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Results of early manipulation under general anesthesia in intra articular distal femur fractures

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Abstract
Background: Post operative knee stiffness after intra articular distal femur fracture causes significant disability affecting daily activities of the patient and causing concern for the surgeon. Although the importance of early post operative mobilization is emphasized to all patients, many patients, especially those from rural areas have no access to specialized physiotherapy and do not understand the importance of the same. These patients also do not visit the hospital on scheduled days of follow up due to various socio economic reasons. Hence, such patients can have restriction of knee movements (flexion as well as extension) very early during the post operative period.
We present our study protocol of early MUGA & suture removal at 3 weeks after surgery of these fractures. At 3 weeks, the soft tissue healing of the trauma as well as the surgery has occurred to a great extent. The surgical site pain and inflammation has also reduced. All patients who are operated will always come to hospital for suture removal. We planned to do a MUGA for the knee along with suture removal at 3 weeks for these patients.
Material and method: A prospective study carried at our institution for patients admitted and operated for intra articular distal femur fracture. These patients were evaluated for knee range of motion (ROM) at 3 weeks and posted for MUA & suture removal.
Results: 15 patients who were operated for intra articular distal femur fracture underwent Early MUA at 3 Weeks. The mean pre manipulation mean knee flexion was 60°. On manipulation mean knee flexion of 110° was achieved. At the time of follow up at 3 months mean knee flexion was 123°.The average time for MUA was 15 minutes. No complication occurred during manipulation procedures.
Conclusion: Early MUA is suitable and effective non-invasive treatment modality for post-operative stiffness in cases of intra articular distal femur fractures.

Keywords: knee stiffness, manipulation under anaesthesia, post traumatic

Introduction
Intra articular distal femur fractures are at a higher risk for developing post operative knee stiffness. Supracondylar femur fractures after surgical fixation typically lose between 30° to 40° of knee flexion compared with normal knee [1]. Various mechanisms are lead to loss of motion in intra articular fractures around knee. Femoral fractures treated with external fixators may develop adhesions of the quadriceps to the femur. Intra articular fractures may develop adhesions in parapatellar gutters and patellofemoral joint. Bishop and colleagues [2] evaluated factors predicting knee stiffness after peri articular fractures of the knee. Extensor mechanism disruptions, fasciotomy, need for more than 2 procedure to obtain skeletal stabilization, need for soft tissue coverage and wounds that preclude knee range of motion were associated with an increased risk for the development of knee stiffness.
Range of motion of normal knee is from full extension to 140° of flexion [3]. Daily activities like walking requires 63° of flexion and up to 93° of flexion while standing up from chair [4]. Although the goal of fracture fixation is to maximize knee range of motion, these amounts must be considered for providing functional range of motion to the patients.
Anatomic reduction of fracture is important in minimizing posttraumatic arthritis in peri articular fractures [5]. Early motion of the injured joint over prolong period of immobilization is now frequently emphasized as immobilization is an established risk factor for developing knee stiffness after intra articular fracture fixation [6].

Although the importance of early post operative mobilization is emphasized to all patients, many patients, especially those from rural areas have no access to specialized physiotherapy and do not understand the importance of the same. These patients also do not visit the hospital on scheduled days of follow up due to various socio economic reasons. Hence, such patients can have restriction of knee movements (flexion as well as extension) very early during the post operative period.
We present our study protocol of early MUGA & suture removal at 3 weeks after surgery of these fractures. At 3 weeks, the soft tissue healing of the trauma as well as the surgery has occurred to a great extent. The surgical site pain and inflammation has also reduced. All patients who are operated will always come to hospital for suture removal. We planned to do a MUGA for the knee along with suture removal at 3 weeks for these patients.

Aims & objectives

The purpose of the study was to evaluate the results of early closed manipulations of knee performed under general anesthesia in patients of Intra Articular distal femur fractures.

Materials & methods

This was a prospective study carried at our institution for patients admitted and operated for intra articular distal femur fracture. These patients were evaluated for knee range of motion (ROM) at 3 weeks and posted for MUA & suture removal after taking informed consent.

Inclusion criteria

1. Patients between 18 to 50yrs of age.
2. Good bone quality.
3. Closed intra articular distal femur fractures.
4. No associated ipsilateral limb fracture.

Exclusion criteria

1. Age <18yrs and >50 yrs.
2. Poor quality (osteoporotic) bone.
3. Open intra articular distal femur fractures.
4. Other fractures of ipsilateral limb.
5. Patient not willing for manipulation under general anesthesia.

Patients who met inclusion criteria underwent manipulation under anesthesia and suture removal in same sitting.

Procedure

Manipulations in all cases were performed in operation theatre under general anesthesia after achieving complete muscular paralysis. In supine position with hip in 90 degree flexion the leg was allowed to fall on its weight at the edge of OT table (fig.1). On maximum passive flexion, force was applied gradually using proximal tibia as primary lever during manipulation to bend the knee and was extended fully before repeating cycle. Very gradual pressure was applied on proximal tibia by the surgeon (fig. 2). A cotton roll/bolster was placed under distal femur and the thigh was stabilized by the assistant. Once 90° flexion was achieved, the hanging leg was placed on the OT table and further manipulation was done to achieve further flexion (fig. 3). Minimum 90 degree of flexion was achieved and firm resistance to further bending was taken as end point (fig. 4). During manipulation, fluoroscopy was done to look for fracture gapping, implant failure or iatrogenic fracture. Pre and post manipulation measurements of knee ROM were done with goniometer and readings were recorded (fig. 6). At the end of manipulation suture/staple removal was done.

Fig 1: Patient in supine position on OT table with bolster placed under distal femur.

Fig 2: Gradual pressure applied by surgeon on proximal tibia thigh stabilized by assistant.

Fig 3: Affected limb taken on edge of OT table.

Fig 4: 90° flexion of knee achieved with leg in hanging position.

Fig 5: Hip flexed and gradual pressure applied for further flexion.

Fig 6: Final knee flexion >90° achieved.

Physiotherapy exercises were started on first post operative day along with continuous passive motion (CPM) and patients were discharged on independently bending knee beyond 90 degree. Follow up of patients was kept in OPD and measurements were recorded.

Pre/post manipulation arc of motion, timing of manipulation, any complication and final range of motion at follow up were clinically measured and documented.

Statistical analysis was performed to assess the knee ROM arc before and after manipulation till recent follow up. The Judet's criteria was used for analysis of flexion after manipulation as excellent, if flexion was greater than 100°; good, from 81° to100°; fair, from 50° to 80°; and poor, if less than 50° [7].

Results

15 Patients consisting of 10 male and 05 females with age ranging from 21 to 50 mean 35 years having post traumatic stiffness in closed intra articular fracture of distal femur underwent manipulation under general anesthesia. The mean time of manipulation after intra operative fixation was 3 weeks.

Before manipulation at 3weeks post surgery, mean knee flexion was 60° (range 40°-80°).

On manipulation under anesthesia mean knee flexion was110° (range 90°-120°).

The average time for manipulation under general anesthesia was 15 minutes.

No complication occurred during manipulation procedures.

At the time of follow up at 3 months mean knee flexion was123° (range 110°-130°).

The mean increase in the knee ROM arc through manipulation was 63°.

As per Judet's criteria 12 patients had excellent results while 3 patients had good results.

Discussion

Early manipulation under anesthesia in intra articular distal femur fracture in our study assisted in regaining the post operative loss of flexion of knee by breaking the adhesions. Manipulation under anesthesia is an initial non operative modality for knee stiffness. Outcomes in patients of post arthroplasty stiffness have shown improvement in knee ROM after manipulation under anesthesia [8-11] but its utility for post traumatic fracture cases has not been extensively studied. Evans *et al.* compared MUA with open arthrolysis for combat related arthrofibrosis after traumatic injuries of knee. [12] They found MUA to be more effective than open arthrolysis and with lower complication rate. Their study reported improvement of flexion to 106° closely resembles our result of 110°. Haller *et al.* [13] Studied arthrofibrosis in proximal tibia fractures and found early manipulation within 3 months gave good results compared to late.

Conclusion

Manipulation under general anesthesia (MUA) in our study led to immediate improvement in knee ROM benefitting all patients. Along with physiotherapy and continuous passive motion (CPM) most patients were able to retain most of the knee motion.

Clinical relevance

Early closed manipulation under anesthesia (MUA) is safe and suitable as first line therapy to prevent posttraumatic knee stiffness in cases of intra articular distal femur fracture.

Conflict of interest: NIL
Source of support: NIL

References

1. Ehlinger M, Dujardin F, Pidhorz L *et al*. SoFCOT. Locked plating for internal fixation of the adult distal femur: influence of the type of construct and hardwareon the clinical and radiological outcomes. Orthop Traumatol Surg Res. 2014; 100(5):549-54.
2. Bishop J, Agel J, Dunbar R. Predictive factors for knee stiffness after periarticular fracture: a case control study. J Bone Joint Surg Am. 2012; 94(20):1833-8.
3. American Academy of Orthopaedic Surgeons. Joint motion: methods of measuring and recording. 6th edition. Edinburgh (United Kingdom): Churchill Livingstone; 1972.
4. Laubenthal KN, Smidt GL, Kettelkamp DB. A quantitative analysis of knee motion during activities of daily living. Phys Ther. 1972; 52:34-43.
5. Knirk JL, Jupiter JB. Intra-articular fractures of the distal end of the radius in young adults. J Bone Joint Surg Am. 1986; 68:647-59.
6. Magit D, Wolff A, Sutton K *et al*. Arthrofibrosis of the knee. J Am Acad Orthop Surg. 2007; 15(11):682-94.
7. Judet R. Mobilisation of the stiff knee. J Bone Joint Surg [Br]. 1959; 41-B:856-7.
8. Ipach I, Mitlag F, Lahrmann J *et al*. Arthrofibrosis after TKA—Influence factors on the absolute flexion and gain in flexion after manipulation under anaesthesia. BMC Musculoskelet Disord. 2011; 12:184.
9. Bawa HS, Wera GD, Kraay MJ, *et al*. Predictors of range of motion in patients undergoing manipulation after TKA. Clin Orthop Relat Res. 2013; 471:258-263.
10. Keating EM, Ritter MA, Harty LD, *et al*. Manipulation after total knee arthroplasty. J Bone Joint Surg Am. 2007;

89:282-286.
11. Namba RS, Inacio M. Early and late manipulation improves flexion after total knee arthroplasty. 2007; 22(6 i 2):58-61.
12. Evans KN, Lewandowski L, Pickett A, Strauss JE, Gordon WT. Outcomes of Manipulation under Anesthesia versus Surgical Management of Combat-Related Arthrofibrosis of the Knee. J Surg Orthop Adv. 2013; 22(1):36-41.
13. Haller JM, Holt DC, McFadden ML, Higgins TF, Kubiak EN. Arthrofibrosis of the knee following a fracture of the tibial plateau. Bone Joint J. 2015; 97-B:109-14.