

THE GAMMA NAIL FOR PERITROCHANTRIC FRACTURES: A STUDY OF 32 CASESV. Nava Krishna Prasad¹, Athmaram M²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: The Gamma Nail was designed to treat unstable intertrochantric and subtrochantric fractures of the femur. Unstable peritrochantric fractures of the femur are very common. Thirty two such cases are treated using the Gamma nail under image intensifier. In all cases except one, the long gamma nail is used. Importance is given to accurate reduction and static locking of the nail. In this prospective study we observed satisfactory union with little loss of position, even in comminuted fractures. Operative complications were nil. Anterior thigh pain was seen only in a case where short nail was used. Nonunion after compression hip screw fixation was also successfully treated with a long gamma nail. We strongly recommend this procedure in all unstable peritrochantric fractures.

KEYWORDS: Fixation, Peritrochantric fractures, Gamma Nail.

INTRODUCTION: Unstable intertrochantric and subtrochantric fractures are difficult to fix and present problems in management.^{1,2} The most common current method of fixation uses a large screw in the femoral head secured to a plate on the lateral aspect of the upper femur. This has the disadvantage that the plate is lateral to the line of load bearing. Any defect in the medial cortex of the femur, due to imperfect reduction, comminution or a metastasis means that a varus stress will be applied to the fixation with every weight-bearing step. This may cause cutting out of the screw from the head of the femur³ or failure at the nail-plate junction or of the screws securing the plate to the bone.^{4,5} Implant failure has been related to type of fracture, particularly its stability; and to inadequate reduction, osteoporosis, and inexact placement of the screw within the femoral head.^{3,6,7}

The use of Zickel nail meets some of these objections, but is difficult to insert and has its own complications, the fracture of the base of the greater trochanter, being the commonest. The Gamma Nail was accordingly developed in an attempt to overcome a few of these problems.

The Gamma Nail has four main components:

1. An intra-medullary rod passed down the upper shaft of the femur,
2. The screw passed through a hole in the proximal part of the rod and inserted into the head,
3. A set screw which prevents the rotation of the main screw and
4. The facility to lock the nail distally.

The gamma nail was introduced after the success of closed intramedullary nailing of femoral shaft fractures. The theoretical advantage of using a femoral nail instead of a plate is that the nail is nearer to the axis of weight bearing (Calcar) through the femoral head and the leverage is, therefore, reduced.⁸ It allows sliding between the two parts to produce impaction as in the sliding screw; it can be inserted by a closed technique. A smaller exposure associated with less morbidity, shorter operating time and lower blood loss.

ORIGINAL ARTICLE

We are presenting our results in our series of 32 peri-trochanteric fractures fixed with a gamma nail.

PATIENTS AND METHODS: This is a prospective study of 32 cases with peri-trochanteric fractures of femur fixed with gamma nail at the Government Medical College Hospital – Anantapur from April 2002.

INCLUSION CRITERIA:

- Unstable inter trochanteric fractures. (Type).
- Sub trochanteric fractures.
- Patients of all ages.
- Patients with severe osteoporosis. (Singhs Index – Grade).
- Patients with ipsilateral trochanteric and shaft fractures.
- Patients with associated injuries elsewhere in the skeletal system.
- Fractures less than two weeks old.

EXCLUSION CRITERIA:

- Patients who had a trail of conservative treatment inside or outside our hospital.
- Stable trochanteric fractures. (Type).
- Patients who are psychiatric receiving ECT.

A detailed history regarding the mode of injury, time since injury, diabetes, hypertension and other medical problems were taken. Trochanteric fractures were classified using Kyles^{9,10} modification of the Boyd's classification. Sub-trochanteric fractures were classified using the Seinsheimer's¹¹ classification. After the necessary investigations, control of the medical problems, keeping at least one unit of cross matched blood the surgery is undertaken.

All the cases are done under spinal anesthesia. After placing on a fracture table, the fracture is reduced under image intensification. The limb is placed in 10° of internal rotation. A small incision is made above the greater trochanter and the guide wire is passed in thru the fracture site in a trochanteric fracture and from the tip of greater trochanter in a sub trochanteric fracture.

The medullary cavity is reamed up to one millimeter more than the desired diameter of the nail to be introduced. The pre-measured nail is inserted and the guide wire is removed.

Using the image intensifier the guide wire is passed into the neck thru the jig of the gamma nail and this guide wire is kept in the center of the neck of the femur. Compression of the fracture is tried using the screw device on the compression screw inserter. After this the compression screw is locked with a set screw from the inside of the nail. After this the distal locking is done. If it is a short nail the jig is used and if it is a long gamma nail free hand technique is used.

POST-OPERATIVE MANAGEMENT: Adequate analgesics and appropriate antibiotics are administered. The patient is made to sit up with support on the second day. Gentle knee bending is started on the third day and non-weight bearing walking with walker is started on the fifth day. The patients are discharged after suture removal is on the ninth day.

ORIGINAL ARTICLE

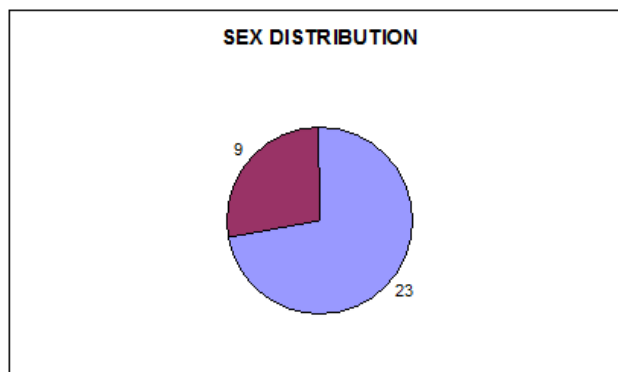
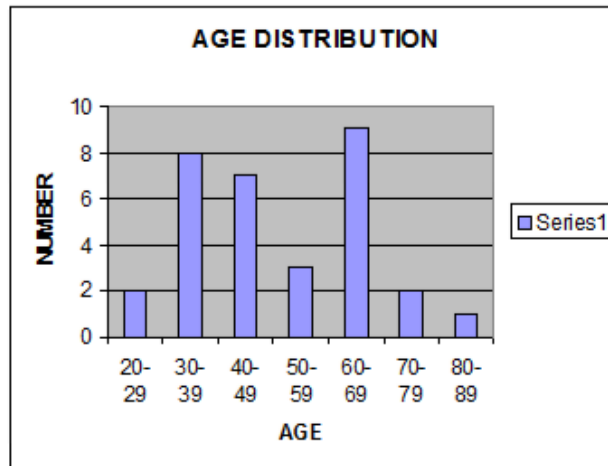
They are advised to come every six weeks and check x-rays are taken. Weight bearing was allowed after an average of 16 weeks.

STUDY DETAILS:

Boyd's III	11
Boyd's IV	2
Seinshiemer's Type I	2
Type II A	1
Type II B	2
Type II C	1
Type III A	4
Type III B	4
Type IV	4
Type V	1

Table 1: CLASSIFICATION OF FRACTURES

OBSERVATION:



CLASSIFICATION:

- Boyd's III – 11
- Boyd's IV – 2
- Seinsheimer's –TYPE I – 2
 - TYPE II A – 1
 - TYPE II B – 2
 - TYPE II C – 1
 - TYPE III A – 4
 - TYPE III B – 4
 - TYPE IV – 4
 - TYPE V – 1

MODE OF INJURY:

- R T A- 18
- FALL AT HOME - 14

RESULTS:

Boyd's Type III - TOTAL CASES – ELEVEN:

- ALL UNITED WELL IN AN AVERAGE OF FOUR MONTHS.
- SHORTENING OF 1.5 cm IN TWO CASES.

Boyd's Type IV - TOTAL CASES – TWO:

- BOTH UNITED WELL IN AN AVERAGE OF FOUR MONTHS.
- NO SHORTENING.

Seinsheimers Type I - TOTAL CASES – TWO:

- BOTH UNITED IN THREE MONTHS.

Seinsheimers Type II A - ONE CASE DONE:

- NO CALLUS EVEN AFTER THREE MONTHS.
- AFTER BONE GRAFTING IT UNITED.

Seinsheimers Type II B:

- TOTAL CASES – TWO.
- ALL UNITED WELL IN FOUR MONTHS.

Seinsheimers Type II C:

- ONE CASE DONE.
- UNITED WELL WITHIN FOUR MONTHS.

Seinsheimers Type III A:

- TOTAL CASES – FOUR.
- THREE UNITED WITHIN FOUR MONTHS.
- ONE UNITED AFTER BONE GRAFTING AFTER WAITING FOR THREE MONTHS.

ORIGINAL ARTICLE

Seinsheimers Type III:

- TOTAL CASES – FOUR.
- ONE CASE UNITED AFTER FIVE MONTHS.
- REST THREE HAD TO UNDERGO BONE GRAFTING AS THERE WAS NO CALLUS AFTER THREE MONTHS.

Seinsheimers Type IV:

- TOTAL CASES – FOUR.
- ONLY ONE UNITED IN FIVE MONTHS.
- THE REST UNDERWENT BONE GRAFTING AFTER THREE MONTHS AS THERE WAS NO CALLUS.

Seinsheimers Type V:

- ONE CASE PERFORMED.
- THE REDUCTION WAS NOT APPROPRIATE.
- WE HAD TO OPEN AND PUT AN ENCIRCLAGE WIRE.
- UNITED AFTER FOUR MONTHS.

OBSERVATION: This study is concerned with the surgical management of peri-trochanteric fractures using the Gamma Nail. This study has a particular interest in studying the time taken for union and complications that occur in using the Gamma Nail. This is a prospective study from December 2002 with an average follow up of 6.5 months.

Thirty two patients were studied in this prospective study. Twenty three were male while the rest nine were female. The average age was 49.56 years with the youngest being 26 and the oldest was 80.

The fractures were caused either by a Road Traffic Accident (18) or a fall at home. (14) All the patients were put on skin traction with the affected limb on a Bholer Braun splint with the foot end elevated.

CONCLUSIONS:

- THE AMOUNT OF COMMUNITION IS NOT A PROBLEM FOR USING THE GAMMA NAIL.
- FRACTRE UNION IS INDEPENDENT ON THE AMOUNT OF COMMUNITION.
- THE FINAL RESULT IS DICTATED BY THE DISTANCE BETWEEN THE FRAGMENTS.
- GAMMA NAIL IS EASY TO FIX COMPLEX FRACTURES.
- WE SHOULD NOT HESITATE TO OPEN THE FRACTURE SITE IF THE GAP BETWEEN THE FRAGMENTS IS LARGE.
- THIS GIVES GOOD RESULT.

BUT THIS DEFEATS THE PURPOSE OF CLOSED NAILING: KEEP THE OPTIONS OPEN, WE CAN HAVE A MIXTURE OF BOTH CLOSED NAILING AND OPEN REDUCTION DEPENDING UPON THE AMOUNT OF COMMUNITION AND DISPLACEMENT OF THE FRAGMENTS.

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AUTHORS:

1. V. Nava Krishna Prasad
2. Athmaram M.

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Orthopaedics, Government Medical College, Anantapur.
2. Associate Professor, Department of Orthopaedics, Government Medical College, Anantapur.

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Dr. Athmaram M,
13-2-540, Ramachandra Nagar,
Anantapur-515001.
E-mail: athmaramadishes@yahoo.com

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