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AN OUTCOME ANALYSIS IN MALUNITED DIAPHYSIAL FRACTURE OF FEMUR TREATED WITH ORIF AND IMIL NAILING WITHOUT BONE GRAFTING

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ABSTRACT A prospective study over one year which includes 12 cases of malunited femoral diaphyseal fractures which are initially managed by native bandaging is treated with open osteotomy and reduction with reamed imil nailing augmented with the callus from the fracture site and not using bone graft from any other site,all 12 cases achieved signs of union within 6 months of surgery and the mean post operative gain in limb length was 2cm and post operative knee flexion achieved was 120 degrees (range 45-130 degrees).

KEYWORDS : malunited femur shaft,open reduction and intramedullary interlocking nailing,femoral osteotomy

INTRODUCTION:

femur shaft fractures are seen commonly in high velocity trauma in young individuals and there is a high tendency for such fractures of the middle third of shaft of femur,It is a common practice in rural areas that such fractures are initially managed by a native bandaging and massaging by traditional bone setters,and these patients consult an orthopedician only after a long delay of a minimum of 4 months by which time most of these cases report to the opd with Femoral diaphysial malunited fractures and it is not a rare scenario,many cases have been reported at this Tertiary care hospital which is located in close vicinity to a rural area.These patients present with deformity at the femur and decreased knee flexion and shortening of limb length(4-5),these patients are evaluated clinically and examined for knee flexion,deformity and limb length discrepancy and have found to have succesfull outcome for a well planned surgical correction(1-2).

AIM: To analyze the outcome of malunited middle third femur fracture treated with open osteotomy and reduction and fixation with intramedullary interlocking nail augmented with the callus obtained from the fracture site.

INCLUSION CRITERIA:

1. Patients of both sexes from 18 to 50years
2. Patients willing for surgical management
3. Patients who underwent native bandaging as inetial management for shaft of femur fracture for a maximum duration of 8 months

EXCLUSION CRITERIA:

1. patients who are skeletally immature and above the age of 50 years
2. Patients who are not willing for surgery
3. Patients with co morbidties
4. Patients with poor skin conditions at the incision site.
5. Patients with underlying infection

PATIENTS AND METHODS:

This is a prospective study conducted over a 1 year period from may 2018 to september 2018 and shows results of 12 cases treated with open osteotomy and reduction and fixed with intramedulary interlocking nail and fracture reduction site is augmented with the callus obtained from the fracture site in patients who have come with malunited diaphyseal fracture of femur.

Patients were selected according to the iclusion and exclusion crietirias and are assesd radiologically evaluation systematically included standard AP and lateral preoperative x-rays of both femur full length and the site of malunion is identified and presence of callus(fig1) is confirmed and physical examinations were carried out in opd basis and thus the site of deformity and limb length disreptency are all noted and are explained the need for correction and the outcome expected,patients are assessed by the anesthetist after necessary blood investigations.Patients are taken up for surgery after necessary consent from the patient and relatives.

METHODS AND METHODOLOGY:

Intraoperatively, the patient in supine position under spinal anesthesia on a standard surgical table. Longitudinal skin incision through a lateral approach to the malunion site,decortications and oblique plane osteotomy at the malunion were performed, the callus obtained is presearved for augmenting at the fracture site later, then repermeabilization of the femoral shaft,reaming carried out with appropriate reamers, placement of the stainless steel Intramedullary interlocking nail nail after reduction of the fracture site by hyperflexion, placing the two fragments end-to-end and holding by bone clamps, followed by extension so as to align the fragments. No bone graft was taken from any site, the callus is now augmented at the fracture site ,interlocking procedure was performed with proximal and distal screw placements. The knee was systematically mobilized under anesthesia at the end of the procedure (fig 2). A suction drain was placed till day 2 dressing change.Postoperative care systematically included inj.enoxaparin sodium thromboembolic treatment (4000 IU/day) and an antibiotic treatment 2 gm inj.ceftriaxone per day for 4 days.Pain control treatment comprised of 1gm inj.paracetamol iv two timesa day.Walking with partial weight-bearing was initiated on day 2 with adjustable walker support and joint mobilization on D5 ,Radiographic follow-up occurred on day 12-14, day 30, 2 months, and 6 months after surgery.We studied bone union, limb length inequality,Full weight bearing walking, and knee movements.

Seven males and five females were treated (mean age being 27.5years;the range is 18-50years) all of whom have underwent tradtional bandaging as initial management choice and underwent surgery with a mean time to surgery of 8 months (the range is 4-14 months),and the mean limb length discrepancy of 3cm(range is 2-6cm)the mean knee flexion was at 90 degrees (range 0-120 degrees).No bone graft was taken and added from any other part of the body only the callus obtained from open osteotomy and

reduction of the malunion was added at the fracture reduction site but reaming and decortications were systematically carried out.All the patients were evaluated clinically and radiographically on post operative day 1, day-12-14,day-30,day 90 and 6 months and 1 year based on evalutions on limb length discrepancy,mobility and bone union.

RESULTS:10 cases achieved signs of union within 6 months(fig 3) of surgery and the mean post operative gain in limb length was 2cm and post operative knee flexion achieved was 120 degrees (range 45-130 degrees),however 2 cases had a delayed union at 7 months and 8 months respectively. The results are detailed in Table 1.The patients' mean hospital stay was 6 days (range,4—9 days). The patients achieved union within a mean 120 days with walking possible without walker support and return to professional activities.Knee mobility was improved in all patients, with a mean flexion of 120◦ (range, 45◦—130◦)

TABLE 1

Patient	Sex	Age (years)	Time to surgery (months)	Femur diaphyseal site of maluninon from which callus graft is taken	Limb Shortening (cm)		Knee flexion (◦)		Union achieved by
					Pre op	Post op	Pre op	Post op	
1	M	43	9	Middle 1/3	2	0.5	90	110	D120
2	F	18	14	Middle 1/3	2.5	1	90	120	7months
3	M	29	13	Middle 1/3	3.5	1	90	120	D180
4	M	33	4	Proximal 1/3middle 1/3 junction	4	1.5	75	120	D180
5	F	46	11	Middle 1/3	3	1	110	125	D90
6	M	36	7	Middle 1/3	3.5	1	100	130	D120
7	F	49	8	Middle 1/3	3	1	100	130	D180
8	F	25	5	Middle 1/3	3	1	80	130	D180
9	M	37	6	Distal 1/3	2.5	1	75	125	D120
10	M	22	9	Middle 1/3	3	1	85	125	D180
11	F	18	14	Middle 1/3	2.5	1	120	125	8months
12	M	40	6	Middle 1/3	3	1	100	130	D180

FIG 1 pre operative image

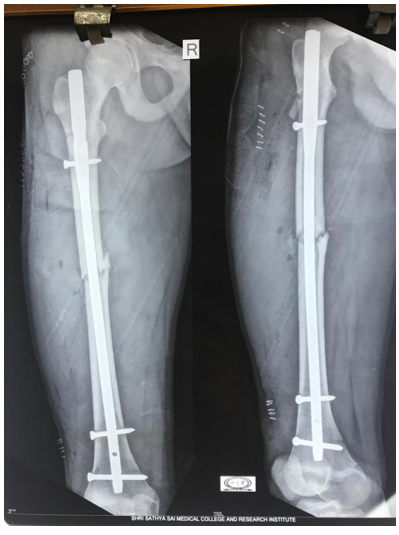

FIG2:immediate post operative image

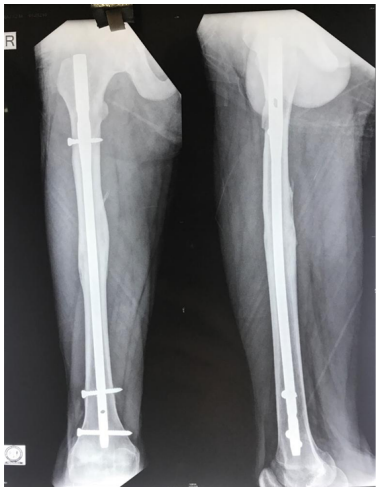

FIG 3 6 months follow up

DISCUSSION:

Recent femoral diaphyseal fractures and their treatment is well documented.Closed interlocking intramedullary nailing [2,3] is always the treatment of choice with regard to these fractures. Malunited femur mid third shaft fractures always require osteotomy and performed by an open procedure [4,5]. Similar cases are seen mostly in developing countries [4,5].Mahaisavariya and Laupattarakasem [5] and Gahuakamble et al. [4] report 14 cases of femur shaft mid third malunion treated with intramedullary nailing.The difficulty treating femoral mid shaft malunion correcting limb shortening involves carrying out the procedure in a single operation. Continious traction of the lower limb spreads to the soft tissues and can result in neurovascular complications [6,7]. Length gain was obtained intraoperatively by a single procedure on a standard surgical table.The reduction maneuver has allowed to obtain reduction without the help of traction table, with hyperflexion of the two fragments placed end-to-end followed by reduction by extension. In their series, Gahuakamble et al. [4] reported a case of continuous traction over 14 days after osteoclasia in a patient with 5 cm of shortening, followed secondarily by osteosynthesis. We have obtained a mean length gain of 2 cm (range, 1.5-4 cm) with no neurovascular complications.

No bone graft is harvested from any other site.Judet and Patel [10] has described osteoperiosteal decortications and compression of the osteotomy site augmented with callus from the with walking resulted in bone union.Meanwhile iliac bone graft and three local grafts were used in the four patients reported by Gahuakamble et al. [4].The problem of stabilization in rotation was corrected by using an interlocking intramedullary nail .The interlocking nails which were used prevented secondary rotation at the site. After impaction, osteotomy that was carried out , corresponding to the oblique plane osteotomy,helped in stabilizing the rotation.This impaction was attained by partial weight-bearing on POD 2.Systemic mobilization of the knee joint was carried out under anesthesia at the end of the procedure which had a good improvement in knee flexion post operatively.Gahuakamble et al. [4] reported complications such as patellar ligament rupture and fracture around the knee after correction of Malunited femur shaft, limb length gaining surgery and knee mobilization. In all our patients, knee mobility has seemed to be improved. The only complication observed in this series was the Delayed union in 2 cases.

CONCLUSION:

Malunion common in diaphyseal fracture of femur treated with traditional bandaging;it is a common sight in rural population,by doing open osteotomy and reducton and reamed Intramedullary interlocking nail fixation,the patient can be mobilised earlier and using the callus obtained from the fracture site during open osteotomy to augment the fracture reduction not only help in fracture union but also dismisses the need for opening a diferent site and obtaining bone graft (like illiac crest),major drawbacks for illiac crest bone graft being -donor site morbidity,prolonged treatment time,deep infection,iliac fracture,chronic pain,arterial injury,arteriovenous fistula formation,abdominal organ herniation, pevic instability,uretral injury,major heamatoma formation requiring operative irrigation(11) and minor complications include temporary pain,transient gait disturbances,superficial heamatomas,superficial seromas,scar dysesthesia,local numbness, tenderness,hypertrophic scars,stitch abscesses and prolonged drainage (11). The surgical treatment has helped the patients to achieve a better quality of life and livelihood.

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