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Minimally Invasive Surgery in the Foot & Ankle



What is minimally invasive surgery? ^{1,2,3}

There are different terms associated with Minimally Invasive Surgery (MIS).

1. Percutaneous surgery: Surgery performed within the smallest possible working incision in a closed procedure, ie underneath intact skin
2. Minimal incision surgery: Surgery performed through the smallest incision necessary to perform the procedure properly
3. Minimally invasive surgery: Surgery performed with minimum injury to the surrounding structures

No matter what name we are using, the advantages of MIS:

- Minimum injury to adjacent tissue
- Reduced post-operative morbidity
- Enhanced rehabilitation progress

History and development of MIS in the Foot & Ankle ²

In 1945, Podiatrist Dr Morton M Polokoff first described subdermal surgery using fine instruments. In the 1970s the concept of MIS was spread among North American Podiatrists. In the 1980s US surgeon Dr Stephen Isham developed forefoot procedures using MIS techniques. In the 1990s Dr Mariano de Prado broadened the indications and developed the procedures in Spain.

Organisation of MIS Foot & Ankle Surgery ²

In the USA there is the Academy of Ambulatory Foot and Ankle Surgery. In Europe, GRECMIP (Group of Research and Study in Mini-Invasive Surgery of the Foot and Ankle) was formed in Bordeaux in 2002. Both organisations have developed percutaneous surgery, ankle related arthroscopy and computer assisted surgery. Hong Kong has close ties with GRECMIP.

Clinical application in Hong Kong

Hallux valgus ^{1,2,3,4} (Bunion)

There are over 100 surgical treatment methods for symptomatic bunion.

One recently developed MIS method ^{4,5} is Percutaneous Distal Chevron Osteotomy of the 1st metatarsal bone, with internal fixation, to treat mild to moderate severity bunions. Using this method, there are only a few tiny wounds over the dorsum of the foot. This method has decreased post-operation complications such as wound infection, wound pain and is cosmetically more acceptable because of the smaller scars.

For severe bunions, we may use multiple percutaneous osteotomies to correct the deformity.

Hallux Rigidus ^{1,2,3}

The term means 'stiffness of the great toe', but is usually caused by osteoarthritis. The motion of the 1st Metatarsophalangeal joint is decreased which affects walking and can be very uncomfortable. We can use a tiny wound to decompress the joint, to remove the osteophytes (Percutaneous Cheilectomy) ^{1,2} and improve the motion of the toe.

Metatarsalgia ^{1,2,3,6}

Metatarsalgia is a general term which describes pain over the metatarsal heads or metatarsophalangeal joints. Usually the cause is too much load on the metatarsal heads, and in severe cases there are painful plantar callosities over the metatarsal heads which affect walking. We can perform distal metatarsal minimally invasive osteotomy (DMMO) ^{1,2,6} to realign the metatarsals to relieve the pain.

Plantar Fasciitis ^{3,7}

Plantar Fasciitis is a common problem in the general population. Classical symptom is heel pain on weightbearing or initiation of first few steps of walking. Most of the patients recover with medication, orthoses, plantar fascia stretching exercises and weight reduction. For resistant cases, we can offer endoscopic plantar fascia release⁷ to release the symptomatic part of plantar fascia to relieve the pain.

Arthroscopic and endoscopic applications in the foot and ankle region ^{3,5,8,9,10,11}

Arthroscopic techniques ^{5,8,11} provide a far superior view to open techniques, and have become the standard of care for many procedures:

- Anterior and posterior ankle impingement
- Osteochondral lesion or loose body inside ankle, subtalar ¹⁰, Metatarsophalangeal joints ⁸
- Synovitis of foot and ankle joints
- Ankle, subtalar, midfoot and forefoot degenerative disease

Tendoscopy application for tendinopathy in the foot and ankle region ^{3,5,11,12,13,14}

The tendons of the foot & ankle have a hard life, and can be injured or degenerate. A new technique of tendoscopy allows an excellent view without the conventional long incisions, and allows treatment of some conditions.

- Achilles tendon ¹³
- Tibialis posterior tendon ¹⁴
- Flexor hallucis longus ¹¹
- Peroneal tendons ¹²

Reference

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