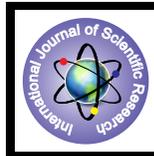


Long Term Results with Management of Neglected Fracture Neck Femur with Repositioning Osteotomy



Medical Science

KEYWORDS : Neglected fracture neck femur , repositioning osteotomy, internal fixation

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ABSTRACT

Hip fractures are common and pose a major health concern in every society. They are more common in elderly age group mainly due to osteoporosis. However in young adults they occur in bone with normal density and hence they comprise a separate group from prognosis and management perspectives. Non-union is a common complication of these fractures and leads to severe morbidity. Of the various surgical modalities available for management of intertrochanteric fractures we study the complications, improvement in the functional status and long term results of repositioning osteotomy with internal fixation in patients of young age group of less than 50 years. We studied a total of 67 patients with an average follow-up of 34+/- 15.37 months and they showed more than 90% favourable results in the form of ability to perform routine activities. Though technically demanding our method of repositioning osteotomy and internal fixation with double angle blade/barrel plate is an effective head conserving procedure in young adults with favourable results and minimal complications.

Introduction:

Hip fractures are common in elderly age group as the bones are osteoporotic but in young adults they occur in a bone of normal density and thus constitute a different group. To healthcare system and society intertrochanteric and femoral neck fractures represent an epidemic [1] . Intertrochanteric fractures occurs in extracapsular location through well vascularised cancellous bone, thus fracture union occurs almost invariably. On the other hand femoral neck fractures have a different environment that of limited and unprotected blood supply, intracapsular location and severe trabecular atrophy of femoral neck are factors that frequently inhibit fracture healing and lead to osteonecrosis [2,3]. Femoral neck fracture occur due to high velocity trauma in young adults. Operative treatment for old neglected fractures of femoral neck can be grouped in two categories viz. Head sacrificing –replacement arthroplasty and head conserving procedures.

Partial and total replacement arthroplasty is inappropriate for young patients as the life of prosthesis is less than the expected life of the patient and procedures such as total replacement are more likely to fail. Osteotomy is not the first choice of treatment but repositioning osteotomy is now preferred [4,5].

Aim:

Evaluation of repositioning osteotomy in patients less than 50 years with fracture of the neck of femur of more than three weeks duration. To study complications, improvement in the functional status and long term results of repositioning osteotomy with internal fixation. Materials and methods: Patients less than 50 years with fracture neck of more than 3 weeks duration were included in the study. Radiographically viable head and Pauwell’s angle >30-degrees[]. Repositioning osteotomy and internal fixation by double angle blade plate /barrel plate was performed. The osteotomy wedge angle was assessed according to the principles outlined by Pauwell. The correction (wedge) angle was calculated as the difference between the Pauwell’s fracture angle minus Pauwell’s optimal angle using radiographs. All patients underwent preoperative , postoperative and follow-up radiographs . Patients were encouraged to perform non-weight bearing exercises of hip in immedi-

ate post operative period and gradual weight bearing from 4-6 weeks with crutches. Patients were clinically assessed and evaluation chart was prepared at each visit.

Results:

A total of 67 patients were included in the study. Age ranged from 15-50 years. Follow-up period ranged from 8-70 months after surgery with an average of 34+/-15.37 months (Tables 1,2,4). Most patients showed favourable results in the form of ability to perform weight bearing and other routine activities on affected limb (Table 3). Non-union occurred in 9 patients and avascular necrosis occurred in 4 patients. 5 patients developed infection which was controlled within 7 days of stitch removal and no further complications.

Age distribution (Table 1):

No.	Age in Years	Frequency		Percentage	
		Blade plate	Barrel plate	Blade plate	Barrel plate
1	10-19	2	6	5.56	19.35
2	20-29	9	7	25	22.58
3	30-39	9	9	25	29.03
4.	40-49	16	7	44.44	22.58
5.	50-59	-	2	-	6.45
	Total	36	31	100	100

Duration of injury (Table 2):

No.	Duration in weeks	Frequency		Percentage	
		Blade plate	Barrel plate	Blade plate	Barrel plate
1	3-8	21	17	58.33	54.83
2	9-14	10	3	27.78	9.67
3	15-20	1	3	2.78	9.67
4.	>20	4	8	11.11	25.80
	Total	36	31	100	100

Functional Results (Table 3)

No.	Sit cross legged, squat, bear weight on affected limb	Frequency		Percentage	
		Blade plate	Barrel plate	Blade plate	Barrel plate
1	Cross legged	33/36	30/31	91.67	96.7
2	Squat	33/36	30/31	91.67	96.7
3	Bear weight on affected limb	33/36	27/31	91.67	87.09

Type of Fracture (Pauwell's Classification) (Table 4)

No.	Type of fracture	Frequency		Percentage	
		Blade plate	Barrel plate	Blade plate	Barrel plate
1	Type I	1	-	2.78	-
2	Type II	21	15	58.33	48.38
3	Type III	14	16	38.89	51.67
	Total	36	31	100	100

Discussion:

In 1935 Pauwell's outlined the basic principles and mechanisms of valgus osteotomy [6]. Pauwell proved that healing of non-union takes place without debridement of the old fracture surfaces all that is needed was to change the mechanical situation. Our study has shown that repositioning osteotomy and internal fixation with double angle barrel plate is an effective head conserving procedure in young adults and does not require open reduction of the fracture. This procedure improves biomechanical environment at the hip by converting shearing forces at the fracture site into compressive forces. This leads to compression at the fracture site where the patient bears weight. The compression within physiological limits favours osteogenesis and trabeculae are laid along the lines of stress (Wolff's law) and the valgus osteotomy compensate for the limb shortening which occurs due to absorption of the neck [7]. This procedure may be undertaken as a last resort to save the head in cases of failed internal fixation also.

As far as blade plate fixation is concerned literature has never denied the complexities of instrumentation, increased operative time thus more blood loss and precise three dimensional orientation of the femur during surgery and the surgeon's expertise. This procedure offers biological mode of fixation in repositioning osteotomy, can be used predictably in non-union of fracture neck of femur, unstable fracture of neck of femur and even in avascular necrosis with no evidence of segmental collapse, coxa vara and in cases of failed internal fixation. There are certain limitations with double angle blade plate. It requires more technical precision and exhaustive pre-operative planning. Once seating chisel is inserted there is no point of return. Denrick has mentioned retrograde impaction, only per operatively easier to achieve in fresh fractures but difficult to achieve in non-union with absorbed neck with fibrous tissue in between [8]. Blade plate put the soft head against the sharp cutting U-profile of blade, thus increased incidence of joint penetration /cutting through of the head (fontnesi et al 1991[9]).

The advantages with double angle barrel plate with lag screw which were observed are technical simplicity (procedure is same as for dynamic condylar screw), preoperative antegrade compression, no sharp tip to cut through, dynamic compression at the fracture site till union occurs, less operative time (average operative time 45 minutes) and less blood loss. To avoid eccentric rotation of the head dur-

ing compression on table or during convalescent period, 6.5 mm cancellous screws can be directly placed exactly parallel to the lag screw.

Conclusion: Of all the currently available modalities for management of neglected fracture neck of femur our method of repositioning osteotomy and internal fixation with double angle blade/barrel plate is an effective head conserving procedure in young adults with favourable results and minimal complications.

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