

rheumatoid arthritis, and irritation of a bursa.⁴

Morton's toe is found mostly in middle-aged women, with a male/female ratio of 1: 8. This strong predilection most likely reflects the use of pointed high heels by women.^{5,6} Viladot reported that the age of occurrence ranges from 25 to 50 years, while Greenfield et al. mentioned an average age of 58 years.^{7,8} Many cases of Morton's toe have been reported in Europe and the USA,^{7,9-12} but clinical studies in Taiwan are rare.

Evaluation of patients with suspected Morton's toe requires differential diagnosis from diseases with similar manifestations, such as bursitis and diabetic neuritis. While this disease is often diagnosed clinically on the basis of patient characteristics (e.g., age, sex) and symptoms; magnetic resonance (MR) imaging, sonography, and evaluation of sensory action potentials (SAP) are sometimes needed to confirm the diagnosis. The presence of Mulder's click on the lateral squeeze test is considered diagnostically significant.¹³⁻¹⁵ This clicking may also be caused by an adventitious bursa that forms in close association with the neuroma between the metatarsal heads, and a differential diagnosis is easily made with history taking.⁴ Conservative treatment is usually preferred in patients with Morton's toe, although surgery is recommended when conservative treatment fails. To the best of our knowledge, a formal diagnosis and management guideline⁵ for Morton's toe have not been reported.

The purpose of this report is to present the clinical outcomes of patients undergoing surgery after failed conservative treatment for Morton's toe, and to propose a new diagnosis and management scheme for this disease.

PATIENTS AND METHODS

The flowchart for diagnosis and management of Morton's toe used in this study is illustrated in Fig. 5. This scheme was used for treatment and diagnosis in patients with suspected Morton's toe seen in our department from April 1990 through February 1994, although only those who underwent surgical correction of Morton's toe were included in the analyses in this

study. Patients with suspected Morton's toe might include a) a possible Morton's toe, and b) relative, uncertain "Morton's toe-like disease" such as bursitis, diabetic neuritis, etc. The indication of suspected Morton's toe for performance of the lateral squeeze test were a) greater occurrence in females; b) pain localized in the third and fourth toes; c) pain sharp and electric in character; and d) paresthesia.

Patients with suspected Morton's toe (history taking and chief complaint) underwent further study with the lateral squeeze test, as illustrated in Fig. 1. A positive result (Mulder's click and electrical pain) on the lateral squeeze test, along with a history consistent with Mor-



Fig. 1. Lateral squeeze test: a technique for palpating Morton's neuroma.

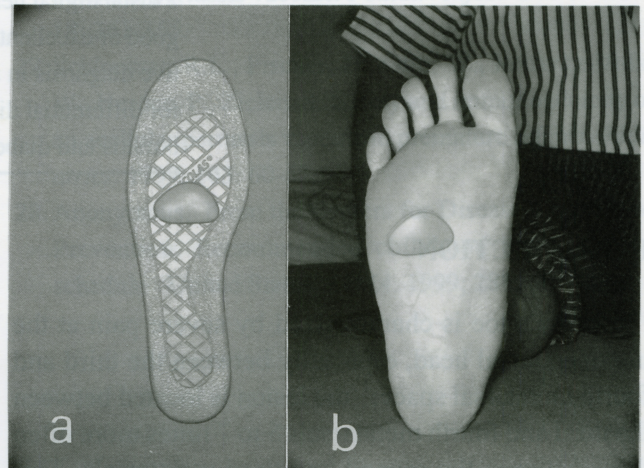


Fig. 2. (a) Attachment of a beveled metatarsal pad to a shock-absorbing insole. (b) Beveled metatarsal pad for relief of Morton's neuroma.