

Case 57 What is the diagnosis?

Insidious onset forefoot pain in a 50 year old female for last 3 months.



Diagnosis: II MTP instability

Demographics of MT instability

Lesser MTP joint instability occurs much more commonly than has been recognized previously.

The most frequent presentation of this deformity occurs in older sedentary women. However, Coughlin reported this to occur in the younger male athletic population. Age: 55 to 69

> 86% were women

They observed the presence of hallux valgus in nearly 50% of cases, hallux rigidus in 14%, and hallux varus in 7%.

Although many reports on plantar plate insufficiency have indicated it occurs almost universally at the second MTP joint. Some study: 64% II toes; 32% III and 4% in IV

Main Pathology

The plantar plate has a firm, thick fibrocartilage insertion on the proximal phalanx and a loose thinner one on the plantar neck of the metatarsal consisting mostly of synovial tissue. It has an average thickness of 2 mm in its central portion, being constituted primarily of type I collagen (75%).

Despite the strong insertion onto the proximal phalanx, most plantar plate ruptures occur at the middle and distal regions.

Etiology

Acute trauma, high-fashion shoe wear, rheumatoid arthritis, and other various inflammatory conditions been blamed.

Now: A degenerative tear of the plantar plate as a definitive cause of this deformity has now been well documented as the primary pathology [Foot Ankle Clin N Am 19 (2014) 385–405]

Coughlin [Foot & Ankle International/Vol. 33, No. 4/April 2012]

10% of the patients attributed their symptoms to trauma [sports injury]

60%, all of them women, attributed their condition to the long time use of high fashion shoe-wear.

The other 30% of the patients: insidious

Clinical Features

Early: Pain in and around the lesser MTP joints is a common complaint that is difficult to diagnose especially when there is no obvious deformity.

Patients may describe the feeling of a mass, or “walking on a marble.” The pain is accentuated with ambulation and is reduced with rest. In the early stages of plantar plate attenuation, only swelling with no deformity may be present.

With time, however, the capsule and ligaments, and the intrinsic musculature lose their capacity to compensate for the torn plantar plate and progressive deformity develops. As the deformity progresses, the second toe may cross either under or, more often, over the hallux, especially in the presence of a hallux valgus deformity.

Development of a callosity beneath the involved MTP joint was uncommon

Clinical Grading

Table 1 Clinical staging of examination for second MTP joint instability		
Grade	Alignment	Physical Examination
0	No MTP joint malalignment; prodromal phase with pain but no deformity	MTP joint pain, thickening or swelling of the MTP joint, diminished toe purchase, negative drawer
1	Mild malalignment of MTP joint; widening of the webspace, medial deviation	MTP joint pain, swelling of MTP joint, reduced toe purchase, mildly positive drawer (<50% subluxable)
2	Moderate malalignment; medial, lateral, dorsal, or dorsomedial deformity, hyperextension of the MTP joint	MTP joint pain, reduced swelling, no toe purchase, moderately positive drawer (>50% subluxable)
3	Severe malalignment; dorsal or dorsomedial deformity; the second toe can overlap the hallux; may have flexible hammertoe	Joint and toe pain, little swelling, no toe purchase (dislocatable MTP joint), flexible hammertoe
4	Dorsomedial or dorsal dislocation; severe deformity with dislocation, fixed hammertoe deformity	Joint and toe pain, little if any swelling, no toe purchase, dislocatable MTP joint, fixed hammertoe deformity

Specific Tests

1. Drawer Test

Joint stability: The stability of the lesser MTP joint was determined with the “drawer test.”

With the involved toe dorsiflexed 25 degrees at the MTP joint, the vertical stress test was performed.

Classified

Stage 0 = stable joint,

1 = mild instability (<50% subluxable),

2 = moderate instability (>50% subluxable),

3 = gross instability (dislocatable joint),

4 = dislocated joint.

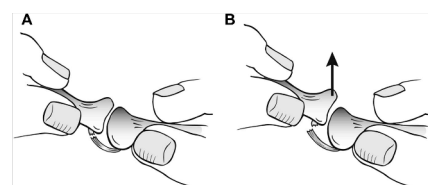
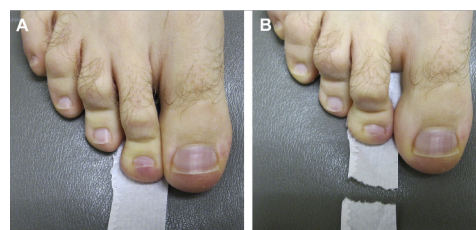


Fig. 5. Drawer test. (A) The toe is grasped by the examiner. (B) Dorsally directed force causes pain and subluxation at the MTP joint. Arrow denotes dorsal subluxation of the proximal phalanx on the lesser metatarsal head.

2. Toe Purchase test

Toe purchase: The strength of toe touch on the ground or digital purchase was evaluated using the “paper pullout test.”⁶ With the patient standing, a narrow strip of paper (1 cm wide by 8 cm long) was placed beneath the affected toe, and the patient was asked to plantarflex the digit. If the patient was able to prevent the paper strip from being pulled out from beneath the digit, this was considered a positive test.

When the patient was able to resist in some way the pulling out of the paper strip but not so efficiently so that the paper could be removed, the result was considered reduced, and when the power exerted on the paper strip was so weak so that it could be easily removed, the test was considered negative. In this study, both “reduced” and “negative” findings were grouped as a “negative” toe purchase test.



g. 6. Paper pull-out test. (A) A slip of paper is placed beneath the affected digit. (B) With plantar flexion pressure at the digit, tearing of the paper denotes adequate strength.

3. **Cross over toe:** the end result of instability of the metatarsophalangeal (MTP) joint,



culminates in sagittal and coronal plane deformity

Investigations

1. X rays :

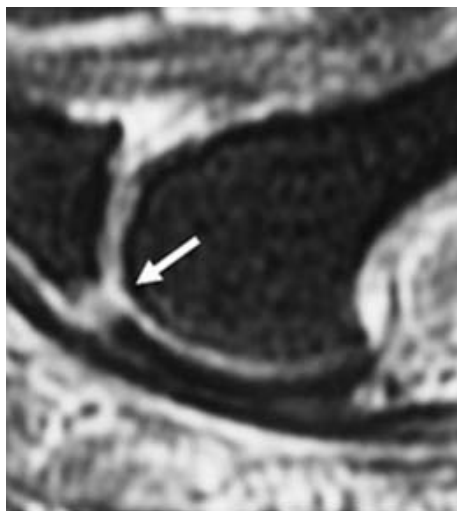


Figure 7-30

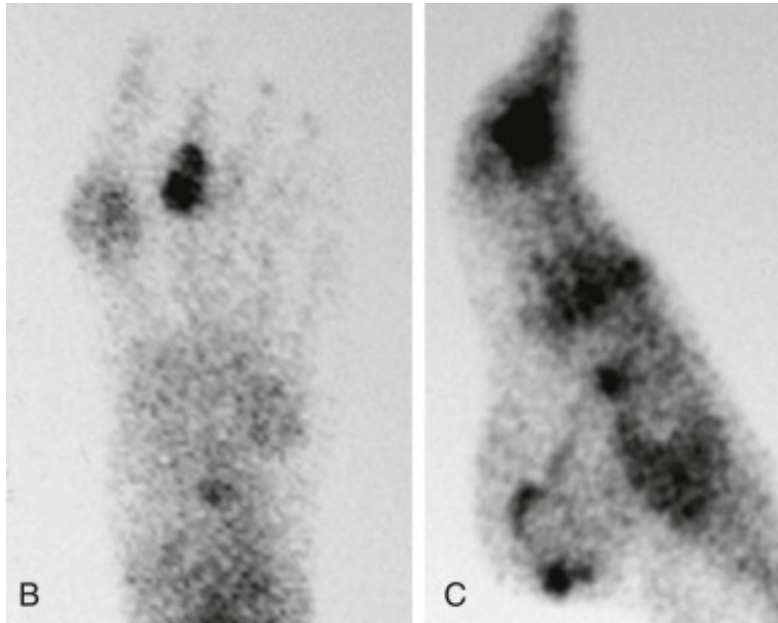
A, A 52-year-old man with pain at the second metatarsophalangeal (MTP) joint and a slight hallux valgus deformity. **B**, Six-month follow-up demonstrates narrowing of the joint space, pathognomonic of a hyperextension deformity. Often subluxation can occur insidiously. **C**, At 15-month follow-up, the second MTP joint has dislocated.

2. Ultrasound: Does show discontinuity in the plantar plate

3. MRI: Gold Standard



4. Bone Scan



5. Athroscopy using 2.7 telescope

Treatment

Nonoperative

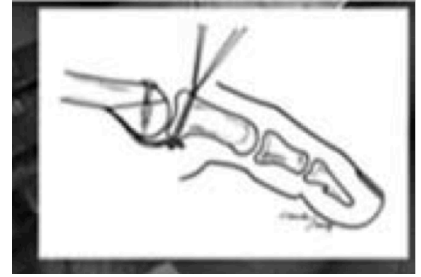
Rest, padding, taping or injections may eliminate the symptoms
This does not achieve correction or realignment of the deformity.



Figure 7-26
A, With a hammer toe deformity, a callus has developed at the tip of the second toe. B, A toe cradle. C, The cradle is used to decrease pressure beneath the tip of the lesser toe.

Operative

Coughlin: Through a dorsal approach, the direct plantar plate repair + a Weil osteotomy +lateral soft tissue reefing can restore the normal alignment of the MTP joint. [Foot & Ankle International/Vol. 33, No. 4/April 2012] Grade I-III. Approach: Dorsal



Grade IV: combine the flexor to extensor transfer

References

- Foot & Ankle International/Vol. 33, No. 4/April 2012 :301
- Foot & Ankle International 35(9) 876, 2014
- Foot Ankle Clin N Am 19 (2014) 385–405