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DOUBLE SEGMENTAL TIBIAL FRACTURES A RARE FRACTURE

Surgery

Dr.Mohammed Iftekar Ali

M.S.Orthopaedics Associate Professor Department Of Orthopaedics Prathima Institute Of Medical Sciences Karimnagar

ABSTRACT

Segmental tibial fractures are uncommon and double segmental fractures/ trifocal fractures are rarely seen{1}. Literature search revealed that only fifteen cases reported closed double segmental tibial fracture treated with expert nailing. Nail remains effective treatment modality of such fractures. Moreover, we discussed the possible mechanisms which can lead to such an injury. We also discussed the management of segmental tibial fracture and the difficulties encountered with them. This case was managed by modern osteosynthesis technique with a pleasing outcome.

KEYWORDS

Double Segment, Tibia, Closed Injury,interlocking Nail.

INTRODUCTION

Segmental tibial fractures feature a unique fracture type characterized by a completely isolated intercalary osseous fragment separated by at least two distinct fracture lines [1-4] . Segmental tibial fractures are an uncommon injury pattern accompanied by significant soft tissue trauma and higher complication rates.It is usually associated with high energy trauma, and an increasing prevalence of vehicular accidents is a cause of elevated cases exhibiting atypical fracture configuration. Leg bones are susceptible to direct and indirect forces during trauma and are one of the most common sites of fracture.[5]. Their subcutaneous location only adds to its susceptibility. We are reporting an unusual fracture configuration with a double segmental fracture/ three level bone fracture pattern of the tibia and a multi-segmental fracture of the fibula.[6].

PATIENTS AND METHODS

Between 2012 and May 2018, I provided first-line treatment for 10 double segmental tibial fractures at the prathima institute of medical sciences karinagar.

This series of patients was composed of 8 men and 2 womenshown in table:1,, mean age 40.8 years (range 17-71).Ten were traffic accident victims: motorcycle (n=8), automobile driver or passenger (n=2). The left tibia was involved in 8 cases, the right in 2. Seven patients had multiple injuries and 2 multiple fractures.

Common fibular nerve palsy was noted in one patient. Clinical presentation led to the diagnosis of compartment syndrome complicating the fracture at admission in two patients.

According to the AO classification [Muller et al. [16]], there were 2 type C21 fractures, 3 type C22 fractures and 5 type C23 fractures. Two patients had a trifocal fracture associating two shaft fractures and a proximal metaphyseal fracture in one and a distal metaphyseal fracture in the other. The fibula was fractured in all cases .

RESULTS

Postoperative complications were described for the entire population. One patient developed fatty embolism on day two with respiratory distress and coma which resolved; this patient had a thoracic contusion and a homolateral femoral shaft fracture. Two patients developed sural phlebitis without embolic migration to the lung. During nailing in two patients the initially non-displaced proximal fracture moved into varus misalignment (10° and 12° respectively). One patients developed local infection treated by antibiotics. This patient achieved bone healing at 12 months. Nine patients achieved healing without changing the nail.

Clinical and radiological outcome data were thus available for 10 patients.Seven healed at 5 to 10 weeks with no change in the fixation; the nail had to be dynamized for the three others.

Partial weight bearing was allowed at three months with total weight bearing at four months. First intention bone healing was achieved in 9 patients .

DISCUSSION

Segmental tibial fractures are uncommon injuries that occur in about 12.8% of tibial fractures.1 They are usually a part of multiple injuries and are caused by high energy trauma. Commonly there is associated severe soft tissue injury and periosteal stripping which result in major impairment of the blood supply to the central fragment, and 50% of these fractures are open.2 Because of the reasons stated above, the management of these fractures poses a formidable challenge to the surgeons. It is important to note that more than two-thirds of segmental tibial fractures will require more than one surgical intervention as pointed out by Giannoundis et al.1 It is therefore extremely vital to plan meticulously so that the surgeon is well prepared for a subsequent surgical intervention if such a situation arises. A majority of segmental tibial fractures have one intercalary segment. When the pace of injury is very high, it usually results in comminution at the fracture site. A double segmental fracture of the tibia as seen in our patient is very rare. The postulated mechanism of fracture pattern in our patient is probably due to a combination of direct and indirect forces{7}.. The direct force is the impact sustained when the leg was hit by the crash guard of the bike with moderate velocity but not high enough to cause comminuted fracture or secondary fracture. The relative osteopenic bone quality further adds to the above mechanism. The indirect forces are those of twisting and other movements when the patient fell down on the pavement. A thorough review of the literature has retrieved very few articles on the management of segmental tibial fractures. There has been a significant change in the management of these injuries due to the development of new orthopaedic implants. The three currently favoured treatment modalities include intramedullary locking nails, external fixators (with their different constructs and versatility) and plaster of paris. Giannoudis et al1 used unreamed tibial nail in both closed and open grade 1 fractures while external fixator was the preferred modality in open fractures. Although intramedullary fixation using conventional unreamed interlocking nail offers mechanical, technical and biological advantages over other forms of fixation, fixation of segmental tibial shaft posses complications related to angular alignments and malalignment postoperatively.We used an unreamed tibial intramedullary nail that was locked proximally with 2 oblique locking screws and could be located more proximally than other conventional static interlocking nails. This type of intramedullary nail resulted in an improved stability and a reduced incidence of proximal fracture displacement[8].

Conclusion

A rare case of closed double segmental fractures of the tibia treated successfully with new generation interlocking nail is presented. New generations of interlocking nails are clearly emerging as the implant of choice for closed and grade 1 segmental fractures, whereas external fixators can be reserved for grade 2 and 3 open fractures.

FIGURE:1.PRE OPERATIVE X-RAY

FIGURE:2 POST OPERATIVE X-RAY

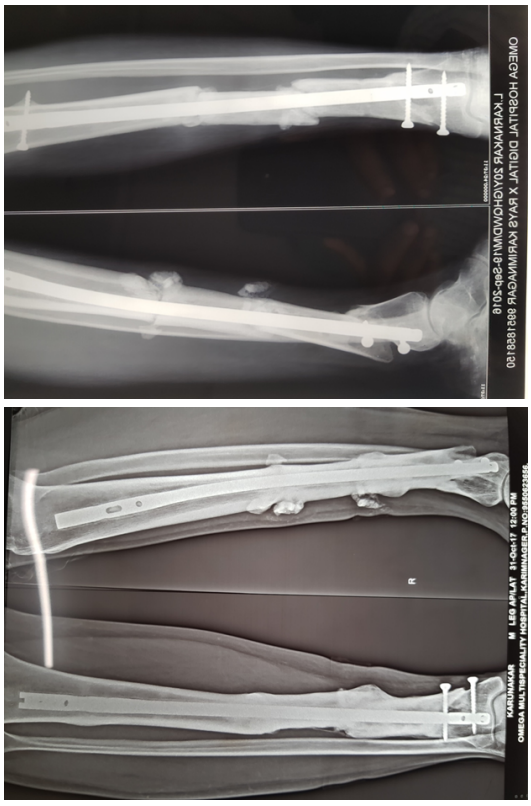

FIGURE:3 ATER UNION

TABLE:1

S.NO:	MALE	FEMALE
1	8	2

REFERENCES

1. Giannoudis PV, Hinsche AF, Cohen A, et al. Segmental tibial fractures: an assessment of procedures in 27 cases. Injury 2003;34(10):756-762.
2. Woll TS, Duwelius PJ. The segmental tibial fracture. Clin Orthop Relat Res 1992;(281):204-207.
3. Zucman J, Maurer P. Two-level fractures of the tibia. Results in thirty-six cases treated by blind nailing. J Bone Joint Surg Br 1969;51(4):686-693
4. Wu CC, Shih CH. Segmental tibial shaft fractures treated with interlocking nailing. J Orthop Trauma1993;7(5):468-472.
5. Huang CK, Chen WM, Chen TH, et al. Segmental tibial fractures treated with interlocking nails. A retrospective study of 33 cases. Acta Orthop Scand 1997;6 8(6):563-566.
6. Beardi J, Hessmann M, Hansen M, et al. Operative treatment of tibial shaft fractures: a comparison of different methods of primary stabilisation. Arch Orthop Trauma Surg 2008;128(7): 709-715.
7. Henley MB, Meier M, Tencer AF. Influences of some design parameters on the biomechanics of the unreamed tibial intramedullary nail. J Orthop Trauma 1993;7 (4):311-319.
8. Laflamme GY, Heimlich D, Stephen D, et al. Proximal tibial fracture stability with intramedullary nail fixation using oblique interlocking screws. J Orthop Trauma 2003;17(7):496-502.