

12, 2, 1999 4

The Journal of the Korean Society of Fractures
Vol.12, No.2, April, 1999

AO Dynamic Condylar Screw

= Abstract =

Treatment of Comminuted Supracondylar and Intercondylar Femoral Fractures with AO Dynamic Condylar Screw

Kyung-Chul Kim, M.D., Jae-Yeul Choi, M.D., Hwa-jae Jeong, M.D.,
Bon-Seep Koo, M.D., Kyung-Ho Kim, M.D.

*Department of Orthopaedic Surgery, College of Medicine, Sungkyunkwan University,
Kangbuk Samsung Hospital, Seoul, Korea*

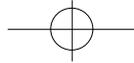
Between 1990 and 1995, 22 comminuted supracondylar and intercondylar femoral fractures in 22 patients were treated with the AO dynamic condylar screw(DCS). Minimum twelve months of clinical and radiographic follow-up evaluation were available on all patients. All cases achieved clinical and radiographic bony union. Functional results were graded using a Schatzker and Lambert's criteria. Results were seen to be excellent to good to fair in 100% of A2 cases, 86% of C2 cases, 75% of A3 cases and 67% of C3 cases. The more comminuted fractures were found to have worse clinical results and more radiographic malunion. The ability to obtain good fixation in osteoporotic bone is distinct advantage of the DCS. The results of DCS fixation compare favorably with previous studies using other fixation devices in comminuted supracondylar and intercondylar femoral fractures.

Key Words : Distal femur, Comminuted supracondylar and intercondylar fractures, DCS

108 (110-745)

Tel : (02) 739-3211

* 1998 9



19 (86%)
(modified extensile approach) , 3 (14%)
(medial parapatellar arthrotomy)

. 70
AO condylar blade plate(CBP) AO
dynamic condylar screw(DCS) 가 1.5cm

6,15,16,17,21,23) 가 5 가
2 3

3,4,8,9,10,16) . 7 DCS
. 1 a
Ilizarov

AO technique AO DCS
22 3 DCS

AO DCS DCS AO 95 °
(plate)
. CBP

가 , 가
DCS CBP
2cm

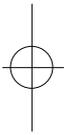
1990 1995 DCS CBP
2cm

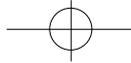
AO technique AO DCS 1/3 -
1 가 22 , wire guide
22 C-arm
1cm가

15 (68%), 7 (32%)
, 55 (23 -78) , tapping , tapping
16 (12-35)
가 15 (68%) 가 가
5 (22%), 1 (5%), 1 (5%)
6 ,

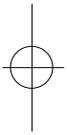
4 , 3 , 3 .
AO A
12 (55%) A2 8 , A3 4 C
10 (45%) C2 7 , C3 3 .
6 (27%) Gustilo K-wire

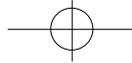
Anderson⁷⁾ 2 , 3 , a 1 .





3
가 .
10 DCS 16 (73%)
tapping 3
(mild) 가 3 (14%)
(moderate) a A3
10 가 1 (4%)
3 가 가 . 2 (9%)
6 (severe) 1 C2
9 가 가 1 C3 가 2
가
4-6 , 13 (59%), 2cm 가 7 (93%)
2cm 2 (9%) . A2
15 (8 -22) 가 . 1cm 가
, C2 4 (57%)
1cm A3
, 3 (75%), C3 (100%)
가
Schatzker
Lambert¹⁸⁾ (Table 1) 가 . A 12 11 (92%), C
10 9 (90%)
A 5 (42%), C 2 (20%)
가 . 20° A2
Schatzker Lambert 0 , A3 3 (75%), C2 3
가 (excellent)- (good)- (fair) (43%), C3 (33%) 가
86% 가 A3 75%, C3 . 가
67% (failure) A3 1 a A2 10 , A3 17 , C2 18
2cm C3 19 . C
1 2cm . C3 12 가
가 2 A3 1 C3
10 , 18 12
. C2 1 22 15 (68%)
() , 11 (50%)

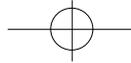




()
 가 . 6°
 6 (27%)
 A2 4 (50%), A3 3,4,8,9,10,13,16,24)
 3 (75%), C2 3 (43%) C3 2 (67%)
 6°
 가 A3 C3 Tile¹⁹⁾ Wenzl²⁵⁾ 1970 Schatzker
 가 .C 2mm AO technique AO CBP
 가 C3 1 70%
 가 8mm
 1 가
 Singh 60 10 2,13,18,22) 가
 90% - - 60
 75% AO 12)
 15 가 Schatzker Lambert
 18)
 2 1 가 2 , DCS
 15,16,21,23,26)

Table 1. Rating system of Schatzker and Lambert

| | | | | | |
|-----------|---|-----|-------------------------|--------|--------|
| Excellent | full extension: flexion loss less than 10° no varus, valgus or rotary deformity no pain perfect joint congruency | 86% | 가 | A2 | C2 |
| Good | no more than on of the following: loss of length not more than 1.2cm less than 10° varus or valgus flexion loss not more than 20° minimal pain | | 가 | A3, C3 | 75% |
| Fair | any 2 of the criteria in Good category | | | A3 | C3 |
| Failure | any of the following: flexion to 90° or less varus or valgus deformity, exceeding 15° joint incongruency disabling pain no matter how perfect the X-ray | | Zehntner ²⁶⁾ | C3 | 가 가 |
| | | | | DCS | |



DCS
 가
 가
 6
 AO DCS
 가
 67%
 가
 가 A3
 Lambert 20) . CBP Olerud¹⁴⁾ C3 A2, C2
 , Mize 11) 가 , 가
 Lewert Modny⁹⁾ 가 73% C3 가 DCS
 가 가
 가
 (supracondylar nail)
 3)가

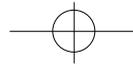


DCS 가
 60 , 10
 7 , 3
 Benum¹⁾ . 10
 가 90%
 DCS
 Gile 6)
 가 가

REFERENCES

- 1) **Benum P** : The use of bone cement as an adjunct to internal fixation of supracondylar fractures of osteoporotic femurs. *Acta Orthop Scand*, 48:52-56, 1977.
- 2) **Chiron HS, Tremoulet J, Casey P and Mueller ME** : Fractures of the distal third of the femur treated by internal fixation. *Clin Orthop*, 100:160-170, 1974.
- 3) **Danziger MB, Caucci D, Zecher SB, Segal D and Covall DJ** : Treatment of intercondylar and supracondylar distal femur fractures using the GSH supracondylar nail, *Am J Orthop*, 684-690, 1995.
- 4) **David SM, Harrow ME, Peindl RD, Frick SL and Kellam JF** : Comparative biomechanical analysis of supracondylar femur fracture fixation: Locked intramedullary nail versus 95-degree angled plate, *J Orthop Trauma*, 11:344-350, 1997.





- 5) **Firoozbakhsh K, Behzadi K, DeCoster TA, Moneim MS and Naraghi FF** : Mechanics of retrograde nail versus plate fixation for supracondylar femur fractures, *J Orthop Trauma*, 9:152-157, 1995.
- 6) **Giles JB, DeLee JC, Hechman JD and Keever JE** : Supracondylar-intercondylar fractures of the femur treated with a supracondylar plate and lag screw, *J Bone Joint Surg*, 64-A:864-870, 1982.
- 7) **Gustilo RB and Anderson JT** : Prevention of infection in the treatment of on thousand and twenty-five open fractures of long bone : retrospective and prospective analysis. *J Bone Joint Surg*, 58-A:453-458, 1976.
- 8) **Karpman RR and Del Mar NB** : Supracondylar femoral fractures in the frail elderly, *Clin Orthop*, 316:21-24, 1995.
- 9) **Lewert AH and Modny MT** : Transfixation Rod in condylar and intercondylar fractures of femur, *Orthop Rev*, 16:310-316, 1987.
- 10) **Marsh JL, Jansen H, Yoong HK and Found EM** : Supracondylar fractures of the femur treated by external fixation, *J Orthop Trauma*, 11:405-411, 1997.
- 11) **Mize RD, Bucholz RW and Grogan DP** : Surgical treatment of displaced, comminuted fractures of the distal end of the femur. *J Bone Joint Surg*, 64-A:871-879, 1982.
- 12) **Mueller CS, Grantham SA and Shelton ML** : *A Comprehensive Classification of Fractures of Long Bones*. Berlin. Springer:138-147, 1990.
- 13) **Neer CS, Grantham SA and Shelton MI** : Supracondylar fracture of the adult femur. A study of one hundred and ten cases, *J Bone Joint Surg*, 49-A:591-613, 1967.
- 14) **Olerud S** : Operative treatment of supracondylar-intercondylar fractures of the femur. Technique and results in fifteen cases. *J Bone Joint Surg*, 54-A:1015-1032, 1972.
- 15) **Radford PJ and Howell CJ** : The AO dynamic condylar screw for fractures of the femur, *Injury*, 23:89-93, 1992.
- 16) **Sanders R, Regazzoni P and Ruedi T** : Treatment of supracondylar-intercondylar fractures of the femur using the dynamic condylar screw, *J Orthop Trauma*, 3:214-222, 1989.
- 17) **Schatzker J** : Fractures of the distal femur revisited, *Clin Orthop*, 347:43-56, 1998.
- 18) **Schatzker J and Lambert DC** : Supracondylar fractures of the femur, *Clin Orthop*, 138:77-83, 1979.
- 19) **Schatzker J and Tile M** : *The Rationale of Operative Fracture Care*. Berlin, Springer Verlag :264, 1987.
- 20) **Schatzker J, Home G and Waddell JP** : The Toronto experience with the supracondylar fracture of the femur 1966-1972, *Injury*, 6:113, 1974.
- 21) **Schatzker J, Mahomed N, Schiffman K and Kellam J** : Dynamic condylar screw-a new device, *J Orthop Trauma*, 3:124-132, 1989.
- 22) **Seinsheimer F** : Fractures of the distal femur. *Clin Orthop*, 153:169-179, 1980.
- 23) **Shewring DJ, Meggitt BF** : Fractures of the distal femur treated with the AO dynamic condylar screw, *J Bone Joint Surg*, 74-B:122-125, 1992.
- 24) **Stewart MJ, Sisk TD, Williams SL Jr** : Fractures of the distal third of the femur. A comparison of methods of thretment, *J Bone Joint Surg*, 48-A:784-807, 1966.
- 25) **Wenzl H, Casey PA, Hebert and Belin J** : *Die operative Behandlung der distalen Femurfraktur*. AO Bulletin, Chur,AO, 1970.
- 26) **Zehnter MK, Marchesi DG, Burch HB and Ganz R** : Alignment of supracondylar/intercondylar fractures of the femur after internal fixation by AO/ASIF technique, *J Orthop Trauma*, 6:318-326, 1992.

