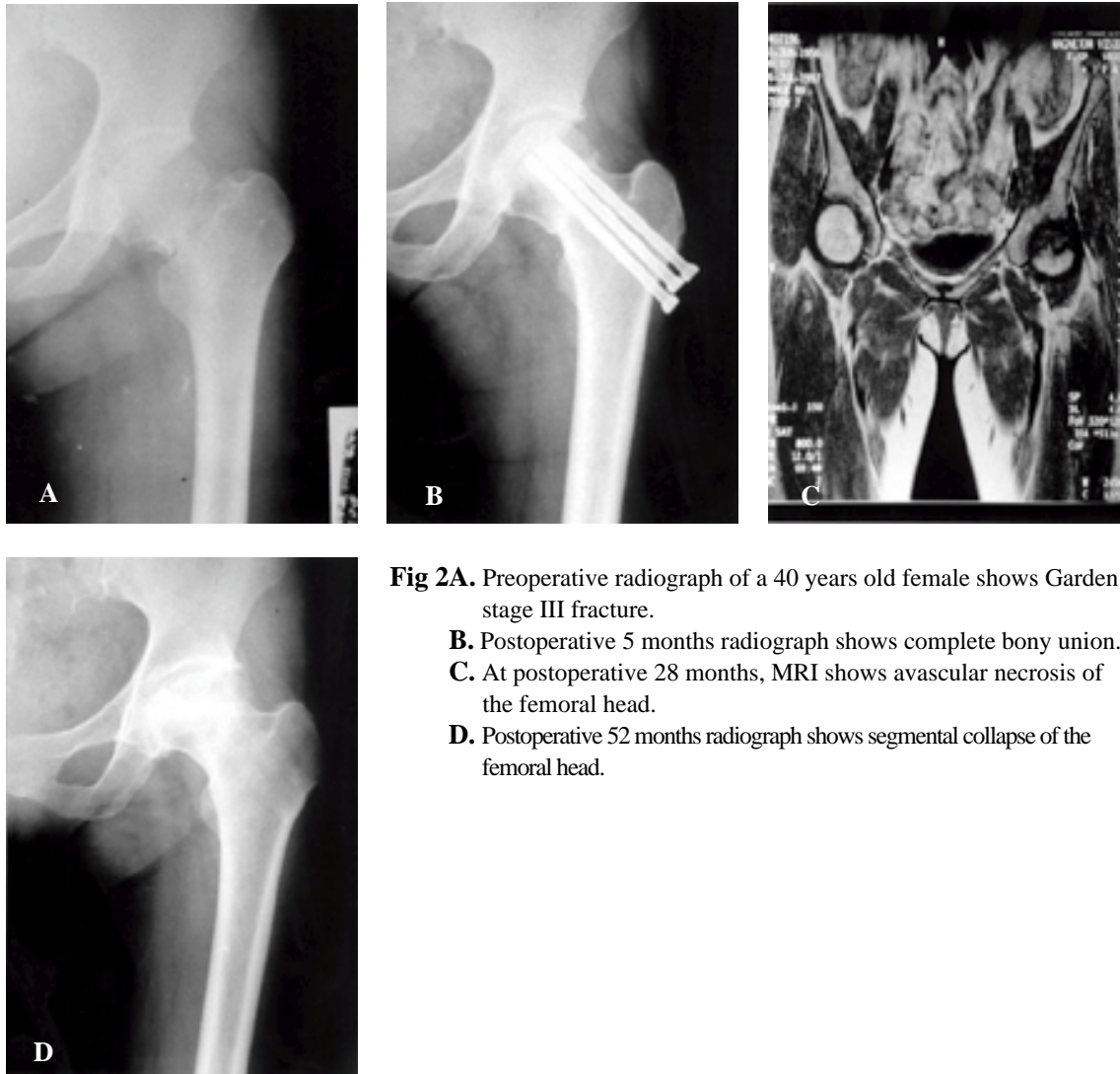
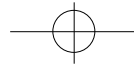


Fig 2A. Preoperative radiograph of a 40 years old female shows Garden stage III fracture.

B. Postoperative 5 months radiograph shows complete bony union.

C. At postoperative 28 months, MRI shows avascular necrosis of the femoral head.

D. Postoperative 52 months radiograph shows segmental collapse of the femoral head.

. Barnes⁴⁾ Massie¹⁸⁾

Anderson⁷⁾

Garden
41 8 (20%)
12 10 (83%)

가
($P < 0.01$). Arnold¹⁾

가
, Calandruccio 18 4 (22%)
2 (6%)

가 가

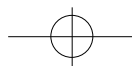
($P > 0.05$).

Singh index 3

4 35

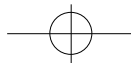
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Abstract

Treatment of Femoral Neck Fractures with Cannulated Screws

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Purpose : This study was performed to evaluate the results of femoral neck fractures in adult treated with cannulated screws and the factors that may affect results.

Materials and Methods : From April 1992 to December 1998, the authors analysed 53 cases of femoral neck fracture treated with cannulated screws and followed more than one year. According to Garden 's classification and anatomic location, we classified the fracture type. We used Garden alignment index for the accuracy of reduction and Singh index for the degree of osteoporosis. The clinical results were analysed by Lunceford 's assessment.

Results : According to Lunceford 's assessment, the results were good or excellent in 40 cases(75%). Mean bony union time was 16.3 weeks. There were 10 cases(19%) of avascular necrosis of the femoral head, 6 cases(11%) of nonunion and 2 cases(4%) of malunion. There were significant relationship between complication rate and accuracy of reduction($P<0.01$), operative delay more than 7 days($P<0.05$).

Conclusion : The important factors that may affect the results are accuracy of reduction and interval between injury and time of operation, the others were degree of displacement, anatomic site, degree of osteoporosis. The results of this study indicate that cannulated screw fixation is an effective method for femoral neck fractures in adult.

Key Words : Femur, neck fracture, cannulated screw.

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