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**EDITOR**  
**B. O. OSOTIMEHIN**

**ASSISTANT EDITOR**  
**A. O. UWAIFO**

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## Hip fractures in a tropical teaching hospital

SO Ogunlade, TO Alonge and OE Idowu

*Division of Orthopaedic and Trauma, Department of Surgery, University College Hospital, Ibadan, Nigeria*

### Summary

The pattern of hip fractures, treatment, outcome of treatment, and complications of forty-four consecutive patients treated over a five-year period were retrospectively studied. This represents 3.5% of the hospitalised patients in orthopaedic services. The male: female ratio was 1:1.3. Seventy percent of the fractures occurred in those over 65 years of age. The fractures were the result of low energy trauma in 81.8% of patients. Intracapsular (cervical) fractures accounted for 79.5% of the total cases. Only two patients had associated injuries on admission. Austin Moore hemiarthroplasty was the choice of hip replacement for intracapsular fractures, while ORIF (Open reduction and internal fixation using fixed angle blade plate) was done for patients with (extracapsular) trochanteric fractures. Anaesthesia (general or regional) was uneventful. Non-fatal pulmonary embolism occurred in one patient post-hemiarthroplasty while in the hospital. This study shows that hip fractures are not uncommon in our environment although far less common than what obtains in the Caucasians.

**Keywords:** *Fracture, hip, tropical treatment elderly, osteoporosis*

### Résumé

La fréquence des fractures du bassin, le traitement et les complications chez 44 patients consécutifs traités et suivis durant une période de 5 ans était rétrospectivement étudiées. Ceci représentait 3.5% des patients hospitalisés au service orthopédique : la proportion mâle femelle était 1 : 1.3. Soixante dix pour cent (70%) des fractures apparus aux patients de plus 65 ans. Les fractures résultant du traumatisme de peu d'énergie étaient présentes chez 81.8% de patients. Les fractures cervicales estimaient à 79.5% des cas total et deux patients seulement avaient des blessures associées à l'admission. Austin Moore hemiarthroplastie était le choix du joint remplacement pour les fractures intracapsulaires lorsque ORIF (réduction ouverte et fixation interne utilisant les plaques d'angle) était fait pour les

patients ayant les fractures trochantériques. L'anesthésie générale ou régionale était sans problème. L'embolie pulmonaire non-fatale apparaît chez un patient après l'hémiarthroplastie à l'hôpital. Cette étude montre que les fractures du bassin sont moins observées dans notre environnement qu'en occident.

### Introduction

The hip is a common site of fracture in the elderly [1]. Fracture of the hip occurs most commonly in patients over 50 years of age and it is commoner in females [2].

It is rare in members of the races in which osteoporosis is uncommon. It is presumed to be a pathological fracture in association with osteoporosis and sometimes osteomalacia [3]; therefore decrease bone density on roentgenograms has been correlated with a high incidence of femoral neck fractures [4,5]. The incidence of fracture neck of femur is often used as a measure of age-related osteoporosis in population studies [2]. These fractures tend to occur in people with above average osteopenia, many of whom have bone losing or bone weakening disorders such as osteomalacia, diabetes mellitus, stroke (disuse), alcoholism and chronic debilitating diseases [6,7]. Some of these conditions also contribute to an increased tendency to a fall. By contrast, femoral neck fractures in general are said to be uncommon in Negroid populations and in patients with osteoarthritis of the hip [8].

Femoral neck fractures seem to be more related to failure of the outer diameter of the femoral neck to expand with age and increased acetabular bone width-added to a focal bone loss [9].

In most cases women with trochanteric fractures are older, and of shorter height than those with intracapsular cervical fractures [9]. The bone mineral density has been found to be lower in patients with trochanteric fractures. The most common classification of displaced intracapsular femoral neck fractures is that of Garden [10]. Garden's classification is based on degrees of displacement of the intracapsular fracture. The classification are stage I, which is an incomplete fracture, stage II, is an undisplaced complete fracture, stage III is a displaced fracture, while stage IV is total displacement of the fracture. (Table 1).

**Table 1:** Garden's classification of femoral neck fractures (Intacapsular).

Stage I	Incomplete or impacted fracture of the femoral neck with no displacement of the medial trabeculae.
Stage II	Complete fracture of the femoral neck with no displacement of the medial trabeculae.
Stage III	Complete fracture of the femoral neck with varus angulation and displacement of the medial trabeculae.
Stage IV	Complete fracture of the femoral neck with total displacement of the fragments.

Evans, on the other hand, devised a widely used classification system for trochanteric fracture that is based on the division of fractures into stable and unstable groups [11].

This article was chosen to describe the pattern of injury and treatment given in our environment, assess the outcome of treatment and complications, and compare non-operative and surgical treatment.

Types 1 and 2 of Evans classification are stable while types 3,4, and 5 are unstable (Table 2).

#### Patients and methods

The case notes (including operation theatre logs) of all patients with fracture of the hip treated at the University College Hospital (UCH) from 1<sup>st</sup> January 1996 to 31<sup>st</sup> December 2000 were extracted from the Medical Records Department and reviewed. Data retrieved from each patient's record included demographic data, mechanism of injury, associated bony or soft tissue injury, treatment injury, associated bony or soft tissue injury, treatment (operative/non-operative), type of anaesthesia, length of hospital stay, and morbidity/mortality rates.

Data was analysed by simple frequency, percentages and fisher's exact test as appropriate.  $P < 0.05$  was considered significant.

**Table 2:** Evans classification of trochanteric fracture.

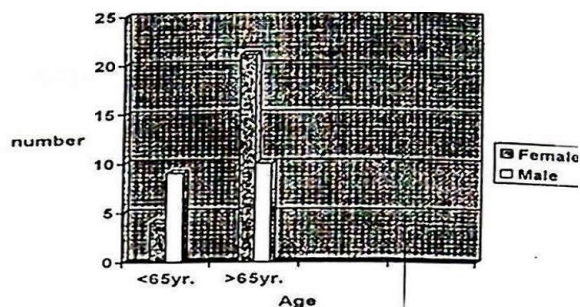
Type 1:	Undisplaced two-part fracture
Type 2:	Displaced two-part fracture.
Type 3:	Three-part fracture with greater trochanter displaced.
Type 4:	Three-part fracture with displaced culcar and lesser trochanter.
Type 5:	Four-part fracture with medial and posterior lateral cortex fractures. (Combined 3 and 4).

#### Results

Forty-four patients with fracture of the hip were treated in UCH during the five-year period under review. During this period a total of 1,256 admissions were made in the

orthopaedic unit. This represents 3.5% of the hospitalised patients in orthopaedic services.

Twenty-five of these patients were female while nineteen patients were male (M: F = 1:1.3). The mean age was 63.5 years (9-95 years). Seventy percentage of the fractures occurred in those over 65 years of age (Figure 1).

**Fig. 1:** Age distribution pattern.

Thirty-five of the total cases (79.5%) were intracapsular fractures while the remaining were trochanteric fractures (Table 3). The fractures were the result of low energy trauma (trivial falls) in 81.8% and it followed road traffic accidents in 18.2%. Only two patients had associated injuries on admission (acetabular and humeral fracture).

Four patients with trochanteric fracture had conservative treatment due to financial constraint or late presentation. Austin Moore hemiarthroplasty was the choice of hip replacement for intracapsular fractures, two of which were bipolar hemiarthroplasties, while ORIF (Open reduction and internal fixation using fixed angle blade plate) was done for four patients with trochanteric fractures (Table 6).

There was no morbidity or mortality attributed to the form of anaesthesia; both regional and general, which were employed. There was a case of failed spinal, which was subsequently converted to general. Non-fatal pulmonary embolism occurred in one patient post hemiarthroplasty while in the hospital. Post-operatively, patients were mobilized within 48 to 72 hours. Ambulation was delayed significantly in a patient due to severe ipsilateral osteoarthritis of the knee. The diagnosis of pulmonary embolism was made based on a patient developing chest pain and dyspnoea with diagnosed thrombosis of the pelvic vein.

#### Discussion

The femoral neck is about 5 cm long, and it connects the shaft at an angle of about 125° (widest at birth and less in females). On all aspects the neck diverges as the capitular articular surface is approached. It is narrowest at its midpart, widest laterally with numerous vascular foramina,

especially anterior and posterosuperiorly [12]. It has been shown that muscular attachment produces an axial load along the axis of the femoral neck and coupled with the external pressure these two determine the fracture pattern [12].

Table 3: The pattern of fracture.

Side	Intracapsular	Trochanteric
Right	20	3
Left	15	6
Total	35	9

Table 4: Aetiology of hip fractures.

Trauma	Intracapsular	Trochanteric	Total
Low energy	33	3	36
High energy	2	6	8
Total	35	9	44

$P = 0.001$ .

Femoral neck fracture is rare in the young. Seventy percent of the cases in our series were above 65 years of age (Figure 1). Intracapsular fracture accounted for 79.5% of all the cases. The preceding trauma was a trivial fall in 81.8% (Table 4). Trochanteric fractures were the main fracture pattern (66.7%) following high-energy trauma (road traffic accident/fall from heights) injuries. This agrees with the observation by Lloyd that more severe trauma produces intertrochanteric fractures and this may partly explain the higher mortality rate when compared with intracapsular fractures [13]. Trochanteric fractures were relatively uncommon in our series (Table 3). The youngest patient with a trochanteric fracture was 62 years of age.

Following injury, motion of the hip causes pain. If displacement has occurred the extremity is often externally rotated and shortened (although not all hip fractures are so obvious clinically). Debilitated or mentally handicapped patients may not complain of hip pain even in the presence of bilateral fractures, while patients with an impacted fracture may still be able to walk. Therefore, before any treatment is instituted in patients with suspected femoral neck fractures, antero-posterior and lateral radiographs of the hip should be obtained.

The femoral head gets its blood supply from three sources namely the intramedullary vessels in the femoral neck, ascending cervical vessels in the capsular ligament and the vessels of the ligamentum teres femoris. The intramedullary supply is interrupted by the cervical femoral fracture while the retinacular vessels may be torn if there is significant displacement. Hence displaced intracapsular fractures have a high rate of non-union and avascular necrosis [14]. However, trochanteric proximal femoral fractures unite quite well and seldom cause avascular necrosis.

Table 5: Type of anaesthesia.

Anaesthesia	Percent
GA	50
Spinal	35.7
Epidural	7.15
GA/Spinal	7.15
Total	100

\*GA-General anaesthesia.

Table 6: Management modality.

Management	Number
Surgery	
Austin Moore hemiarthroplasty	1
ORIF	4
Non-operative	4
Discharge against medical advice	3
Total	44

\*ORIF (Open reduction and internal fixation) -using Assut screws, partially threaded screws, fixed angle blade plate and cancellous screw.

In Garden's stage 1 and 2 fracture, it is generally agreed, whatever the age group, that the treatment of choice is ORIF using cannulated AO screws or pins introduced up the femoral neck to hold the femoral head in position. This is safely done with the aid of an image intensifier. In Garden's stage 3 and 4 fractures it is unlikely that the femoral head will survive because of the disruption of its blood supply. However, in younger patients, early fixation is advisable after adequate reduction. The hope is that the femoral head will revascularise before it collapses. In the older patients, the chance of survival of the femoral head is so low that it is best to replace the head with prosthetic devices. The choice of replacement can be by total hip replacement or hemiarthroplasty.

There was no morbidity or mortality attributed to the form of anaesthesia used for the different surgical procedures in our series. This is similar to the findings of Koval *et al.* [15]. It may also be due to the small number of cases studied.

Significant variations in mortality exist with age and gender. Walker *et al.*, in a study among individuals aged 6 years or older in New Zealand, noted a fatality rate of 8% within 35 days of admission to the hospital following hip fractures [16]. Case fatality was found to be twice as high in men compared to women and four to five times higher in individuals aged 85 years and older, compared to people aged between 60 and 64 years. The two main cause of death were accidental falls and ischaemic heart disease. Koval *et al.* noted a hospital mortality of 3.1% in a study on 642 patients [15]. We recorded no mortality during hospitalization.

In conclusion, this study shows that hip fractures are not uncommon in our environment. However it represents 3.5% of all admission to the orthopaedic service; this shows that it is far less common than in the Caucasians where hip fractures account for up to 30% of all admissions [17]. There is female and intracapsular fracture preponderance. When hip fracture occurs in the elderly following a trivial fall, intracapsular fracture is most likely. Regional anaesthesia, if appropriate, should be preferred.

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