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Occurrence of fresh distal tibia fractures in adults

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Abstract

This study has been done to know the commonest causes of occurrence of distal tibia fractures in adults. In this study 20 patients of fresh distal tibia fractures in adults studied between June 2017 to may 2018 in mamta general hospital, khammam. Among these 13 were males and 7 were females and RTA was the chief cause of fractures accounting to 70% and left side accounts for 60%. In this study fracture classified according to AO/OTA classification and fracture pattern according to this classification, there was 12 cases of 43A type of injury and 08 cases of 43B type of injuries and 60% cases were grade 1 compound and 40% grade 2 compound fractures. This is comparable with other series like jing-wei zhang *et al.* reported average age is 43 years, males preponderance about 75%, RTA was the chief cause of injury accounting to 80% and Sven. A.F. tulner *et al.* reported average age group 43 years, males accounting to 85% and RTA was the major cause. In the present study of 20 cases, 12(60%) patients had excellent outcome, 6(30%) had good outcome, 2(10%) had fair outcome.

Keywords: Distal tibia, displaced fracture, comminuted fractures, compound fractures, adults

Introduction

Fractures of tibia and fibula are most common long bone fractures and exposed anatomical location makes it vulnerable to direct blow and high energy trauma as a result of RTA. Not only are they common, but often difficult to treat due to high incidence of complications such as compartment syndrome, vascular and neural injuries. Injuries and accidents have increased in modern era due to fast pace of life of man from one place to another place which have brought both comfort and catastrophe like road traffic accidents and crippling many young lives, these are responsible for most complex fractures of distal tibia. Over the past two decades, the AO/OTA classification has been the most accepted classification in the literature. It is reproducible and allows not only descriptive, but also treatment guidelines for each defines fracture type.

The three types and nine groups of the AO/OTA classification of distal tibia fractures is illustrated. The three types are extra articular, partial articular, and total articular, and they are divided in to nine groups based on the amount of comminution, as illustrated:

Type 43A- non-articular fractures: A1-Metaphyseal simple
A2-Metaphyseal wedge
A3-metaphyseal complex

Type 43B- partial articular fractures: B1-Pure split
B2-Split depression
B3-Multifragmentary depression

Type 43C- Complete articular fractures: C1-Articular simple
C2-Articular simple metaphyseal multifragmentary
C3-Articular multifragmentary

If not treated properly distal tibia fractures are the cause of disability for long time in the form of pain, instability and early degenerative arthritis of ankle joint. Distal tibia fractures have the highest rate of non union among all long bones Because of scarcity of soft tissues,

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their subcutaneous nature, and poor vascularity. This is a prospective study undertaken to evaluate the incidence of distal tibia fracture with respect to age, sex, laterality, mode of injury, pattern of fractures in adults have been analyzed.

Objectives

To study the incidence of grade 1 & 2 compound distal tibia fractures with respect to age, sex, mode of injury, type of fracture pattern and laterality of injury.

Material and Methodology

20 adult patients with distal tibia fracture were selected for the study, there were 13 males (60%) and 7 females (40%), all the fractures in the series were post traumatic, no pathological fractures were included in the study. Distal tibia fractures treated conservatively and grade 3 compound fractures belongs to Gustilo & Anderson classification, old fractures more than 3 weeks and patients with distal tibia fractures with ankle dislocation are excluded. And descriptive data of the patients like age, sex, fracture type, detailed history were obtained by interviewing the patients by clinical examination and necessary investigations were recorded in predesigned and pretested Performa.

Observation and Results

A total of 20 patients with fresh fractures of the distal tibia and fibula was studied from June 2017 to may 2018 at mamta medical college and super specialty hospital, khammam. Following factors were observed and tabulated as follows.

Table 1: Incidence of distal tibia fractures according to age distribution

Age group	No. of cases	Percentage
21-30	2	10%
31-40	4	20%
41-50	5	25%
51-60	6	30%
61-70	2	10%
71-80	1	5%
Total	20	100%

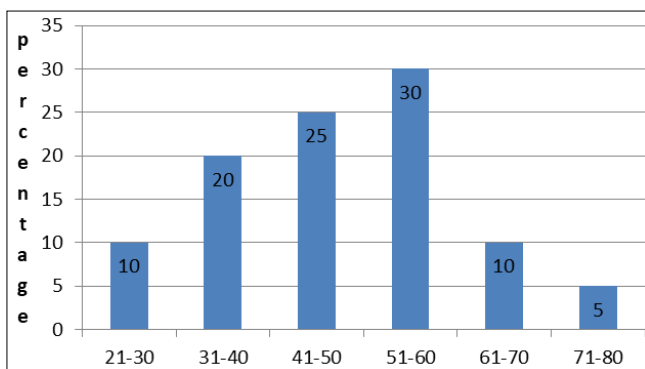


Fig 1: Age Distribution

In the present study average age group is 54 years, this is comparable to jing-wei zhang *et al.* and sven A.F. tulner *et al.* average age group is 43 years.

Table 2: Incidence according to sex

Injury side	No. of cases	Percentage
Right	08	40%
left	12	60%
Total	20	100%

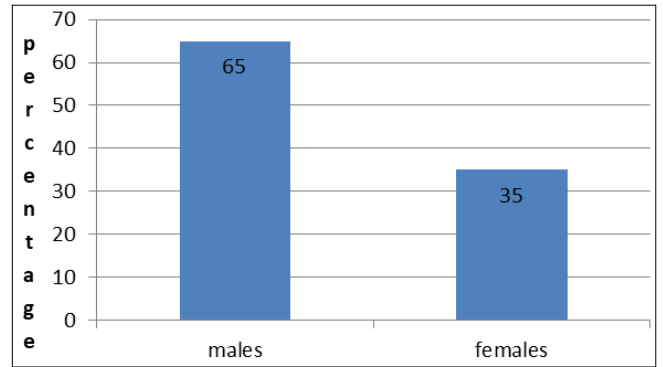


Fig 2: Sex Distribution

Higher incidence in males noted is attributed to the increased road traffic accidents in males accounting to 65%. This is comparable to Jing-wei zhang *et al.* shows 75% in males and sven A.F. tulner *et al.* accounts for 85% in males.

Table 3: Incidence according to side

Sex	No. of cases	Percentage
Male	13	65%
Female	07	35%
Total	20	100%

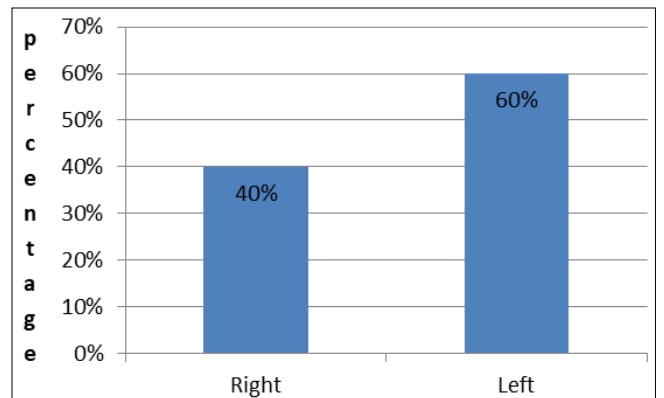


Fig 3: Side Affected

Left side accounts for 60% and right side injury seen in about 40% of cases in our study.

Table 4: Mode of injury

Mode of injury	No of Cases	Percentage
RTA (high energy & low energy)	14	70%
Self Fall (low energy)	06	30%
Total	20	100%

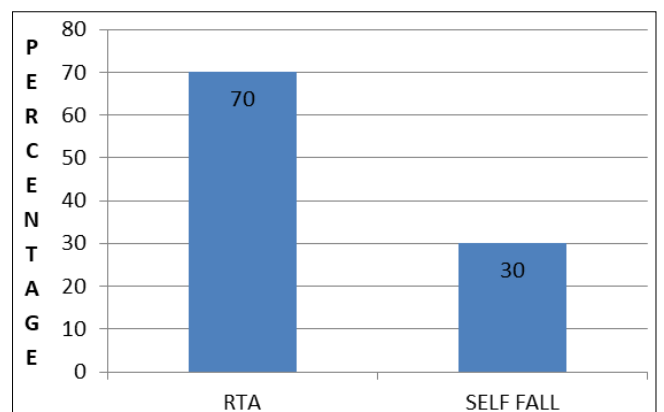


Fig 4: Mode of Injury

RTA is the major cause of fractures occurring in 70% of cases followed by self fall injuries accounting about 30% of patients in our study. This is comparable to jing-wei zhang *et al.* and sven A.F. tulner *et al.* accounts for RTA as major cause of injury.

Table 5: According to Fracture pattern type.

Type of injury	No. of cases	Percentage
43A	12	60%
43B	08	40%
Total	20	100%

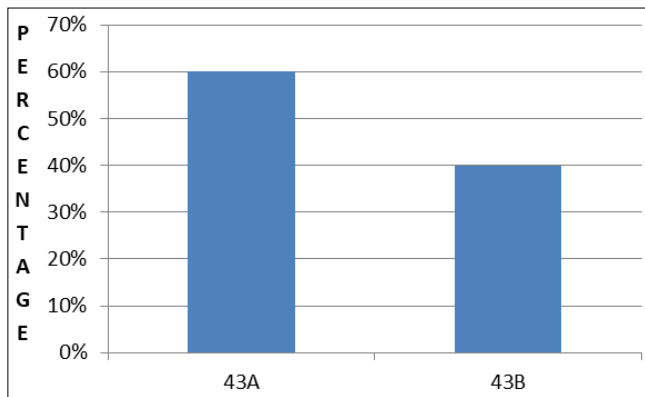


Fig 5: Fracture Pattern

43A type of injury accounts for 60% of cases followed by 43B type which is seen in 40% of cases in our study

Table 6: Showing open injury type

	No. of cases	Percentage
Grade-I	12	60%
Grade-II	08	40%
Total	20	100%

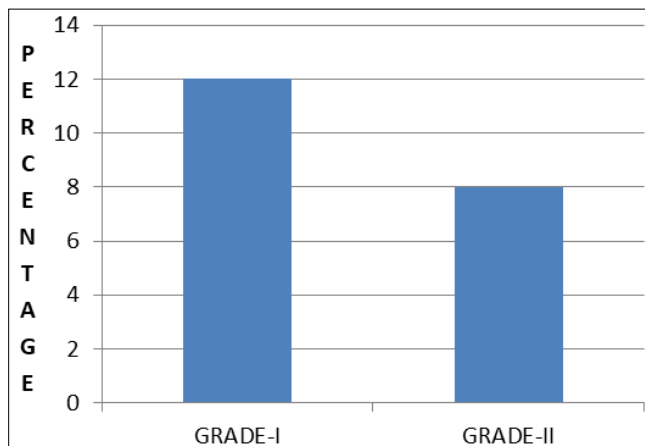


Fig 6: Show in fig grade i and ii

Discussion

Twenty cases of fresh distal tibia fractures were studied from June 2017 to May 2018 forms the basis of the present study. Average age group is 54 years, AO/OTA classification has been followed to classify the fractures and their incidence, 60% patients had 43A type of injury followed by 43B accounting for remaining 40%.

Regarding the sex incidence there were 65% male patients and 35% female patients. Road Traffic Accidents were the main mode of injury accounting for 70% of cases. In the present study, 40% fractures occurred on the right side and

60% fractures occurred on the left side. Injury is classified according to Gustilo Anderson classification, out of 20 cases studied 12 (60%) were grade-I and 8(40%) were grade-II type.

this is comparable to other series like jing-wei zhang *et al.* average age group is 43 years, 75% males, RTA is the chief cause of fracture, and 43A type of fracture pattern accounts for majority of them. Sven A.F. tulner *et al.* which shows average age group 43 years, males preponderance to about 85%, RTA is the major mode of injury, and 43B is majority of cases.

Comparing with other series made by jing-wei zhang *et al.* and sven A.F. tulner *et al.* reported present study as excellent results in 60% of cases and good results in 30% of cases and fair results in 10% of cases.

Conclusions

Distal tibia Fracture represent a complex problem and optimal management is essential if the patient is to regain significant pre injury level of function, this study comprised of 20 patients of fresh distal tibia fractures selected to know the incidence of fracture with respect to age, sex, mode of injury laterality and fracture pattern.

1. 43A type of fracture pattern according to AO/OTA classification found commonest followed by 43B type of fracture pattern, high incidence noted in males, left side is more often involved than the right with maximum cases seen in fourth and fifth decades of life and RTA is the common cause of fracture.
2. No incidence of post traumatic arthritis, malunion has been noticed.
3. The quality of clinical results was proportionate to the accuracy of fracture reduction.
4. It is concluded that rigid fixation following anatomical reduction is an effective way of managing distal tibia fractures and avoid the complications seen with conservative treatment.

Most complications following internal fixation of distal tibia fractures are minor and can be easily treated.

References

1. Hong Gao, Ching-Quing Zhang, Cong Feng Luo, Zu-Bhin-Zhou, Bing Fang Zing. Clinical Orthopaedics and related research. 2009; 467(3):831-37.
2. John Charnley. The closed treatment of common fractures. Cambridge. Colt Books Ltd, 1999.
3. Ring D, Jupiter JB, Gan BS, Israeli R, Yaremchuk MJ. Infected Nonunion of the Tibia, Clinical Orthopaedics and Related Research. 1999; 369:302-311. Doi: 10.1097/00003086-199912000-00032
4. Toh CL, Jupiter JB. The Infected Nonunion of the Tibia, Clinical Orthopaedics and Related Research. 1995; 315:176-191.
5. Tulner SAF, Schaap GR, Strackee SD, Bes-Selaar PP, Luitse JS, Marti RK. Long-Term Results of Multiple-Stage Treatment for Posttraumatic Osteomyelitis of the Tibia. Journal of Trauma. 2004; 56(3):633-642. doi:10.1097/01.TA.0000112327.50235.0A
6. Colin Yi-Loong Woon, Merng-Koon Wong, Tet-Sen Howe. LCP external fixation - External application of an internal fixator: two cases and a review of the literature. Doi: 10.1186/1749-799X-5-19. Journal of Orthopaedic Surgery and Research. 2010; 5:19.
7. Vassilios S. Mippo-An Update Current Orthopaedics.

- 2008; 22(3):2027.
8. Dogra Fracture of lower extremity. In Campbell's Operative Orthopaedics 11th Ed. Mosby Inc. 3:3123-3125.
 9. Salmons Stanley Muscles. Williams Peter L *et al.* in Gray's Anatomy, 38 edition, Edinburg; Churchill Livingstone, 1995, 2092.
 10. Wikipedia contributors. Müller AO Classification of fractures. Wikipedia, The Free Encyclopedia. 2016; 17(14):11. UTC. Available at: https://en.wikipedia.org/w/index.php?title=M%C3%BCller_AO_Classification_of_fractures&oldid=725732806. Accessed September 26, 2016.
 11. Tscherne H, Oestern HJ. A new classification of soft-tissue damage in open and closed fractures (author's transl)]. *Unfallheilkunde*. 1982; 85(3):111-5.
 12. Gustilo RB, Anderson JT. Prevention of infection in the treatment of one thousand and twenty-five open fractures of long bones: Retrospective and prospective analyses. *J Bone Joint Surg Am*. 1976; 58:453-8.
 13. Martin JS, Marsh JL, Bonar SK, De Coster TA, Found EM. Assessment of the AO/ASIF fracture classification for the distal tibia. *J Orthop Trauma*. 1997; 11:477-483.
 14. George W, Wood II. General Principles of Fracture Treatment. Terry Canale in Campbell's Operation Orthopaedics, 10 edition, St. Louis, Mosby, 2000, 2671.
 15. Kitakoka HB, Alexander IJ, Adelar RS, Nunley JA, Myerson MS, Sander M. Clinical rating system for ankle hindfoot, midfoot, hallux and lesser toe. *Foot Ankle Int*. 1994; 15:135-49.
 16. Oleaur C, Molander H scoring scale for symptom evaluation after ankle fracture. *Arch Orthop Trauma Surg*. 1984; 103(3):190-4.
 17. Jing-Weizhang, Nabil Ebraheim A, Ming Li, Xian-Feng He. Distal tibial fracture: An ideal indication for external fixation using Locking plate. *Chinese Journal of Traumatology*. 2016; 19:104-108. <http://dx.doi.org/10.1016/j.cjtee.2015.05.006>.
 18. Sven Tulner AF, Simon Strackee D, Peter Kloen. Metaphyseal locking compression plate as an external fixator for the distal tibia. *International Orthopaedics (SICOT)*. 2012; 36:1923-1927. DOI 10.1007/s00264-012-1585-7.
 19. Ramotowski W, Granowski Zespol R. An original method of stable osteosynthesis. *Clin Orthop Relat Res*. 1991; 272:67-75.
 20. Vallier HA, Cureton BA, Patterson BM. Factors influencing functional outcomes after distal tibia shaft fractures. *J Orthop Trauma*. 2012; 26:178-183. [PubMed]
 21. Woon CY, Wong MK, Howe TS. LCP external fixation – external application of an internal fixator: two cases and a review of the literature. *J Ortho P Surg Res*. 2010; 5:19. [PubMed]
 22. Cannada LK, Anglen JO, Archdeacon MT. Avoiding complications in the care of fractures of the tibia. *J Bone Joint Surg Am*. 2008; 90:1760-1768. [PubMed]
 23. Shuler FD, Obrebsky WT. Tibial shaft fractures. In: Stannard JP, Schmidt AH, Kregor PJ, editors. *Surgical Treatment of Orthopaedic Trauma*. Thieme; New York, 2007, 742-766.