

External fixation of type I intertrochanteric fractures in elderly patients with high risk comorbid conditions.

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الخلاصة

في مدينة الديوانية كجزء من العراق الذي يعتبر من الدول النامية يوجد لدينا مستشفى واحد ذو عدد محدود من الاسرة ويوجد عدد كبير من المرضى الذين يعانون من كسر بين المدورين في الفخذ وهكذا نوع من الكسور يحدث عادة في المرضى الذين يعانون من امراض سريرية عالية الخطوره تجعلهم غير مؤهلين او صالحين لتحمل اجراء عمليات تحت التخدير العام او عمليات طويلة المدة وصعوبة ادخالهم بهذا العدد لمدة طويلة في هذا المستشفى ذو القدره المحدوده من الاسرة لعلاجهم تحفظيا لذلك يعتبر علاج هكذا كسور في هكذا نوع من المرضى تحديا طبيا. ان هذه الدراسه تهدف الى تقييم علاج الكسور بين المدورين في الفخذ بواسطة التثبيت الخارجي للمرضى كبار السن ذوي الخطورة العاليه في مدينة الديوانيه. دراستنا تتضمن (40) مريضا متوسط اعمارهم (73.5) سنة ونوع الكسور هو النوع الاول حسب تصنيف (كايل) ومعدل مدة المتابعة في هذه الدراسه كانت (12) شهرا . التثبيت الجيد والتمشي في وقت مبكر تحقق في معظم المرضى. الشفاء الكامل للكسر تحقق في كل المرضى وتمت ازالة جهاز التثبيت الخارجي في معدل زمني (95) يوما . خمسة وعشرون مريضا حصل لديهم التهاب مسلك الدبوس وستة مرضى حصل لديهم قصر في الطرف الاسفل بمعدل (2) سم بسبب التقوس التزوي الذي حصل بسبب الانحشار في موقع الكسر اثناء وضع الوزن في المشي. دراستنا هذه اظهرت بان طريقة علاج الكسور بين المدورين في الفخذ باستخدام التثبيت الخارجي هو عبارته عن طريقه بسيطه ممكن اجرائها تحت التخدير الموضعي دون الحاجه الى التخدير العام ونحن نعتقد بانها طريقه بديله جيد للتثبيت الداخلي المستخدم في علاج هذه الكسور خصوصا في المرضى المسنين الذين يعانون من امراض اخرى عاليه الخطورة.

Abstract

In Al- diwaniya city as part of a developing country we have only one hospital and we have high number of intertrochanteric fracture patients which usually occurs in patients having medical illnesses which make them unfit for general anaesthesia or lengthy operation or keeping them for long time on conservative treatment in hospital. So due to these factors the treatment of high risk patients with intertrochanteric fracture is a challenge.

In this study we aim to evaluate the results of treatment of intertrochanteric fractures of the femur by external fixation in a group of high risk geriatric patients in Al-diwaniya city / Iraq.

Our study involves 40 patients with mean age of 73.5 years, and type I kyle classification with the average follow up time of 12 months.

Good fixation and early ambulation was achieved in most of the patients.

Complete fracture healing was achieved in all patient and the fixator was removed after an average of 95 days.

Twenty five patients developed superficial pin tract infection and six patients had an average shortening of 2cm due to varus angulation by impaction at fracture sites during weightbearing

Our study demonstrates that treatment of intertrochanteric fractures by external fixation is simple and can be done under local anaesthesia with or without narcotic analgesia and we think it is good alternative to internal fixation in medically high risk patients.

Introduction

Intertrochanteric fractures are by definition extra capsular and they are common in elderly osteoporotic people (1). The increase of the average life expectancy together with

osteoporosis and senile muscular insufficiency may explain the increasing number of patients with intertrochanteric fractures(2). The main aim of treatment of Intertrochanteric are to mobilize the patient

early and to ensure union in appropriate position(3). That's why these fracture are almost always treated by surgery either internal or external fixation. Non operative treatment may be appropriate for terminally ill or non ambulatory patients(4) .In these type of patients three factors affecting the type of surgery chosen ;first the osteoporosis, second immobilization, and third the medical illnesses which commonly present in such patients. Implant failure and malunion are frequently observed in osteoporotic patient treated by internal fixation.(3,5) .Long immobilization following internal fixation is not possible owing to the risk of decubitus ulcers, pneumonia, urinary tract infections, deep vein thrombosis, and cardiopulmonary complications(2,6,7,8,9) . In our circumstances, due to limited availability of modern anesthesia, medically high risk patients with intertrochanteric fractures remain unsuitable for long operation of open reduction and internal fixation. *Anderson et al*, used external fixation for the treatment of intertrochanteric fractures for the first time in 1943(2) . Scott also used it because of its advantages such as short operation time, early post-operative mobilization, preservation of fracture hematoma and early fracture union(10,11,12,13). So external fixation performed under regional anesthesia offers significant alternative to internal fixation in high risk old patients.

Patients and methods

A total of 40 patients(25 female and 15 male) were admitted to Al- diwaniya teaching hospital during the period from October 2009 to August 2012, with intertrochanteric fractures, mean age 73.5 years (60-93), all fractures were resulted from fall on the ground, all patient who selected in this study had high surgical and anesthetics risk factor for an open surgical procedure or for long anesthesia because they have more than one a accompanying disease; 20 patients had IHD, 15 patient had DM, 15 had hypertension, 2 had Parkinson disease and one had cerebral dysfunction. We selected only patient who

had type I kyle intertrochanteric fracture either displaced or undisplaced which can be closely reduced to anatomical position under fluoroscopic control. The patients were admitted to Diwaniya teaching hospital and preoperative investigations and assessment were done for them. The modality of anesthesia were 16 spinal, and 24 local anesthesia with narcotic analgesia. The patient was placed on orthopedic table and the reduction was checked by fluoroscopy. The displaced fracture was reduced by traction in abduction and internal rotation. After reduction three shanz pins were inserted into the femoral neck percutaneously, the tips of pins were 10 mm from joint line and the frame of external fixator is applied with 135 degree to the proximal pins and then three pins inserted also percutaneously to the femoral shaft (fig.1). Then we moved the knee joint to flexions at 90 degree during surgery to increase the range of knee movement. Active hip and knee exercise were started on the first postoperative day. The patient starts nonweight bearing walking on crutches and the patient discharged after several days of treatment after teaching the patient how to use crutches, walking and sitting. The stitches were removed after 14 days of operation. The patient evaluated at 15 days interval at first month and monthly later on for knee movement, pintract infection and fracture union by radiograph. The fixators were removed after an average of 95 (80-130) days at the outpatient clinic. The characteristics of our patients are summarized in table 1.

Results

The average follow up period were 12 month (6-20). We evaluated the patient results clinically and radiologically .

Radiographically we check for union and neck shaft angle by pelvic x ray.

Clinically we evaluated the leg length discrepancy by measuring the distance between anterior superior iliac spine and medial malleolus.

All fracture united quietly and 6 patients (15%) had varus malunion and these patients had shortening of about 2 cm at the end of follow up.

Five patients could walk with 2 crutches, 20 could walk with one crutch and 15 walk without any support. Regarding knee movement all patients had limited knee flexions in early postoperative period but during the follow up the knee movement became better by physiotherapy and the mean range of knee movement was 95 degree (70-110) at the end of follow up .

Pin tract infection was developed in 35(14%) pins and these were treated with wound dressing and antibiotic cover . There was no deep infection in our patients. No implant failure was recorded.The results are summarized in table 2.

Discussion

Intertrochanteric fractures are one of the most important fractures of the lower extremity. The prevalence of hip fractures is increasing owing to the increase in life expectancy and the inefficient treatment of osteoporosis, which still the basic factors for such fractures(3,5).

In such old patients the first goal is to save the life of the patient and to get the patient up as soon as we can to prevent the complications of recumbency. This can be achieved by external or internal fixation.

In old patients with medical illness we have to choose fixation method with short operative time, minimal blood loss, can be done without need for general anesthesia and so efficient to permit the patient to get up and to be discharged from hospital as soon as possible.

Several studies using an external fixation for fixation of intertrochanteric fractures have shown better functional result because it has shortened operative time and resulted in less blood loss ,less pain and short hospital stay.(14,15,16,17,18)

Our study showed that external fixation can be applied under local anesthesia which is

very safe for high risk geriatric patients and the average time for surgery was 32 minutes.

Christodoulou et al and *Eksioglu et al* reported that with external fixation the average anesthetic time was 35 minutes including reduction and application of external fixation compared with 72-100 minutes for open reduction and internal fixation(6,7).

Karn et al in comparative study between external fixation and sliding hip screw in management of trochanteric fractures found that the operative time was 20-30 minutes for external fixation and 60 -120minutes for internal fixation(19).

Kostas et al reported an average operative time of 37+8 in treatment of intertrochanteric fractures in elderly high risk patients by external fixation (17).

The average hospital stay in this study was 7 days, during which we taught the patients how to sit, how to use crutches during walking and this is comparable with the result of *Subasi et al* who reported that the average hospital stay in their patients was 8 days (2).

Kostas et al reported an average hospitalization of 6 days using external fixation in treatment of intertrochanteric fractures (17).

Christodoulou et al in their comparative study reported average hospital stay of 6 days for external fixation and 16 days for internal fixation group(6).

Vossinakis et al in comparative study between external fixation and internal fixation in treatment of pertrochanteric fractures found the hospitalization was 8±1.5 days for external and 16.7±2.2 days for internal fixation(20)

In this study there was no problem regarding fracture union and all fractures united completely .The average time to complete union was 96 days,which is comparable with *Subasi et al* who reported 94 days as an average time for complete union and *Tak et el* who reported 14 weeks as an average time for healing , as compared to 4-5 months for

internal fixation.(2,7,16,21). We think this is because external fixation preserve the fracture hematoma which is very important in fracture union.

The most common complications were pin tract infections, hip and knee stiffness and, varus deformity which result in shortening.

In our study pin tract infection was seen in 35 (14%)of pins while *Subasi et al* reported 10% pin tract infection(2),*Suhail et al* reported 8%(18) and *Kostas et al* 39%(17); this is may be due to the difference of personal hygienic care; nevertheless it did not affect the outcome of fixation i.e there was no implant failure due to this infections and was managed by simple dressing and systemic antibiotic and we taught the patients how to clean the pins and all these infection resolved after pins removal.

In our study we reported shortening of about 2cm was in 6(15%) patients due to varus angulation developed because of impaction during weight bearing ,this is comparable with the results of *Subasi et al* (15%)(2),while *Suhail et al* reported 25% shortening of 2±1 cm(18).

This shortening in our patients did not affect the walking because of the age and less daily functional demand of these patients provided the patients get up early.

The range of hip motion was initially limited but at the final follow-up all patients regained good range of movement.

Knee stiffness is reported as one of the commonest complications in external fixation probably as a result of transfixing the vastus lateralis (2,16,18).

In our study the range of knee movement was more than 90 degree of flexion and no extension lag because we used short frame which did not transfix much of vastus lateralis and we moved the knee into full range of motion after application of external fixator intraoperatively in addition to early knee motion postoperatively.

Conclusion:

We may conclude that the External fixation of intertrochanteric fractures is simple, safe, rapid and can be performed under local anesthesia with or without narcotic analgesia. It does not need a complicated instrumentation if compared with internal fixation. In addition it does not need prolonged hospital stay , allow early mobilization of patients and does not requires anesthesia for second surgery to remove the implants.

Moreover the complications are not that complex and can be managed easily or the patients can cope with them (e.g. Shortening).

Based on what have just mentioned, this technique may be considered as an alternative treatment modality for high risk patients with type 1 kyle classification intertrochanteric fractures.



Fig. 1.-The left hip of a 70 years old male patient

- A.Preoperative anterolateral x-ray.
 B.postoperative anterolateral x-ray.
 C.Anterolateral x-ray 88 days postoperative (after fixator removal).

Table 1: Characteristics of study sample

Number	40 patients
M:F ratio	25: 15 (1.67:1)
Mean age (range)	73.5% (70-90) years
Co morbidity	
Diabetes mellitus	25 (62.5%)
CVA	1(2.5 %)
Parkinsonism	2(5%)
Hypertension	15 (37.5%)
IHD	15 (37.5%)

Table 2: Results

Complications	Pin tract complication 35 pin (14 %)
	6 out of 40 (15 %) shortening
Outcome	5 (12.5%) on two crutches
	20 (50 %) on one crutch
	15 (37.5%) no crutches
Range of knee movement (degree flexion)	95% (70 -110)

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