



# SUPRACONDYLAR FRACTURE FEMUR; DYNAMIC CONDYLAR SCREW FIXATION EXPERIENCE AT LIAQUAT UNIVERSITY HOSPITAL JAMSHORO

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**ABSTRACT... Objectives:** Our experience by dynamic condylar screw in the treatment of supracondylar femur fracture, which is quite a long time, has stayed challengeable issue in orthopedic surgery, at LUH. **Study Design:** An observational cross sectional study. **Setting:** Orthopedic Surgery Department, Liaquat University. **Methodology:** Cases along both sexes with additional articular fractures, conceded inside of 2-3 days were incorporate and cases having open epiphysis, open fracture, pathological and intra articular fractures were not a piece of this study. Hospital stay average was 18 days. Follow up was done of every one of the Patients after each third week for two only visits, then every 6th week for about 6 months. All the data were recorded on particularly outlined proforma. **Results:** In this study 19(63.3%) male and 11 female (36.6%) patients. Mean age was found 35yrs. Commonest cause of injury was RTA in 80% patients. 65% patients got injury to left lower limb while 35% to right lower limb. There were only two infections i.e. the infection rate was 6.66%. Union rate was 93.3% and nonunion rate was 3.3% and there was only one mal union i.e. mal union rate was 3.3% .Bone grafting was done in 21 patients. The overall good to excellent results were in 84% cases and fair to poor in 16% cases. **Conclusions:** DCS gives solid fractures fixation after decrease and makes post-operative recovery simple, so in light of patient's financial state in Pakistan. DCS is perfect insert for distal femoral exceptionally for these fractures.

**Key words:** Dynamic condylar screw, Dupracondylar fracture femur

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## INTRODUCTION

Distal third fracture occupies distal 12cm of femur considered proximally as of articular surface of femoral condyles. These fractures happen at about 1-10<sup>th</sup> rate of proximal femur and compose up 6% of femur fractures totaly.<sup>1</sup> Most high-vitality distal femur fractures happen in males somewhere around 15 to 50 years, whereas mostly low-vitality happen in osteoporotic ladies about 50 years of the age.<sup>1</sup> Fractures may be connected to diaphyseal and metaphyseal or may have intra articular augmentation. In youthful grown-ups, serious brutality created by high vitality injury as, accident by motor vehicle and fall from height more often than not precipitate this sort of crack and every now and again connected with life threatening situations<sup>2</sup> like head, abdomen, spine, pelvic and chest wounds. Early surgical adjustment can encourage consideration of the

soft tissues, allow early mobility and decrease the multifaceted nature of nursing care.<sup>3</sup> Distinctive treatment modalities are being utilized by accessibility, understanding reasonableness and their biomechanics like angle blade plate (ABP), DCS, condylar support plate (CBP) and anatomically contoured locking plates (ACLPL) yet every insert has its own benefits and bad marks as ABP and DCS obliges evacuation of extensive bone and insertion of ABP is in fact requesting however ABP stayed standard treatment methodology for obsession of supracondylar breaks of femur for a more extended period, but Dynamic Condylar Screw is less demanding to embed, give more interfregmantary pressure over an intercondylar fracture and right sagittal plane malalignment.<sup>4,5</sup> Condylar brace plates do not have the strength of settled point gadgets and are inclined to Varus fall or screw failure.<sup>6,7</sup> these

days, distal femoral fractures are being dealt with all the more normally with anatomically shaped bolting plates, however their biomechanical preference and lower difficulty rates are debatable still now. Recently outlined inserts are extremely costly and the people groups who referred to our department, are not affordable for expensive implants so we conducted our experience with DCS, to assessed the surgical consequences of DCS in our patients at Liaquat Medical University Hospital Jamshoro.

## METHODOLOGY

This observational cross sectional study, conducted in orthopedic surgery department Liaquat University cases along both sexes with additional articular fractures, conceded inside of 2-3 days were incorporate and cases having open epiphysis, open fracture, pathological and intra articular fractures were not a piece of this study. Most of the patients admitted through emergency of Liaquat university Hospital Hyderabad where protocol of ATLS carried out for every patient and patient resuscitated accordingly. Detailed history regarding mechanism and modes of injury were taken. Every patient went for radiograph of femur with knee and hip joint antero posterior and lateral views of affected limb. On confirmation, skin traction with 10lb weight applied on affected side and patient admitted in department of orthopedic surgery where patient investigated for medically and surgically point of view. Before surgery, patients were transfused with 1-2 unit of blood and also 1-2 unit of blood arranged for surgery if necessary. All the necessary investigations were carried out and patients were evaluated for General/spinal Anaesthesia fitness and kept on OT list as early as possible but if some delay was involved due to unavoidable circumstances then the patient put on skeletal traction through distal tibial pin. As our institute is divided in to two parts, one part of institute is situated at jamshoro where we perform the elective surgery while at civil hospital Hyderabad which is our 2<sup>nd</sup> part of institute where we not only run the OPD but also receive emergency from city as well as from major part of interior of Sindh but unfortunately our city part of orthopedic department is without facility of image intensifier so it was not possible for us to fix these

fractures within 24 hours while in the developed countries it is done early. Surgeries performed in supine position after maintaining the all protocol of cleaning and draping. Lateral incision used in all cases and DCS screw size confirmed on image intensifier. During the postoperative round, radivac drain, neurovascular status was assessed and required postoperative radiographs were advised. On 2<sup>nd</sup> day patient was mobilized on bed and after 48 hours of surgery antiseptic dressing was done after 48 hours and radivac drain removed after assessment. Patient were encouraged for isometric and isotonic exercises to strengthen the quadriceps and increase the range of knee movement, patients were not allowed to bear full weight on affected side till any clinical and radiological findings of union. To minimize the risk of implant failure, touchdown weight bearing was not allowed as majority of patients were uneducated. The average hospital stays of patients from day of admission to discharge was 18 days. All the Patients were followed up every third week for two visits and then every sixth week for a total of 24 weeks. All the information regarding patient' sage, sex, occupation, address, hospital stay, arrival of time after injury, type of fracture, mechanism of injury, associated injuries, Postoperative complications, follow up visits and union times were recorded on specifically designed proforma.

## RESULTS

There were 19 male (63.3%) and 11 female (36.6%) patients. Mean age was 35yrs. Mostly 80% cases were injured due to RTA, while 10% cases were fall and 10% were injured due to industrial injury. 65% patients got injury to left lower limb while 35% to right lower limb. All cases were treated with DHS having fractures according to A/O classification from A1 to A3. 8 fractures were of type A1, 12 cases were A2 & 10cases wereA3. There were only two infections i.e. the infection rate was 6.66%. The infection was superficial and treated with debridement. Three patients had mild post-operative pain and three patients had moderate pain. The average range of motion of knee joint was 107°. Twenty four patients had excellent range of motion of knee joint of 0-135°. This was achieved by early Quadriceps and knee flexion exercises.

The limb length was maintained and equal to contra lateral limb in 27 patients. There was only loss of 1-2 cm in three patients. Quadriceps wasting occurred in three patients i.e. loss of 1 cm in three patients.

Nonunion rate was 3.3% and there was only one mal union i.e. mal union rate was 3.3%. Bone grafting was done in 21 patients. The source of graft was iliac crest. The over results were good to excellent in 84% cases and fair to poor in 16% cases.

| Age groups             | N. of pt./(%) |
|------------------------|---------------|
| <b>AGE GROUPS</b>      |               |
| 18-20                  | 6\ (20%)      |
| 21-30                  | 12\ (40%)     |
| 31-40                  | 6\ (20%)      |
| 41-50                  | 3\ (10%)      |
| 51-60                  | 3\ (10%)      |
| <b>GENDR</b>           |               |
| Male                   | 19\ (63.3%)   |
| Female                 | 11\ (36.6%)   |
| <b>CAUSE OF INJURY</b> |               |
| RTA                    | 24\ (80.0%)   |
| H/O Fall               | 03\ (10.0%)   |
| Industrial injury      | 03\ (10.0%)   |

Table-I. Patient's basic characteristics n=30

| Discrepancy and Quadriceps     | N. of pt./(%) |
|--------------------------------|---------------|
| <b>Limb Length Discrepancy</b> |               |
| No Discrepancy                 | 27\ (90%)     |
| Loss of 1-2cm                  | 03\ (10%)     |
| Loss of 2-3cm                  | 00            |
| Loss of 3-4cm                  | 00            |
| Loss of >4cm                   | 00            |
| <b>Quadriceps Wasting</b>      |               |
| Non                            | 27\ (90%)     |
| Loss of 1-2cm                  | 03\ (10%)     |
| Loss of 2-3cm                  | 00            |
| Loss of >3cm                   | 00            |

Table-II. Limb Length Discrepancy and Quadriceps Wasting n=30

| ROM of Knee Joint | N. of pt./(%) |
|-------------------|---------------|
| 0-135             | 24\ (80%)     |
| 0-120             | 03\ (10%)     |
| 0-105             | 03\ (10%)     |
| 0-90              | 00            |
| < 90              | 00            |

Table-III. Post-Operative Range of Motion of Knee Joint\_n=30

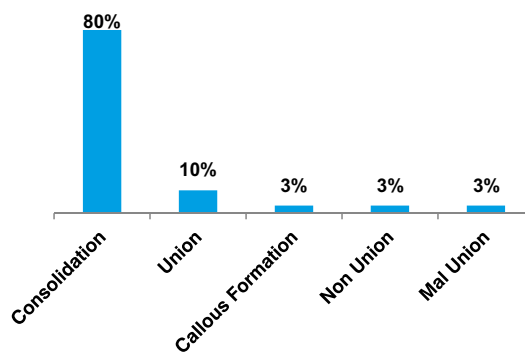
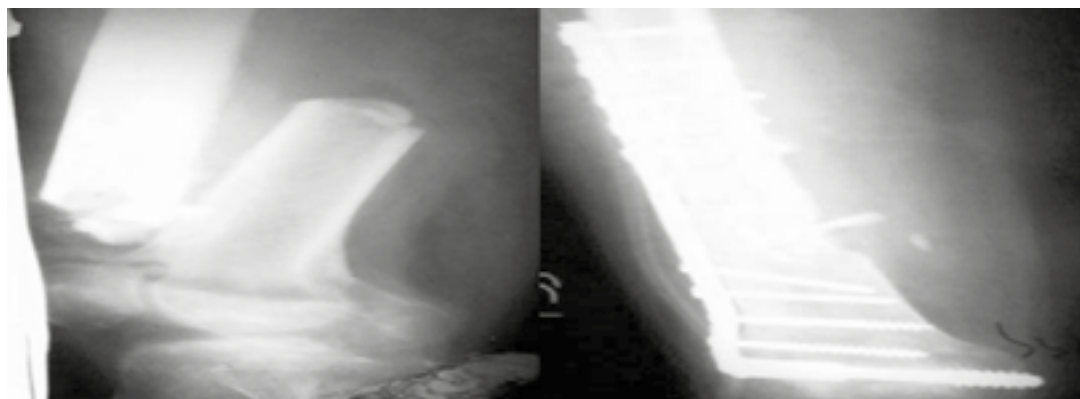
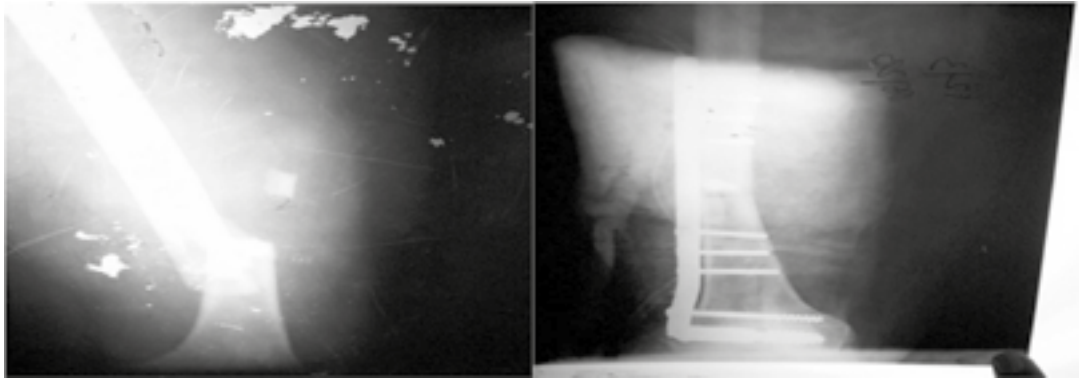


Figure-1. Radiological assessment n=30



Pre-Operative X-ray Post-Operative X-ray (DCS)



Pre-Operative X-ray Post-Operative X-ray (DCS)



Pre-Operative X-ray Post-Operative X-ray (DCS)

## DISCUSSION

The management of distal 3<sup>rd</sup> fractures of femur has historically been difficult to treat. Most of the literatures over past 20 years have shown the complications of non-surgical treatment. The surgical treatment of distal 3<sup>rd</sup> fractures of femur has been recently improved by the ASIF (A/O group in Switzerland). So good to excellent results have been obtained by this modern technology and improved implants and following principles of surgery. Distal femur fractures having posed considerable therapeutic challenges right through the fracture treatment history.<sup>8-10</sup> Injuries of the young cases associated with high velocity injuries, while and old were seen with osteoporotic bone injuries.<sup>11</sup> Powerful muscles in the thigh make the fracture deformed and it is very difficult to counter balance these forces by close methods and if open reduction or the internal fixation is performed, the implants can be subjected to considerable stress.<sup>12</sup>

Techniques of internal fixation are improved with the passage of time & different types of implants have been used for the fixation of supracondylar fractures of femur.<sup>13-15</sup> The fixed angle blade plate was very popular up to 1970s. This fixation is difficult technically and needs accurate insertion of the blade in 3-plans simultaneously.<sup>16,17</sup> Intramedullary devices provide more biological fixation than that provided by plates because they are load sharing rather than load sparing implants. It is demonstrated that biomechanically they give less unbending fixation of fractures of the distal femur than plate fixation.<sup>18,19,20</sup> Short technical requirement alternative is the (DCS). It is technically easier to apply than a blade plate, allow adjustment in the sagittal plane and moreover it can be used for both supracondylar and intercondylar fracture with at least 4 cm intact bone in the femoral condyles above the Intercondylar notch is necessary for successful

fixation.<sup>21,22,23</sup> The employments of screws and plates in the fracture's fixation likewise have an inalienable downside of delivering load protecting device. Resultant osteopenia makes a significant risk of refracture to the plate. This is very in elderly cases very important those having osteoporotic bones.<sup>38</sup>

There 19 male and 11 female patients. As our society is male dominant society so male are affected more. This male predominance has been shown in various studies. Saleem showed 75% male and 25% female in his study. Zulfiqar et al<sup>25</sup> showed 85.7% male and 14.30% female, Nadeem Waheed et al<sup>24</sup> showed 65% male and 35% female, Ghiasuddin has shown 88% male and 12% female. In western studies the male to female ratio is less than that of our study.<sup>26,27</sup>

The road traffic accident is the major cause of lower 3<sup>rd</sup> fractures of femur. This is shown in various studies Nadeem 65%, Zulfiqar 59.5 %, Ghiasuddin 80% while KM Marya in India reported 92% road traffic accidents.<sup>28</sup> Sudheer U reported 77.5% RTAs<sup>29</sup> and in Australian study, 82% has been reported.<sup>30</sup>

The average hospital stays of patients from day of admission to discharge was 18 days. Zulfiqar et al<sup>25</sup> has shown average hospital stay of 21 days while Nadeem 18 days. Brundage SI, Mendelson SA and Ozdemir HM have shown that In the Western world most of the patients are fixed within first 24 hours because of facilities of early fixation.<sup>32,33,31</sup>

There were only two infections out of 30 cases i.e. infection rate was 6.6%. The infection treated by debridement. Ostrum and Geel reported infection rate 0% in their study while Gile, Pritchett<sup>34</sup>, Sanders, Regazonni and Ruedi<sup>35</sup> had shown infection rate of 0-5.3% in their studies. Ghiasuddin<sup>36</sup> has shown 4% infection rate in his study. The average range of motion of knee joint was 107°. Robert F ostrum<sup>37</sup> reported 106° and Hafiz Shahid had shown 110° range of motion of knee joint which is comparable to

our study. The limb length was maintained and equal to contra lateral normal limb in 27 patients. There was only loss of 1-2 cm in three patients. Robert F ostrum<sup>37</sup> had shown loss of 2.3 cm and loss of 3cm in his two cases out of 30. There was no quadriceps wasting in 27 patients out of 30. There was only loss of 1 cm in three patients. In this study union rate was 93.3% which is comparable to D a r et al<sup>39</sup> and Khan et al.<sup>40</sup> Nonunion rate was 3.3% in these 30 cases after comprehensive fixation by dynamic condylar screw. Giles, Pritchett, Sanders and Regazonni reported nonunion rate of 0-5.7%. Ostrum and Geel had shown nonunion rate of 3.3% in their studies. Ghiasuddin<sup>36</sup> has shown the nonunion rate of 0% in his study. The incidence of mal union was 3.3% in this study which is comparable to 5.3-11% of Giles, Pritchett Sanders and Regazonni. Ghiasuddin showed mal union rate of 0%. Cancellous bone graft was used to fill supracondylar defect at the time of fixation in 21 cases, in Cases of comminution to achieve more rapid union. The source of graft was iliac crest. Overall satisfactory results were in 84% while fair to poor results found in 16% cases. Ostrum and Geel reported 87% excellent to good results in their study. Ghiasuddin showed 96% good to excellent results and 4% fair to poor results in his study.

## CONCLUSION

We concluded that DCS is simple, less in fact requesting and remunerating technique for treatment for supracondylar femur fractures of adults, and DCS is cheap insert as nearby market of inserts are manufacturing on moderate costs. It gives solid union after reduction and makes the recovery simple, considering the financial state of Pakistani patients, DCS is perfect insert for distal femoral particularly for supracondylar fractures.

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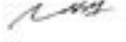
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**PREVIOUS RELATED STUDY**

Mukhtar Ahmed, Asghar Ali, Muhammad Shafi. SUPRACONDYLAR FRACTURES; COMPARISON OF MEDIAL AND LATERAL APPROACH FOR FIXATION OF HUMERUS IN CHILDREN (Original) Prof Med Jour 13(2) 244-252 Apr, May, Jun, 2006.

Noor Akbar Sial, Abid Rashid, Ajmal Yasin. SUPRACONDYLAR HUMERUS FRACTURES; OUTCOME OF OPEN REDUCTION AND PERCUTANEOUS CROSSED PIN FIXATION (Original) Prof Med Jour 18(1) 147-153 Jan, Feb, Mar 2011.

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