



Original Article

Study on the Management of Open Tibia-fibula Fracture in Rehabilitation Institute and Hospital for the Disabled (RIHD), Dhaka, Bangladesh

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Abstract

This study was performed in the Rehabilitation Institute and Hospital for the Disabled (RIHD), Dhaka, Bangladesh from July 1992 to Dec. 1992. Total emergency operations during these six months were 1906. Out of these, 230 cases were open fractures of tibia-fibula, which is 13% of the total, 57% of the victims were in the age group of 15-44 years. 85% were male. Eighty five percent of fractures were caused by road traffic accidents. Methods of treatment were 7 types. 78% fractures were treated by sufficient irrigation debridement and immobilized by long leg cast with making window, most of them falls in type 1 and type 2. In type 3 fractures, after sufficient irrigation and debridement, primary fixation gives the best result for better preservation of function. Average duration of hospital stay is also shown in the paper.

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Introduction

Open fractures are surgical emergencies that perhaps to be thought of as incomplete amputation. Starting from the First World War when death was about 80% in open fractures, different types of management were predicted. Tscherne describes the four eras of open fracture treatment: (1) era of life preservation (2) era of limb preservation (3) era of infection avoidance (4) era of functional preservation.¹ Now we have to think in what era we are?

Tibia fibula is the bone of leg and lies in dependable part of the body, so are in more vulnerable position. Almost whole of the one surface of tibia is subcutaneous and devoid of periosteum. Four closed compartments surround the tibia.² The open fractures of bone of leg are

commonly complicated with infection, bared bone, non-union, compartment syndrome, or stiff knee or ankle.

The updated classification of bony as well as soft tissue injuries is given by the modification of Gastilo and Tscherne. Prognostic information about the outcome of fractures grouped is into five categories:³

Type-1: Open fractures have a clean wound less than 1 cm long.

Type-2: Wounds is more than 1 cm long but is without extensive soft tissue damage, skin flaps or avulsions.

Type-3-A: Open fractures have extensive soft tissue lacerations or flaps, maintain adequate soft tissue coverage of bone or they result from

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high energy trauma regardless of size of the wound. This group includes segmental or severely comminuted fractures even those with 1 cm lacerations.

Type-3-B: Open fractures have extensive soft tissue loss with periosteal stripping and bony exposure. They are usually massively comminuted.

Type-3-C: Open fractures include fractures with an arterial injury that requires repair regardless of the size of the wound.

Methodology

Total 9,651 cases were attended in RIHD casually in the 6 months of the study. Among these 1805 cases were operated as emergency. Out of these 230 operations were done on open fractures of tibia- fibula i.e. 13% of the total operations done by copious irrigation with hydrogen peroxide. 10% betadine solution and normal saline and debridement were done in 184 cases followed by immobilization with long cast and dressing given with making window. Lower tibial skeletal traction was applied in 13 cases after sufficient irrigation and debridement. 9 cases were immobilized by external fixator (Hoffman). After sufficient irrigation and debridement were immobilization was done by K-wire in 5 cases. 4 cases after sufficient irrigation and debridement, immobilized by primary fixation. 3 of them were fixed with intraosseous screws and by Steinman pin. 2 of the screw fixation were failed due to incomplete purchase. But one of them gave the best result.

Results

Thirteen (13%) of the total emergency operations were done in open tibia fibula fractures. 78% of the cases treated by sufficient irrigation debridement and immobilized by long leg cast making window over the wound for dressing. Average hospital stays in this group were 4 weeks. According to operation note this group includes type 1 and type 2 injuries. But the functional preservations were not followed up. In 9 cases after sufficient irrigation and debridement external fixators were applied but the average duration of

hospital stay was 20 weeks. The fractures of these groups were included in type 3B. Primary rigid fixations were done in cases during the 6 months of the study. Out of these 2 cases were followed and split thickness skin graft were done after 3 weeks and due to rigid fixation proximal and distal joints movements were started about 4 weeks after the injury and gives the best functional result.

Table-1: Age distributions:

| Age in years | Number of Patients (n= 230) | Percentage |
|--------------|--------------------------------|------------|
| 1-14 | 52 | 22.62% |
| 15-44 | 143 | 60.42% |
| 45+ | 39 | 16.96% |

Table-2: Sex distributions:

| Sex | Number of Patients (n= 230) | Percentage |
|--------|--------------------------------|------------|
| Male | 196 | 85% |
| Female | 34 | 15% |

Table-3: Methods of treatment:

| Methods | Total number of patients (n= 230) | Average duration of hospital stay in weeks |
|--|--------------------------------------|--|
| 1. Irrigation, Debridement, Long cast, Window | 180 | 4 |
| 2. Irrigation, Debridement, Long back slab | 13 | 8 |
| 3. Irrigation, Debridement, Skeletal traction | 7 | 9 |
| 4. Irrigation, Debridement, External fixator | 9 | 20 |
| 5. Amputation | 12 | 6 |
| 6. Irrigation, Debridement, fixed with K-wire | 5 | 10 |
| 7. Irrigation, Debridement, Internal fixation. | 4 | 3 |

Discussion

Normal anatomical containment and alignment of tissues and absence of dead or dying tissues normalizes the circulation early. If the fixation is rigid one early mobilization also normalizes both arterial supply, venous and lymphatic drainage, which reduces tissue oedema.

increased resistance of the tissues to infection and ultimately enhance the achievement of best function preservation.

In this context we can mention the works of Pandian M (1972, Patna India), who done intra medullary loose nailing within 2 hours, 6 hours and 6-8 days, and limb was enclosed in a plaster cast. Dressing was given through a window. Nailing was done in 40 cases and there was no case of non-union, none had required amputation. Discussion of the papers by Rotlifts AWC (Bristol) revealed that the result is impressive and reduce time in hospital but the technique might be dangerous. Vieyra (London) actively criticized that internal fixation of open wounds had been actively discouraged as a matter of policy. Owen R (Oswestry) said that Pandian's paper should be considered in the context to local conditions. The method that was appropriate to the Indian patient might not be so successful in this country.

Another work on complex open tibial fractures managed with external fixation and pedicle muscle flaps by Jones RE, Byrd S and Cierny G (Dallas, Texas) reported on type 3 open tibial fractures-proved to be a useful methods. Twenty limbs had been so treated. There had been

one below knee amputation and persistent infection. Then mean time of unprotected weight bearing had been 18.5 weeks. There had one non-union and delayed union.

Conclusion

From this study, any comments on any individual group of methods of treatment are difficult. Management of type 3B fractures is really a problem. Primary fixation within 4 hours either by intra medullary nailing, plate screw or only screw as in oblique fractures, Hospital stay were minimum and functional preservation was better than the fixation either by external fixator or by plaster cast.

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