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A Study of Surgical Management of Neglected Intracapsular Fracture Neck Femur with Cancellous Screw Fixation And Free Fibular Grafting in Adolescents".

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Abstract: *Intracapsular fracture neck femur have always presented great challenges to orthopaedic surgeons and remain in many ways today the unsolved fracture as far as treatment and results are concerned. With delay,Intracapsular fracture neck femur is associated with a high incidence of non-union and avascular necrosis. Although many techniques have been described for femoral head salvage in these circumstances, a less technically demanding procedure with high yield results is yet to be evaluated. In the present study, role of free fibular grafting for neglected intracapsular fractures among adolescents in 22 patients have been reviewed retrospectively. The results of this technique are promising with good union rate and satisfactory outcome rate. However, its superiority with subset analysis and with other techniques need to be analysed.*

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I. Introduction

Intracapsular fracture neck femur have always presented great challenges to orthopaedic surgeons and remain in many ways today the unsolved fracture as far as treatment and results are concerned [1].Intracapsular fractures are devastating injuries that most often affect the elderly [2].There is no defined lag period for such fractures to be called "neglected."Meyers et al introduced this term to indicate a delay of 3weeks or more, from thetime of injury to seek medical help [3]. With delay,Intracapsular fracture neck femur is associated with a high incidence of non-union and avascular necrosis [4]. Furthermore avascular necrosis is more likely to be symptomatic in the younger population [4] . The rate of non union is between 10-30% for such neglected fractures [5].Both non-union and avascular necrosis is so devastating functionally that they affect not only the patient but also the society.

An important part of rationale for treatment of the fracture neck femur is preservation of the blood supply to the femoral head which is critical for a satisfactory long term result, as in these fractures femoral head blood supply is compromised [6].

Most agree that attempts should be made to salvage the femoral head. While considering salvage options, procedures like proximal femoral osteotomies, muscle pedicle bone grafting, and transfracture abduction osteotomy are presently being followed with varying results. These procedures have a common pitfall of altering the anatomy of proximal femur or not addressing the reconstruction of the proximal femur. This hinders the future joint replacement options. Cortical bone grafting with internal fixation options are well accepted with varying results. The various bone grafting modalities are vascularized fibular grafting and free fibular bone grafting. Free fibular bone grafting is technically easier compared to vascularized fibular grafting which requires the microsurgical expertise. It is well accepted that any neglected fracture neck femur for union requires mechanical stability, viability and compression at the fracture site for its union. Free fibular grafting with two or three partially threaded cancellous screws gives adequate stability till fracture union and also produces a conducive environment for fracture union. Interfragmentary compression using multiple screws along with full thickness fibula especially postero-inferiorly gives adequate stability and axial loading across the fracture site and improves the chance of union. Full thickness fibula is advantageous in this situation as it provides good stability, provides some collapse at the fracture site when compared to partial thickness fibula[7].

In view of these considerations, present study is to evaluate the neglected femoral neck fractures treated with cancellous screw fixation and free fibular graft.

II. Methodology

A total of 22 patients having intracapsular fracture neck femur in whom the delay in instituting treatment was more than three weeks and operated for the same by CR/ORIF with free fibluar graft , in the age group of 10-18 years were retrospectively analysed. Preoperatively all patient were evaluated with

anteroposterior and cross table lateral radiographs to check for the amount of neck resorption. In those cases where there was gross displacements examination under image intensifier was done to know about the reduction.Patients having a minimum follow-up of less than three years, pathological fracture or showing features of osteonecrosis on plain radiograph were excluded from the study.

Surgical Technique:

A standard lateral incision about 7-10 cms just below the base of trochanter and exposure by reflecting the vastus lateralis origin. In those cases where reduction could not achieved by close means open reduction was done by the standard anterolateral approach. The fracture site was curetted thoroughly so that raw fracture surface was created. In few cases where the neck was deficient corticocancellous grafts were added to reconstruct the femoral neck. After
placing the grafts the limb was rotated and the fracture reduction was securedwith a standard DHS guide wire placing the guide wire inferiorly and posteriorly in femoral neck. Deliberately a low angle of guide wire was preferred such that the fibula will just skirt the calcar femorale and transfix the fracture. Couple of screws was passed in remaining part of neck of femur such that they remain parallel to each other in anteroposterior view and spread out in lateral views. Reaming was done over the guide wire by a 8mm reamer with oscillatory movement so that the head does not get rotated. The cortical region of lateral aspect of femur over guide wire was reamed with 12mm reamer. Ipsilateral fibula was then exposed by a standard posterolateral approach in lower half of leg. Full thickness fibula of desired length was harvested subperiosteally. The fibula was then threaded over guide wire and hammered gently over guide wire under image guidance. Care was taken to prevent splitting of fibula while hammering and it was hammered such that it lies subchondrally in the desired portion of femoral head. An additional screw was placed in few fractures where the neck was wide and need for third screw was felt by the surgeon.

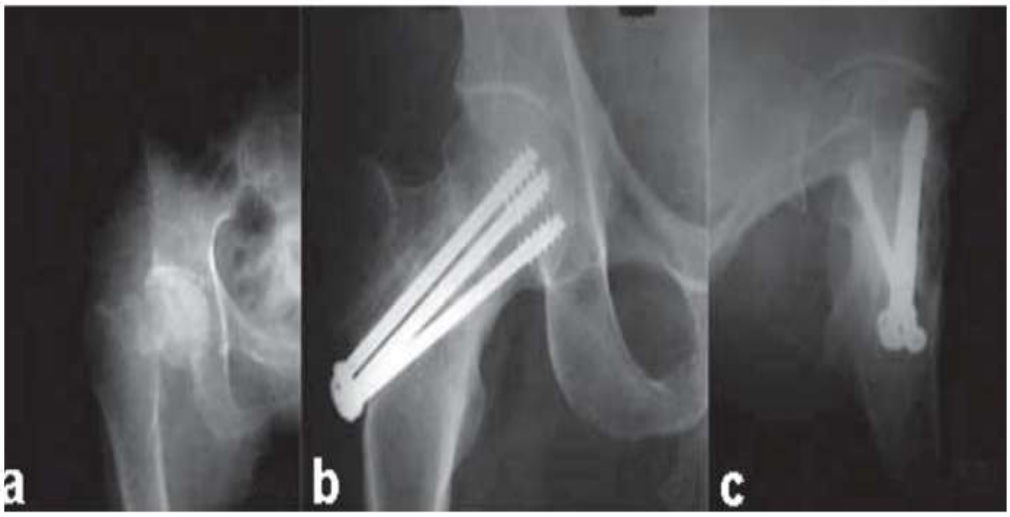

Fig 1 : a) Pre op Radiograph of a non union neck of femur. b) and c) post op radiograph showing healed fracture with inset cc screws and fibular strut graft .

Post operatively an anteroposterior and cross table lateral view of hip was taken to assess
the reduction and patient is started on non weight bearing walking with rehabilitation protocol of quadriceps and hamstring strengthening exercises. Patient is followed every month until 6 months to see radiological signs of union on x rays. Amount of shortening, Harris hip score and radiological features at each follow up are documented. The fracture was said to be united if the patient was walking without aid and the radiograph showed trabeculae bridging the fracture gap. Nonunion was defined as radiolucent gap existing between sclerosed bony ends even one year after the surgery.

Fig 2: Pre and post op x rays of patient with neglected neck of femur fracture treated with cc screws and fibular graft.

III. Results

Among the 22 patients included in the study, the average age was 16.4 years (Range 13- 18 years). There were 15boys and 7girls. The delay between the injury and operation varied widely from four weeks to 42 weeks (16.4 weeks). Eighteen of them had a minimum three-year follow-up (mean 4.6 years).Satisfactory bony union was achieved in 15 out of 22 patients. The time required for union varied from 4 to 7 months, average being 5.2 months. In four cases, union occurred in 10°-20° (mean 15°) of varus, because of loss of reduction. Nonunion occurred in three cases and aseptic osteonecrosis in another six patients. Of the 19 patients where union was achieved, five showed excellent results, 11 patients showed good, and three had poor functional result as evaluated using harris hip scores. No major donor site morbidity was seen in any case; however, seven of our patients had minor complains such as mild ache, ankle swelling after rigorous walking, and some weakness of long toe flexors and extensors.

IV. Discussion

Osteosynthesis using different techniques of bone grafting is described for neglected fractures of femoral neck. Our union rate of 86.36% is comparable to that of Nagi *et al [8]* (90%), Sandhu *et al. [9]* (88.09%) and Le Croy *et al.[10]* (90.90%). In the absence of an established classification system for neglected femoral neck fractures, the functional result is difficult to compare with the use of a different scoring system. Previous literature [11-12] stresses that osteonecrosis is not a contraindication of osteosynthesis. They observed that reaming provides internal autogenous graft and encourages growth of vascular granulation tissue. We agree with Sotto-Hall *et al.[13]* that the femoral head is not necessarily osteonecrotic even with extended period of neglect, as such patients instinctively assume the position of maximum joint capacity (flexion, external rotation, and abduction), which relieves intraarticular tamponade. However in our study, we did not note any case of femoral head AVN preoperatively to validate the point.

Vascularized fibular graft [10] and vascularized iliac bone graft [11] are reported to give superior result; however, this consists of microvascular anastomosis that most orthopedic surgeons are not commonly well versed with.The use of nonvascularized fibular strut graft is technically less demanding. Fibula being cortical provides mechanical strength besides stimulating union, and its incorporation with the surrounding bone gives biological fixation. Once the graft is revascularized, the osteoblasts stimulated by bone morphogenic protein replace the resorbed bone. If this bone is appropriately stressed, the graft acquires sufficient strength to handle the observed forces.

V. Conclusion

Nonvascularized fibular strut graft along with cancellous screws provides a dependable and technically less-demanding alternative. We recommend its use to salvage the femoral head in younger patients. Fibula being cortical provides mechanical strength besides stimulating union and getting incorporated as biological graft.

References

[1]. David G Lavelle. Fractures and Dislocations of the Hip. In: Campbell's operative orthopaedics. Terry Canalle s, BeatyJH :editors. Pennsylvania. 2008; Mosby Elsevier. 11 th edition,vol-3: p3237-308.

[2]. Ross K Leighton. Fractures of the Neck of Femur. In: Rockwood and Green's Fractures in Adults. Bucholz RW, Heckman JD, Court-brown CM: editors. Philadelphia. 2006; Lippincott Williams & Wilkins. 6th ed,vol-2; p1753-92.

[3]. Meyers MH, Harvey JP Jr, Moore TM. Treatment of displaced subcapital and transcervical fractures of the femoral neck by muscle-pedicle- bone graft and internal fixation. A preliminary report on one hundred and fifty cases. J Bone Joint Surg Am 1973;55:257–274
[4]. Protzman RR and Burkhalter WE. "Femoral neck fractures in young adults". J Bone & Joint Surgeries. 1976; 58-A : p689-95.
[5]. Beris AE, Payatakes AH, Kostopoulons VK, Kormopillias MD, et al. Non union of femoral neck fracture with osteonecrosis of femoral head. Orthop Clin North Am. 2004;35:335-43
[6]. 6)Luice RS, Fuller, Stephen, Burdick DC and Johnston RM,: "Early prediction of avascular necrosis of the femoral head following femoral neck fractures". Clinical Orthopaedics. 1981; 161: p207-14.
[7]. Henderson MS: Un-unitedfracture of neck of femur treated by the aid of bone graft. JBJS 22A:91-106,1940.
[8]. Nagi ON, Gautam VK, Marya SK. Treatment of femoral neck fractures with a cancellous screw and fibular graft. J Bone Joint Surg Br. 1986;68:387–91
[9]. Sandhu HS, Sandhu PS, Kapoor A. Neglected fracture neck of femur: A predictive classification and treatment by osteosynthesis. Clin Orthop Relat Res. 2005;431:14–20.
[10]. Le Croy CM, Rizzo M, Gunnesen EE, Urbaniak JR. Free vascularized fibular bone grafting in the management of femoral neck nonunions in patients younger than 50 years. J Orthop Trauma. 2002;16:464–72
[11]. Marti RK, Schuller HM, Raymakers EL. Inter-trochanteric osteotomy for nonunion of the femoral neck. J Bone Joint Surg Br. 1989;71:782–7
[12]. 12. Jackson M, Learnmonth ID. The treatment of nonunion after intracapsular fracture of the proximal femur. Clin Orthop Relat Res. 2002;399:119–28
[13]. 13. Sotto-Hall R, Johnson LH, Johnson RA. Variations in intra-articular pressure of the hip joint in injury and disease: A probable factor in avascular necrosis. J Bone Joint Surg Am. 1964;46:509–16.

*Dr. Raja Ramesh Badavath. "“A Study of Surgical Management of Neglected Intracapsular Fracture Neck Femur with Cancellous Screw Fixation And Free Fibular Grafting in Adolescents”." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.9 (2017): 21-24