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Fixation of Traumatic Femoral Shaft Fracture in Port Harcourt: Comparison of Locked Intramedullary Nailing and Plating.

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ABSTRACT

Background: Trauma is increasingly becoming a public health concern worldwide. Femoral fractures resulting from trauma are challenging to manage. Definitive stabilization of the fractured femur shaft could be done by various methods. Locked intramedullary nailing is the gold standard for surgical stabilization and plating are two options for management. Both methods have advantages and disadvantages.
Method: This is a prospective randomized study conducted in two centres, located in Port Harcourt metropolis over a period of twelve months. Ethical approval was obtained from both hospitals and informed consent was obtained. Data were analysed using Statistical Package for Social Science (SPSS) version 20. Results were presented in graphs and tables.
Result: A total of 70 patients completed the study with 35 in each group. Males were more in number. The commonest cause of injury was motor vehicular accidents with n= 16 (45.7%) in the nailing group and n= 24 (68.6%) in plating group. The average time to weight bearing was 4 weeks for nailing and 9.26 weeks for plating. Also, the average time to return to normal activity was 8.31 weeks for nailing and 14.09 weeks for plating. The average time to early bony union was 14.49 weeks for nailing and 18.69 weeks for plating.
Conclusion: Fixation of traumatic femoral shaft fracture using locked intramedullary nailing resulted in a shorter duration of hospital stay and early commencement of normal duties.

INTRODUCTION

Trauma is the bane of an industrialized society. The manufacture of fast-moving vehicles and high-calibre weapons has increased its incidence and is thus a growing public health burden worldwide[1-4]Femoral shaft fracture is a common injury and usually follows high-energy trauma in young men, mostly from road traffic crashes, gunshot injuries and falls from heights[3-7]

Femoral shaft fracture is often associated with injuries to other body systems and could be complicated by severe haemodynamic instability, fat embolism, acute respiratory distress syndrome, and multiple organ dysfunction[4,5,6]. Femoral shaft fractures are amongst the major injuries following trauma that an orthopaedic surgeon will commonly manage.[5]

Management of traumatic femoral shaft fracture is divided into initial resuscitation, later definitive stabilization of the fracture and treatment of other injuries depending on their severity[3,4,6]. Various methods of treatment of femoral shaft fracture include traction with or without cast bracing, external fixation, plating and intramedullary nailing[5,6,7]. Conservative management of femoral shaft fracture had been with traction and cast bracing[8] but the high rate of complications such as malunion and knee joint stiffness together with problems of prolonged immobilization have made such treatment unpopular. Conservative management is however an option of treatment in resource-poor countries and occasionally when temporary stabilization is required before definitive surgery[2,9]. The use of an external fixator is generally reserved for open fractures and as a damage control procedure for polytraumatized patients not fit for a long duration of surgery[3,6].

Fixation with locked intramedullary nails (Locked nailing) is believed to be the gold standard for most femoral shaft fractures[6,7,8,910,11]. Its advantages include restoration of length, rotational stability and early functional use of the extremity[9,10,11]. The use of interlocking nails which acts as internal splinting also shows superiority with a short hospital stay, low non-union rate and low infection rate. This method of fixation however requires an image intensifier and fracture table. The Surgical Implant Generation Network (SIGN) nailing system was designed to be used in resource-poor areas where fracture table and intraoperative imaging may not be available[2,9,12,13,14]. The SIGN nail has allowed the use of locked intramedullary nails in many centres in Nigeria for humeral, femoral and tibial diaphyseal fractures.[13,14]

A retrospective study on intramedullary nailing has been carried out by Furo et al.[15] but none comparing the outcome of intramedullary nailing and plating in Port Harcourt. We are unaware of any study conducted in Port Harcourt, Rivers state comparing both methods of femoral fixation. The essence of this study is to scientifically compare interlocking nailing and plating methods of fixation of traumatic femoral shaft fracture in a resource-limited region.

MATERIALS AND METHODS

This study was carried out on adults with fresh traumatic femoral shaft fractures who presented for treatment within two weeks of injury in Port Harcourt metropolis. This was a prospective randomized study involving the two tertiary care centres in Port Harcourt, Nigeria over a period of twelve months. This study was conducted at the University of Port Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital both in Port Harcourt metropolis. Patients were then followed up in the Orthopaedic Outpatient Clinic of the respective hospitals after discharge.

The patients that were included in the study were patients aged between 18 to 65 years with fracture of the femoral shaft who presented to either the University of Port Harcourt Teaching Hospital or Braithwaite Memorial Specialist Hospital both in Port Harcourt for treatment within two weeks of injury during the study period. Patients with medical co-morbidities unfit for surgical stabilization, pathological fractures, non-union of the femoral shaft, More than Type 1 open fracture of the femur using Gustilo et al classification, below 18 years and above 65 years were excluded from the study. Recruited patients were allotted into either nailing or plating group based on random sampling by balloting. The research assistant wrote down alphabets A and B in equal numbers for patients to choose from. Those who choose A were in the nailing group, while those who choose B were in the plating group.

Patients, who met the inclusion criteria and accepted to be recruited for the study, signed an informed consent form. Then at the emergency unit, quick history was taken, and then patients were adequately resuscitated using the Advanced Trauma Life Support protocol when necessary. Detailed history and good clinical examination were done on these patients after adequate resuscitation. Radiological investigation of the fracture and other injuries if any was done to classify and determine fracture pattern, Packed Cell Volume and Urinalysis was requested and those with Packed Cell Volume of less than 27% were transfused as required. Other investigations done are Electrolyte, Urea and Creatinine, and chest radiographs for hypertensive patients and those above 40 years. Blood sugar estimation to rule out diabetes was done.

Fractures were classified using the AO/OTA classification system of femoral shaft fracture. An adequate preoperative anaesthetic review was carried out to determine fitness for surgery and anaesthesia. Patients were on preoperative fasting for at least 6 hours. All information obtained was adequately entered into the proforma/ questionnaire. The choice of anaesthesia was spinal anaesthesia except when

contraindicated. Prophylactic antibiotic Ceftriaxone 1 gram was given at the commencement of anaesthesia.

For plating, exposure to fracture was done through a posterolateral approach down to the fracture site. The fracture was reduced under direct vision and the appropriate stainless steel broad dynamic compression plate (DCP) was placed and then secured with cortical screws with at least eight cortices above and below the fracture site.

For interlocking nailing, SIGN instrumentation was used and the fracture site was opened through a mini direct posterolateral approach down to the bone. The fracture was then reduced under direct vision. The entry point for the nail was either the greater trochanter for antegrade nailing or the intercondylar ridge of the femur for retrograde nailing depending on the location of the fracture on the shaft. Reaming of the intramedullary canal was done to chatter then an appropriately sized nail 2 sizes below the last reamer used to obtain chatter was introduced into the medullary canal and then locked with SIGN cortical locking screws.

A drain was placed and the wound was dressed with sterile material after wound closure in both plating and nailing.

Postoperatively, patients were monitored for haemodynamic stability in the recovery room. Adequate analgesia was given (Pentazocine and Diclofenac suppositories. Ceftriaxone 1 gram daily was continued for at least another 48 hours post-operatively. Patients commenced oral feeds once they can communicate intelligently.

The drain was removed on the 5th day postoperatively while sutures were removed on the 14th day postoperatively and then discharged on the 14th postoperative day. Patients were followed up in the outpatient clinic initially at 2 weeks after discharge from the hospital then monthly for at least 6 months. Assessing for clinical and radiological union was done at 6, 12 and 24 weeks. For this study, clinical union was said to have been achieved when pain is absent at the site and painless weight bearing. While radiological union is when there is the presence of bridging callus or absence of fracture line on a plain radiograph. Physiotherapy was commenced soon after surgical stabilization and was done in the physiotherapy department of the hospital.

The sample size was calculated using the formula[52] for the comparison of two groups

$$n = \frac{(u + v)^2 \quad (\acute{o}^2_1 + \acute{o}^2_0)}{(\mu_1 - \mu_0)^2}$$

Where

n= the minimum sample size
$\mu_1 - \mu_0$= difference between the means
$\acute{o}_1 + \acute{o}_0$= standard deviations
$+u$ = the power required at a 95% confidence interval, 1.64
v= significance level required, 1.96

μ_1= the meantime of full union of femoral shaft fracture using the plating method was gotten from a study by Ogunlade et al[16] = 20.0 weeks
μ_0= the mean of time of full union of femoral shaft fracture using interlocking (SIGN) nail method, was gotten from a study by Ikpeme et al[13] = 16.9 weeks
$\acute{o}_1$ = the Standard deviation of time of full union of femoral shaft fracture using the Plating method = 4.0 weeks
$\acute{o}_0$ = the Standard deviation of time of full union of femoral shaft fracture using Interlocking (SIGN) nail method = 5.4 weeks

$$n = \frac{(1.64+1.96)^2 \quad (4.0^2+5.4^2)}{(20-16.9)^2}$$

$$n = \frac{(3.6)^2 \quad (16 + 29.16)}{(3.1)^2}$$

$$n = \frac{12.96 \text{ X } 45.16}{9.61}$$

$$n = \frac{585.27}{9.61}$$

n=60.90

The sample size for both groups will be approximately 61 or all samples check.

Compensating for non-response, assuming an attrition of 10% (response rate of 90%), the minimum sample size is

$N_s = n/0.9$

$N^s = 61/0.9 = 67.8$ for both groups.

Minimum sample size = 68 or all samples checked.

Data collected were analysed using the Statistical Package for Social Sciences (SPSS) for windows version 20. Observed differences between the two groups were tested for statistical significance using the Pearson Chi-square test for association between categorical variables and the student t-test to compare the association between means. The level of significance was set as $p < 0.05$. The result was

presented by descriptive statistics using tables of frequency count, percentages and graph presentations while the research hypotheses were tested using appropriate statistical techniques and as an inferential analysis to test the relatedness of the research objectives and findings.

Consultants in both hospitals supervised the research and performed the surgeries. Two senior registrars and nurses in both hospitals assisted in the emergency room, operating theatre and outpatient clinic. The study protocol was given to all participants and their various roles were discussed in order to full cooperation and involvement. A research assistant supervised the random sampling.

Ethical approval was obtained from the research and ethics committees of the University of Port-Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital in line with the Helsinki declaration.

RESULTS

A total of eighty-two (82) patients were recruited for the study during the periods. Seven (7) patients were lost to follow-up at different periods during the study while five (5) patients were excluded because of age, mechanisms of injury and duration between injury and presentation to the hospital. A total of seventy (70) patients however completed the study and were analyzed.

Socio-Demographic Characteristics of Patients in the Study

The socio-demographic characteristics examined include age distribution, sex distribution, educational level and occupation in both the nailing and plating group. The age most prevalently affected was between 30 - 40 years with 16 patients (45.7%) in the nailing group and 10 patients (28.6%) in the plating group. The sex distribution shows a male preponderance with 20 patients (74.3%) in the nailing group and 25 patients (71.4%) in the plating group while females accounted for a lesser number with nine patients (25.7%) in the nailing group and 10 patients (28.6%) in the plating group. The most frequently occurring educational level was the tertiary level of education with 25 patients (71.4%) in the nailing group and 22 patients (62.9%) in the plating group. The most frequent occupation of the patients among the study population was civil servants with 11 patients (31.4%) in the nailing group and nine patients (25.7%) in the plating group distribution of the demographics is as shown in table 1. The differences in proportions of the sociodemographic variables were not statistically significant ($p<0.05$).

Table 1: Comparison of the socio-demographic characteristics of patients between groups in the study

Socio-demographic characteristics	Groups in the study		Total
	Nailing N=35 n (%)	Plating N=35 n (%)	N=70 n (%)
Age distribution			
≤ 20 years	1 (2.9)	2 (5.7)	3 (4.3)
21 – 30 years	10 (28.6)	10 (28.6)	20 (28.6)
31 – 40 years	16 (45.7)	10 (28.6)	26 (37.1)
41 – 50 years	5 (14.3)	8 (22.9)	13 (18.6)
51 – 60 years	3 (8.6)	4 (11.4)	7 (10.0)
> 60 years	0 (0.0)	1 (2.9)	1 (1.4)
	Fisher's exact test=3.608; p-value=0.657		
Sex distribution			
Female	9 (25.7)	10 (28.6)	19 (27.1)
Male	26 (74.3)	25 (71.4)	51 (72.9)
	Chi Square=0.072; p-value=0.788		
Educational level			
Primary	1 (2.9)	0 (0.0)	1 (1.4)
Secondary	9 (25.7)	13 (37.1)	22 (31.4)
Tertiary	25 (71.4)	22 (62.9)	47 (67.1)
	Fisher's exact test=1.847; p-value=0.440		
Occupation			
Student	10 (28.7)	8 (22.9)	18 (25.7)
Trader/Business	6 (17.2)	10 (28.7)	16 (22.8)
Professional	3 (8.6)	3 (8.6)	6 (8.5)
Civil servant	11 (31.4)	9 (25.7)	20 (28.5)
Skilled worker	5 (14.3)	5 (14.3)	10 (14.2)
	Chi square=9.90 p-value=0.769		

Cause of Injury

The major cause of injury was motor vehicle injuries with 16 (45.7%) in the nailing group and 24 (68.6%) in the plating group, followed by Motor cycle injuries which accounted for seven (20.0%) in the nailing group and five (14.3%) in the plating group. The distribution of other causes of injury in the two groups is shown in figure 1. The differences in the proportion of the causes of injury between the two groups were not statistically significant (p >0.05).

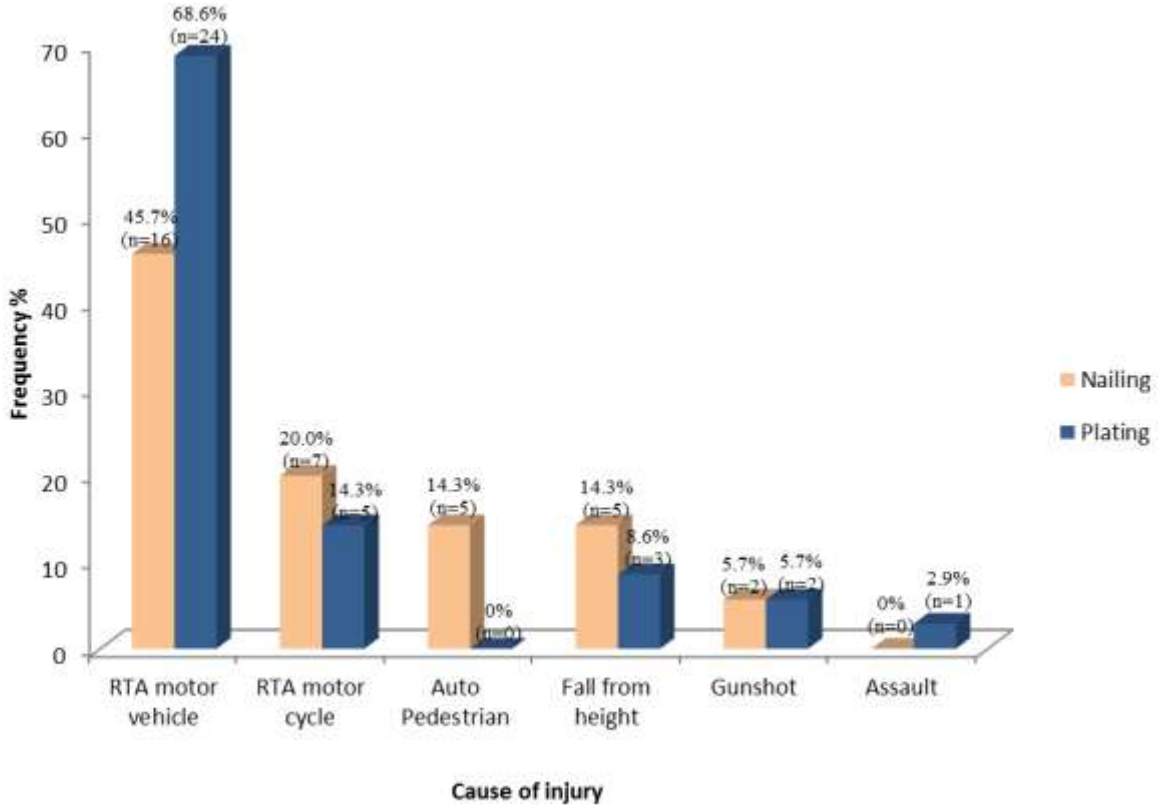

Figure 1: Distribution of causes of injury across study groups

Location of Fracture on the Shaft

The proximal part of the femoral shaft was the location of the fracture among three (8.6%) patients in the nailing group and four (11.5%) patients in the plating group. The middle part of the femoral shaft was noticed to be the location of the fracture (77.1%) patients in the nailing group and 25 (71.4%) patients in the plating group while the distal part of the femoral shaft was the location in five (14.2%) patients in the nailing group and six (17.1%) patients in the plating group. The differences in the proportion of the location of the fractures on the shaft between the two groups were not statistically significant (p >0.05).

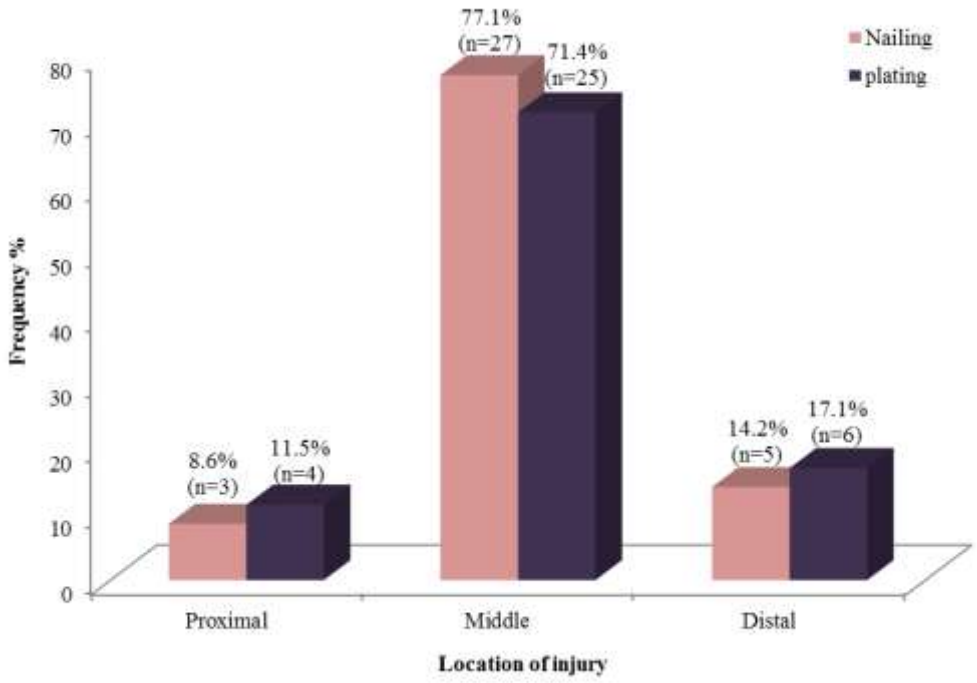

Figure 2: Distribution of location of injury across study groups

Laterality of Fracture

The left limb accounted for fracture in 17 (48.6%) patients of the nailing group and in 18 (51.4%) patients of the plating group. Also, among the nailing group fracture was located on the right limb in 12 (34.3%) patients while for the plating group, the right limb was the location in 23 (65.7%) patients.

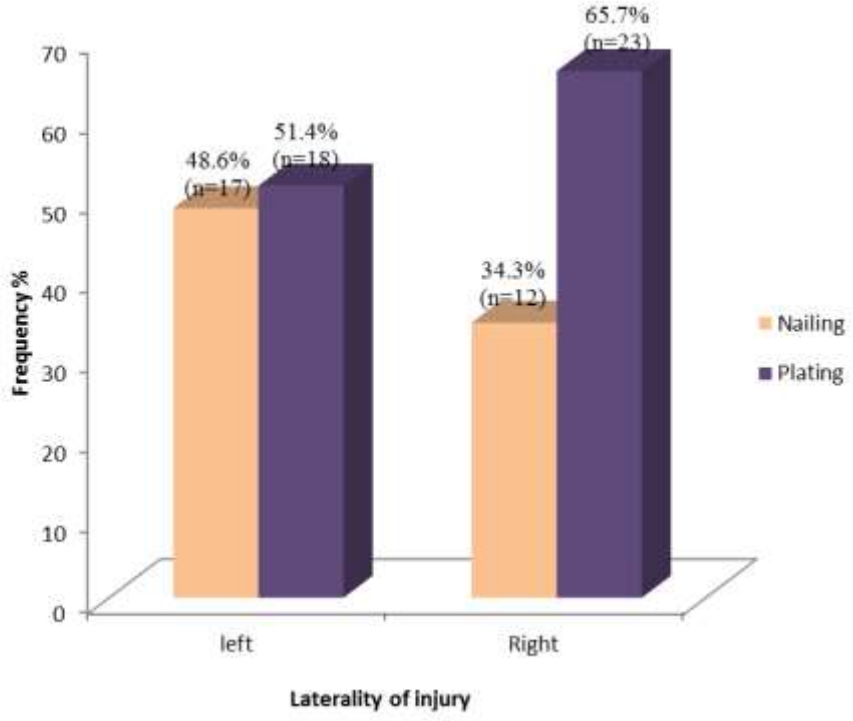

Figure 3: Laterality of fracture across study groups

AO CLASSIFICATION OF THE FRACTURES

A comparison of the f AO Classification of the fractures showed that B2 fractures were the most common fracture type in both groups accounting for 11(31.4%) in the nailing group and 11 (31.4%) in the plating group. The distribution of other fracture types is shown in table 2. The differences in proportions were not statistically significant (p >0.05).

Table 2: Comparison of AO Classification of the fractures between groups

	Groups in the study		
AO Fracture type	**Nailing n (%)**	**Plating n (%)**	**Total n (%)**
A1	1 (2.9)	2 (5.7)	3 (4.3)
A2	8 (22.9)	6 (17.1)	14 (20.0)
A3	9 (25.7)	11 (31.4)	20 (28.6)
B1	4 (11.4)	2 (5.7)	6 (8.6)
B2	11 (31.4)	11 (31.4)	22 (31.4)
B3	1 (2.9)	3 (8.6)	4 (5.7)
C2	1 (2.9)	0 (0.0)	1 (1.4)
Total	**35 (100.0)**	**35 (100.0)**	**70 (100.0)**

Fisher's exact test=3.473; p-value = 0.804

Duration of Hospital Stay between Groups in the Study

There was no significant difference noticed in the mean duration of hospital stay between the nailing and the plating group across the different causes of injury (p>0.05).

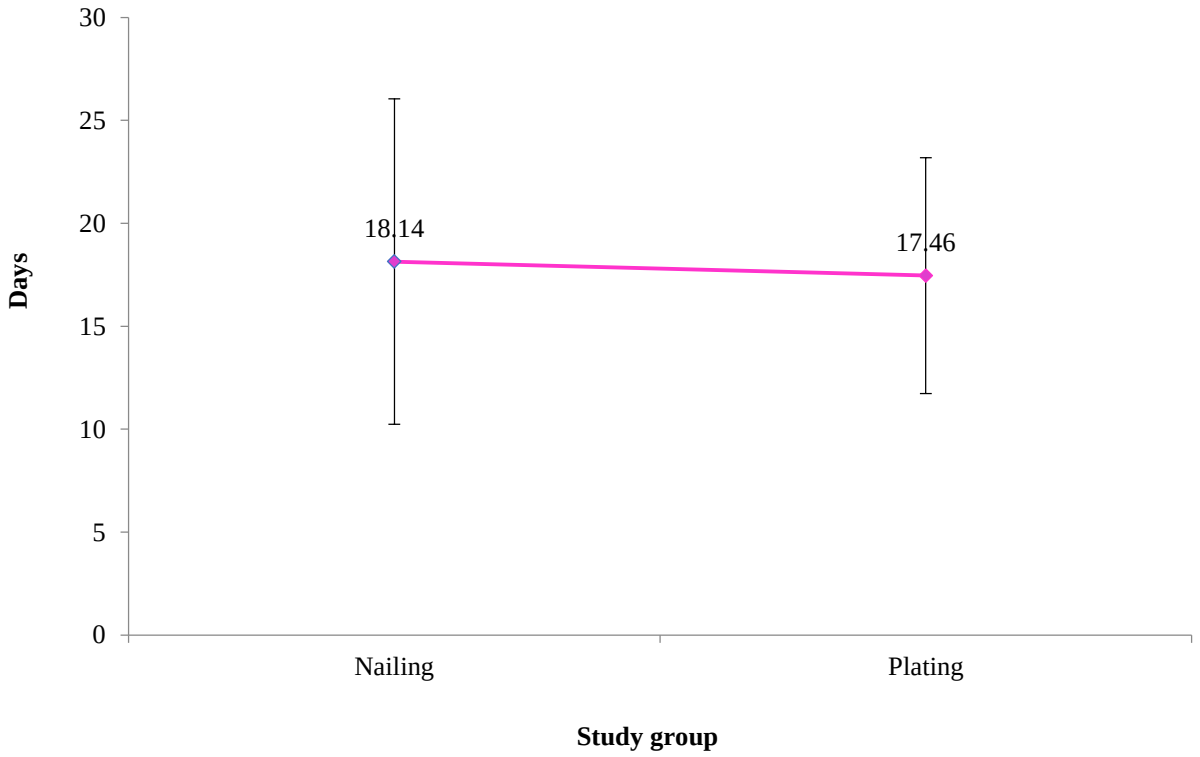

Figure 4: Comparison of the average time between surgery and discharge between groups in the study

Time to Weight Bearing Between Groups in the Study

The mean time to weight bearing was significantly lower among the nailing group in comparison to the plating group ($p<0.05$). There was no case of assault among the nailing group. There was also no case of auto-pedestrian injury among the plating group.

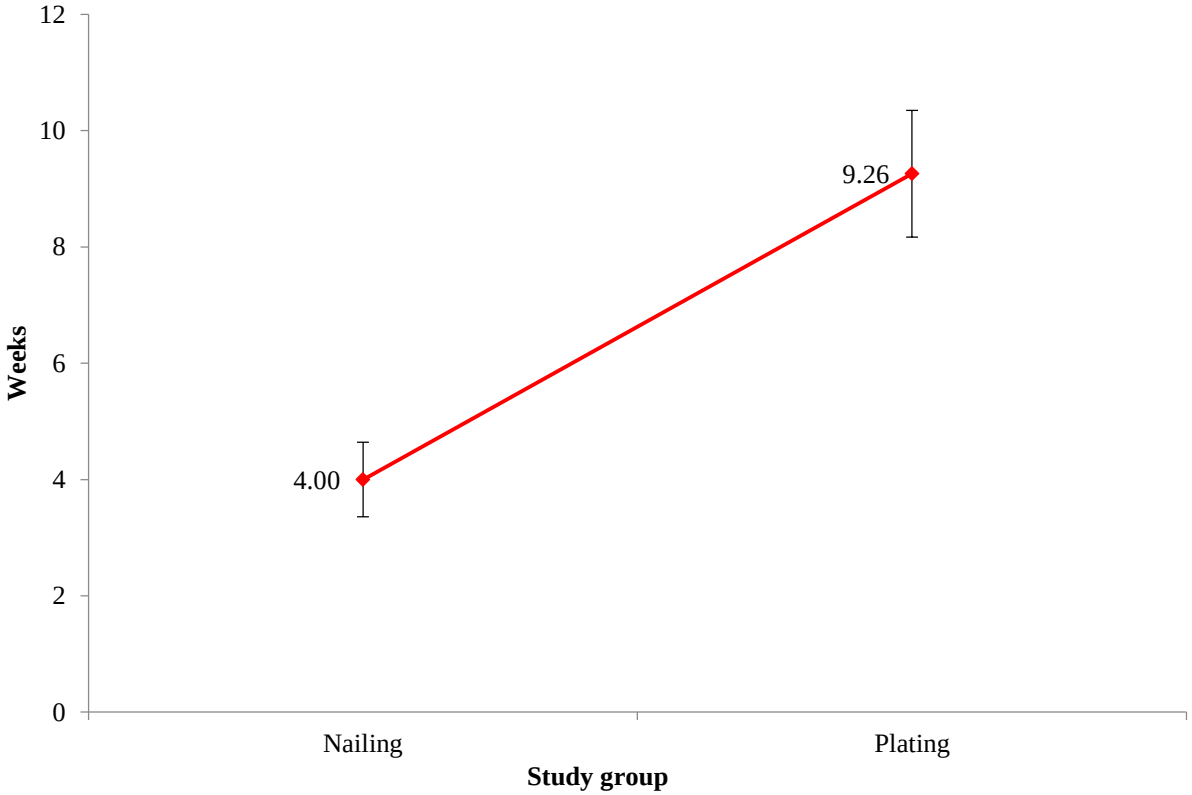

Figure 5: Comparison of the average time to weight bearing between groups in the study

Time to Return to Normal Activity between Groups in the Study

The mean time to return to normal activity was significantly lower among the nailing group in comparison to the plating group ($p<0.05$).

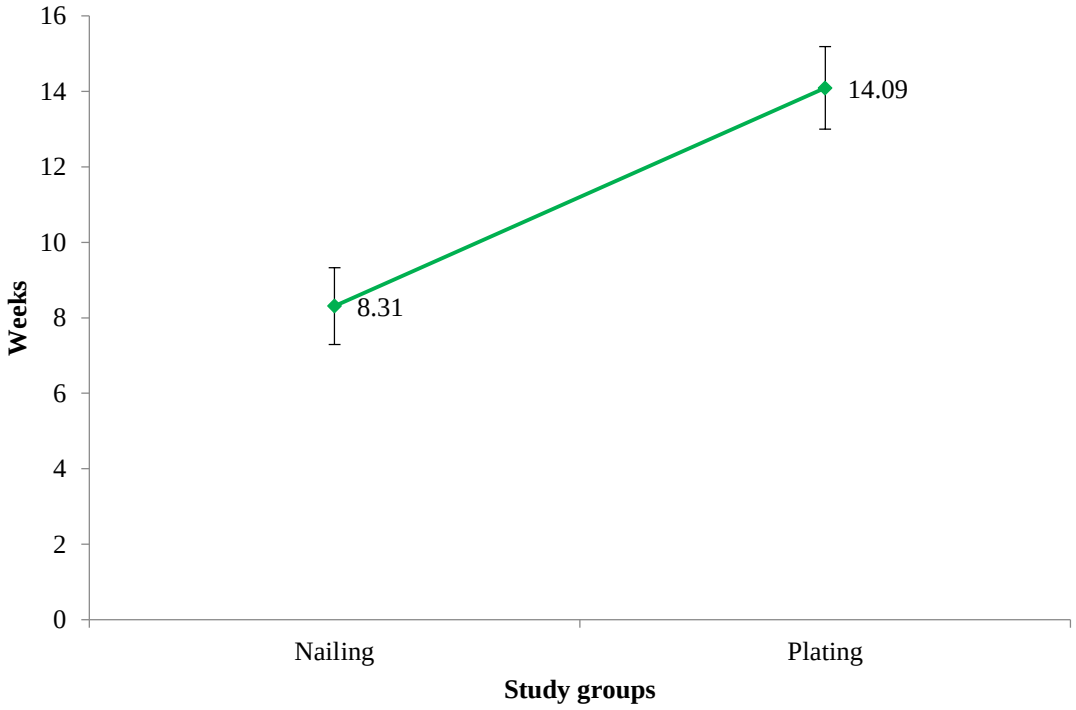

Figure 6: Comparison of the average time to return to normal activity between groups in the study

Time Interval between Surgery and Return to Work

The mean time interval from surgery to return to work was significantly lower among the nailing group in comparison to the plating group in those whose cause of injury was RTC motor vehicle (10.75±3.91 vs. 16.33±3.0), and overall (10.60±3.69 vs. 15.71±3.42) p<0.05. There was no case of assault among the nailing group. There was also no case of auto-pedestrian injury among the plating group and there was no significant difference noticed between the mean time from surgery to work among the nailing group in comparison to the plating group among those who fell from height and those with RTC by motorcycle (p<0.05).

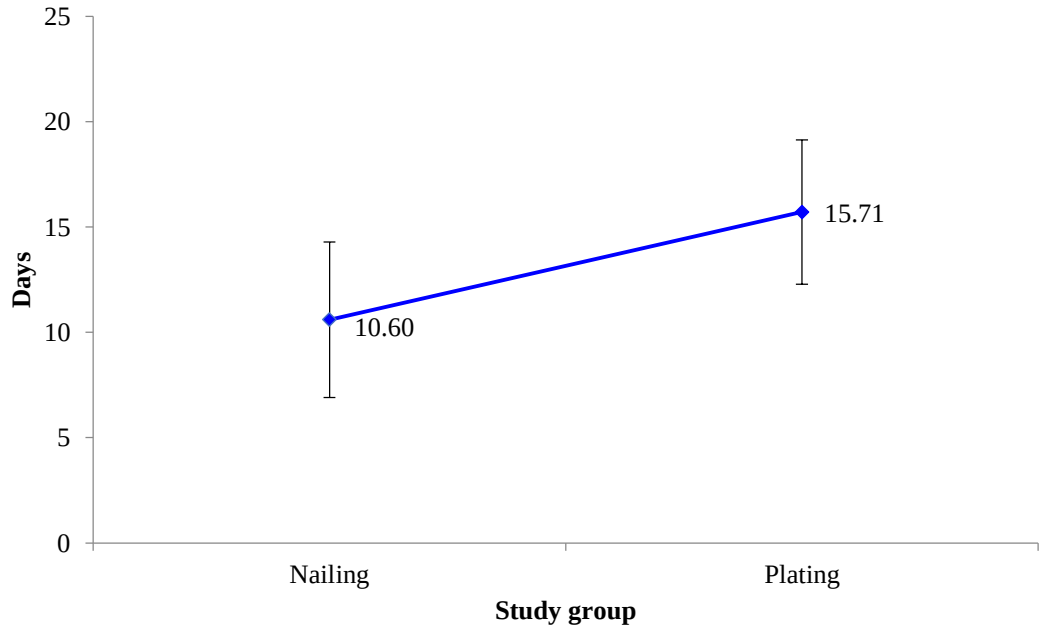

Figure 7: Comparison of the mean time interval from surgery to return to work between groups in the study

Time to Bony Union between Groups in the Study

The mean time to bony union was significantly lower among the nailing group in comparison to the plating group in those whose cause of injury were fall from height, gunshot, RTC motor vehicle, RTC motorcycle and overall ($p<0.05$). There was no case of assault among the nailing group. There was also no case of auto-pedestrian injury among the plating group.

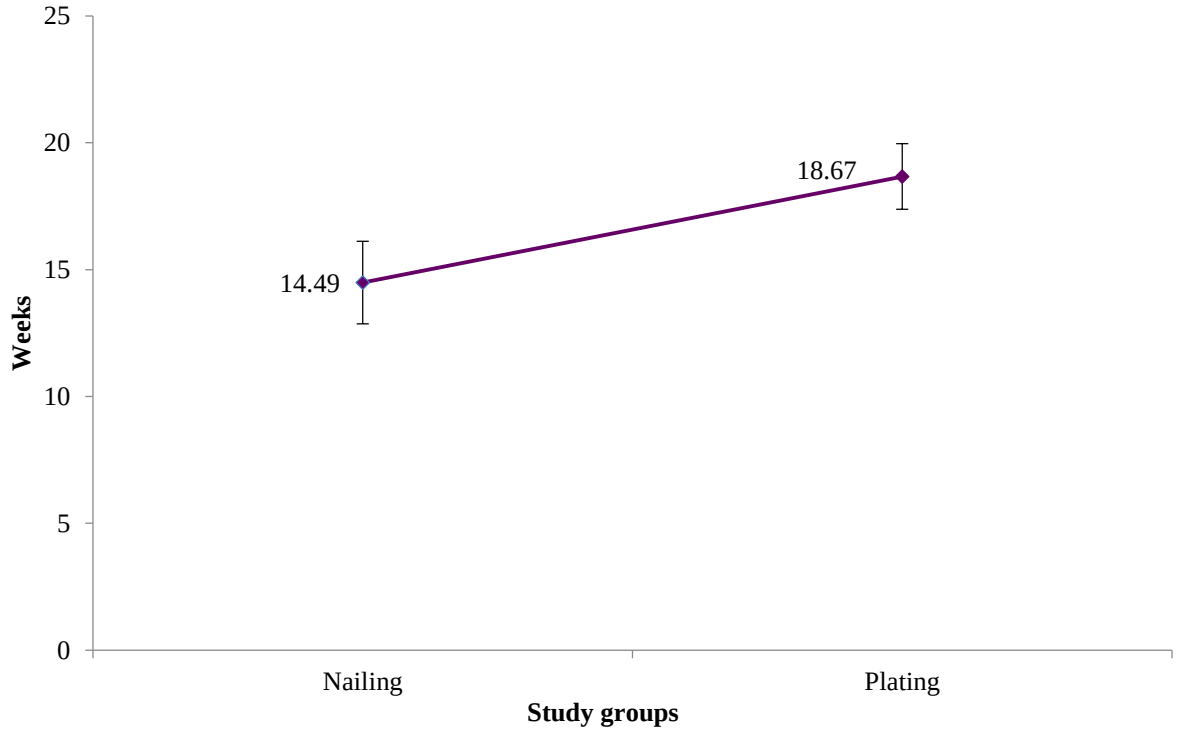

Figure 8: Comparison of the meantime to bony union between groups in the study

Distribution of Complications

Among the nailing group range of knee motion <110 and rotational deformity were the most common complication three (8.5%) seen while haemorrhage and infection were the least common complication noticed (2.9%). Among the plating group haemorrhage, was the commonest complication seen in five (14.3%) while rotational deformity and limb length discrepancy were the commonly noticed one (2.9%).

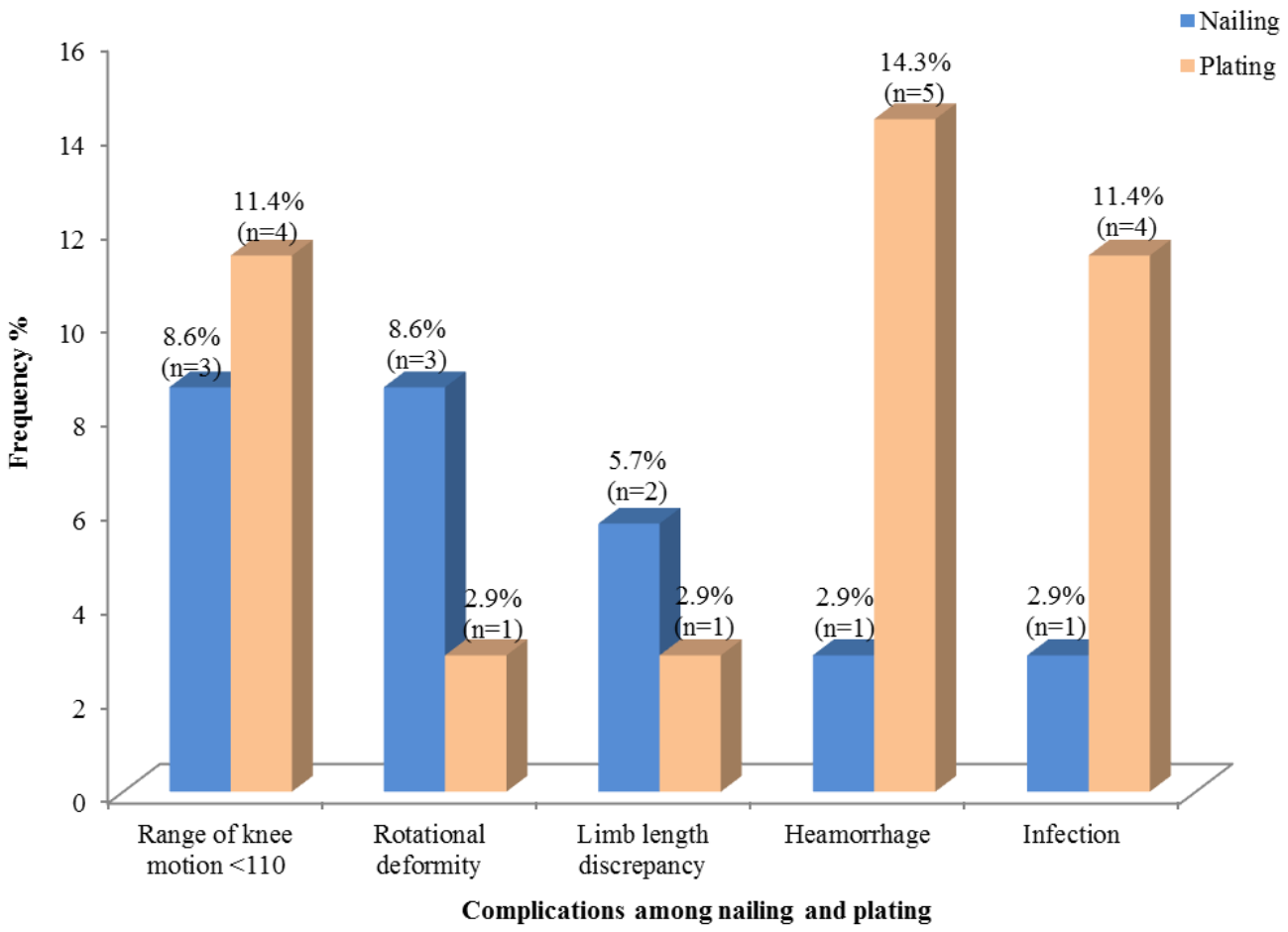

Figure 9: Distribution of complications across study groups

Blood Transfusion

One (2.9%) patient was transfused in the nailing group compared to four (11.4%) patients in the plating group.

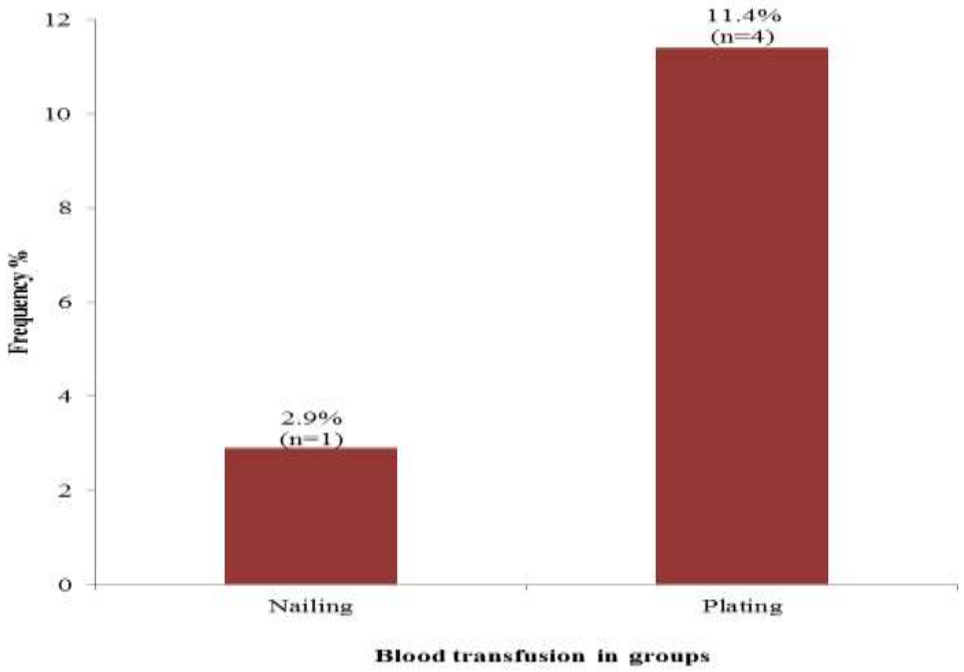

Figure 10: Distribution of blood transfusion across study groups

Direct Cost of Hospital Bill

The estimated average direct financial cost of nailing and plating for a mean total number of hospital stay of 28 days for nailing and 32 days for plating. The direct financial cost for nailing was two hundred and nineteen thousand naira compared to two hundred and ten thousand naira.

Table 3: Average cost of hospital bill between study groups

Charges	Rate (N)	Nailing group (N)	Plating group (N)
Implant	-	50,000	35,000
Surgery fee	-	90,000	90,000
Nursing care	500/ day	14,000	16,000
Bed fee	1000/ day	28,000	32,000
Radiograph	1500/ view	12,000	12,000
Physiotherapy	-	10,000	10,000
Pharmacy	-	15,000	15,000
TOTAL		**219,000**	**210,000**

DISCUSSION

Traumatic fracture of the femoral shaft is common in our environment and is a major cause of morbidity and mortality in the young population. Surgical fixation of femur shaft fracture aims to maintain alignment, restore length, achieve bony union and return the patient to pre-injury function as early as possible. However, this has to be at an affordable cost to both the patient and the hospital.

The age group most affected in this study is the 31- 40 year age group in both the nailing and plating groups which was closely followed by the age group 21-30 years. This is in keeping with various studies where persons below 40 years are mostly affected. Kortor et el[17] in Lagos reported a mean of 43.1 years, and Naeem-Ur-Razaq et al[18] reported a mean of 37.05 years in Abbottabad. Understandably, people younger than 40 years are the active workforce in most societies and are involved in daily economic and recreational activities in the community which puts them at risk of

traumatic events. In this study persons younger than 40 years contributed 77.2% (n=35) for the nailing group and 62.9% (n=35) for the plating group while persons older than 60 years was just one 2.9% (n=35) in the plating group and none in the nailing group. There was a male preponderance in this study with males contributing 72.9% (n=70) of traumatic femoral shaft fractures as against 27.1% (n=70) of females. This pattern was similar to that of Kortor et el.[17] reporting a ratio of 2.2:1. Males are breadwinners of most families and are responsible for their financial demands. However, with increasing advocacy for female education and empowerment this trend may be reversed in the future. The highest proportion of professional groups in this study were civil servants accounting for 31.4% (n=35) of nailing and 25.7% (n=35) of plating while others are professionals and businessmen. These patients have dependents and with the current national minimum wage set at thirty thousand naira,[19] the economic impact of fixation by either method cannot be overemphasized hence a fixation method that returns patients to work early and is also cost-effective will be most preferred.

The commonest mechanism of injury in both groups was motor vehicle crashes which accounted for 45.7% (n=35) for the nailing group and 68.6% (n=35) for the plating groups respectively. This is closely followed by motorcycle crashes at 20.0% (n=35) for the nailing group and 14.3% (n=35) for the plating group. The reduction in motorcycle crashes may result from the ban on motorcycles for commercial purposes in Port Harcourt, Rivers state. Older North American studies show similar reports.[20,21] More recent North American studies reveal osteoporosis from ageing as a common cause.[22,23] Additionally, the energy transfer in motor vehicle crashes is far higher than in motorcycle crashes because of their velocity at the time of impact. In this study, gunshot injury only contributed 5.7% (n=35) each for both the nailing and the plating group. The few cases may be due to reduced presentation to hospitals to avoid police interrogation and arrest[24] since the majority of gunshot wounds result from civil unrest and criminality.[3,4] Also, most fractures resulting from gunshot injuries are often high-grade open fractures and would have been excluded from this study.

The mean duration to weight bearing was shorter in the nailing group, with an average of 4.00 weeks for nailing compared to 9.26 weeks for the statistically significant plating group. This may be because the nail is a load-sharing implant with a widespread bone interface compared to a plate that is a load-bearing implant. Thus, after nailing patients can bear weight earlier without the risk of implant breakage compared to the plating. The mean duration to commence normal activity was significantly shorter in the nailing despite the cause of injury, with an average of 8.31 weeks for nailing and 14.09 weeks for plating which was statistically significant. The interlocking nail is a load-sharing implant and provides axial and rotational stability with no stress riser effect of multiple screws holes in the shaft of the femur, thus it can sustain high stress of ambulation without failure compared to compression plating which is a load-bearing implant with multiple screw holes and stress riser effect.

The duration of bony union was shorter in the nailing group compared to the plating group, with an average of 14.49 weeks for nailing and 18.69 weeks for plating which was statistically significant. This may be because the nail provides relative stability and such fixation has the tendency to heal by secondary bone healing producing florid callus initially that are readily visualized on x-ray compared to a plate that is used to achieve absolute stability resulting in direct bone healing with minimal callus around the fracture site. However, both nailing and plating have been reported to have high bone union rate[12-14]

Analysis of postoperative complications showed that haemorrhage (greater than 1.5L blood loss) and infection (superficial surgical site infection) were the major complications in the plating group while rotational deformity and limb length discrepancy (greater than 2cm) were the major postoperative complications in the nailing group. In total there were more complications seen in the plating group than in the nailing group. Complications were seen in 15 patients in the plating group and 10 patients in the nailing group.

Significant haemorrhage requiring transfusion was seen in 5 patients in the plating group and only 1 patient in the nailing group. While infection was seen in 4 patients in the plating but only 1 patient in the nailing group had a superficial surgical site infection. This can be attributed to the larger soft tissue exposure, wider periosteal stripping and longer duration of surgery in the plating group. Chaudhary et al.[25] reported a higher incidence of blood loss from plating than nailing humeral shaft fracture and Bostman et al.[26] reported a higher incidence of both deep and superficial infection from plating than nailing femoral shaft fractures. The average duration of surgery in the plating group was 2 hours and 15 minutes while it was 1 hour and 30 minutes in the nailing group. However, the surgeon's technique, experience and theatre design are other contributory factors, hence this may not be universal.

Rotational deformity was seen in 3 patients in the nailing group and 1 patient in the plating group. Limb length discrepancy was seen in 2 patients in the nailing group and 1 patient in the plating group. While plating aims to achieve anatomic reduction and rigid fixation, nailing which aims to achieve functional reduction and relative stability. This may account for the significantly higher proportion of rotational deformity in the nailing group.

The cost of the implant showed that the nail implant is more expensive than the plate with fifteen thousand naira and the total estimated hospital bill is also higher in patients who had nailing compared to those who had plating with a difference of nine thousand naira. Although the plating group spent a

longer duration in the hospital with an average of 32 days compared to the nailing group which spent an average of 28 days in the hospital. This difference in the estimated cost of hospital bills is marginal as patients who can afford plating could also afford the yearly cost of care for nails. The long duration of the hospital stay was due to a delay in surgical fixation and physiotherapy mobilization.

CONCLUSION

Operative fixation is an excellent method of fixation of traumatic femoral shaft fractures. Open interlocking nailing and plating of traumatic femoral shaft fractures both have post-operative complications. While haemorrhage and infection are common with the plating of these fractures, rotational deformity and limb length discrepancy are common with nailing. Open interlocking has the advantage of early return to normal occupational activity for traumatic femoral shaft fracture. Both techniques have a high bony union rate for traumatic femoral shaft fracture with the interlocking nailing providing a better early outcome compared to the plating.

RECOMMENDATION

Open intramedullary nailing and plating are ideal options for treatment for traumatic femoral shaft fracture as they have reduced hospital stay, early return to work and high union rate. All adults should be offered these methods of treatment of femur shaft fracture, open intramedullary nailing additionally has a lower rate of infection and haemorrhage than plating and should be considered as a first-line treatment option for traumatic femoral shaft fracture.

LIMITATIONS

The duration of the study was limited by a short follow-up period due to the expected time to submit the dissertation to the postgraduate college for assessment. The study was interrupted by several industrial actions and several upward reviews of the cost of implants and surgery.

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