

VARUS DISTAL FEMORAL OSTEOTOMY IN YOUNG ADULT WITH GENU VALGUM AND FIXATION WITH DCS

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Objective: The purpose of the present study was to study and analyze the surgical results of distal femoral varus osteotomy in patients with genu-valgum.

Material and Methods: Between September 2006 to November 2013, 18 distal femoral osteotomies were performed on 14 patients at deptt: of orthopaedic surgery Services hospital Lahore. After taking the history and physical examination, appropriate radiographs were taken. We did varus femoral osteotomy by standard lateral approach and 95 angled DCS fixation then followed the patient clinically and radiographically till sound healing of osteotomy was achieved.

Results: This study was done on 18 knees (14 patients) with mean age 17 years (range 16 to 19 years). The mean duration of follow up was 7.9 months. (range, 6 to 9 months). The tibiofemoral angle before operation and after operation was compared. The average tibiofemoral angle before operation was 19.24° (14° to 24°) and follow up was 6.75° (5° to 8°). Mean LDFA before surgery was 74.85° (67° to 83°) and after surgery was 86.90° (83° to 90°).

Conclusions: Distal femoral osteotomy with DCS fixation through lateral approach can be reliable procedure for the treatment of valgus knee deformity. In this procedure tibiofemoral angle correction can be achieved without compromising the function of quadriceps muscle which helps in the early rehabilitation of the patient in terms of restoring the knee movements. Another advantage of lateral approach is, along with genu-valgum correction, the patella can be stabilized simultaneously.

Keywords: Genu Varum, Osteotomy.

Introduction

Genu valgum is a remarkably common deformity in childhood. Though deformities up to the age of 12 years can be satisfactorily managed by epiphyseal stapling, cases of under correction and over correction are common.¹ When the patient presents after the second growth spurt, stapling operation is no longer indicated and only corrective osteotomy remains the logical choice. Cuneiform osteotomy, closing wedge osteotomy, opening wedge osteotomies and osteotomy osteoclasia have been conventionally used.²⁻⁵ Several authors stated showed that if knee shows an anatomic tibiofemoral angle > 10 to 12° of valgus or if the plane of the joint deviates from the horizontal in the superolateral direction, more than 10° , a distal femoral osteotomy is the preferred method of limb realignment.⁶⁻⁸ This procedure corrects deformity in the lower femur, which is more pronounced than in knees with varus deformity. It also restores the orientation of the joint line towards the horizontal and does not disturb medial collateral ligament stability.^{9,10} Recently it has been demonstrated that for the realignment of proximal and distal mechanical axis

after the osteotomy, the axis of correction should pass through the CORA (center of rotation of angulation) of deformity.⁸ Without meeting this requirement, the proximal and distal axis will be translated to each other after correction leading to lazy S deformity. With this objective in mind we performed closing osteotomy for correction of genu valgum deformity in young adults.

Aims and Objects

The purpose of the present study was to study and analyze the surgical results of distal femoral varus osteotomy in patients with genu -valgum.

Material and Methods

Between September 2006 to November 2013, 18 distal femoral osteotomies were performed on 14 patients at our institution. Standing anteroposterior and lateral radiographs of the knees and CT generated images were taken preoperatively and postoperatively to measure tibiofemoral and lateral distal femoral angles. Our surgical indications were genu-valgum with a valgus tibiofemoral angulation of $>12^{\circ}$ and narrowing of lateral joint space and cosmetic concerns. We tried to consider the deformity with a deviated mechanical

axis as a principle indication for surgery even though the patient is completely asymptomatic. Without intervention, biomechanically the knee most likely has an increased risk of developing early osteoarthritis.^{13,14} Surgery was performed on a standard operating table, with patient in supine position. The knee was initially kept flexed with the help of a sand bag. Pneumatic tourniquet was routinely used. After drapping the leg 10 cm long skin incision was made over the lateral aspect of the lower one third of thigh extending to just above the superolateral border of the patella and whole of anterior supracondylar region of femur was exposed by reflecting the vastus lateralis anteriorly.

A stable construction is achieved by taking an appropriate size 2/3 wedge from the medial supracondylar area, leaving the lateral cortex intact. A prebent DCS was inserted into the femoral condyle, parallel to the joint line. The osteotomy site was closed with a plate in contact with lateral femoral cortex. This spontaneously achieved a tibiofemoral angle of approximately to 5° and then final osteosynthesis was performed with the dynamic compression plate. A cortical or cancellous lag screw was inserted through the hole above the bend in DCS, across the osteotomy site, to provide the additional stability. It was observed that medial most portion of the proximal fragment hampered the closing of distal fragment. A triangular bony projection was occasionally removed from this area to facilitate closing of osteotomy.

Postoperatively, the affected limb was immobilized in a knee immobilizer for six weeks. Patient began active knee flexion and extension exercises 48 hours after operation and continued to do until 130° knee flexion was achieved. Non weight bearing walking was commenced on the second postoperative day and was continued until initial healing of the osteotomy site had been confirmed radiographically, usually after six weeks of follow up. Full weight bearing was only permitted after 3 months of follow up and after radiographs showed good healing of osteotomy site.

Results

Eighteen osteotomies were carried out on 14 patients, 4 patients having bilateral deformities. After an initial period of intensive observation for 3 months, the patients were followed up initially at 6 weekly intervals and subsequently at 3 monthly intervals. The average age at operation was 17 years (range 16 to 19). There were 12 females and 2 males. The preoperative and postoperative femorotibial

angles and lateral distal femoral angles were compared. The average femorotibial angle before operation was 19.25°(14° to 24°) and at follow up was 6.75°(5° to 8°). Mean LDFA before surgery was 74.85°(67° to 83°) and after surgery was 86.9°(83° to 90°).

Table-1: Mean Pre and post operative femorotibial angle and LDFA angle.

| Angle (Degree) | Preoperative Mean | Postoperative |
|----------------|-------------------|---------------|
| Femorotibial | 19.25° | 6.75° |
| LDFA Angle | 74.85° | 86.9° |

All the patients were happy with the cosmetic correction



Fig-1: (Preoperative).

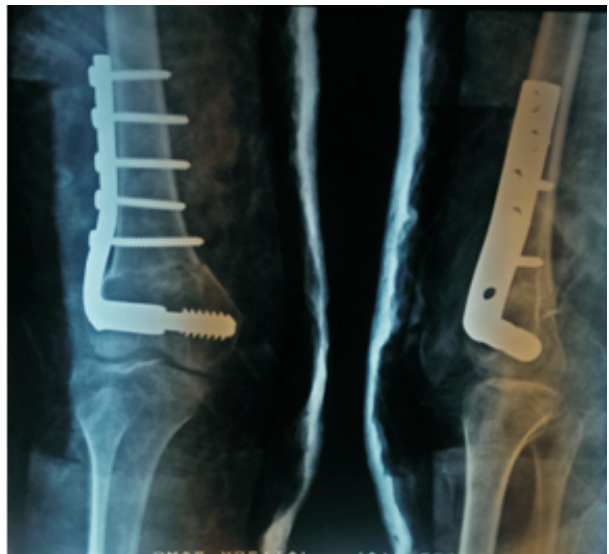


Fig-2: (Post-operative).

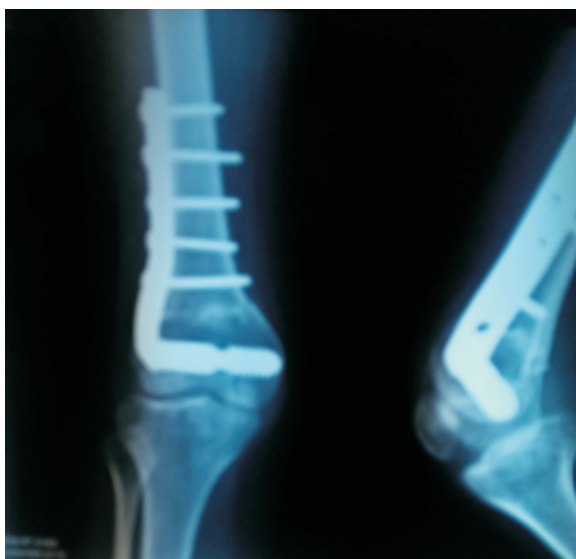


Fig-3: (Post-operative).



Fig-4: (Post-operative).

Most knees regained 95° flexion within 2 months and almost full ROM at 4 months after surgery. No complications (wound infection, gross restriction of knee movements due to quadriceps damage, implant failure, nonunion, painful walking) were noticed in any patient.

Discussion

Satisfactory results have been obtained with closing

wedge distal femoral osteotomy through lateral approach. It has been accepted fact that corrective osteotomy if possible should be performed at the apex of deformity.¹⁵ The method of fixation after osteotomy appears to have a great influence on the results of this procedure. Use of DCS for fixation at the osteotomy site has been associated with a high healing rate and promising results in short term follow up studies.^{7,8,10} In a study done by Wang JW et al. on 30 knees that distal femoral varus osteotomy was fixed with a 95° DCS, with blade plate reported that 83% had satisfactory results and only one non union occurred.⁸ Healy WL et al. evaluated 23 distal femoral varus osteotomies at an average of 4 years postoperatively. The average tibiofemoral angle preoperatively was 18° of valgus, which was corrected to an average of 2° of valgus. According to the hospital for special surgery knee score, 19(83%) of the 23 knees were rated as good or excellent.¹¹

In another study conducted by Mathews J and Coauthors, they described 21 patients treated with distal femoral varus osteotomies immobilized by casting, staples and casting, and rigid internal fixation with an AO blade plate. They reported adequate correction of valgus deformity, and rigid fixation permitted postoperative early mobilization.¹²

Conclusion

In conclusion distal femoral varus osteotomy with DCS can be a reliable procedure for the treatment of valgus knee deformity. In this procedure tibiofemoral angle correction and lateral distal femoral angle correction can be achieved. Patients are happy with the cosmetic correction. Damage to the quadriceps muscle is negligible. Postoperative morbidity is less and there is early postoperative recovery in terms of regaining the knee function. In genu- valgum correction patella stability should be stabilized simultaneously.

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