

**EPIDEMIOLOGY OF TIBIA FRACTURES: A 6-MONTH STUDY IN A MAJOR
ORTHOPEDIC HOSPITAL authors Dr. Vatsal Khetan¹, Dr. Harsha
Makwana², Dr. Naitik Panchal³, Dr. Dhaval Modi⁴,**

Dr. Vatsal Khetan¹, Dr. Harsha Makwana², Dr. Naitik Panchal³, Dr. Dhaval Modi⁴,

13rd year resident, Department of Orthopedics, Vadilal Sarabhai Hospital, Ahmedabad

2Associate Professor, Department of Emergency Medicine, Vadilal Sarabhai Hospital

3 2nd year resident, Department of Orthopedics, Vadilal Sarabhai Hospital

4 Professor and Head of Department, Department of Orthopedics, Vadilal Sarabhai Hospital

Abstract:

Aims and Objective:

1. Collect data of tibia fractures at VS General Hospital.
2. Demographic distribution of tibia fracture.
3. Correlate and elaborate various aspects like cause and management.

Background:

Epidemiologic differences in the site and type of fractures within different populations arise due to inherent differences in the populations, their culture practices and lifestyles.

Through this study, we aim to provide data that may help to update the demographic information of patients that are diagnosed with tibial fractures in terms of the frequency of such injuries, mechanism of injury, fracture patterns and sites and the surgical procedure involved in their care.

Materials And Methods:

This study is designed as a retrospective observational study of 100 patients who were diagnosed with tibial fractures between February and July, 2017.

Results:

Most of our patients were young male adults, with ages between 21 and 40 years.

RTA was the most common cause of fracture.

Evening was the most common time of the day followed by afternoon, during which patients were brought in.

Isolated fractures were more common than polytrauma.

Maximum patients had fracture in midshaft region of closed variety and were managed operatively.

Inference And Conclusion:

Tibia fracture is most common in young male patients who are more involved in motor vehicle activities. There seem to be a major dominance of RTA at evening which appears to have increased traffic activity.

BACKGROUND

Epidemiologic differences in the site and type of fractures within different populations arise due to inherent differences in the populations, their culture practices and lifestyles. We have chosen to focus on a relatively less studied fracture, the tibial fracture. With the rapid pace at which countries are developing, road traffic accidents (RTAs) are beginning to account for a major share in significant morbidity and mortality. This is compounded by the fact that in developing countries like India, RTAs are usually poorly documented and fatalities remain under-reported. This study was designed to provide an update on various aspects of tibial fractures that were brought to the Vadilal Sarabhai General Hospital, Ahmedabad, between February and July, 2017. Through this study, we aim to provide data that may help to update the demographic information of patients that are diagnosed with tibial fractures in terms of the frequency of such injuries, mechanism of injury, fracture patterns and sites and the surgical procedure involved in their care.

MATERIALS AND METHODS

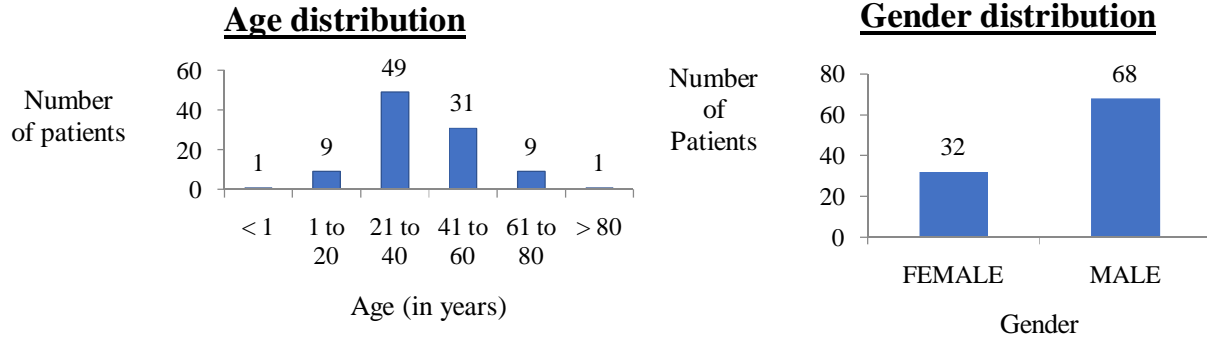
This study is designed as a retrospective observational study of 100 patients who were diagnosed with tibial fractures between February and July, 2017. Patient charts were reviewed and data was collected for gender, age and details of the fracture like the cause, site, type and pattern, operative procedure, follow-up care, complications and other relevant clinical data.

VARIOUS TYPE OF TIBIA FRACTURES:-

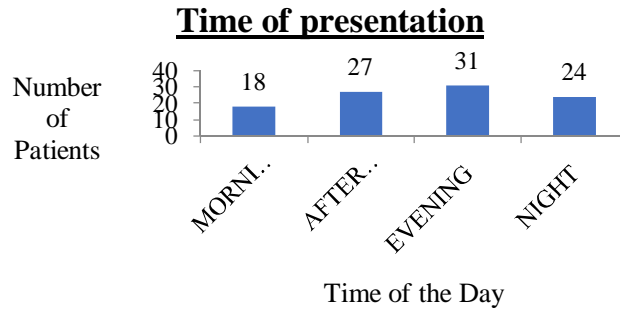


RESULTS AND DISCUSSION

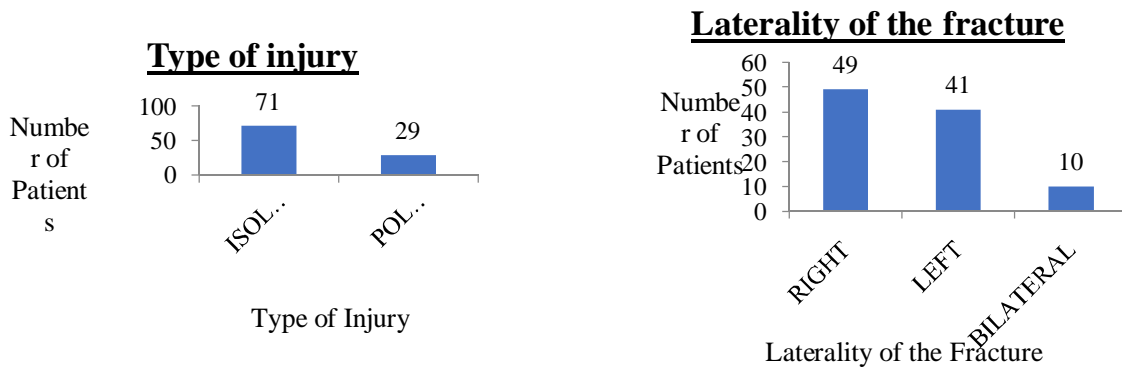
We collected data of 100 patients (32 female, 68 male). The mean age of our patients was 37.64 ± 16.96 years. The median age was 35 years. Most of our patients were young adults, with ages between 21 and 40 years. One of our patients was 8 months old, while one was 85 years of age. This was also seen in the study carried out by Elsoe *et al*¹ in 2015



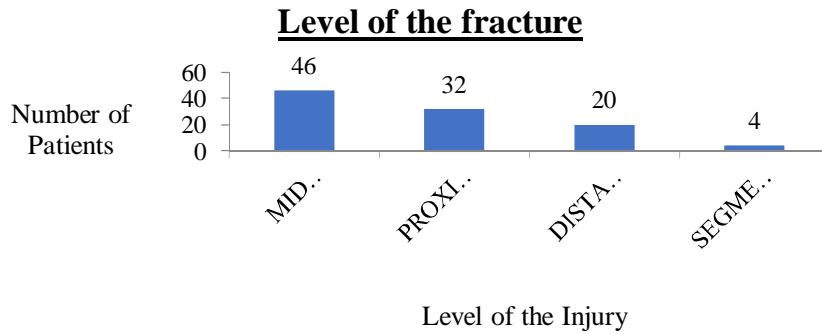
Evening was the most common time of the day followed by afternoon, during which patients were brought in. 31 patients came in the evening while 27 came in the afternoon



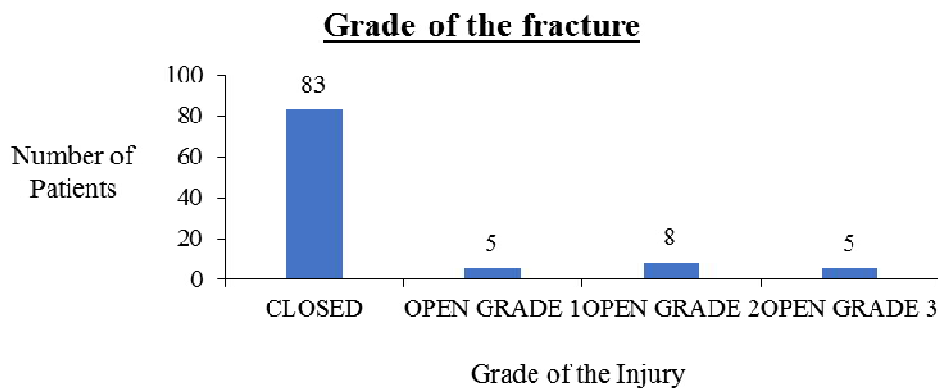
Isolated fractures were more common than polytrauma (71 compared to 29), with right tibial fractures (49) being almost as favored as left (41). Bilateral fractures were seen in 10 patients.



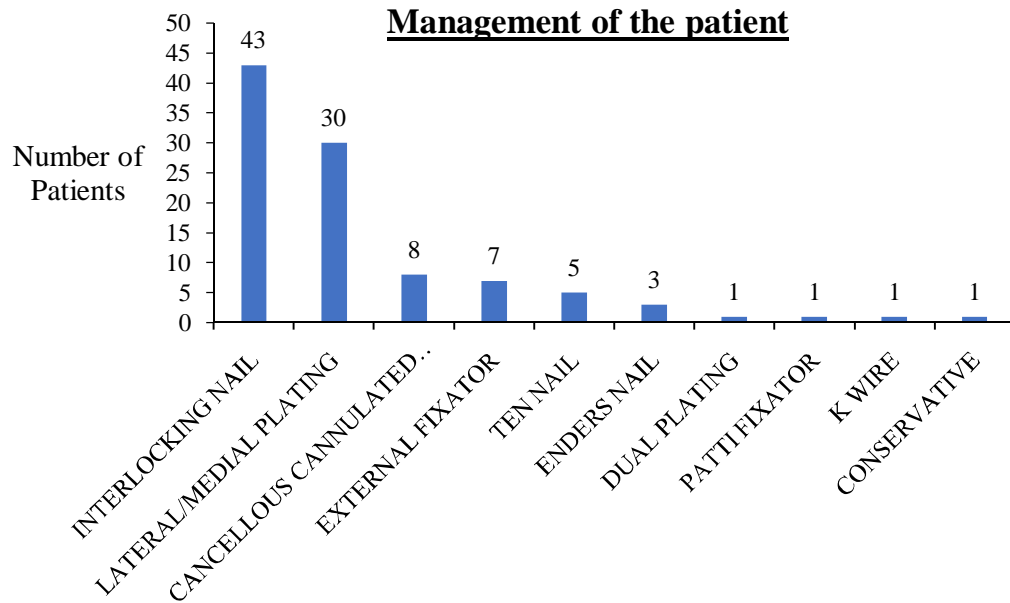
46 fractures occurred in the mid shaft region, 32 in the proximal shaft. This has also been observed by Grecco *et al*². Two of the segmental fractures were associated with bilateral tibial fractures- one mid shaft fracture and one distal shaft fracture, which have been included in their respective categories



We saw mostly closed fractures (83), while out of the remaining open fractures, grade 2 fractures were the most common ones. (including one bilateral fracture in which one limb had closed fracture while the opposite limb had open grade 2 fracture, which has been included in both categories), as also seen in the study conducted by Grecco *et al*².

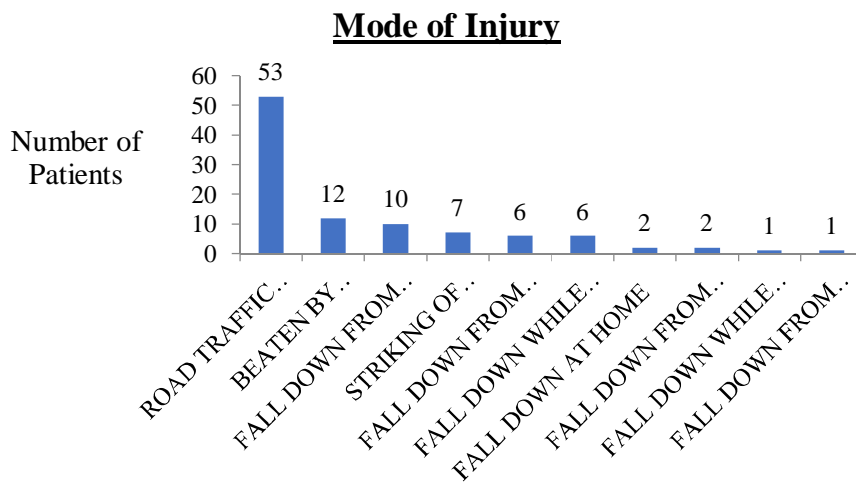


The most common form of intervention was operative, in which the interlocking nail was used most frequently (43 patients) followed by plating (30 patients). This was considered the best form of management in a study by Foote *et al*³ in 2015. In one patient operative intervention was not required because of minimal displacement.



Operative Intervention

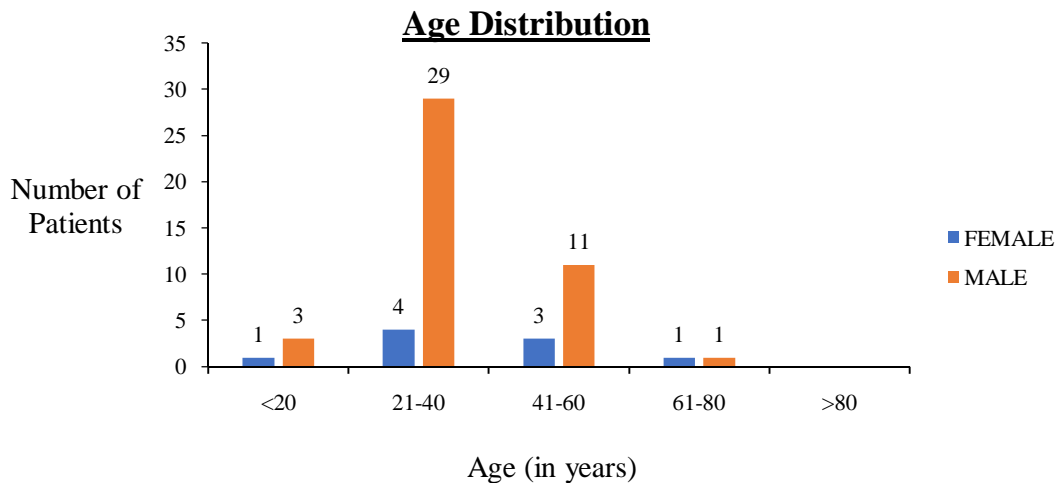
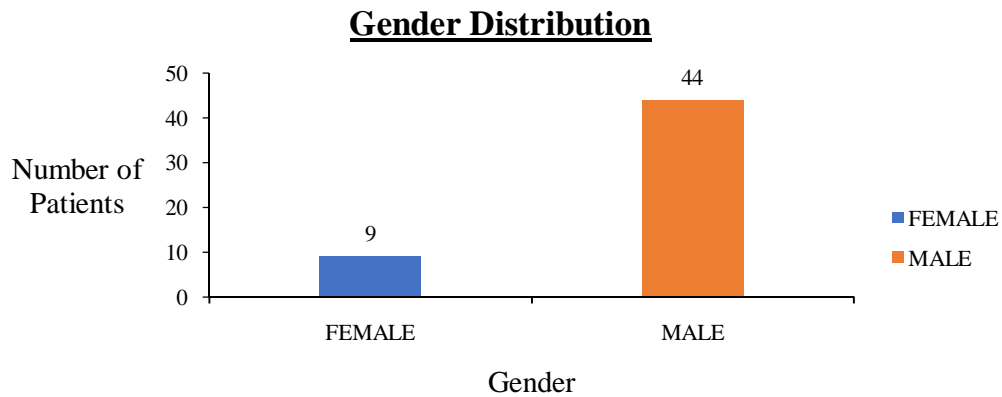
The most common cause of tibial fractures was seen to be road traffic accidents (RTAs) (53 patients). This was also observed in other independent studies in developing countries, as seen in the study by Clelland *et al*⁴ in 2016 and by James and Kealey⁵ in 2014.. Assault (beaten by opposite party) was a distant second, while fall down from height and whilewalking was seen in only 6 patients each

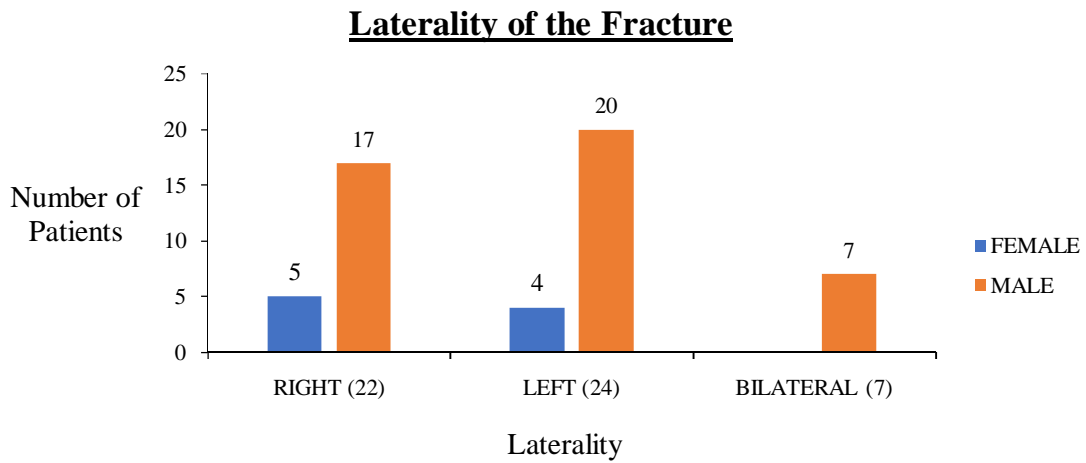
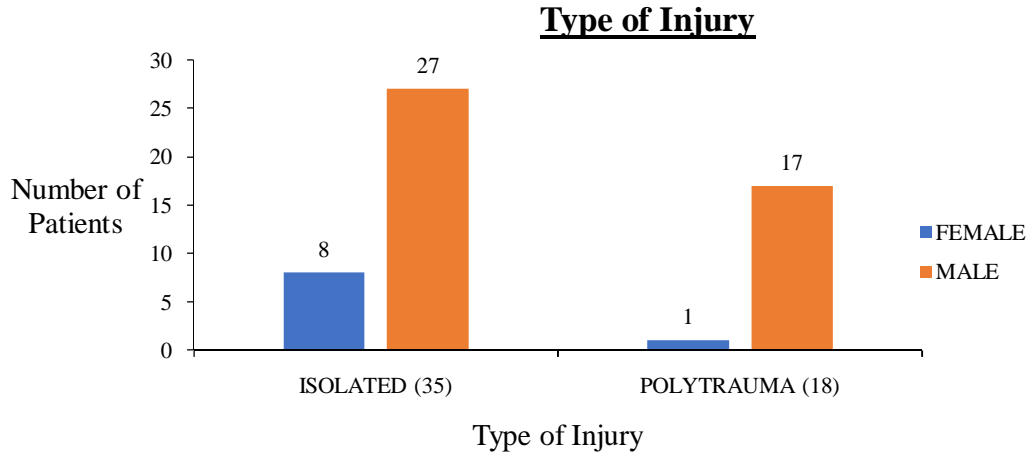


Mode of Injury

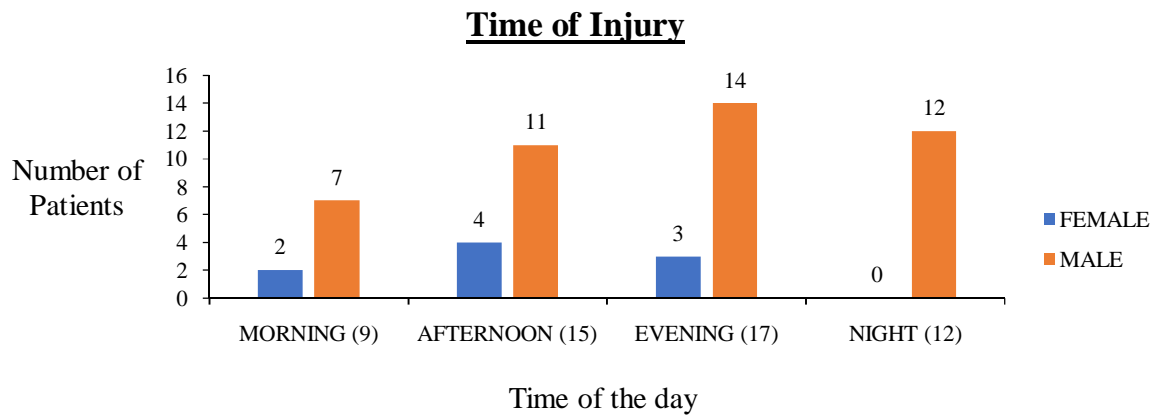
Evaluation of patients with RTA

Out of a total of 53 patients that had experienced tibial fractures due to RTAs, majority were male (44 patients) between the ages of 21 and 44 (29 patients) as observed by Clelland *et al.* in 2016⁴. This was also seen by Elsoe *et al*¹ in 2015. Isolated tibial fractures were seen more commonly (35 patients), and more so on the left limb in males, while the fractures were seen in either limb equally commonly in females who had an RTA. Bilateral fractures were seen only in male patients.

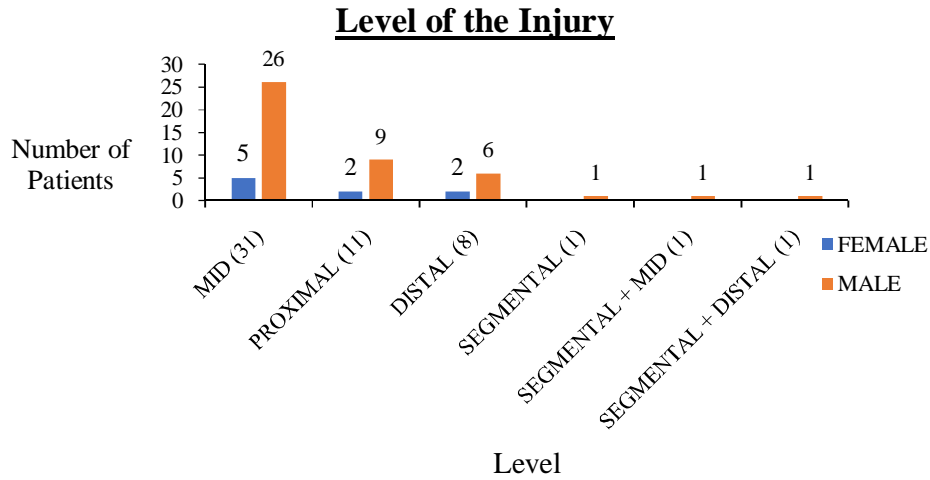




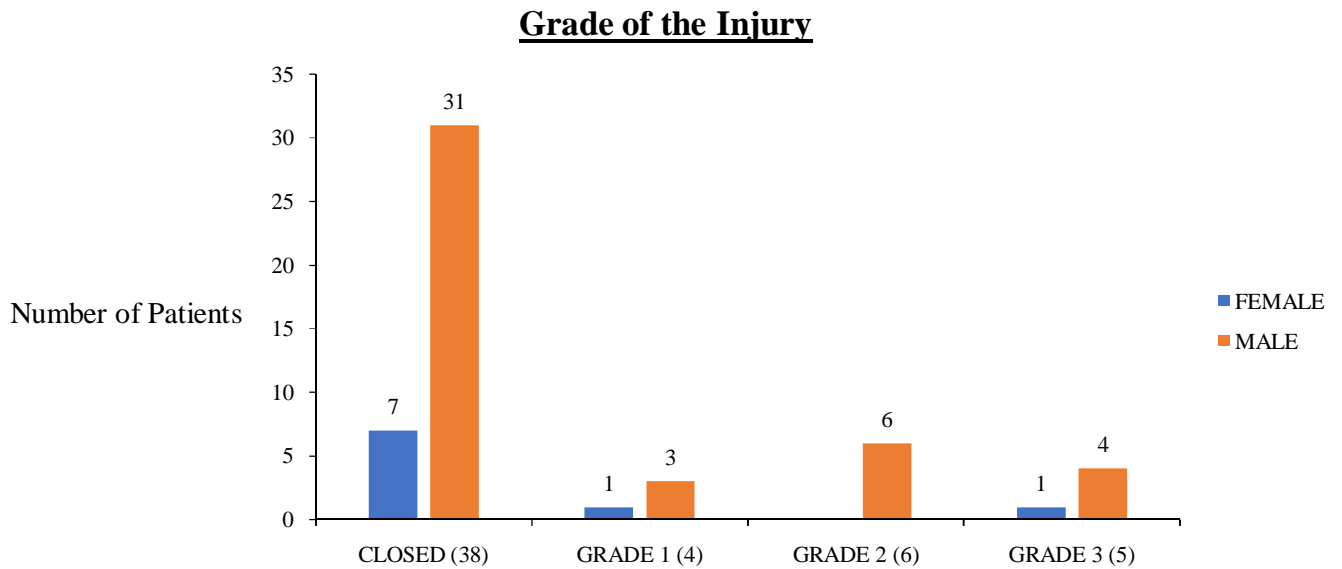
While male patients presented more commonly in the evening and night time (14 and 12 patients, respectively), females were seen more commonly during afternoon and evening (7 patients in total).



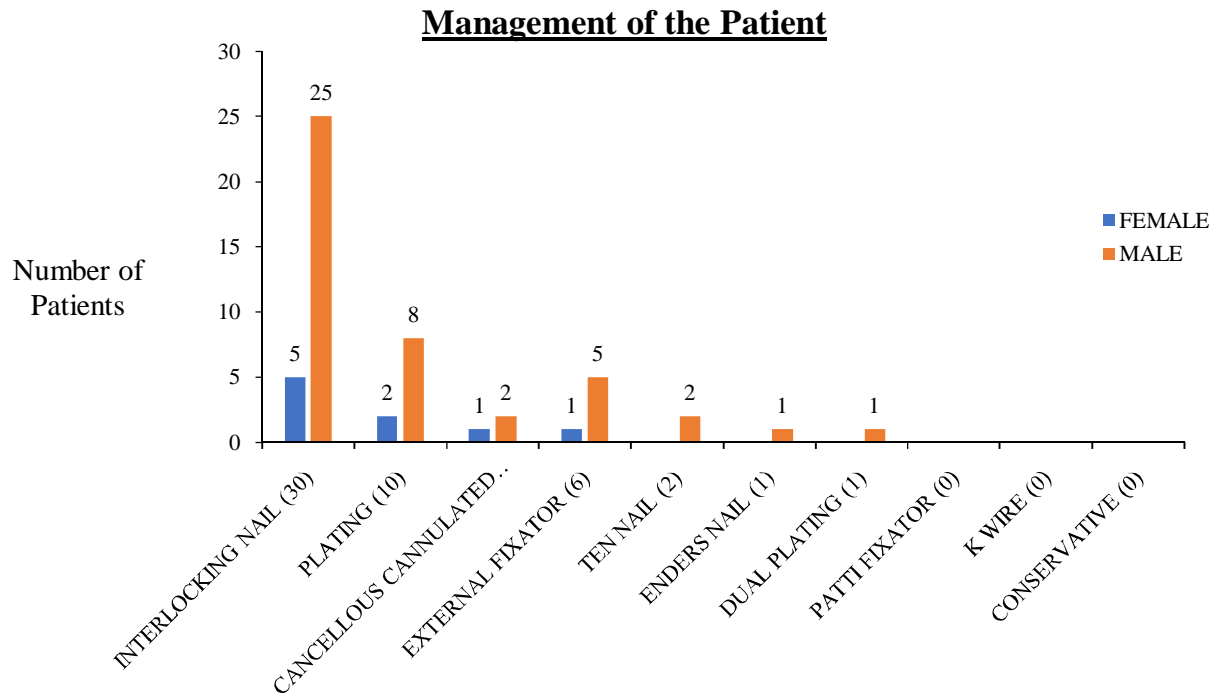
As seen in general, mid shaft fractures were more commonly seen than proximal fractures and distal fractures. Both the bilateral fractures had an element of segmental fracture in one limb, while the other showed mid shaft fracture or distal shaft fracture.



Again, as seen generally, closed fractures were more common than open ones. However, none of the females we observed had open grade 2 fractures.



All the patients who had presented with tibial fracture due to RTAs were managed operatively. Most of the patients were managed using interlocking nails (30 patients) or plating (10 patients). Nailing required the least re-operative intervention, followed by external fixation and plating, as seen in the study by Foote, *et al.*³ in 2015. However, patients with open fractures were mostly fixed with external fixator as a primary damage control surgery. This was later converted to internal fixation once the wound management was complete.



CONCLUSION

In our study, we found that road traffic accident was the most common cause for tibial fractures in adults. Tibial fractures were seen most commonly in young adult males who experienced road traffic accidents in the evening and night and all such fractures required operative management.

Take home MESSAGE:

As per our study, maximum occurrence of tibia fracture is in young male adults involved in motor vehicle activities. Accidents tend to occur in high traffic zones which are most crowded during evening hours

Young males need to follow traffic rules and proper safety measures. Their morbidity is a burden on their family as well as the community, both mentally and economically.

DRIVE SAFE!

-Thank you

References

1. Elsoe R, Larsen P, Nielsen N, Swenne J, Rasmussen S, Ostgaard S. Population-Based Epidemiology of Tibial Plateau Fractures. *ORTHOPEDICS*. 2015; 38: e780-e786. doi: 10.3928/01477447-20150902-55
2. Grecco, Marco Aurélio Sertório, Prado Junior, Idyllio do, Rocha, Murilo Antonio, & Barros, José Wagner de. Epidemiology of tibial shaft fractures. *Acta Ortopédica Brasileira*, 10(4), 10-17. <https://dx.doi.org/10.1590/S1413-78522002000400002>
3. Foote CJ, Guyatt GH, Vignesh KN, et al. Which Surgical Treatment for Open Tibial Shaft Fractures Results in the Fewest Reoperations? A Network Meta-analysis. *Clinical Orthopaedics and Related Research*. 2015;473(7):2179-2192. doi:10.1007/s11999-015-4224-y.
4. Clelland SJ, Chauhan P, Mandari FN. The epidemiology and management of tibia and fibula fractures at Kilimanjaro Christian Medical Centre (KCMC) in Northern Tanzania. *The Pan African Medical Journal*. 2016;25:51. doi:10.11604/pamj.2016.25.51.10612.
5. An Epidemiological Study of Diaphyseal Tibial Fractures, The Royal Victoria Hospital Experience, Mr Andrew James, Mr David Kealey