Case Reports and Series

Rare Lateral Dislocation of the First Metatarsophalangeal Joint: A Case Report and Review of the Literature

Amir Reza Vosoughi, MD 1, Pascal F. Rippstein, MD 2

1 Assistant Professor, Foot and Ankle Surgeon, Bone and Joint Diseases Research Center, Department of Orthopedic Surgery, Shiraz University of Medical Sciences, Shiraz, Iran
2 Chief, Department of Foot and Ankle Surgery, Schulthess Klinik, Zurich, Switzerland

ABSTRACT

Traumatic lateral dislocations of the first metatarsophalangeal (MTP) joint are very rare. A 44-year-old male was referred after a motorcycle to car accident because of an exposed head of the left first metatarsal through a laceration on the medial aspect of the first MTP joint. Radiographs showed a lateral dislocation of the first MTP joint, with concomitant fractures of the neck of the second metatarsal and the base of the third and fourth metatarsal bones. The dislocation was reduced in the emergency department with the patient under conscious sedation after thorough irrigation. At the 1-year postoperative visit, the patient had full painless range of motion of the first and second MTP joints without any complaints. Lateral dislocation of the first MTP joint is an injury usually associated with fracture of the adjacent metatarsals and/or ligamentous injuries. It is easily reducible, with acceptable midterm outcomes.

© 2016 by the American College of Foot and Ankle Surgeons. All rights reserved.

First metatarsophalangeal (MTP) joint dislocation is an infrequent injury of the foot. The most common direction of dislocation of the first MTP joint is dorsally. Dorsal dislocations of the first MTP joint have been well described by Jahss (1,2). Traumatic lateral dislocations of the first MTP joint are very rare. To the best of our knowledge, only 8 cases have been reported in published studies from 1986 to date (3–9). We present another case of lateral dislocation of the first MTP joint and a comprehensive review of the published data.

Case Report

A 44-year-old male presented to the emergency department with a deformed left big toe after a motorcycle to car accident. The exposed head of the first metatarsal through an approximately 5-cm laceration on the medial aspect of the first MTP joint with a skin abrasion on the dorsal side of the midfoot was noted. Dorsoplantar and oblique radiographs of the left foot showed lateral dislocation of the first MTP joint with an intact sesamoid–tendon complex. Also, an obvious fracture of second metatarsal neck and a questionable fracture of the base of the metatarsal bones were seen (Fig. 1). In the emergency department, thorough irrigation, followed by reduction of the first MTP joint was performed with the patient under ankle block anesthesia and conscious sedation (Fig. 2). To diagnose any possible tarsometatarsal injuries or fracture of the base of the metatarsals, a computed tomography scan was requested. Finally, fracture of the third and fourth metatarsal base bones, fracture of the second metatarsal neck, and intact sesamoid bones were diagnosed (Fig. 3).

The patient was transferred to the operating room after he was confirmed to be hemodynamically stable. First, wound irrigation and debridement of the dirty tissues were performed. Exploration of the wound showed an intact sesamoid complex and stripped off medial capsule and ligaments of the first MTP joint from the head of the first metatarsal (Fig. 4). After tight repair of the capsule and ligaments, the joint was completely stable. Because of the stable tarsometatarsal joints found using stress tests with the patient under anesthesia, no fixation for fracture of the base of the metatarsals was performed. Also, reduction of the first MTP joint resulted in acceptable reduction of the neck of the second metatarsal fracture. Hence, no open...
reduction or fixation was performed. A short leg non-weightbearing cast was applied.

At 3 weeks postoperatively, the short cast was changed to a short leg fiberglass walking cast for the next 3 weeks. At 1 year postoperatively, full painless range of motion of the first and second MTP joint, without tenderness, swelling, or crepitation, was apparent. A follow-up radiograph revealed a normal anatomic relationship (Fig. 5). The patient was completely satisfied and could return to his preinjury level of activity as a baker.

Discussion

Lateral dislocation of the first MTP joint is seen very rarely. After searching the PubMed, Embase, and Web-of-Science databases, only 6 case reports regarding lateral dislocation of the first MTP joint were found (3–7,9). Also, another case report in Korean language was detected by searching the image database of Google (8). Piétu (6) described 2 cases with lateral dislocation of the first MTP joint. Finally, we found 8 cases in published studies. The characteristics of all reported cases are listed in the Table.

The proposed mechanism of lateral dislocation of the first MTP joint is direct high-energy valgus trauma to the big toe. Direct trauma...
to the medial of the forefoot resulted in simultaneous fracture, dislocation, or fracture–dislocation of the head or neck of the adjacent metatarsal bones (4–7,9), just as occurred in the present case. Moreover, open dislocations with medial laceration in several reported cases support this mechanism (3,5,6). Medial deviation of the first metatarsal causes enlargement of the first intermetatarsal space and sprain or rupture of the ligaments of the first tarsometatarsal joint (6) or fracture of the base of the adjacent metatarsals as described in the present case. In all reported cases, similar to ours, the sesamoid–conjoined tendon complex was intact, except for in the case reported by Chou (9). The sesamoid fracture in that case might have been an associated fracture caused by direct trauma in a traffic accident.

Our patient reported that bilateral hallux valgus deformities had been present for several years before acute trauma. A hallux valgus angle of 40° and 1-2 intermetatarsal angle of about 17° in the injured left foot (Fig. 5) was found compared with a hallux valgus angle of 31° and 1-2 intermetatarsal angle of about 18° for the uninjured right foot. The increase in the angles resulted from stretching of the medial soft tissues of the first MTP joint. Therefore, an incompetent medial capsuloligamentous complex of the first MTP joint secondary to hallux valgus should be considered as a possible cause because the incompetent complex could not resist the direct valgus force to the big toe.

According to the previous case reports, the short- to midterm outcome of first MTP joint lateral dislocations are good, with an acceptable range of motion and without any local complaints or limitations in shoe wear. However, long-term outcomes have not been reported in published studies. Thus, the possibility of arthritic changes with longer follow-up periods should be considered.

In conclusion, lateral dislocation of the first MTP joint is a very rare injury associated with fracture of the adjacent metatarsals and ligament injuries. Usually, it will be reducible easily, with acceptable midterm outcomes.

**Table**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Age (yr)</th>
<th>Gender</th>
<th>Mechanism</th>
<th>Type</th>
<th>Associated Injury</th>
<th>Reducible</th>
<th>Sesamoid Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henderson et al (3)</td>
<td>19</td>
<td>Male</td>
<td>Motorcycle accident</td>
<td>Open</td>
<td>Big toe; IP joint dislocation</td>
<td>Yes</td>
<td>Intact</td>
</tr>
<tr>
<td>Gale (4)</td>
<td>20</td>
<td>Male</td>
<td>Fall from motorcycle</td>
<td>Open</td>
<td>Fracture of neck of second, third, and fourth metatarsals</td>
<td>Yes</td>
<td>Intact</td>
</tr>
<tr>
<td>Bousselmame et al (5)</td>
<td>24</td>
<td>Male</td>
<td>Motorcycle accident</td>
<td>Open</td>
<td>Fracture of head of second metatarsal</td>
<td>Yes</td>
<td>Intact</td>
</tr>
<tr>
<td>Pietu (6)</td>
<td>23</td>
<td>Female</td>
<td>MVA</td>
<td>Closed</td>
<td>NA</td>
<td>No</td>
<td>Intact</td>
</tr>
<tr>
<td>Kasmaoui et al (7)</td>
<td>28</td>
<td>Male</td>
<td>Traffic accident</td>
<td>Closed</td>
<td>Fracture of neck of second and third metatarsals; first and second Lisfranc joint dislocation</td>
<td>Yes but unstable</td>
<td>Intact</td>
</tr>
<tr>
<td>Yun et al (8)</td>
<td>38</td>
<td>Male</td>
<td>Falling down</td>
<td>Closed</td>
<td>Avulsed bone fragment from proximal phalanx of big toe</td>
<td>Yes</td>
<td>Intact</td>
</tr>
</tbody>
</table>

**Abbreviations:** IP, interphalangeal; MTP, metatarsophalangeal; MVA, motor vehicle accident. Not applicable.
References