

Herbert/Whipple

:

.

,

< >

: Herbert/Whipple

: 4

12

(jig, Zimmer)

(guide wire)

A, B, C, D 4 , 0, 5, 10 3

12가

가 가

가

가

: 가 가

가

D5,

C10

C가

가

: Herbert/Whipple

가

D5 ,

C5

가

A0 D0

: , Herbert/Whipple ,

:

910

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* 2002
* 2000

가

가

1-7)

6,8,9)

9-11)

11-13)

10)

K-

10,16)

8-10,12,15,17,18)

8,9,10,12-15,17,18)

8,11,17)

Herbert jig

jig

가 8,10,11,19)

가

8,17,18)

가

8,17)

가

가

가

3,8,13,18)

8,18)

가

4

(Vinyl polysiloxane putty, 3MR)

12 48

Herbert/Whipple

(guide wire) (jig, Zimmer)

4 , 3 12가

가

5%, 10%, 15%,

A, B, C, D 4

가

(0)

5%, 10%

(10)

(5),

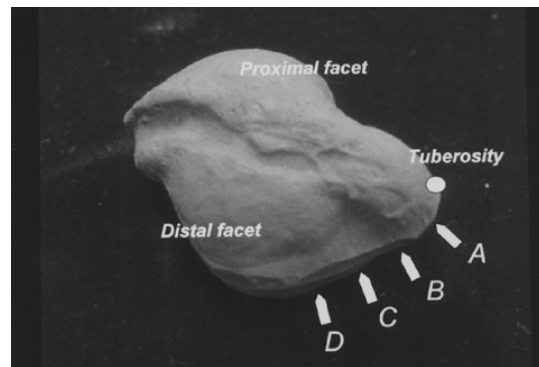


Fig. 1 : A. The landmark of entry point is the most volar surface of the scaphoid tuberosity. Entry points are A, B, C, and D moving 5%, 10%, 15%, 20% of the scaphoid length in a dorsal and distal direction. B. The landmark of target point is the most proximal surface of the scapholunate ligament. Target points are 5, 10, and 15 moving 0%, 5%, 10% of the scaphoid length in a radial and slightly volar direction.

A0, A5, A10, B0, B5, B10, C0, C5, C10, D0, D5, D10 12 (Fig 1).

가 가
가

가 (Fig 2).

Herbert/Whipple
(leading thread diameter, 3.0mm)

가

가

ANOVA with postHoc test
($p < 0.05$).

Kruskal-Wallis test



Fig. 2 : Wrong placement. **A.** Distal medial facet (scaphocapitate joint) penetration **B.** Cortical cutout

Herbert

A0 4 2 , D0 4 3 가
(Fig 3).
가

A5 2.3mm

D5 4.2mm (Table 1).
C5 3.8mm 가

(Table 2).

A0 2.3mm

C10 4.1mm

(Table 3).

Table 1. Average distance from the hole of guide wire to the nearest cortex in the proximal section (mm)

Entry point Target point				
	A	B	C	D
0		3.0	3.9	
5	2.3	3.1	3.9	4.2
0	2.9	2.9	3.5	3.0

Table 2. Average distance from the hole of guide wire to the nearest cortex in the middle section (mm)

Entry point Target point				
	A	B	C	D
0		2.7	3.0	
5	3.6	2.9	3.8	3.4
0	3.4	3.3	3.6	3.5

Table 3. Average distance from the hole of guide wire to the nearest cortex in the distal section (mm)

Entry point Target point				
	A	B	C	D
0		2.4	3.3	
5	3.3	3.4	3.6	3.3
0	2.3	3.4	4.1	3.2

Table 4. Entry point

	Proximal	Middle	Distal
P value	0.000	0.294	0.036
Subset	C	-	C
	A	-	A
Rank	C>D>B>A	A>C>D>B	C>D>B>A

Table 5. Target point

	Proximal	Middle	Distal
P value	0.288	0.112	0.176
Subset	-	-	-
Rank	0>5>10	10>5>0	5>10>0

가 4 3
12
C, D, B, A C가 가
A가가 가 (p<0.05).
A, C, D, B , C, D, B, A ,
가 (Table 4). 가
0, 5, 10 , 10, 5, 0 , 20% 가
5, 10, 0 가 5% 가
(Table 5). 가
가
가
15%
5%
가
가
1-8).
5%, 20%
2가
3, 10). K-
10).
Herbert Fisher⁹⁾ 15% 가
jig 가
jig
9).
jig 가
15).
8, 11, 13, 17, 18).
Herbert/Whipple
C5 가 A0 D0
Herbert/Whipple
D5 ,
가

Herbert/Whipple

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Abstract

Ideal Placement of the Herbert/Whipple Screw in Scaphoid Fracture : A Model Study

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Purpose : To evaluate optimal placement of the Herbert/Whipple screw in scaphoid fracture.

Materials and Methods : Forty eight models molded from four cadaver scaphoids were used for this study. Using the Herbert/Whipple jig, the guide wire was placed distal to proximal into each scaphoid with twelve method which were four entry points and three target points. Guide wire placement was then evaluated with three planes in the proximal, middle, distal planes and distance from the nearest cortex.

Results : The most concentric position in the proximal plane was D5, in the middle plane C10. As distal entry point, the most concentric position in proximal plane was C. There were no statistical concentric, as middle, distal plane, and proximal entry point,

Conclusion : The most ideal placement were D5 in proximal fractures of the scaphoid, C5 in distal fractures. In waist fractures of the scaphoid, there were relatively safe, except A0 and D0. The position of entry points was more important than that of target points for ideal screw placement.

Key Words : Scaphoid fractures, Herbert/Whipple screw, Ideal placement

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