Outcome of Fibular Strut Graft in Neglected Neck of Femur Fracture

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ABSTRACT

Objective: To evaluate the role of fibular strut graft for neglected neck of femur fracture via functional and radiological outcome.

Methods: This descriptive study was carried out from January 2013 to July 2015. Data including age, gender, duration of fracture, complications during surgery and final outcome in terms of functional and radiological was documented on preformed proforma. SPSS 18 was used for data analysis .

Results: A total of 16 patient were included in the study. There were 10 male and 6 females. 68.75% (11) patients showed excellent and good results and 31.25% (5) patients showed fair and poor results. Mean and standard deviation time of union was 19.8±4.13weeks (. 12.5%(2) patients ended up with features of AVN and 6.25%(01) patient went into non-union.

Conclusion: Fibular strut graft for neglected neck of femur fracture has good and excellent results. It is simple, easy, cost effective procedure. It can be adopted as a first and index choice while dealing with neglected neck of femur fracture.

Key words: Fibular strut graft, neglected neck of femur fracture, non-union, AVN (avascular necrosis)

INTRODUCTION

Neglected neck of femur fracture is a common orthopedic problem throughout the world mostly in developing countries[1]. It has worse socioeconomic implication in the perspective of its dare complications of a vascular necrosis (AVN) and arthritic changes needing arthroplasty specifically in nations on low economic strata[2,3]. It poses a big challenge to Orthopaeditions because of its common and frequent complications of a vascular necrosis and arthritis due to precarious and risky blood supply[3].

Neglected neck of femur fracture is difficult issue to be handled. A variety of treatment options are available to address the problem with variable results, none of the treatment stands to be gold standard and treatment of choice[1]. A frequently used method until recently is valgus trochanteric osteotomy or modified valgus osteotomy with dynamic hip screw with good results[4,5]. Neglected neck of femur fracture is also managed by dynamic hip screw with bone grafting (autogenous) with bone morphogenetic proteins (BMPs) with good outcomes[6]. Tripple muscle pedicle bone graft to increase blood supply and healing. Sartorius, tensor fascia latae, and gluteus medius or single muscle quadriceps femoris pedicle bone graft having promising functional outcomes[7,8]. As a last resort hemiarthoplasty to be chosen if any of the procedure fails with AVN or established AVN without primary or redo surgery.

Fibular strut graft with cancellous screws is a good and acceptable modality of treatment with promising results[9]. Fibular strut graft with cancellous screws provides stable and durable fixation and is technically easier for neglected neck of femur fractures especially in young adults. Free fibular strut graft not only possesses osteoblastic activity but also provide structural support to the fracture[10,11]. Fibular grafting is a simple, less technical and having the property of retaining and saving natural femoral head. It preserve the femur head and reduces chances of non-union and onset of AVN is delayed and sufficient time is bought till replacement procedures[10,11,12,13,14].

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The study is aimed to find out outcome of fibular strut graft in neglected neck of femur fractures.

METHODS

This descriptive study was conducted from Jan 2013 to July 2015. The patients inclusion criteria was Neglected neck of femur fracture i.e. fracture which is 30 days or older (up to 6 months) without any prior orthopedic management and treatment. Neck of femur fracture including subcapital, trans cervical and basicervical were included. Age limit was 18 years to 50 years. Ethical review committee approval was taken.

An exclusion criterion was patients with systemic, medical, surgical or other co-morbidities were excluded from study. Polytrauma patients were excluded. Patients with intertrochanteric fracture were excluded.

All Patients were recruited via outpatient department (OPD) directly. After admission to orthopedic department informed consent was taken. All patients were operated on elective list under general anesthesia, on a traction table with image intensifier facility to help in reduction, proper screw placement. After prep drape fracture was reduced, two A0 screws passed, one in the superior another in the inferior corner. After screws placement central portion of the neck was drilled with standard DHS single reamer to make a slot for bone graft to fit in. Mid-shaft fibular graft was taken and harvested in neck of femur. Postoperative radiography was performed and wound site checked. Patients were discharged on second postoperative day and were followed after 2 weeks on first visit, then 4 weekly for a period of 20 weeks. Partial Weight bearing was allowed at 10-12 weeks, according to radiological assessment and full weight bearing at 15-18 weeks.

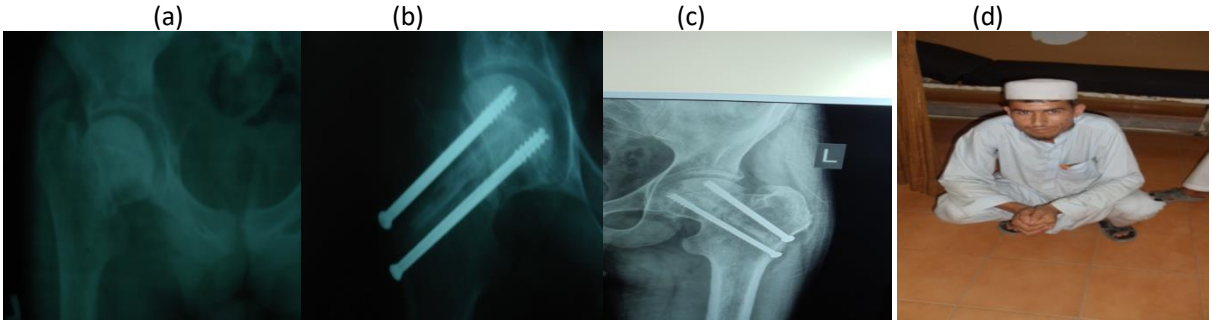

Fig 1: shows neglected neck of femur in a 22 year old male (a);preop pic (b); immediate post op (c);27 weeks follow up (d) 10 1 year follow up

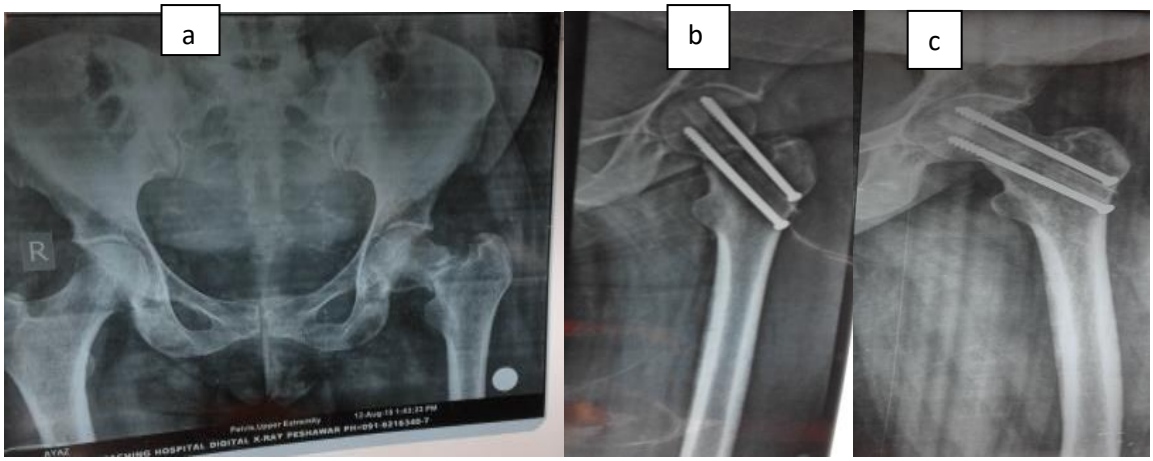

Fig 2: showing neglected neck of femur in 28 year female.(a); preop (b) immediate post op (c) 10 months post with harris hip score upto 100.

RESULTS

This study enrolled a total of 16 patients of which 10 (62.5%) were male and 6 (37.5%) were female. Mean age was 33.63±10.14 years from 18-50 years and average follow up was 39.94±6.49 weeks (30-52). Mean time of union was 19.8±4.13 weeks. Functional results according to Harris hip score were calculated (table 3), radiological results were calculated according to ficat grading (table4) and functional and radiological results for supcapital, transcervical and basicervical fractures were also calculated separately (table 5). 11 (68.75%) Patients had excellent and good outcome, while 5(31.25%) patients had fair and poor outcome. Two patients (12.5%) had features of AVN (ficat grade 3 and 4), which were among the poor outcome and with unsatisfactory results. One patient (6.25%) among the poor category had non union fracture.

Table 1: showing Harris hip score

Harris hip score	Functional outcome
90-100	Excellent
80-89	Good
70-79	Fair
<70	Poor

Table 2: showing ficat grading

Grade 1	Description
0 (excellent)	Normal hip and normal head
I (excellent)	Normal radiograph, ischemic changes on MRI or bone scan
II (good)	Radiographic changes of repair and subchondral sclerosis, head spherical
III (fair)	Radiographic subchondral lucent lines, wedge shaped sclerosis partial collapse of the head, head no longer spherical
IV (poor)	Irregular head complete collapse with arthritic changes in the joint

Table 3: showing number of patients, and Harris hip score i.e functional outcome (N=16)

Functional outcome	No of patients & proportion
Excellent	n=7, (43.75%)
Good	n=4, (25%)
Fair	n=3, (18.7%)
Poor	n=2, (12.5%)

Table 4: showing number of patients, and radiological outcome (ficat grading) (n=16)

Radiological outcome (ficat grading)	No of patients & proportion
Excellent	n=7, (43.75%)
Good	n=4, (25%)
Fair	n=3, (18.75%)
Poor	n=2, (12.5%)

Four patients had suncapital fracture, out of which two had excellent and two had good results. Eight patients had transcervical fracture, three had excellent, one had good and two had fair and poor results each. Four patients had basicervical fracture, two had excellent results, one had good and one had fair result.

DISCUSSION

Neglected neck of femur fracture can be addressed by a diverse array of treatment modalities each one with own pitfalls [1]. It still pose a problem to orthopedic surgeons especially in developing countries [1,3]. Fibular strut graft is simple, technically easier cost effective and with good functional results in neglected neck of femur fracture.

Our study was aimed to find out outcome and efficacy of fibular strut grafting in the treatment of neglected neck of femur fracture. The simplicity, demanding no technicality, cost effectiveness and promising results appoints fibular strut graft to be adopted for the treatment of neglected neck of femur fracture. Many of local Asian and European studies coin the same [9,10,11,12].

In our study enrolling 16 patients 68.75% (n=11) showed excellent and good results and 31.25% (n=5) patients showed fair and poor results. Out of these five patients, two patients developed AVN and one patient (6.25%) ended up with non-union fracture. These patients were later on considered for replacement procedures. One patient had interlocking nail done for femur shaft fracture with missed (neglected neck of femur fracture), interlocking nail was replaced with locking plate pus bone graft and fracture neck was addressed with fibular strut graft plus AO screws. No issues of skin breakage, wound infection, coxa vara or valga, internal or external rotation were detected.

Majority of the patients were from low socioeconomic strata and low IQ, which might be a cause for delayed presentation and understanding them about physiotherapy and post op care was difficult. Many of them had started early weight bearing. Secondly because of poverty and scarce resources most of the patients were paying infrequent and inconsistent visits so could have biasing effects on outcome.

Pal CP 2014 [9] one of an Asian study entailing 72 patients prospectively showing 69.44% satisfactory results and 30.5% non satisfactory. Four patients had non-union and 3 developed avascular necrosis. Our results are comparable to this study but our sample was small and follow up was short.

Azam MQ et al [10] a retrospective cohort Asian study comprising of 32 patients showing 59.37% satisfactory functional and radiological results and 40.6% non satisfactory results, 3 patients (9.37%) had non union and 6 patients (18.75%) had AVN. Functional and radiological Results of this study are less than our study (59.37% vs 68.7%), this may be because of patient selection criteria (retrospective cohort) and technical aberrations.

Although our study is showing good result our sample may not be a representative one to clearly state the results. Being in low-income territory follow up and treatment guidelines were not strictly applied. The exact behavior of individual fractures i.e subcapital, transcervical and basicervical fractures cannot be known by our study. Similarly age and time cannot be correlated exactly to AVN and non-union by our study. Further large multicenter, multivariants and randomized controlled trials are recommended in this regard.

CONCLUSION

Fibular strut graft for neglected neck of femur fracture is simple, dependable, technically easy, cost effective and with good and excellent results. Keeping in mind non-union and AVN, it can be adopted as a first and index choice while dealing with neglected neck of femur fracture.

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