

## Case report

# TURF TOE IN A TAEKWANDOO PLAYER: CASE REPORT

Namık Sahin<sup>1</sup>✉, Teoman Atici<sup>1</sup>, Sadik M. Bilgen<sup>2</sup> and Omer F. Bilgen<sup>3</sup>

<sup>1</sup> Clinics of Orthopedics and Traumatology, SSK Hospital, Bursa, Turkey

<sup>2</sup> Clinics of Orthopedics and Traumatology, Sariyer State Hospital, Istanbul, Turkey

<sup>3</sup> Department of Orthopedics and Traumatology, Uludag University, Bursa, Turkey

Received: 05 February 2004 / Accepted: 19 March 2004 / Published (online): 01 June 2004

### ABSTRACT

Metatarsophalangeal joint injuries of great toe termed as ‘turf toe’ can occur in many sportive activities. However, it has not been reported before in taekwondo players. These injuries may result in significant morbidity. Turf toe injuries, which are mainly treated with conservative methods, occasionally require surgery. In this case report, we present a surgically treated turf toe in a taekwondo player.

**KEY WORDS:** Turf toe, taekwondo, treatment, surgery.

### INTRODUCTION

Foot injuries occur in athletic population frequently and delay active participation in sporting events. They are ranked third among the sports injuries and reported to be 5 to 45% by Clanton et al. (1994) and Rodeo (1990). According to Bowers and Martin (1976) the definition of turf toe (TT) is: ‘injury of the great toe metatarsophalangeal (MTP) joint plantar capsuloligamentous complex’, which causes major morbidity by limiting physical activity and training in athletes. The term TT has been used for more specific diagnoses, such as first MTP joint sprain or strain, osteochondral fracture, sesamoiditis, sesamoid fracture, first metatarsal head contusion, first MTP joint dislocation, capsulitis and hallux limitus by physicians and trainers. TT has been divided into three grades by Clanton et al. (1986) in order to be useful as a guideline in planning the treatment and determining the time to be active again.

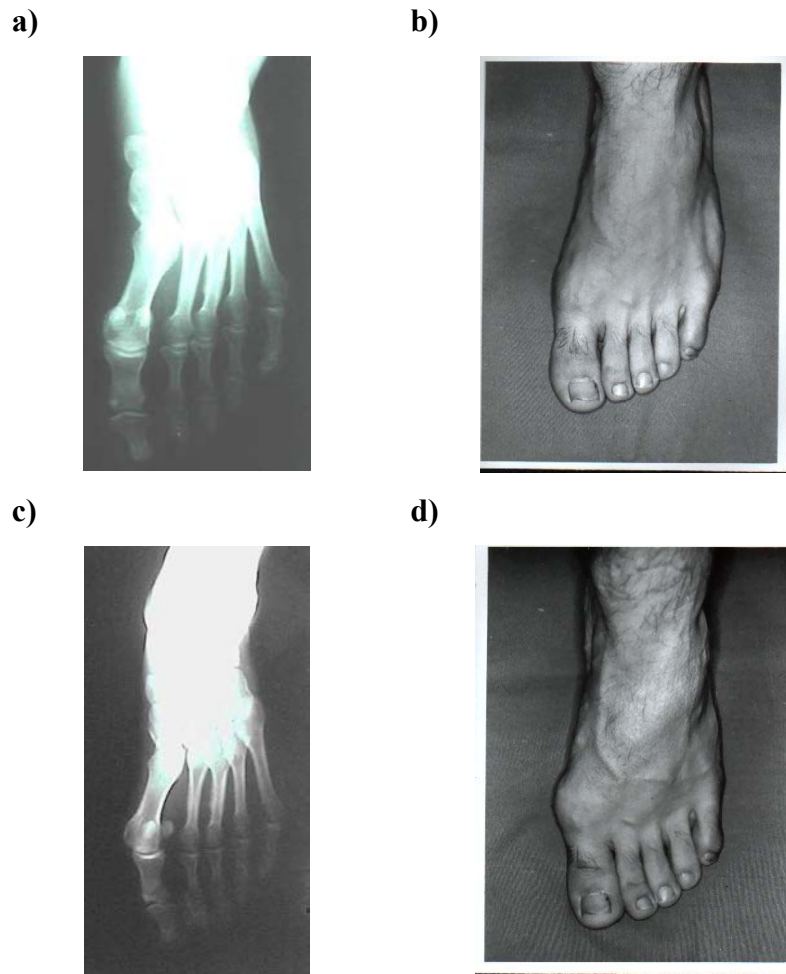
Major predisposing factors in the emergence of this injury are: hard and unyielding playing surfaces that lack the ability to absorb shock and flexible lightweight shoes that do not limit hyperextension of MTP joint. It has been reported that this type of injury occurs mostly in American football and in other sports such as basketball,

football, tennis, gymnastic and wrestling (Coker et al., 1978; Jones and Rainer, 1999; Kubitz, 2003). To treat the TT, in general, conservative methods are used and on rare incidents surgery is indicated (Rodeo et al., 1990; Fahey, 1986; Mullis and Miller, 1980).

Taekwondo, which is defined as the philosophy of kicks and punches, is one of the leading Olympic sports in many countries. TT injury may occur in this sporting activity practiced with bare foot on artificial surfaces and where the MTP joint is forced into hyperextension. To date, TT injury has not been reported in taekwondo players and in particular, it has rarely been treated with surgery in other cases.

### CASE REPORT

A 19-year-old male taekwondo player applied to our clinic in February 2002, complaining of pain and discomfort in the left foot great toe. The injury occurred as attempting to kick with the right foot in which the MTP joint was stressed in hyperextension and valgus position on left bare foot. The patient reported that he was subjected to different treatments for the last year, and the result was not satisfactory enough to resume sporting activities. After physical and radiological examinations, it was found that a

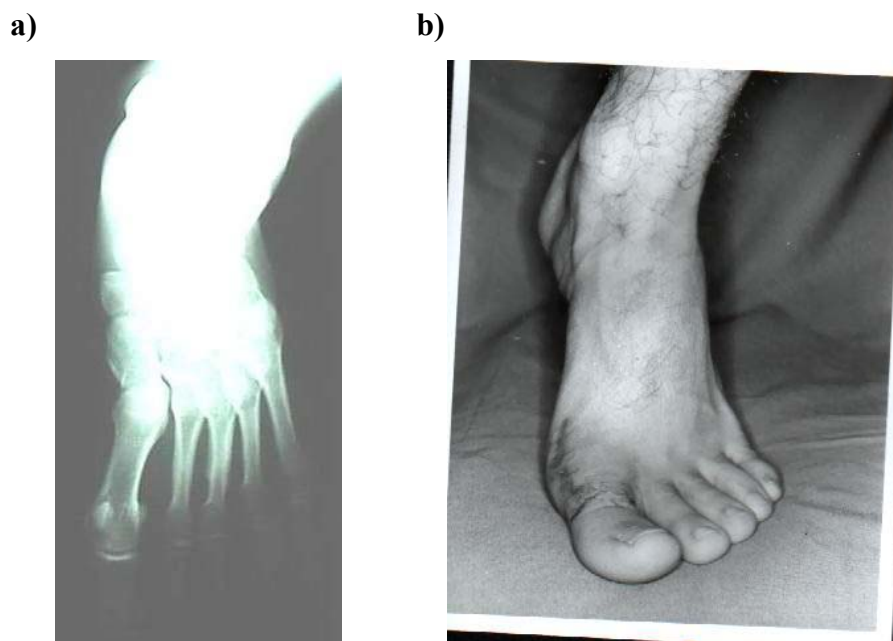


**Figure 1.** Preop clinical and radiological appearance of the case. a, b) Radiological and clinical appearance of the foot without weight bearing. c, d) Radiological and clinical appearance of MTP joint instability formed by weight bearing.



**Figure 2.** On the preop MR imaging of the case fluid collection and edema are seen in the surrounding MCL foot I. MTP joint level and osseous structure appear intact.

severe pain and noticeable posteromedial instability developed in great toe when MTP joint was forced into hyperextension under weight bearing (Figure 1 a-d). The patient was given conservative treatment with compressive bandage and non-steroid anti-inflammatory drugs and was asked not to participate in sporting activities. At the end of six month, there was no improvement. On the contrary, an edema was diagnosed around soft tissues of the first MTP joint by MRI, but no contusion in osseous structures (Figure 2). Since the pain and instability did not respond to conservative treatment, surgery was performed in November 2002. During surgery laxity in medial collateral ligament and in capsuloligamentous complex, and posteromedial instability in MTP joint were observed. During surgery T-shaped incision was performed on capsuloligamentous complex medially. Plantar part of capsuloligamentous complex was stitched to its superior part and the dorsal part on to the plantar part. In this way augmentation of capsule was achieved. Following the surgery compressive dressing was applied for three weeks, and the patient



**Figure 3.** Postop clinical and radiological appearance of the case. a) Radiological appearance of the foot with weight bearing. b) Clinical appearance of the foot with weight bearing. Clinical and radiological appearance of the foot after instability has been restored.

was allowed to practice partial weight bearing during this time. Subsequently, he was able to perform full weight bearing and total range of motion exercises. At the end of third month, on his physical examination, no pain was observed and adequate stability in the joint was confirmed, which allowed the patient to resume his exercises. The physical examination at the end of tenth month revealed that the patient had neither complaints nor symptoms, and therefore he was recommended to continue his sporting activities as he sees appropriate (Figure 3 a, b).

## DISCUSSION

Foot injuries are one of the important problems that delay to restart training, especially among professional elite athletes. TT, which was accepted as the injury of the plantar capsuloligamentous complex in the MTP joint of great toe by American Orthopedic Foot and Ankle Society in 1990, may at a later stage lead to decrease in push off power and the formation of hallux rigidus, hallux valgus, arthrofibrosis and intraarticular free fragment (Coker et al. 1978; Coughlin and Karpman, 1990; Clanton and Ford, 1994; Watson et al., 2000).

Incidentally, successful treatment protocol may provide faster return to sport. In addition to standard radiographic methods, MR imaging techniques could be beneficial in grading the injury. MR investigation revealed a marked soft tissue

edema in plantar surfaces, edema in flexor hallucis longus tendon, tear in plantar capsule and increased signal intensity in oblique head of adductor hallucis and flexor hallucis brevis, intact osseous structure (Tewers et al., 1994; Ashman et al., 2001). In the present study MRI of the patient who failed to return to sport despite a long conservative treatment period, revealed fluid collection and edema in medial collateral ligament (MCL) and no contusion in osseous structure.

TT injuries, which are generally treated with conservative methods, rarely require surgery. Clanton et al. (1986) reported that in 50% of 20 athletes with TT whom they monitored over five years, the symptoms were persistent. Aggressive treatment may be given subsequent to conservative treatment when chronic pain, limitations of movements and discomfort with exercise has developed. Repairing the capsule and plantar plate surgically, sesamoidectomy and excision of loose bodies, if there is any, are the methods those are recommended (Coker et al., 1978; Mullis and Miller 1980; Coughlin and Karpman, 1990; Graves et al.1991; Rodeo et al., 1993; Watson 2000; Title and Katchis, 2002).

Graves et al. (1991) reported four cases with plantar plate injury to the first MTP joint and proximal retraction of the sesamoids by the flexor hallucis brevis. After being treated conservatively, two of the patients returned to preinjury activities. One patient required sesamoidectomy for persistent pain and the final patient is still unable to return to

his preinjury job requiring standing and lifting heavy objects.

Coker et al. (1978) stated that the capsular tear is the main pathology in this type of injury, suggesting the need for surgical repair in chronic cases. Rodeo et al. (1990) reported that TT cases, who were treated with distal sesamoid excision and capsule repair returned to sporting activities without problems. Mullis and Miller (1980) reported that they did not receive any respond to conservative treatment and observed the tear off adductor tendon, lateral capsule and lateral collateral ligament in a basketball player and subsequently performed a late stage surgical repair, as the result of which the symptoms disappeared.

In our case, since there was no receding in pain and posteromedial instability by conservative treatment, subsequently capsular plication and augmentation were performed in capsule-ligamentous complex on medial side and the athlete managed to return to sporting activities by the end of the third month.

## CONCLUSION

In a taekwondo player, great toe MTP joint injury may occur when the joint is forced into hyperextension repeatedly if the exercise is being performed bare foot on hard and artificial surfaces. We are of the opinion that in those cases who have not responded to conservative treatment, surgical repair focused on the reconstruction of primary pathology should be taken into consideration as a choice of treatment.

## REFERENCES

- Ashman, C.J., Klecker, R.J. and Yu, J.S. (2001) Forefoot pain involving the metatarsal region: Differential diagnosis with MR imaging. *Radiographics* **21**, 1425-1440.
- Bowers, K.D. and Martin, R.B. (1976) Turf-toe: A shoe-surface related football injury. *Medicine and Science in Sports* **8**, 81-86.
- Coughlin, M. and Karpman, R.R. (1990) Sesamoid pathology of the hallux and Turf Toe. Review course. In: *Surgery of the Foot and Ankle*. Ed: Coughlin, M., Karpman, R.R. Rosemont, IL, American Orthopaedic Foot and Ankle Society 415.
- Clanton, T.O., Butler, J.E. and Eggert, A. (1986) Injuries to the metatarsophalangeal joints in athletes. *Foot and Ankle Clinics* **7**, 162-169
- Clanton, T.O. and Ford, J.J. (1994) Turf Toe injury. *Clinics in Sports Medicine* **13**, 731-735.
- Coker, T.P., Arnold, J.A. and Weber, D.L. (1978) Traumatic lesions of the metatarsophalangeal joint of the great toe in athletes. *The American Journal of Sports Medicine* **6**, 326-331.
- Fahey, T. (1986) *Athletic training: Principles and practice*. Mayfield Publishing Company. Palo Alto, 410.
- Hockenbury RT. (1999) Forefoot problems in athletes. *Medicine and Science in Sports and Exercise* **31(7 Suppl)**, 448-458.
- Graves, S.C., Prieskorn D. and Mann R.A. (1991) Posttraumatic proximal migration of the first metatarsophalangeal joint sesamoids : a report of four cases. *Foot and Ankle Clinics* **12**, 117-122.
- Jones, D.C. and Rainer, M.R. (1999) Turf toe. *Foot and Ankle Clinics* **4**, 911-916.
- Kubitz, E.R. (2003) Athletic Injuries of the First Metatarsophalangeal Joint. *Journal of The American Podiatric Medical Association* **4**, 325-332.
- Mullis, D.L. and Miller, W.E. (1980) A Disabling Sports Injury of the Great Toe. *Foot and Ankle Clinics* **1**, 22-25.
- Rodeo, S.A., O'Brien, S. and Warren, D.L. (1990) Turf-Toe: an analysis of metatarsophalangeal joint sprains in professional football players. *The American Journal of Sports Medicine* **18**, 280-285.
- Rodeo, S.A., Warren, R.F. and O'Brien, S.J. (1993) Diastasis of bipartite sesamoids of the first metatarsophalangeal joint. *Foot and Ankle Clinics* **14**, 925-934.
- Tewes, D.P., Fischer, D.A., Fritts, H.M. and Guanche, C.A. (1994) MRI findings of acute Turf Toe. *Clinical Orthopaedics and Related Research* **304**, 200-203.
- Title C.I. and Katchis S.D. (2002) Traumatic foot and ankle injuries in the athlete: Acute athletic trauma. *Orthopedic Clinics of North America* **33**, 587-598.
- Watson, T.S., Anderson, R.B., Davis, W.H. (2000) Periarticular injuries to the hallux metatarsophalangeal joint in athletes. *Foot and Ankle Clinics* **5**, 687-713.

## AUTHORS BIOGRAPHY

### Namık SAHİN

#### Employment

Orthopedic Surgeon, Clinics of Orthopedics and Traumatology, SSK Hospital, Bursa, Turkey

#### Degree

MD

**E-mail:** namiksahin@yahoo.com

### Teoman ATICI

#### Employment

Orthopedic Surgeon, Clinics of Orthopedics and Traumatology, SSK Hospital, Bursa, Turkey

#### Degree

MD

### Sadik M. BILGEN

#### Employment

Orthopedic Surgeon, Clinics of Orthopedics and Traumatology, Saryyer State Hospital, Istanbul, Turkey

#### Degree

MD

---

**Omer Faruk BILGEN****Employment**

Orthopedic Surgeon, Department of Orthopedics and Traumatology, Uludag University, Bursa, Turkey

**Degrees**

Prof., MD.

**E-mail:** ofbilgen@uludag.edu.tr

---

**KEY POINTS**

- MTP joint injury may occur when the joint is forced into hyperextension repeatedly if the exercise is being performed bare foot on hard and artificial surfaces.
- Surgery should be taken into consideration as a choice of treatment of Turf Toe.

**✉ Dr. Namık Sahin**

Sehreküstü Mh. Cemal Nadir Cd. No: 6/2 Bursa, Turkey