



14, 2, 2001 4

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&lt; &gt;

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.

: 1994 1 1998 12

18

45, 45

20 30

11 (24.4%)

가

가 14 (31.2%) 가

1/3

27

(60.0%)

26

(57.8%)

가

39

, 5

Rush pin

1

Rush pin

가

12.7 ,

13.5

12.4 -14.1

Grace Eversmann 가

가 22 (48.9%),

16 (35.6%),

5 (11.1%),

2 (4.4%)

:

84.5%

가

:

,

,

가 20

가

.

:

143-130

1

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Knight Purvis<sup>15)</sup>, Hughston<sup>12)</sup>

3.

가

1994 1

1998 12

5

1/3, 1/3, 1/3  
 1/3 6 (13.3%), 1/3 27  
 (60%), 1/3 12 (26.7%)  
 1/3 8 (17.8%), 1/3 26 (57.8%),  
 1/3 11 (24.4%) .

1  
 , 45

가 가

18

45

4.

21  
 (46.6%) 가 12 (26.7%),  
 6 (6.7%), 3 (6.7%) ,  
 20 (44.5%) 가  
 11 (24.4%), 11  
 (24.4%), 3 (6.7%) .

1994 1 1998 12

5.

가 가

18

45

, 45

, 1

10)

4 (8.9%)

Gustilo Anderson

. 4

3

1

2

3

31

14.9

12

6.

1.

18

72

35.6

18 (40%)

20

30

11

가

8

3

1.5: 1

가

가 7

.

2.

7.

가 14 (31.2%) 가

(Table 1).

**Table 1.** Causes of injuries

Cause of injury	No. of patients
Traffic accident	14(31.2%)
Slip down	11(24.4%)
Fall down	10(22.2%)
Direct trauma	9(20.0%)
Machinery injury	1(2.2%)
Total	45(100.0%)

No. : Number

D.C.P.)

1).

가 ,  
 (Dynamic Compression Plate,

(Fig.

4

1

가 Rush

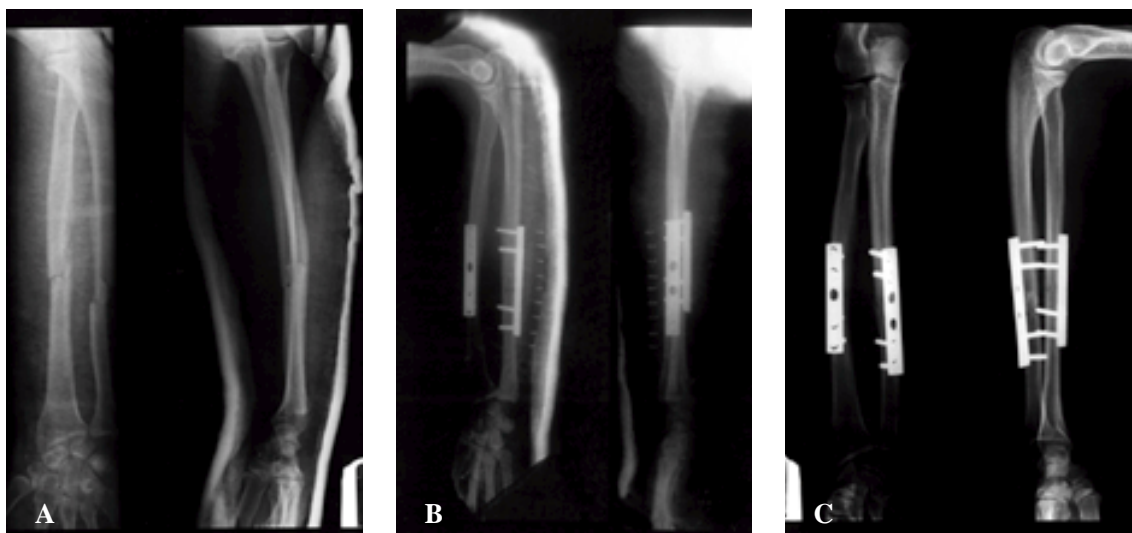
, 1

가

pin

14

D.C.P.



**Fig 1-A.** Roentgenogram shows comminuted mid-shaft fractures of left both forearm bones of a 47 year old woman.

**Fig 1-B.** Immediate postoperative anteroposterior and lateral films show anatomical reduction and internal fixation with plates and screws.

**Fig 1-C.** 6 months after operation, roentgenogram shows good bone union.

Rush pin  
가

arm image intensifier

C-

(Fig. 2), 2

가 14-21

D.C.P.

가

D.C.P.

39

D.C.P.

Rush pin

가 1

가 5

Rush pin

가

12.7 , 13.5

D.C.P.

1/3

가  
(Henry 's approach)

가12.9 ,

가12.9

가12.4 ,

가13.1 ,

(Table 2).

가13.0

가14.1 ,

(Thompson 's approach)

, Rush pin

1/3

(Henry 's approach)

Lister

가 9)

가 Grace

Eversmann

(excellent),

(good),

(acceptable)

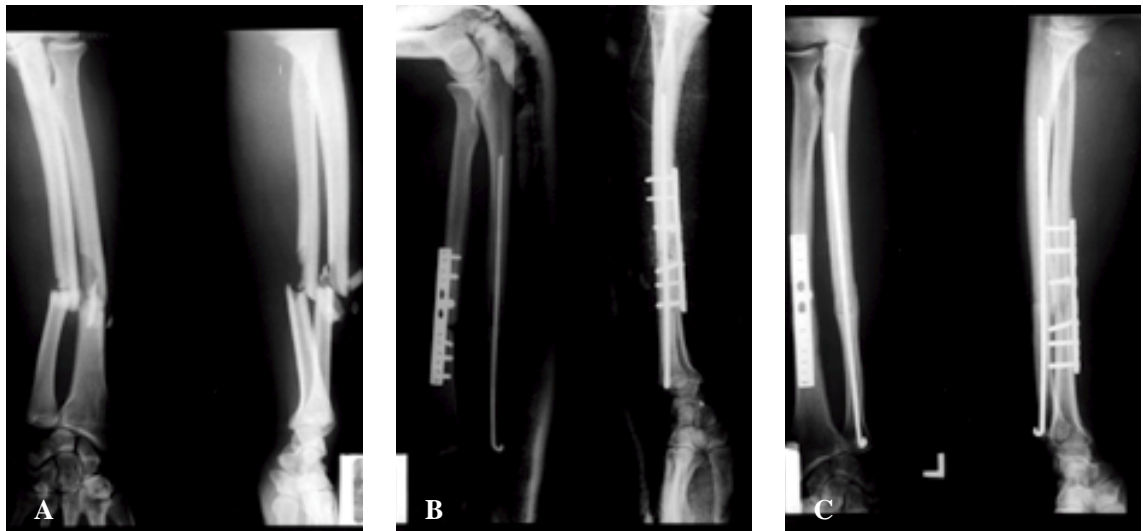
(unacceptable)

(Table 3)

45

22 (48.9%)

, 16 (35.6%)



**Fig 2-A.** Roentgenogram shows marked comminuted mid-shaft fractures of both forearm bones with open wound of a 30 year old man.

**2-B.** Immediate postoperative film. Open reduction and internal fixation with D.C.P. and screws was performed for radius, closed reduction and intramedullary fixation with Rush pin was performed for ulna. Autogenous iliac bone grafts were performed in both bones.

**2-C.** At postoperative 9 months, roentgenogram shows solid bone union.

**Table 2.** Mean duration of bone union by radiologic assessment according to level of fractures

Bone/Level	Proximal 1/3	Middle 1/3	Distal 1/3	Mean duration
Radius	12.9 weeks	12.4 weeks	13.0 weeks	12.7 weeks
Ulna	13.1 weeks	14.1 weeks	12.9 weeks	13.5 weeks

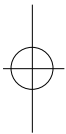
**Table 3.** Functional assessment of both forearm bone fractures treated by operative method(Grace and Eversmann, 1980)

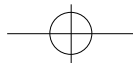
Excellent	Union of the fractures At least, 90% of normal arc of rotation of the forearm
Good	Union of the fractures At least, 80% of the normal arc of rotation of the forearm
Acceptable	Union of the fractures A minimum of 60% of the normal rotation
Unacceptable	Either nonunion of the fractures or less than 60% of the normal rotation

, 5 (11.1%) , 2 (4.4%) Rush pin D.C.P. 가  
 . , 3  
 5 가 , -  
 Rush pin 1 ,



1 가 3 1/3  
 7,13,14,16,20)  
 50% 1/3  
 19)  
 12.5 , 12.7  
 12.7 13.5  
 가 1/3 14.1  
 가 , 가  
 12.4 13.1  
 2 - 가  
 . Sage<sup>24)</sup>  
 (supinator), (pronator teres),  
 (pronator quadratus), (biceps brachii)  
 (abductor pollicis), (bracioradialis) 2,9,12,15,17),  
 - - Lambotte가 1900 Lane  
 , , 22) Danis가 1949 3)  
 Anderson 3) - , 가 (primary  
 , . Bradford 5) bone healing) . Bagby<sup>4)</sup>  
 Burwell Chamley<sup>6)</sup> 가  
 , Sage<sup>24)</sup> 가 , Anderson<sup>1)</sup>  
 1/3 , 1/3 , 가 , Muller 18)  
 가  
 , - 1/3 ,  
 1/3 Rush pin, Kuntscher  
 . Knight Purvis<sup>15)</sup> 24) , Sage<sup>24)</sup>  
 100 Sage  
 , 72% . Knight 15)  
 Hughston<sup>12)</sup> 가 가  
 , Muller 18)  
 , Rockwood 22) (rotational stability) 가  
 (reaming)  
 가 , D.C.P.  
 , semitubular plare D.C.P.





250 • / 14 2

. Rand <sup>21)</sup> 가

Sargent <sup>25)</sup> 가

. Bradford Adams<sup>6)</sup> ,

2 가

1/3 가

(circumduction) 45 11

(torsional) 가

stress)

2) .

Sage<sup>23)</sup> Muller <sup>18)</sup> 12

D.C.P. Hablen<sup>11)</sup> A.S.I.F.

가 18-24

D.C.P.

(three point 12

fixation) Rush pin , Rush pin

가 3

Anderson<sup>2)</sup> .

가 6

Duncan<sup>8)</sup> Gustilo Anderson I, II, III-A

90%

Terry <sup>26)</sup> Gustilo Anderson I II ,

1994 1 1998 12 5

1 가가 18

45 ,

4 2 가 14 (31.2%) 가 ,

20 30 11 (24.4%) 가

가

가

, 1 - Rushpin 1/3 27 (60%), 26 (57.8%) 가 ,

, 1 가

D.C.P. 가 39 , D.C.P.

Rush pin 가 1 , Rush pin

가 5 , Grace Evesmann

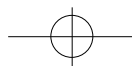
가

(excellent)가 22 (48.9%), (good)가 16

(35.6%), (acceptable) 5 (11.1%)

(unacceptable) 2 (4.4%) 38

Sage<sup>24)</sup>

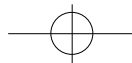


(84.5%)

가 .

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### Abstract

## Operative treatment of diaphyseal fractures of both forearm bones in adults

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**Purpose** : The purpose of this study is to evaluate the effectiveness of operative methods for diaphyseal fractures of both forearm bones in adults.

**Materials and Methods** : Forty five cases with diaphyseal fractures of both forearm bones over 18 year old that are treated by operative methods from January 1994 to December 1998 were followed and analyzed. The most common age group was 3rd and 4th decade(each, 24.4%). Traffic accident was the most common cause of injuries(31.2%). Among both the radius and ulna, middle 1/3 was the most common level of fractures(60%, 57.8%). In operative methods, open redeuction and internal fixation with dynamic compression plate(D.C.P.) and screws were performed in 39 cases, closed reduction and internal fixation with Rush pin were performed in 5 cases, And another 1 case was performed with D.C.P. and Rush pin simultaneously.

**Results** : According to simple X-ray and physical examinations, The average of bone union periods was 12.7 weeks in radius, 13.5 weeks in ulna. The range of bone union periods according to the level of fractures was from 12.4 weeks to 14.1 weeks. For the functional results assessed by Grace and Eversmann method, excellent was 48.9%, good was 35.6%, acceptable was 11.1% and unacceptable was 4.4%.

**Conclusion** : The functional result was satisfactory in 84.5%. So the operative method of diaphyseal fractures of both forearm bones, if proper operative method had been selected and meticulous surgical technique had been performed, was considered as recommendable method.

**Key words**: both forearm bones, diaphyseal fractures, operative treatment.