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Original Research Paper

Orthopaedics

MULTIPLE METATARSAL FRACTURE FIXATION BY K-WIRE : RETROGRADE TECHNIQUE.

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ABSTRACT Multiple metatarsals fracture are common injuries of the foot but their incidence is not known. They can cause severe disability if left untreated or wrongly treated. We had ten patients. There were eight males and two females between the age group of 20 to 45 years. All were from working class (labourer). Immediately after trauma, they were brought to our institute, ACPM Medical College, Dhule. We have described here an effective technique of open reduction and internal fixation by Kirschner wires (retrograde technique). The main goal of the treatment is to help the patient to achieve full functional outcome of the foot. We have found our technique very useful in achieving this.

KEYWORDS : Metatarsals, Kirschner wires , Fracture reduction, Fracture fixation.

Introduction-

Rationale: Multiple metatarsals fracture are one of the most common injuries to the foot and can often cause prolonged disability if they are left untreated. Malunion of these fractures might be a cause of future meta-tarsalgia. Other complications of metatarsal fractures include loss of reduction, delayed union and avascular necrosis of metatarsal head[1],[2]. Therefore appropriate reduction and stable fixation is the key for favourable results.

Fracture reduction can be achieved by closed or open techniques, and fixation can be done with plating, intra-medullary screws, tension-band wiring, k-wire antegrade/ retrograde technique[2-7] . The advantage of intra-medullary fixation by k-wire is that its relatively simple technique, minimal or no periosteal stripping, and easy removal. K-wires get additional inherent stability from neighbouring metatarsals.

So, we describe a simple technique for reduction and fixation of multiple metatarsals fracture by retrograde technique using k-wire.
Objective: To obtain full function of the foot with no deformity.

Material and Methods*:*

We had ten patients. There were eight males and two females between the age group of 20 to 45 years. All were from working class (labourer). Immediately after trauma, they were brought to our institute-ACPM Medical College, Dhule. All the patients had pain and swelling over foot. X-ray of foot Anterior-posterior view and oblique views were taken. Below knee slab was given to the patients.

After preparing the fracture site for an open reduction, a Kirschner wire (K-wire), which has both sharp ends is used for intra-medullary fixation. It is best introduced by free hand in a Retrograde fashion from the fracture site into the medullary canal and taken out of metatarsal head and proximal phalynx in the sole under C-arm guidance. Then open reduction of proximal and distal segment is done by pushing against the head and proximal phalynx and helps to bring metatarsals into the length. At times, especially when the fracture is not fresh, significant force is necessary to overcome the shortening. Once desired possible length has been achieved, drill is attached to the to the free end of k-wire coming out of the sole. Then k-wire is drilled into the medullary canal of proximal segment for proper fixation under C-arm guidance. Then the free end of k-wire at sole cut and bent, leaving a small edge for future removal. All the fractures are fixed by this technique. The whole procedure is done under c-arm guidance to confirm reduction and proper placement of k-wire. Usually metatarsal fractures heal in four to six weeks and so, k-wires are removed after four to six weeks.

Discussion*:*

Multiple metatarsals fracture is not uncommon injuries and incidence of this fracture is on the rise. Mode of injury is mostly fall of heavy object on foot or motorcycle injury; mostly compound injury. It has a potential to lead to major disability if left untreated.

We have treated such injuries by open reduction and internal fixation by K-wire. We had good result in terms of deformity, walking, gait and pain over a period of two years. We have found that our results are coinciding as per the literature.

Internal fixation is required because of the stability given to metatarsals by nearby muscle is lost due to multiple metatarsal fractures. After union, physiotherapy was given and weight bearing was started gradually.

Results and Conclusions*:*

This retrograde fixation of metatarsal fractures is an effective method of treating multiple metatarsal fractures. Both closed or open techniques can be used and additional soft tissue damage can be prevented.

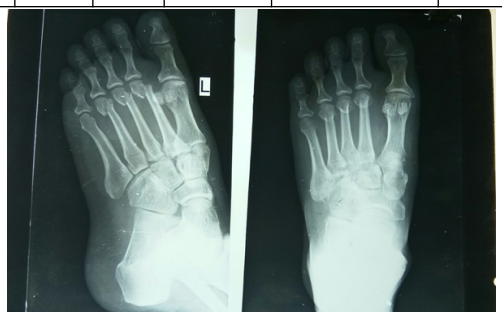
Consent:

The patients have given their informed consent for the case series to be published

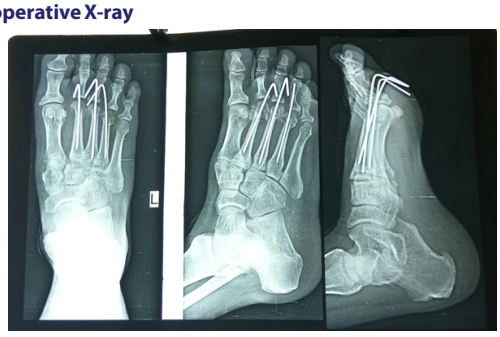
Table 1: Patient data

Index	Age	Sex	Date of injury	Mode of injury	Date of surgery
1)	40 years	Male	25/9/2015	Fall of heavy object	26/9/2015
2)	28 years	Male	20/3/2015	Road traffic accident	22/3/2015
3)	25 years	Female	21/02/2015	Road traffic accident	23/02/2015
4)	44 years	Male	17/04/2015	Fall of heavy object	18/04/2015
5)	38 years	Male	1/05/2015	Fall of heavy object	5/05/2015
6)	43 years	Male	12/04/2015	Road Traffic accident	19/05/2015
7)	42 years	Female	6/03/2015	Road Traffic accident	10/03/2015

Index	Age	Sex	Date of injury	Mode of injury	Date of surgery
8)	41 years	Male	20/01/2015	Fall of heavy object	25/01/2015
9)	21 years	Male	20/06/2015	Road traffic accident	27/06/2015
10)	33 years	Male	23/02/2015	Road traffic accident	28/02/2015



Preoperative X-ray



Postoperative X-ray

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