STUDY OF FAILURE RATE OF GAMMA NAILS FOR FIXATION OF UNSTABLE TROCHANTERIC FRACTURES

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Introduction

Trochanteric fractures significantly affect older patients' physical and mental health as well as their capacity for independent living. Early surgical management is advised to prevent the complications associated with long-term immobility.

Trochanteric fractures are mainly fixed with intramedullary or extra medullary devices even though the intramedullary implant is preferred in unstable trochanteric fractures because it allows load sharing at the fracture site and is more biomechanically stable than the extra-medullary device.

Gamma nails offer the benefit of closed reduction with minimal soft tissue handling which allows early mobilization, , short hospital stay, less operative time, less blood loss, fracture healing and good functional outcome.

As unstable Trochanteric fractures commonly affect elderly individuals with low bone density and related comorbidities, surgical treatment of these fractures is linked with risks suchas fixation failure. These issues include varus collapse, screw cutout, non-union, femoral fracture, peri-implant fracture and infection.

Aim of the work

The aim of this work was to study the failure rate of unstable trochanteric fractures (according to Evans' classification) fixed with gamma nail at El-Hadra University Hospital.

Patients and Methods

This study included 70 patients with ages above 60 years old who were admitted to EL-Hadara University Hospital having traumatic unstable trochanteric fractures of the femur according to Evans classification between December 2021 and june 2022.

Patients unable to weight bear prior to fracture, open-fractures, poly trauma patient and those suffering pathological fracture except for osteoporosis were excluded. Patients above 60 and fit for surgery with isolated fracture were included in the study.

Quality of reduction in each case was assessed immediate post-operative through baumgaertner reduction quality criteria (BRQC).All patients were followed 6 months post-operative radiologically (p-xray both hips and lateral view of affected hip) and clinically with Harris Hip Score.

Fixation failure was detected as screw cut-out, broken implant, lag screw back out, peri-implant fracture and non-union. Other complications related to fixation like DVT, pulmonary embolism, superficial and deep infection was recorded as well as mortality rate.

Results

Table 1: Univariate and multivariate logistic regression analysis to detect the most affecting different risk factors for failure rate patients

	Univariate		#Multivariate	
	P	OR (LL – UL 95%C.I)	p	OR (LL – UL 95%C.I)
Age (70– <80 years)	0.020*	4.824 (1.280–18.178)	0.339	3.563 (0.263–48.235)
Female	0.855	1.143 (0.274 – 4.766)		
Medical history	0.689	0.762 (0.201–2.884)		
Type of fracture (type 5)	0.008*	5.982 (1.595–22.440)	0.029*	33.849 (1.442–794.369)
Type of reduction (Closed)	0.525	2.020 (0.231–17.642)		
BRQC quality of reduction				
Good®		1.000		
Acceptable	0.058	8.500 (0.926–78.023)		
Poor	0.001*	51.0 (4.830–538.475)	0.156	24.002 (0.296–1947.047)
TAD	0.047*	0.761 (0.582–0.996)	0.087	0.671 (0.425–1.060)
Long nail	0.478	1.587 (0.443–5.682)		
Lag position				
Central	0.008*	0.114 (0.023–0.568)	0.743	0.545 (0.015–20.458)
Superior	<0.001*	26.0 (5.485–123.247)	0.501	3.394 (0.097–118.854)
Inferior	0.216	0.261 (0.031–2.193)		
Lat wall thickness				
≥20 m	0.950	1.047 (0.250–4.385)		
10 – <20 m	0.861	1.227 (0.125–12.061)		
Destroyed	0.852	0.855 (0.163–4.468)		
Operation time (hours)	0.064	5.060 (0.912–28.068)		
NSA				
122 – 132 (Neutral) ®		1.000		
>132 (Valgus)	0.255	2.429 (0.528–11.181)		
<122 (Varus)	<0.001*	28.0 (4.590–170.796)	0.044*	28.858 (1.098–758.593)

Table 2: Distribution of the studied cases according to radiological failure (n=70)

Radiological failure	No.	%
Failure		
No	58	82.9
Yes	12	17.1
Causes of failure (n=12)		
Screw cut out	6	50
Brocken implant	4	33.3
Backed out	2	16.6

Conclusion

our study concluded that There are multiple risk factors affecting failure rate of gamma nails in variable degrees such as old age group (70-80 years) with osteoporosis, TAD more than 25 mm, increasing grade of fracture (comminution), superior position of lag screw, poor quality of reduction and varus malunion. by doing multivariate regression analysis of these risk factors, increasing grade of fracture comminution according to Evans and varus malunion respectively considered the most reliable predictors for failure followed by quality of reduction. After 6 months of follow up failure rate represents 17% and mortality rate is 7.1%.