

# Retrospective Evaluation of Infections Occurring in Patients Undergoing Treatment with Locking Reconstruction Plates

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## ABSTRACT

**Background:** The utilization of locking screw plates is viewed as exceptionally supportive specifically in osteoporotic distal femoral fractures, considering their deficiencies in opposing to various collapses and having numerous purposes of obsession. the present study was aimed to assess the infections occurring in patients undergoing treatment with locking reconstruction plates.

**Materials and Methods:** A sum total of 50 patients were selected for the study. 21 patients had surgery on left femoral bone and 29 patients on right femoral bone. 29 patients were males and 21 patients were females. The demographic variables of the patients were recorded. The recorded data included age, sex, date of admission, type of admission (elective versus emergency) and classification of fractures.

**Results:** The mean age of the patients was  $41.23 \pm 18.32$  years. Table 1 shows demographic data of three patients. Emergency surgery was provided to 3 patients whereas elective surgery was provided to 5 patients.

**Conclusion:** Treating distal femoral fractures with reconstructive locking reconstruction plate allows sound bone healing and is not associated with major complication.

**Key Words:** Reconstructive; Femoral; Demographic.

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## INTRODUCTION

Distal femoral fractures correspond to 6% of femoral fractures, have regularly a bimodal event: in youngsters generally identified with a high-vitality injury whereas in older individuals normally because of a low-vitality injury.<sup>1,2</sup> Ng et al. surveyed that distal femoral fractures representing 29% of non-proximal femoral fractures, and their frequency had been growing up.<sup>3</sup> The utilization of locking screw plates is viewed as exceptionally supportive specifically in osteoporotic distal femoral fractures, considering their deficiencies in opposing to various collapses and having numerous purposes of obsession.<sup>4</sup> In any case, it is outstanding that the complexity in fractures healing and the rate of complications are as yet imperative clinical issues. A portion of the more important complications regarding locking reconstructing plates are infections, joint disorder, and nerve injury.<sup>5</sup> Henceforth, the present study was aimed to assess the infections occurring in patients undergoing treatment with locking reconstruction plates.

## MATERIALS AND METHODS

The present study was conducted in the department of orthopedics of medical institute. The protocol of the study was approved from the ethical committee of the institute. For the study,

previous 5 years hospital records of patients who have undergone locked plating surgical treatment for distal femoral fractures were viewed.

## Inclusion Criteria

- Patients had supracondylar femoral fracture
- Patients were treated with locking reconstruction plates
- Age of the patient equal to or more than 18 years
- Atleast 4 weeks of follow up

## Exclusion Criteria

- Intramedullary fixation
- Metastatic disease
- Damaged motor or nerve function of lower extremity preceding surgical procedure

A sum total of 50 patients were selected for the study. 21 patients had surgery on left femoral bone and 29 patients on right femoral bone. 29 patients were males and 21 patients were females. The demographic variables of the patients were recorded. The recorded data included age, sex, date of admission, type of admission (elective versus emergency) and classification of fractures. Infection of the surgical site was classified as deep or superficial. Infections that required surgical treatment for recovery

were called deep infections and infections that required only local antibiotic treatment and wound care were defined superficial infections. The cases of infection whether deep or superficial were successfully managed.

The statistical analysis of the data was done using SPSS software for windows. Student's t-test and Chi-square test were used to check the significance of the data. A p-value of less than 0.05 was predefined to be statistically significant.

**RESULTS**

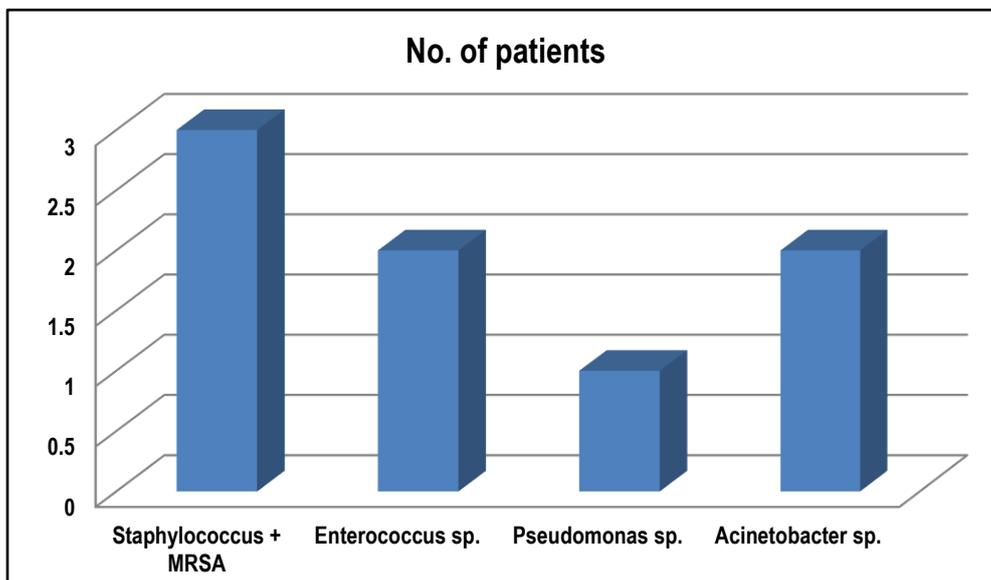
A total of 50 patients were selected to participate in the study. Out of 50 patients, post-operative infection at surgical site was experienced by 8 patients. The mean age of the patients was 41.23±18.32 years. Table 1 shows demographic data of three patients. Emergency surgery was provided to 3 patients whereas elective surgery was provided to 5 patients. Table 2 shows frequency of different infectious organisms present in patients.

**Table 1: Demographic data of the participants**

|  |                    |
|--|--------------------|
| <b>Total no. of patients</b>             | <b>50</b>          |
| <b>Number of patients with infection</b> | <b>8</b>           |
| <b>Average age (years)</b>               | <b>41.23±18.32</b> |
| <b>Type of surgery</b>                   |                    |
| • <b>Emergency</b>                       | <b>3</b>           |
| • <b>Elective</b>                        | <b>5</b>           |

**Table 2: Frequency of different infectious organisms present in patients with infection**

| <b>Name of infectious organism</b> | <b>No. of patients</b> |
|------------------------------------|------------------------|
| <b>Staphylococcus + MRSA</b>       | <b>3</b>               |
| <b>Enterococcus sp.</b>            | <b>2</b>               |
| <b>Pseudomonas sp.</b>             | <b>1</b>               |
| <b>Acinobacter sp.</b>             | <b>2</b>               |



**Fig 1: showing frequency of different infectious organisms present in patients with infection**

**DISCUSSION**

The present study was conducted to assess the Toro G et al conducted a study and presented their experience in treatment of distal femoral fracture in a sample of older people in order to evaluate the technical pitfalls and strategies used to face up the fractures unsuccessfully treated with locking plates. They included people aged more than 65 years, with a diagnosis of distal femoral fracture, treated with locking plates. They considered 'unsuccessfully treated' the cases with healing problems or hardware failures. Of the 12 patients (9 females and 3 males; mean aged 68.75 ± 3.31 years) included, they observed 3 'unsuccessfully cases', 2 due to nonunions and 1 due to an early hardware failure, all treated using a condylar blade plate with a bone graft. One patient obtained a complete fracture healing after

1 year and in the other cases there was a nonunion. They observed as most common technical pitfalls: inadequate plate lengthening, fracture bridging, and number of locking screws. The use of locking plates is an emerging technique to treat these fractures but it seems more challenging than expected. The authors concluded that there is a lack of evidences about the surgical management of distal femoral fractures that is still an important challenge for the orthopaedic surgeon that has to be able to use all the fixation devices available. Al-Mulhim FA et al assessed the prevalence of surgical site infection in orthopedic practice and to identify risk factors associated with surgical site infections. All patients admitted to the orthopedic male and female wards between January 2006 and December 2011 were included in the study group. The data, which were collected from the

medical charts and from the QuadraMed patient filing system, included age, sex, date of admission, type of admission (elective versus emergency), and classification of fractures. Analyses were made to find out the association between infection and risk factors, the  $\chi^2$  test was used. A total of 79 of 3096 patients (2.55%) were included: 60 males and 19 females with the average age of  $38.13 \pm 19.1$  years. Fifty-three patients were admitted directly to the orthopedic wards, 14 were transferred from the surgical intensive care unit, and 12 from other surgical wards. The most common infective organism was Staphylococcus species including Methicillin Resistant Staphylococcus aureus (MRSA), 23 patients (29.11%); Acinetobacter species, 17 patients (21.5%); Pseudomonas species, 15 patients (18.9%); and Enterococcus species, 14 patients (17.7%). Fifty-two (65.8%) had emergency procedures, and in 57 patients trauma surgery was performed. Three (3.78%) patients died as a result of uncontrolled septicemia. SSI was found to be common in their practice. Emergency surgical procedures carried the greatest risk with Staphylococcus species and Acinetobacter species being the most common infecting organisms.<sup>6,7</sup>

Hoffmann MF et al analyzed the complications and clinical outcomes of LP treatment for distal femoral fractures. From two trauma centers, 243 consecutive surgically treated distal femoral fractures (AO/OTA 33) were retrospectively identified. Of these, 111 fractures in 106 patients (53.8% female) underwent locked plate fixation. They had an average age of 54 years (range 18 to 95 years): 34.2% were obese, 18.9% were smokers, and 18.9% were diabetic. Open fractures were present in 40.5% with 79.5% Gustilo type III. Fixation constructs for plate length, working length, and screw concentration were delineated. Nonunion and/or infection, and implant failure were used as outcome complication variables. Outcome was based on surgical method and addressed. The authors concluded that despite modern fixation techniques, distal femoral fractures often result in persistent disability and worse clinical outcomes. Soft tissue management seems to be important. Submuscular plate insertion reduced the nonunion rate. Preexisting total knee arthroplasty increased the risk of hardware failure. Kanoo T et al evaluated open reduction and stable internal fixation (OR-IF) in the surgical management of comminuted mandibular fractures with a new low-profile, thin, mandibular locking reconstruction plate. They prospectively assessed OR-IF of comminuted mandibular fractures with a low-profile locking mandibular reconstruction plate in 12 patients (nine men, three women; patients had other mandibular fractures. Seven patients (58.3%) needed emergency surgery, mostly for airway management. Anatomical reduction of the comminuted segments re-established the mandibular skeleton in stable occlusion with rigid IF via extraoral (33.3%), intraoral (50%), or combined (16.7%) approaches. Immediate functional recovery was achieved. Sound bone healing was confirmed in all patients, with no complications such as malocclusion, surgical site infection, or malunion with a mean follow-up of 16.3 (range 12-24) months. The authors concluded that OR-IF using a low-profile reconstruction plate system is a reliable treatment for comminuted mandibular fractures, enabling immediate functional recovery with good clinical results.<sup>8,9</sup>

## CONCLUSION

From the result of current study, we conclude that treating distal femoral fractures with reconstructive locking reconstruction plate allows sound bone healing and is not associated with major complications.

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