41 T_h e foot and ankle

ANATOMY

ANATOMY

There are 26 (25 with variant) main bones in the foot (seven tarsal bones, five metatarsals and 14 phalanges [13 in the biphalangeal fifth toe variant]) plus the two sesamoids of the hallux and a variable number of other sesamoid and accessory bones. Movements at the ankle joint are mainly dorsiflexion and plantarflexion, but are more complex than this. The joint is actually a truncated section of a cone, meaning that the motion is not simply a hinge; in addition, movement of the ankle leads to rotation of the fib ula at the syndesmosis. This means that the foot externally rotates with dorsiflexion and internally rotates with plantarflexion. Stability is conferred upon the ankle by the congruence of the mortice and the integrity of principally the medial, lateral and inferior tibiofibular ligaments. The subtalar joint is divided into anterior, middle and posterior facets and, along with the talonavicular and calca neocuboid joints, makes up the triple joint complex. These joints are responsible f or inversion and eversion of the hind- and midfoot. The joints are co-dependent such that limitation of one a ff ects movement at the others. Fusion of the triple complex slightly a ff ects movement at the ankle and vice versa. The second tarsometatarsal (TMT) joint is recessed relative to the first and third and acts as a ‘keystone’. Disruption of this joint (Lisfranc’s injury) leads to loss of the transverse arch and an acquired flat foot. The lower leg is divided into f our compartments: /uni25CF the superficial posterior – gastrocnemius, soleus and plantaris; Jacques Lisfranc , 1790–1847, Professor of Surgery and Operative Medicine, Paris, France. /uni25CF the deep posterior – tibialis posterior, flexor digitorum longus and flexor hallucis longus (FHL); /uni25CF the lateral – peroneus brevis and peroneus longus; /uni25CF the anterior – tibialis anterior, extensor hallucis longus, extensor digitorum longus and peroneus tertius. There is only one muscle on the dorsum of the foot, the extensor digitorum brevis. The muscles on the plantar aspect of the foot are divided into four layers, the first being the most superficial, and the course of the neur ovascular structures is a favourite examination topic. The plantar fascia is a very important structure that takes its origin from the heel and inserts into the bases of the proximal phalanges of the toes. At toe-o ff , the fascia tightens and accentuates the medial plantar arch and helps provide a rigid lever arm, the so-called ‘windlass mechanism’. This is essential in the preservation of the integ - rity of the arch of the foot and function of the toes. The blood supply of the foot is from the anterior tibial, the posterior tibial and the peroneal arteries. The following nerves - supply sensation to the foot: posterior tibial, saphenous, sural, superficial and deep peroneal (Figure 41.1). Summary box 41.1 Anatomy of the foot /uni25CF /uni25CF /uni25CF

The principles behind the treatment of each condition, be • it conservative or surgical The signi /f_i cance of progressive neurological diseases • There are 26 major bones in the foot There are four layers of muscles in the sole of the foot The blood supply of the foot is from the anterior and posterior tibial arteries plus the peroneal artery

or medial plantar nerve (from tibial nerve) Medial plantar nerve (branch of tibial nerve) Lateral plantar branch of medial plantar nerve (branch of tibial nerve) Sural nerve Saphenous nerve Super

/f_i cial peroneal nerve Medial calcaneal nerve (tibial nerve) Lateral plantar nerve Figure 41.1 Cutaneous nerve supply of the foot (courtesy of Bartleby.com).

ANATOMY

There are 26 (25 with variant) main bones in the foot (seven tarsal bones, five metatarsals and 14 phalanges [13 in the biphalangeal fifth toe variant]) plus the two sesamoids of the hallux and a variable number of other sesamoid and accessory bones. Movements at the ankle joint are mainly dorsiflexion and plantarflexion, but are more complex than this. The joint is actually a truncated section of a cone, meaning that the motion is not simply a hinge; in addition, movement of the ankle leads to rotation of the fib ula at the syndesmosis. This means that the foot externally rotates with dorsiflexion and internally rotates with plantarflexion. Stability is conferred upon the ankle by the congruence of the mortice and the integrity of principally the medial, lateral and inferior tibiofibular ligaments. The subtalar joint is divided into anterior, middle and posterior facets and, along with the talonavicular and calca neocuboid joints, makes up the triple joint complex. These joints are responsible f or inversion and eversion of the hind- and midfoot. The joints are co-dependent such that limitation of one a ff ects movement at the others. Fusion of the triple complex slightly a ff ects movement at the ankle and vice versa. The second tarsometatarsal (TMT) joint is recessed relative to the first and third and acts as a ‘keystone’. Disruption of this joint (Lisfranc’s injury) leads to loss of the transverse arch and an acquired flat foot. The lower leg is divided into f our compartments: /uni25CF the superficial posterior – gastrocnemius, soleus and plantaris; Jacques Lisfranc , 1790–1847, Professor of Surgery and Operative Medicine, Paris, France. /uni25CF the deep posterior – tibialis posterior, flexor digitorum longus and flexor hallucis longus (FHL); /uni25CF the lateral – peroneus brevis and peroneus longus; /uni25CF the anterior – tibialis anterior, extensor hallucis longus, extensor digitorum longus and peroneus tertius. There is only one muscle on the dorsum of the foot, the extensor digitorum brevis. The muscles on the plantar aspect of the foot are divided into four layers, the first being the most superficial, and the course of the neur ovascular structures is a favourite examination topic. The plantar fascia is a very important structure that takes its origin from the heel and inserts into the bases of the proximal phalanges of the toes. At toe-o ff , the fascia tightens and accentuates the medial plantar arch and helps provide a rigid lever arm, the so-called ‘windlass mechanism’. This is essential in the preservation of the integ - rity of the arch of the foot and function of the toes. The blood supply of the foot is from the anterior tibial, the posterior tibial and the peroneal arteries. The following nerves - supply sensation to the foot: posterior tibial, saphenous, sural, superficial and deep peroneal (Figure 41.1). Summary box 41.1 Anatomy of the foot /uni25CF /uni25CF /uni25CF

The principles behind the treatment of each condition, be • it conservative or surgical The signi /f_i cance of progressive neurological diseases • There are 26 major bones in the foot There are four layers of muscles in the sole of the foot The blood supply of the foot is from the anterior and posterior tibial arteries plus the peroneal artery

or medial plantar nerve (from tibial nerve) Medial plantar nerve (branch of tibial nerve) Lateral plantar branch of medial plantar nerve (branch of tibial nerve) Sural nerve Saphenous nerve Super /f_i cial peroneal nerve Medial calcaneal nerve (tibial nerve) Lateral plantar nerve Figure 41.1 Cutaneous nerve supply of the foot (courtesy of Bartleby.com).

ANATOMY

There are 26 (25 with variant) main bones in the foot (seven tarsal bones, five metatarsals and 14 phalanges [13 in the biphalangeal fifth toe variant]) plus the two sesamoids of the hallux and a variable number of other sesamoid and accessory bones. Movements at the ankle joint are mainly dorsiflexion and plantarflexion, but are more complex than this. The joint is actually a truncated section of a cone, meaning that the motion is not simply a hinge; in addition, movement of the ankle leads to rotation of the fib ula at the syndesmosis. This means that the foot externally rotates with dorsiflexion and internally rotates with plantarflexion. Stability is conferred upon the ankle by the congruence of the mortice and the integrity of principally the medial, lateral and inferior tibiofibular ligaments. The subtalar joint is divided into anterior, middle and posterior facets and, along with the talonavicular and calca neocuboid joints, makes up the triple joint complex. These joints are responsible f or inversion and eversion of the hind- and midfoot. The joints are co-dependent such that limitation of one a ff ects movement at the others. Fusion of the triple complex slightly a ff ects movement at the ankle and vice versa. The second tarsometatarsal (TMT) joint is recessed relative to the first and third and acts as a ‘keystone’. Disruption of this joint (Lisfranc’s injury) leads to loss of the transverse arch and an acquired flat foot. The lower leg is divided into f our compartments: /uni25CF the superficial posterior – gastrocnemius, soleus and plantaris; Jacques Lisfranc , 1790–1847, Professor of Surgery and Operative Medicine, Paris, France. /uni25CF the deep posterior – tibialis posterior, flexor digitorum longus and flexor hallucis longus (FHL); /uni25CF the lateral – peroneus brevis and peroneus longus; /uni25CF the anterior – tibialis anterior, extensor hallucis longus, extensor digitorum longus and peroneus tertius. There is only one muscle on the dorsum of the foot, the extensor digitorum brevis. The muscles on the plantar aspect of the foot are divided into four layers, the first being the most superficial, and the course of the neur ovascular structures is a favourite examination topic. The plantar fascia is a very important structure that takes its origin from the heel and inserts into the bases of the proximal phalanges of the toes. At toe-o ff , the fascia tightens and accentuates the medial plantar arch and helps provide a rigid lever arm, the so-called ‘windlass mechanism’. This is essential in the preservation of the integ - rity of the arch of the foot and function of the toes. The blood supply of the foot is from the anterior tibial, the posterior tibial and the peroneal arteries. The following nerves - supply sensation to the foot: posterior tibial, saphenous, sural, superficial and deep peroneal (Figure 41.1). Summary box 41.1 Anatomy of the foot /uni25CF /uni25CF /uni25CF

The principles behind the treatment of each condition, be • it conservative or surgical The signi /f_i cance of progressive neurological diseases • There are 26 major bones in the foot There are four layers of muscles in the sole of the foot The blood supply of the foot is from the anterior and posterior tibial arteries plus the peroneal artery

or medial plantar nerve (from tibial nerve) Medial plantar nerve (branch of tibial nerve) Lateral plantar branch of medial plantar nerve (branch of tibial nerve) Sural nerve Saphenous nerve Super /f_i cial peroneal nerve Medial calcaneal nerve (tibial nerve) Lateral plantar nerve Figure 41.1 Cutaneous nerve supply of the foot (courtesy of Bartleby.com).

Acquired flat foot

Acquired flat foot

There is a wide range of normal appearance of adult feet. Pathological causes of a flat foot include: /uni25CF tibialis posterior tendon dysfunction; /uni25CF tarsometatarsal arthritis/injury (Figure 41.8); /uni25CF Charcot neuroarthropathy , e.g. diabetes (see Diabetes /uni25CF inflammatory/degenerative arthritis of the subtalar/tal onavicular/naviculocuneiform joints; /uni25CF spring ligament rupture; /uni25CF tarsal coalition. Summary box 41.7 Acquired flat foot /uni25CF /uni25CF /uni25CF The tibialis posterior tendon tends to fail in overweight individuals and those who have flat feet. Often, after unaccus tomed exercise, the tendon swells and is painful. The condition occurs mainly in women; the key test, which is that the patient cannot stand on tiptoe on that leg alone, indicates a significant advanced stage tendon problem. Many individuals will require eatment in the form of a medial displacement calca surgical tr neal osteotomy , flexor digitorum longus or FHL tendon trans fer and spring ligament repair. Failure to treat this condition can lead to spectacular deformity (Figure 41.9). in young athletes An acute traumatic flat foot may develop and military recruits after traumatic injury . Examination shows L Broström , described the surgical treatment of chronic ligament ruptures in 1966. a new-onset flat foot but with a functioning tibialis posterior tendon with single-leg tiptoe preserved; here the injury is an isolated spring ligament tear and early surgery prevents late-onset secondary deformity .

Tibialis posterior tendon dysfunction and tarsometatarsal osteoarthritis are common causes of an acquired /f_l at foot Orthoses, rest and non-steroidal anti-in /f_l ammatory drugs (NSAIDs) can help with symptomatic relief Surgery is a major undertaking but is often highly successful at achieving symptomatic relief Figure 41.9 A tibialis posterior tendon-de /f_i cient foot.

Acquired flat foot

There is a wide range of normal appearance of adult feet. Pathological causes of a flat foot include: /uni25CF tibialis posterior tendon dysfunction; /uni25CF tarsometatarsal arthritis/injury (Figure 41.8); /uni25CF Charcot neuroarthropathy , e.g. diabetes (see Diabetes /uni25CF inflammatory/degenerative arthritis of the subtalar/tal onavicular/naviculocuneiform joints; /uni25CF spring ligament rupture; /uni25CF tarsal coalition. Summary box 41.7 Acquired flat foot /uni25CF /uni25CF /uni25CF The tibialis posterior tendon tends to fail in overweight individuals and those who have flat feet. Often, after unaccus tomed exercise, the tendon swells and is painful. The condition occurs mainly in women; the key test, which is that the patient cannot stand on tiptoe on that leg alone, indicates a significant advanced stage tendon problem. Many individuals will require eatment in the form of a medial displacement calca surgical tr neal osteotomy , flexor digitorum longus or FHL tendon trans fer and spring ligament repair. Failure to treat this condition can lead to spectacular deformity (Figure 41.9). in young athletes An acute traumatic flat foot may develop and military recruits after traumatic injury . Examination shows L Broström , described the surgical treatment of chronic ligament ruptures in 1966. a new-onset flat foot but with a functioning tibialis

posterior tendon with single-leg tiptoe preserved; here the injury is an isolated spring ligament tear and early surgery prevents late-onset secondary deformity .

Tibialis posterior tendon dysfunction and tarsometatarsal osteoarthritis are common causes of an acquired /f_l at foot Orthoses, rest and non-steroidal anti-in /f_l ammatory drugs (NSAIDs) can help with symptomatic relief Surgery is a major undertaking but is often highly successful at achieving symptomatic relief Figure 41.9 A tibialis posterior tendon-de /f_i cient foot.

Acquired flat foot

There is a wide range of normal appearance of adult feet. Pathological causes of a flat foot include: /uni25CF tibialis posterior tendon dysfunction; /uni25CF tarsometatarsal arthritis/injury (Figure 41.8); /uni25CF Charcot neuroarthropathy , e.g. diabetes (see Diabetes /uni25CF inflammatory/degenerative arthritis of the subtalar/tal onavicular/naviculocuneiform joints; /uni25CF spring ligament rupture; /uni25CF tarsal coalition. Summary box 41.7 Acquired flat foot /uni25CF /uni25CF /uni25CF The tibialis posterior tendon tends to fail in overweight individuals and those who have flat feet. Often, after unaccus tomed exercise, the tendon swells and is painful. The condition occurs mainly in women; the key test, which is that the patient cannot stand on tiptoe on that leg alone, indicates a significant advanced stage tendon problem. Many individuals will require eatment in the form of a medial displacement calca surgical tr neal osteotomy , flexor digitorum longus or FHL tendon trans fer and spring ligament repair. Failure to treat this condition can lead to spectacular deformity (Figure 41.9). in young athletes An acute traumatic flat foot may develop and military recruits after traumatic injury . Examination shows L Broström , described the surgical treatment of chronic ligament ruptures in 1966. a new-onset flat foot but with a functioning tibialis posterior tendon with single-leg tiptoe preserved; here the injury is an isolated spring ligament tear and early surgery prevents late-onset secondary deformity .

Tibialis posterior tendon dysfunction and tarsometatarsal osteoarthritis are common causes of an acquired /f_l at foot Orthoses, rest and non-steroidal anti-in /f_l ammatory drugs (NSAIDs) can help with symptomatic relief Surgery is a major undertaking but is often highly successful at achieving symptomatic relief Figure 41.9 A tibialis posterior tendon-de /f_i cient foot.

Ankle instability

Ankle instability

); Most people who sustain an ankle sprain will recover, partic - - ularly if they receive prompt physiotherapy . However, some individuals develop significant instability . On examination an unstable ankle due to ligament disruption will show a marked ‘anterior drawer’ sign. lem, If physiotherapy is unsuccessful at resolving the prob a reconstruction may be needed with ligament augmentation. Anatomical techniques such as the Broström procedure are favoured and may be supplemented with synthetic augments ly mobilisation. Peroneal tendon harvesting for recon - for ear struction is now obsolete with the new reconstruction tech - niques and implants. Other aetiologies of instability include osteochondritis dissecans (OCD) lesions, syndesmosis instability and peroneal tendon pathology . Ankle instability

); Most people who sustain an ankle sprain will recover, partic - - ularly if they receive prompt physiotherapy . However, some individuals develop significant instability . On examination an unstable ankle due to ligament disruption will show a marked ‘anterior drawer’ sign. lem, If physiotherapy is unsuccessful at resolving the prob a reconstruction may be needed with ligament augmentation. Anatomical techniques such as the Broström procedure are favoured and may be supplemented with synthetic augments ly mobilisation. Peroneal tendon harvesting for recon - for ear struction is now obsolete with the new reconstruction tech - niques and implants. Other aetiologies of instability include osteochondritis dissecans (OCD) lesions, syndesmosis instability and peroneal tendon pathology . Ankle instability

); Most people who sustain an ankle sprain will recover, partic - - ularly if they receive prompt physiotherapy . However, some individuals develop significant instability . On examination an unstable ankle due to ligament disruption will show a marked ‘anterior drawer’ sign. lem, If physiotherapy is unsuccessful at resolving the prob a reconstruction may be needed with ligament augmentation. Anatomical techniques such as the Broström procedure are favoured and may be supplemented with synthetic augments ly mobilisation. Peroneal tendon harvesting for recon - for ear struction is now obsolete with the new reconstruction tech - niques and implants. Other aetiologies of instability include osteochondritis dissecans (OCD) lesions, syndesmosis instability and peroneal tendon pathology .

BIOMECHANICS

BIOMECHANICS

The walking cycle is divided into the stance (60%) and swing (40%) phases. The stance phase is divided into three intervals: (i) heel strike to foot flat; (ii) foot flat until the body passes over the ankle; and (iii) ankle joint plantarflexion to toe-o ff . During walking up to 12% of the gait cycle is spent with both feet in the stance phase, but with running there is a period when neither foot is in contact with the gr ound – the ‘float’ phase. During running the cycle time is shortened but the forces generated are very much increased. Summary box 41.2 Biomechanics /uni25CF /uni25CF

The gait cycle is divided into swing and stance phases Running generates increased forces, shortens the gait cycle and has a /f_l oat phase when neither foot touches the ground

BIOMECHANICS

The walking cycle is divided into the stance (60%) and swing (40%) phases. The stance phase is divided into three intervals: (i) heel strike to foot flat; (ii) foot flat until the body passes over the ankle; and (iii) ankle joint plantarflexion to toe-o ff . During walking up to 12% of the gait cycle is spent with both feet in the stance phase, but with running there is a period when neither foot is in contact with the gr ound – the ‘float’ phase. During running the cycle time is shortened but the forces generated are very much increased. Summary box 41.2 Biomechanics /uni25CF /uni25CF

The gait cycle is divided into swing and stance phases Running generates increased forces, shortens the gait cycle and has a /f_l oat phase when neither foot touches the ground

BIOMECHANICS

The walking cycle is divided into the stance (60%) and swing (40%) phases. The stance phase is divided into three intervals: (i) heel strike to foot flat; (ii) foot flat until the body passes over the ankle; and (iii) ankle joint plantarflexion to toe-o ff . During walking up to 12% of the gait cycle is spent with both feet in the stance phase, but with running there is a period when neither foot is in contact with the gr ound – the ‘float’ phase. During running the cycle time is shortened but the forces generated are very much increased. Summary box 41.2 Biomechanics /uni25CF /uni25CF

The gait cycle is divided into swing and stance phases Running generates increased forces, shortens the gait cycle and has a /f_l oat phase when neither foot touches the ground

Charcot

Charcot

Charcot is a condition in which patients develop a neuropathic destruction of the joints. It is often described as painless but - - -

(b) Figure 41.12 Charcot foot: radiographs taken at the time of a trivial injury (a) and 6 weeks later (b) . Figure 41.13 Diabetic foot ulcer.

world diabetes is the biggest cause but in the rest of the world leprosy is also important. However, any other neurological condition can cause this disease. Charcot often presents with a hot, swollen, red extremity . It is often misdiagnosed as cellulitis, gout, fracture or DVT , and many present late because of the di ffi culty in diagnosis. If there is no history of skin damage, infection is unlikely , but MRI and e ven biopsy can help di ff erentiate between infec tion and Charcot. From initiation through to bone consolida tion ma y take up to 18 months. The principle of treatment throughout is to maintain a foot-shaped foot to prevent late pressure ulcers. The acute Charcot foot requires appr opriate splintage in a Charcot retaining orthotic walker (CROW) or a total contact cast (TCC), but many surgeons o ff er an aggres sive early surgical approach if bony prominence/ulceration is thought to be inevitable. Surgical excision of a bony pr nence dramatically reduces ulceration and amputation risk and reconstruction in the early phases of Charcot is now becoming more mainstream, but surgical risks are high. Long-segment fixation with implants and intramedullary nailing is now r ularly undertaken. Failure of non-operative or operative treat ment results in ulceration and amputation. Summary box 41.9 Diabetes /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Any nerve supplying the foot can become entrapped and result in pain, and treatment often requires surgical decom - pression. Tarsal tunnel syndrome is much rarer than carpal tunnel syndrome and is confirmed with nerve conduction. A high proportion of patients retain neurology and pain despite release. - -

Patients with diabetes are prone to infection because of: Peripheral neuropathy Peripheral vascular disease Impaired resistance to infection A Charcot foot is often misdiagnosed but is a surgical emergency and requires urgent admission and management An ulcer in a diabetic foot is a surgical emergency and requires urgent admission and management

Charcot

Charcot is a condition in which patients develop a neuropathic destruction of the joints. It is often described as painless but - - -

(b) Figure 41.12 Charcot foot: radiographs taken at the time of a trivial injury (a) and 6 weeks later (b) . Figure 41.13 Diabetic foot ulcer.

world diabetes is the biggest cause but in the rest of the world leprosy is also important. However, any other neurological condition can cause this disease. Charcot often presents with a hot, swollen, red extremity . It is often misdiagnosed as cellulitis, gout, fracture or DVT , and many present late because of the di ffi culty in diagnosis. If there is no history of skin damage, infection is unlikely , but MRI and e ven biopsy can help di ff erentiate between infec tion and Charcot. From initiation through to bone consolida tion ma y take up to 18 months. The principle of treatment throughout is to maintain a foot-shaped foot to prevent late pressure ulcers. The acute Charcot foot requires appr opriate splintage in a Charcot retaining orthotic walker (CROW) or a total contact cast (TCC), but many surgeons o ff er an aggres sive early surgical approach if bony prominence/ulceration is thought to be inevitable. Surgical excision of a bony pr nence dramatically reduces ulceration and amputation risk and reconstruction in the early phases of Charcot is now becoming more mainstream, but surgical risks are high. Long-segment fixation with implants and intramedullary nailing is now r ularly undertaken. Failure of non-operative or operative treat ment results in ulceration and amputation. Summary box 41.9 Diabetes /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Any nerve supplying the foot can become entrapped and result in pain, and treatment often requires surgical decom - pression. Tarsal tunnel syndrome is much rarer than carpal tunnel syndrome and is confirmed with nerve conduction. A high proportion of patients retain neurology and pain despite release. - -

Patients with diabetes are prone to infection because of: Peripheral neuropathy Peripheral vascular disease Impaired resistance to infection A Charcot foot is often misdiagnosed but is a surgical emergency and requires urgent admission and management An ulcer in a diabetic foot is a surgical emergency and requires urgent admission and management

Charcot

Charcot is a condition in which patients develop a neuropathic destruction of the joints. It is often described as painless but - - -

(b) Figure 41.12 Charcot foot: radiographs taken at the time of a trivial injury (a) and 6 weeks later (b) . Figure 41.13 Diabetic foot ulcer.

world diabetes is the biggest cause but in the rest of the world leprosy is also important. However, any other neurological condition can cause this disease. Charcot often presents with a hot, swollen, red extremity . It is often misdiagnosed as cellulitis, gout, fracture or DVT , and many present late because of the di ffi culty in diagnosis. If there is no history of skin damage, infection is unlikely , but MRI and e ven biopsy can help di ff erentiate between infec tion and Charcot. From initiation through to bone consolida tion ma y take up to 18 months. The principle of treatment throughout is to maintain a foot-shaped foot to prevent late pressure ulcers. The acute Charcot foot requires appr opriate splintage in a Charcot retaining orthotic walker (CROW) or a total contact cast (TCC), but many surgeons o ff er an aggres sive early surgical approach if bony prominence/ulceration is thought to be inevitable. Surgical excision of a bony pr nence dramatically reduces ulceration and amputation risk and reconstruction in the early phases of Charcot is now becoming more mainstream, but surgical risks are high. Long-segment fixation with implants and intramedullary nailing is now r ularly undertaken. Failure of non-operative or operative treat ment results in ulceration and amputation. Summary box 41.9 Diabetes /uni25CF /uni25CF /uni25CF /uni25CF

/uni25CF /uni25CF Any nerve supplying the foot can become entrapped and result in pain, and treatment often requires surgical decom - pression. Tarsal tunnel syndrome is much rarer than carpal tunnel syndrome and is confirmed with nerve conduction. A high proportion of patients retain neurology and pain despite release. - -

Patients with diabetes are prone to infection because of: Peripheral neuropathy Peripheral vascular disease Impaired resistance to infection A Charcot foot is often misdiagnosed but is a surgical emergency and requires urgent admission and management An ulcer in a diabetic foot is a surgical emergency and requires urgent admission and management

Diabetes

Diabetes

Patients with diabetes have foot problems secondary to neuro pathy and microvascular changes. They are at increased risk of infection and ulceration, and trauma (sometimes trivial) can lead to collapse of the foot, also known as Charcot neuro arthropathy (Figure 41.12). Diabetes

Patients with diabetes have foot problems secondary to neuro pathy and microvascular changes. They are at increased risk of infection and ulceration, and trauma (sometimes trivial) can lead to collapse of the foot, also known as Charcot neuro arthropathy (Figure 41.12). Diabetes

Patients with diabetes have foot problems secondary to neuro pathy and microvascular changes. They are at increased risk of infection and ulceration, and trauma (sometimes trivial) can lead to collapse of the foot, also known as Charcot neuro arthropathy (Figure 41.12).

Examination

Examination

The examination of the foot is described in Chapter 35 patient should be watched walking, and both the foot and the footwear of the patient need examining when looking for abnormal load and wear. Examination

The examination of the foot is described in Chapter 35 patient should be watched walking, and both the foot and the footwear of the patient need examining when looking for abnormal load and wear. Examination

The examination of the foot is described in Chapter 35 patient should be watched walking, and both the foot and the footwear of the patient need examining when looking for abnormal load and wear.

FURTHER READING

FURTHER READING

Bulstrode C, Wilson MacDonald J et al . Oxford textbook of trauma and orthopaedics , 2nd edn. Oxford: Oxford University Press, 2017. Miller MD, Thompson SR. Miller’s review of orthopaedics , 8th edn. Philadelphia, PA: Elsevier, 2019. Warwick D, Blom A, Whitehouse M. Apley and Solomon’s concise system of orthopaedics and trauma , 5th edn. Abingdon: CRC Press, 2022. FURTHER READING

Bulstrode C, Wilson MacDonald J et al . Oxford textbook of trauma and orthopaedics , 2nd edn. Oxford: Oxford University Press, 2017. Miller MD, Thompson SR. Miller’s review of orthopaedics , 8th edn. Philadelphia, PA: Elsevier, 2019. Warwick D, Blom A, Whitehouse M. Apley and Solomon’s concise system of orthopaedics and trauma , 5th edn. Abingdon: CRC Press, 2022. FURTHER READING

Bulstrode C, Wilson MacDonald J et al . Oxford textbook of trauma and orthopaedics , 2nd edn. Oxford: Oxford University Press, 2017. Miller MD, Thompson SR. Miller’s review of orthopaedics , 8th edn. Philadelphia, PA: Elsevier, 2019. Warwick D, Blom A, Whitehouse M. Apley and Solomon’s concise system of orthopaedics and trauma , 5th edn. Abingdon: CRC Press, 2022.

Hallux rigidus

Hallux rigidus

erload Hallux rigidus is a painful condition of the hallux MTP joint characterised by loss of motion, especially in dorsiflexion, and osteophyte formation on the dorsum and sides of the joint (Figure 41.4). Hallux valgus /uni25CF /uni25CF /uni25CF /uni25CF In adults there is often a history of trauma or repetitive microtrauma (sport) but, occasionally , there is a strong family history of the condition. Gout and rheumatological conditions may present in this way . Patients complain of sti ff ness and pain on weight-bearing. The most e ff ective non-operative treatment is provision of a sti ff -soled shoe with a deep toe box or a rocker-soled shoe, which are now available on the high street. The mainstays of surgical management ar e injection/ manipulation, cheilectomy (a radical debridement and exci sion of the part of the joint blocking movement), fusion and interposition arthroplasty (Keller-type procedure or silicone inter position). Prosthetic arthroplasty , with hemi-, total, inter position or spacer arthroplasty , is available but many pr ostheses have been withdrawn because of high failure rates and few series extend bey ond 9 years. Newer prosthetic inserts with claimed joint-preserving capabilities similarly fail to show advantages with regards to pain and have a high revision/reoperation rate but are still preferred by some who wish to retain mobility at MTP1 in the short to medium term. Fusion is for the severely a ff ected and is an e ff ective means of abolishing pain, but a ff ects the biomechanics and some patients are left with intractable pain beneath the sesamoids. A fusion will still usually allow sports participation. Summary box 41.4 Hallux rigidus /uni25CF /uni25CF /uni25CF Sesamoid/sesamoid complex problems Turf toe Acute injuries (turf toe) can be managed non-operatively or surgically depending on the grade of the injury and the occupation of the patient. Grade 4 acute rupture may require surgery . Turf toe is a plantar plate disruption usually from hyper extension injuries at MTP1 and may involve sesamoid fractures. Low-grade injuries can be treated non-operatively Albert Henry Freiberg , Professor of Orthopaedic Surgery , University of Cincinnati, Cincinnati, OH, USA, gave his account of this condition in 1926. Thomas George Morton , 1835–1903, surgeon, Pennsylvania Hospital, Philadelphia, PA, USA, described this condition in 1876. athletes (see Chapter 36). Chronic conditions range from stress fracture to avascular necrosis (A VN) and sesamoiditis but are probably all the same phenomenon. Management includes o ffl oading with orthotics, injections of ster oids and, rarely , shaving/excision. Excision surgery car ries a high risk. Lesser toe deformities Hammer, mallet and claw toes are frequent and are usually nonindicative but may be secondary to other deformities in the foot or to underlying neurological disease. Nonoperative treat - ment involves appropriate padding and footwear modification. For symptomatic flexible deformities soft-tissue surgery such as flexor/extensor tenotomies with/without capsulotomy is usually adequate, but for fix ed deformities bony procedures are required such as interposition arthroplasty , fusion or excision arthroplasty . Isolated lesser toe MTP extension/subluxation may result from a ruptured plantar plate at MTP joints and repair tech - niques have evolved recently , but the results ar e moderate at - best and the trend is back to non-operative management where possible. Ultrasound and magnetic resonance imaging (MRI) are now well estab lished for these injuries. - Freiberg’s disease Freiberg’s disease (Figure 41.5) is an ischaemic necrosis of the epiphysis, resulting in pain

and swelling of the joint. It will often settle with rest. Reshaping osteotomies are described, or excision of the proximal phalangeal head for severe adult cases with joint destruction. Excision of the whole metatarsal head should never be performed. Morton’s neuroma and metatarsalgia Metatarsalgia usually occurs secondary to joint problems, overload or irritation of a nerve. Morton’s neuroma is a painful -

Bunions affect women more often than men Patients with hallux valgus have inherited a tendency to develop the condition Not all patients need surgery The choice of operation is determined by the severity of the deformity and presence or absence of any arthritis, instability of the joints or hypermobility Hallux rigidus can affect adolescents as well as adults Stiff-soled shoes with a deep toe box are the most comfortable type of shoe Cheilectomy and fusion are the mainstays of surgical treatment Figure 41.5 Freiberg’s disease.

common digital nerve, most commonly between the third and fourth metatarsal heads and the second/third and is usually secondary to other forefoot pathology . The diagnosis is confirmed by ultrasound or MRI. Non operative treatments include advice about footwear, an orthosis (premetatarsal dome) to splay the metatarsal heads or an injection of steroids. Cryotherapy and even alcohol injections have been r eported. Surgery involves resection (the a ff ected toes will be perma nently partly hemi-numb if the nerve is removed) but this is not without risk of patient dissatisfaction, pain and recurrence, with around 5% reporting bad outcomes, often permanent. European colleagues often simply transect the intermetatarsal lig ament instead. Summary box 41.5 Morton’s neuroma /uni25CF /uni25CF /uni25CF Stress fracture This may occur following sport or may be incipient. It usually presents in the forefoot and may mimic Morton’s neuroma or metatarsalgia. An unexplained aetiology might require biochemical or biomechanical evaluation. Forefoot fractures can usually be managed non-operatively . Stress fractures may occur in any bone. Those of the navic ular, talus and tibial sesamoid often present with vague symp tomatology but early diagnosis with MRI and management are essential with immediate o ffl oading and protection with early fixation – if required, urgently – if a full fracture is seen developing. Vague, poor ly defined midfoot pain in an athlete or military recruit mandates urgent scanning and o ffl oading. Follow-up investigation of bone metabolism/density and exclusion of myeloma may be required.

Morton’s neuroma most commonly affects the second or third web space Surgical excision of neuroma is often successful but has a risk of pain syndrome Guided injections form the mainstay of treatment for most

Hallux rigidus

erload Hallux rigidus is a painful condition of the hallux MTP joint characterised by loss of motion, especially in dorsiflexion, and osteophyte formation on the dorsum and sides of the joint (Figure 41.4). Hallux valgus /uni25CF /uni25CF /uni25CF /uni25CF In adults there is often a history of trauma or repetitive microtrauma (sport) but, occasionally , there is a strong family history of the condition. Gout and rheumatological conditions may present in this way . Patients complain of sti ff ness and pain on weight-bearing. The most e ff ective non-operative treatment is provision of a sti ff -soled shoe with a deep toe box or a rocker-soled shoe, which are now available on the high street. The mainstays of surgical management ar e injection/ manipulation, cheilectomy (a radical

debridement and exci sion of the part of the joint blocking movement), fusion and interposition arthroplasty (Keller-type procedure or silicone inter position). Prosthetic arthroplasty , with hemi-, total, inter position or spacer arthroplasty , is available but many pr ostheses have been withdrawn because of high failure rates and few series extend bey ond 9 years. Newer prosthetic inserts with claimed joint-preserving capabilities similarly fail to show advantages with regards to pain and have a high revision/reoperation rate but are still preferred by some who wish to retain mobility at MTP1 in the short to medium term. Fusion is for the severely a ff ected and is an e ff ective means of abolishing pain, but a ff ects the biomechanics and some patients are left with intractable pain beneath the sesamoids. A fusion will still usually allow sports participation. Summary box 41.4 Hallux rigidus /uni25CF /uni25CF /uni25CF Sesamoid/sesamoid complex problems Turf toe Acute injuries (turf toe) can be managed non-operatively or surgically depending on the grade of the injury and the occupation of the patient. Grade 4 acute rupture may require surgery . Turf toe is a plantar plate disruption usually from hyper extension injuries at MTP1 and may involve sesamoid fractures. Low-grade injuries can be treated non-operatively Albert Henry Freiberg , Professor of Orthopaedic Surgery , University of Cincinnati, Cincinnati, OH, USA, gave his account of this condition in 1926. Thomas George Morton , 1835–1903, surgeon, Pennsylvania Hospital, Philadelphia, PA, USA, described this condition in 1876. athletes (see Chapter 36). Chronic conditions range from stress fracture to avascular necrosis (A VN) and sesamoiditis but are probably all the same phenomenon. Management includes o ffl oading with orthotics, injections of ster oids and, rarely , shaving/excision. Excision surgery car ries a high risk. Lesser toe deformities Hammer, mallet and claw toes are frequent and are usually nonindicative but may be secondary to other deformities in the foot or to underlying neurological disease. Nonoperative treat - ment involves appropriate padding and footwear modification. For symptomatic flexible deformities soft-tissue surgery such as flexor/extensor tenotomies with/without capsulotomy is usually adequate, but for fix ed deformities bony procedures are required such as interposition arthroplasty , fusion or excision arthroplasty . Isolated lesser toe MTP extension/subluxation may result from a ruptured plantar plate at MTP joints and repair tech - niques have evolved recently , but the results ar e moderate at - best and the trend is back to non-operative management where possible. Ultrasound and magnetic resonance imaging (MRI) are now well estab lished for these injuries. - Freiberg’s disease Freiberg’s disease (Figure 41.5) is an ischaemic necrosis of the epiphysis, resulting in pain and swelling of the joint. It will often settle with rest. Reshaping osteotomies are described, or excision of the proximal phalangeal head for severe adult cases with joint destruction. Excision of the whole metatarsal head should never be performed. Morton’s neuroma and metatarsalgia Metatarsalgia usually occurs secondary to joint problems, overload or irritation of a nerve. Morton’s neuroma is a painful -

Bunions affect women more often than men Patients with hallux valgus have inherited a tendency to develop the condition Not all patients need surgery The choice of operation is determined by the severity of the deformity and presence or absence of any arthritis, instability of the joints or hypermobility Hallux rigidus can affect adolescents as well as adults Stiff-soled shoes with a deep toe box are the most comfortable type of shoe Cheilectomy and fusion are the mainstays of surgical treatment Figure 41.5 Freiberg’s disease.

common digital nerve, most commonly between the third and fourth metatarsal heads and the second/third and is usually secondary to other forefoot pathology . The diagnosis is confirmed by ultrasound or MRI. Non operative treatments include advice about footwear, an orthosis

(premetatarsal dome) to splay the metatarsal heads or an injection of steroids. Cryotherapy and even alcohol injections have been r eported. Surgery involves resection (the a ff ected toes will be perma nently partly hemi-numb if the nerve is removed) but this is not without risk of patient dissatisfaction, pain and recurrence, with around 5% reporting bad outcomes, often permanent. European colleagues often simply transect the intermetatarsal lig ament instead. Summary box 41.5 Morton’s neuroma /uni25CF /uni25CF /uni25CF Stress fracture This may occur following sport or may be incipient. It usually presents in the forefoot and may mimic Morton’s neuroma or metatarsalgia. An unexplained aetiology might require biochemical or biomechanical evaluation. Forefoot fractures can usually be managed non-operatively . Stress fractures may occur in any bone. Those of the navic ular, talus and tibial sesamoid often present with vague symp tomatology but early diagnosis with MRI and management are essential with immediate o ffl oading and protection with early fixation – if required, urgently – if a full fracture is seen developing. Vague, poor ly defined midfoot pain in an athlete or military recruit mandates urgent scanning and o ffl oading. Follow-up investigation of bone metabolism/density and exclusion of myeloma may be required.

Morton’s neuroma most commonly affects the second or third web space Surgical excision of neuroma is often successful but has a risk of pain syndrome Guided injections form the mainstay of treatment for most

Hallux rigidus

erload Hallux rigidus is a painful condition of the hallux MTP joint characterised by loss of motion, especially in dorsiflexion, and osteophyte formation on the dorsum and sides of the joint (Figure 41.4). Hallux valgus /uni25CF /uni25CF /uni25CF /uni25CF In adults there is often a history of trauma or repetitive microtrauma (sport) but, occasionally , there is a strong family history of the condition. Gout and rheumatological conditions may present in this way . Patients complain of sti ff ness and pain on weight-bearing. The most e ff ective non-operative treatment is provision of a sti ff -soled shoe with a deep toe box or a rocker-soled shoe, which are now available on the high street. The mainstays of surgical management ar e injection/ manipulation, cheilectomy (a radical debridement and exci sion of the part of the joint blocking movement), fusion and interposition arthroplasty (Keller-type procedure or silicone inter position). Prosthetic arthroplasty , with hemi-, total, inter position or spacer arthroplasty , is available but many pr ostheses have been withdrawn because of high failure rates and few series extend bey ond 9 years. Newer prosthetic inserts with claimed joint-preserving capabilities similarly fail to show advantages with regards to pain and have a high revision/reoperation rate but are still preferred by some who wish to retain mobility at MTP1 in the short to medium term. Fusion is for the severely a ff ected and is an e ff ective means of abolishing pain, but a ff ects the biomechanics and some patients are left with intractable pain beneath the sesamoids. A fusion will still usually allow sports participation. Summary box 41.4 Hallux rigidus /uni25CF /uni25CF /uni25CF Sesamoid/sesamoid complex problems Turf toe Acute injuries (turf toe) can be managed non-operatively or surgically depending on the grade of the injury and the occupation of the patient. Grade 4 acute rupture may require surgery . Turf toe is a plantar plate disruption usually from hyper extension injuries at MTP1 and may involve sesamoid fractures. Low-grade injuries can be treated non-operatively Albert Henry Freiberg , Professor of Orthopaedic Surgery , University of Cincinnati, Cincinnati, OH, USA, gave his account of this condition in 1926. Thomas George Morton , 1835–1903, surgeon, Pennsylvania Hospital,

Philadelphia, PA, USA, described this condition in 1876. athletes (see Chapter 36). Chronic conditions range from stress fracture to avascular necrosis (A VN) and sesamoiditis but are probably all the same phenomenon. Management includes o ffl oading with orthotics, injections of ster oids and, rarely , shaving/excision. Excision surgery car ries a high risk. Lesser toe deformities Hammer, mallet and claw toes are frequent and are usually nonindicative but may be secondary to other deformities in the foot or to underlying neurological disease. Nonoperative treat - ment involves appropriate padding and footwear modification. For symptomatic flexible deformities soft-tissue surgery such as flexor/extensor tenotomies with/without capsulotomy is usually adequate, but for fix ed deformities bony procedures are required such as interposition arthroplasty , fusion or excision arthroplasty . Isolated lesser toe MTP extension/subluxation may result from a ruptured plantar plate at MTP joints and repair tech - niques have evolved recently , but the results ar e moderate at - best and the trend is back to non-operative management where possible. Ultrasound and magnetic resonance imaging (MRI) are now well estab lished for these injuries. - Freiberg's disease Freiberg's disease (Figure 41.5) is an ischaemic necrosis of the epiphysis, resulting in pain and swelling of the joint. It will often settle with rest. Reshaping osteotomies are described, or excision of the proximal phalangeal head for severe adult cases with joint destruction. Excision of the whole metatarsal head should never be performed. Morton's neuroma and metatarsalgia Metatarsalgia usually occurs secondary to joint problems, overload or irritation of a nerve. Morton's neuroma is a painful -

Bunions affect women more often than men Patients with hallux valgus have inherited a tendency to develop the condition Not all patients need surgery The choice of operation is determined by the severity of the deformity and presence or absence of any arthritis, instability of the joints or hypermobility Hallux rigidus can affect adolescents as well as adults Stiff-soled shoes with a deep toe box are the most comfortable type of shoe Cheilectomy and fusion are the mainstays of surgical treatment Figure 41.5 Freiberg's disease.

common digital nerve, most commonly between the third and fourth metatarsal heads and the second/third and is usually secondary to other forefoot pathology . The diagnosis is confirmed by ultrasound or MRI. Non operative treatments include advice about footwear, an orthosis (premetatarsal dome) to splay the metatarsal heads or an injection of steroids. Cryotherapy and even alcohol injections have been r eported. Surgery involves resection (the a ff ected toes will be perma nently partly hemi-numb if the nerve is removed) but this is not without risk of patient dissatisfaction, pain and recurrence, with around 5% reporting bad outcomes, often permanent. European colleagues often simply transect the intermetatarsal lig ament instead. Summary box 41.5 Morton's neuroma /uni25CF /uni25CF /uni25CF Stress fracture This may occur following sport or may be incipient. It usually presents in the forefoot and may mimic Morton's neuroma or metatarsalgia. An unexplained aetiology might require biochemical or biomechanical evaluation. Forefoot fractures can usually be managed non-operatively . Stress fractures may occur in any bone. Those of the navic ular, talus and tibial sesamoid often present with vague symp tomatology but early diagnosis with MRI and management are essential with immediate o ffl oading and protection with early fixation – if required, urgently – if a full fracture is seen developing. Vague, poor ly defined midfoot pain in an athlete or military recruit mandates urgent scanning and o ffl oading. Follow-up investigation of bone metabolism/density and exclusion of myeloma may be required.

Morton’s neuroma most commonly affects the second or third web space Surgical excision of neuroma is often successful but has a risk of pain syndrome Guided injections form the mainstay of treatment for most

Heel pain

Heel pain

The commonest cause of heel pain is plantar fasciitis. Pain is located inferomedially within the heel and is worst first thing in the morning and after periods of rest. The majority of cases settle within 18 months and surgery is rarely required - or successful. Ultrasound-guided injection or shockwave forms the mainstay of treatment for the non-resolving cases. The omi - di ff erential diagnosis list includes calcaneal stress fracture, tarsal tunnel syndrome, seronegative arthropathy and Ledder - hose’s disease. eg - - Heel pain

The commonest cause of heel pain is plantar fasciitis. Pain is located inferomedially within the heel and is worst first thing in the morning and after periods of rest. The majority of cases settle within 18 months and surgery is rarely required - or successful. Ultrasound-guided injection or shockwave forms the mainstay of treatment for the non-resolving cases. The omi - di ff erential diagnosis list includes calcaneal stress fracture, tarsal tunnel syndrome, seronegative arthropathy and Ledder - hose’s disease. eg - - Heel pain

The commonest cause of heel pain is plantar fasciitis. Pain is located inferomedially within the heel and is worst first thing in the morning and after periods of rest. The majority of cases settle within 18 months and surgery is rarely required - or successful. Ultrasound-guided injection or shockwave forms the mainstay of treatment for the non-resolving cases. The omi - di ff erential diagnosis list includes calcaneal stress fracture, tarsal tunnel syndrome, seronegative arthropathy and Ledder - hose’s disease. eg - -

Infection

Infection

Septic arthritis in the foot or ankle is rare except in patients with diabetes and constitutes a surgical emergency; when it occurs it usually follows a surgical procedure but it can also arise as a result of haematogenous spread. Treatment is immediate surgical drainage and administration of appropriate high-dosage antibiotics once cultures are obtained. with methicillin-resistant S. aureus (MRSA) becoming more common. Even with prompt treatment chondrolysis often occurs and subsequent degenerative changes develop rapidly . In immunocompromised patients, opportunistic infec tions can arise and, in those with diabetes, failure to treat with debridement can lead to amputation. It is important to realise that radiographs in the early stages of infection are usually normal and that diagnosis is made on clinical suspicion and with blood tests and more sophisticated imaging such as MRI or bone scanning. Tuberculosis can a ff ect the foot and is associated with major bony damage; it responds surprisingly well to debridement and appropriate antituberculous therapy (Figure 41.11).

Figure 41.11 Tuberculosis of the foot (arrow).

Infection

Septic arthritis in the foot or ankle is rare except in patients with diabetes and constitutes a surgical emergency; when it occurs it usually follows a surgical procedure but it can also arise as a result of haematogenous spread. Treatment is immediate surgical drainage and administration of appropriate high-dosage antibiotics once cultures are obtained. with methicillin-resistant S. aureus (MRSA) becoming more common. Even with prompt treatment chondrolysis often occurs and subsequent degenerative changes develop rapidly . In immunocompromised patients, opportunistic infec tions can arise and, in those with diabetes, failure to treat with debridement can lead to amputation. It is important to realise that radiographs in the early stages of infection are usually normal and that diagnosis is made on clinical suspicion and with blood tests and more sophisticated imaging such as MRI or bone scanning. Tuberculosis can a ff ect the foot and is associated with major bony damage; it responds surprisingly well to debridement and appropriate antituberculous therapy (Figure 41.11).

Figure 41.11 Tuberculosis of the foot (arrow).

Infection

Septic arthritis in the foot or ankle is rare except in patients with diabetes and constitutes a surgical emergency; when it occurs it usually follows a surgical procedure but it can also arise as a result of haematogenous spread. Treatment is immediate surgical drainage and administration of appropriate high-dosage antibiotics once cultures are obtained. with methicillin-resistant S. aureus (MRSA) becoming more common. Even with prompt treatment chondrolysis often occurs and

subsequent degenerative changes develop rapidly . In immunocompromised patients, opportunistic infec tions can arise and, in those with diabetes, failure to treat with debridement can lead to amputation. It is important to realise that radiographs in the early stages of infection are usually normal and that diagnosis is made on clinical suspicion and with blood tests and more sophisticated imaging such as MRI or bone scanning. Tuberculosis can a ff ect the foot and is associated with major bony damage; it responds surprisingly well to debridement and appropriate antituberculous therapy (Figure 41.11).

Figure 41.11 Tuberculosis of the foot (arrow).

Introduction

Introduction

No content extracted automatically.

Learning objectives

Learning objectives

To understand: The basic anatomy and biomechanics of the foot and • ankle The common problems affecting the foot and ankle in • each age group Learning objectives

To understand: The basic anatomy and biomechanics of the foot and • ankle The common problems affecting the foot and ankle in • each age group Learning objectives

To understand: The basic anatomy and biomechanics of the foot and • ankle The common problems affecting the foot and ankle in • each age group

Neurological foot conditions

Neurological foot conditions

Pes cavus The development of unilateral pes cavus is likely to be due to an upper motor neurone lesion, so an appropriate neuro logical examination should be performed and spinal imaging is mandated. Pes cavus is usually bilateral and most cases will be associ ated with an underlying neurological condition, the most com mon being Charcot–Marie–Tooth disease. These patients may pr esent with characteristic progressive small muscle wasting, thin calf musculature, hand symptoms, aches and pains, and cavovarus feet. Examination may show early loss of vibration sense. Precise diagnosis is confirmed with nerve conduction studies and genetic testing. The key deforming force is always relative preservation of the tibialis posterior tendon. Surgical correction of the defor mity is often required. The principal goal of treatment is to obtain a foot that can be placed flat on the ground, and with the pow er of the muscles around the ankle in balance. It will always be necessary to transfer the tibialis posterior tendon. The most commonly performed pr ocedure is to transfer the tibialis posterior tendon to the dorsolateral side of the foot, with a lateralising heel osteotomy and dorsiflexion osteotomy of the first ray with or without a Jones procedure to the great toe and Hibbs procedure to the lesser toes. Older textbooks all universally relay the mistaken belief that it is peroneal over- activity that is the deforming force … it isn’t! Summary box 41.8 Pes cavus /uni25CF /uni25CF /uni25CF /uni25CF Pierre Marie , 1853–1940, neurologist, Hospice de Bicêtre, Paris, France, later becoming Professor of Pathological Anatomy in the Faculty of Medicine, and finally , in 1918, Professor of Neurology . Howard Henry T ooth , 1856–1925, physician, St Bartholomew’s Hospital and the National Hospital for Nervous Diseases, London, UK, described peroneal muscular atrophy in 1886 independently of Charcot and Marie. Sir Robert Jones , 1857–1933, British orthopaedic surgeon. Russell A Hibbs , 1869–1932, Professor of Orthopedic Surgery , Columbia University , New Y ork, NY , USA, described an operation for ‘claw foot’ in 1919. Georg Ledderhose , 1855–1925, German surgeon, described this disease in 1894. Baron Guillaume Dupuytren , 1777–1835, surgeon, Hôtel Dieu, Paris, France, described this condition in 1831. François de la Peyronie , 1678–1747, surgeon to King Louis XIV of France and founder of the Royal Academy of Surgery , Paris, France. - - -

Pes cavus needs neurological investigation About 80% of cases of pes cavus are associated with a neurological disease The commonest cause is Charcot–Marie–Tooth disease Unilateral pes cavus – think diastematomyelia/tumour Figure 41.10 Angioleiomyoma of the hallux.

Neurological foot conditions

Pes cavus The development of unilateral pes cavus is likely to be due to an upper motor neurone lesion, so an appropriate neuro logical examination should be performed and spinal imaging is mandated. Pes cavus is usually bilateral and most cases will be associ ated with an underlying neurological condition, the most com mon being Charcot–Marie–Tooth disease. These patients may pr esent with characteristic progressive small muscle wasting, thin calf musculature, hand

symptoms, aches and pains, and cavovarus feet. Examination may show early loss of vibration sense. Precise diagnosis is confirmed with nerve conduction studies and genetic testing. The key deforming force is always relative preservation of the tibialis posterior tendon. Surgical correction of the defor mity is often required. The principal goal of treatment is to obtain a foot that can be placed flat on the ground, and with the pow er of the muscles around the ankle in balance. It will always be necessary to transfer the tibialis posterior tendon. The most commonly performed pr ocedure is to transfer the tibialis posterior tendon to the dorsolateral side of the foot, with a lateralising heel osteotomy and dorsiflexion osteotomy of the first ray with or without a Jones procedure to the great toe and Hibbs procedure to the lesser toes. Older textbooks all universally relay the mistaken belief that it is peroneal over- activity that is the deforming force … it isn't! Summary box 41.8 Pes cavus /uni25CF /uni25CF /uni25CF /uni25CF Pierre Marie , 1853–1940, neurologist, Hospice de Bicêtre, Paris, France, later becoming Professor of Pathological Anatomy in the Faculty of Medicine, and finally , in 1918, Professor of Neurology . Howard Henry T ooth , 1856–1925, physician, St Bartholomew's Hospital and the National Hospital for Nervous Diseases, London, UK, described peroneal muscular atrophy in 1886 independently of Charcot and Marie. Sir Robert Jones , 1857–1933, British orthopaedic surgeon. Russell A Hibbs , 1869–1932, Professor of Orthopedic Surgery , Columbia University , New Y ork, NY , USA, described an operation for 'claw foot' in 1919. Georg Ledderhose , 1855–1925, German surgeon, described this disease in 1894. Baron Guillaume Dupuytren , 1777–1835, surgeon, Hôtel Dieu, Paris, France, described this condition in 1831. François de la Peyronie , 1678–1747, surgeon to King Louis XIV of France and founder of the Royal Academy of Surgery , Paris, France. - - -

Pes cavus needs neurological investigation About 80% of cases of pes cavus are associated with a neurological disease The commonest cause is Charcot–Marie–Tooth disease Unilateral pes cavus – think diastematomyelia/tumour Figure 41.10 Angioleiomyoma of the hallux.

Neurological foot conditions

Pes cavus The development of unilateral pes cavus is likely to be due to an upper motor neurone lesion, so an appropriate neuro logical examination should be performed and spinal imaging is mandated. Pes cavus is usually bilateral and most cases will be associ ated with an underlying neurological condition, the most com mon being Charcot–Marie–Tooth disease. These patients may pr esent with characteristic progressive small muscle wasting, thin calf musculature, hand

symptoms, aches and pains, and cavovarus feet. Examination may show early loss of vibration sense. Precise diagnosis is confirmed with nerve conduction studies and genetic testing. The key deforming force is always relative preservation of the tibialis posterior tendon. Surgical correction of the defor mity is often required. The principal goal of treatment is to obtain a foot that can be placed flat on the ground, and with the pow er of the muscles around the ankle in balance. It will always be necessary to transfer the tibialis posterior tendon. The most commonly performed pr ocedure is to transfer the tibialis posterior tendon to the dorsolateral side of the foot, with a lateralising heel osteotomy and dorsiflexion osteotomy of the first ray with or without a Jones procedure to the great toe and Hibbs procedure to the lesser toes. Older textbooks all universally relay the mistaken belief that it is peroneal over- activity that is the deforming force … it isn't! Summary box 41.8 Pes cavus /uni25CF /uni25CF /uni25CF /uni25CF Pierre Marie , 1853–1940, neurologist, Hospice de Bicêtre, Paris, France, later becoming Professor of Pathological Anatomy in the Faculty of Medicine, and finally , in 1918, Professor of Neurology . Howard Henry T ooth ,

1856–1925, physician, St Bartholomew’s Hospital and the National Hospital for Nervous Diseases, London, UK, described peroneal muscular atrophy in 1886 independently of Charcot and Marie. Sir Robert Jones , 1857–1933, British orthopaedic surgeon. Russell A Hibbs , 1869–1932, Professor of Orthopedic Surgery , Columbia University , New Y ork, NY , USA, described an operation for ‘claw foot’ in 1919. Georg Ledderhose , 1855–1925, German surgeon, described this disease in 1894. Baron Guillaume Dupuytren , 1777–1835, surgeon, Hôtel Dieu, Paris, France, described this condition in 1831. François de la Peyronie , 1678–1747, surgeon to King Louis XIV of France and founder of the Royal Academy of Surgery , Paris, France. - - -

Pes cavus needs neurological investigation About 80% of cases of pes cavus are associated with a neurological disease The commonest cause is Charcot–Marie–Tooth disease Unilateral pes cavus – think diastematomyelia/tumour Figure 41.10 Angioleiomyoma of the hallux.

Osteochondral lesion of the talus

Osteochondral lesion of the talus

Patients with persistent pain (and sometimes instability) in the - ankle following an injury should be suspected of having an osteochondral lesion, with MRI or CT usually required for diagnosis. Repair of cartilage is not yet possible and large meta-analyses of experimental techniques such as grafting, cell - culture, implants and stem cells have not yet shown any statis - - e tical benefit. Debridement and microabrasion/microfractur form the mainstay of treatment. Large fragments seen early might benefit from early fixation. Juveniles seem to have a high ery rate and surgery should not be necessary . spontaneous recov Many patients have ongoing pain following ankle injury that is simply due to synovitis within the ankle joint, prominence of the syndesmotic ligament into the joint, impaction injury or undiagnosed fracture or OCD lesion. MRI is mandatory for these cases but usually misses the synovitis. Synovitis may be treated non-operatively , with an injection of steroid. Persistent symptoms may require arthroscopic debridement. Osteochondral lesion of the talus

Patients with persistent pain (and sometimes instability) in the - ankle following an injury should be suspected of having an osteochondral lesion, with MRI or CT usually required for diagnosis. Repair of cartilage is not yet possible and large meta-analyses of experimental techniques such as grafting, cell - culture, implants and stem cells have not yet shown any statis - - e tical benefit. Debridement and microabrasion/microfractur form the mainstay of treatment. Large fragments seen early might benefit from early fixation. Juveniles seem to have a high ery rate and surgery should not be necessary . spontaneous recov Many patients have ongoing pain following ankle injury that is simply due to synovitis within the ankle joint, prominence of the syndesmotic ligament into the joint, impaction injury or undiagnosed fracture or OCD lesion. MRI is mandatory for these cases but usually misses the synovitis. Synovitis may be treated non-operatively , with an injection of steroid. Persistent symptoms may require arthroscopic debridement. Osteochondral lesion of the talus

Patients with persistent pain (and sometimes instability) in the - ankle following an injury should be suspected of having an osteochondral lesion, with MRI or CT usually required for diagnosis. Repair of cartilage is not yet possible and large meta-analyses of experimental techniques such as grafting, cell - culture, implants and stem cells have not yet shown any statis - - e tical benefit. Debridement and microabrasion/microfractur form the mainstay of treatment. Large fragments seen early might benefit from early fixation. Juveniles seem to have a high ery rate and surgery should not be necessary . spontaneous recov Many patients have ongoing pain following ankle injury that is simply due to synovitis within the ankle joint, prominence of the syndesmotic ligament into the joint, impaction injury or undiagnosed fracture or OCD lesion. MRI is mandatory

for these cases but usually misses the synovitis. Synovitis may be treated non-operatively , with an injection of steroid. Persistent symptoms may require arthroscopic debridement.

PAEDIATRIC CONDITIONS

PAEDIATRIC CONDITIONS

These are discussed in Chapter 44 .

(b) Figure 41.2 (a, b) Hallux valgus and bunion.

PAEDIATRIC CONDITIONS

These are discussed in Chapter 44 .

(b) Figure 41.2 (a, b) Hallux valgus and bunion.

PAEDIATRIC CONDITIONS

These are discussed in Chapter 44 .

(b) Figure 41.2 (a, b) Hallux valgus and bunion.

PATHOLOGY IN THE ADULT The forefoot

PATHOLOGY IN THE ADULT The forefoot

Hallux valgus Hallux valgus is deviation of the big toe away from the midline, i.e. towards the lesser toes, and is usually associated with a bunion, a swelling made up of both bone and bursa on the 41.2). It is medial aspect of the first metatarsal head (Figure a common condition that a ff ects women more than men, and that is often bilateral. It is believed that the tendency to hallux valgus is inherited and that fully enclosed shoes accelerate the development of the condition, although not all agree. With increasing deformity the first ray becomes defunc - tioned and elevated, and overload of the second metatarso - phalangeal (MTP) joint often results in pain, swelling and eventually plantar plate disruption and dislocation. This can . The present with a prominent callosity beneath the second MTP joint and eventually hammering of the second toe. algus includes a wider Non-operative treatment of hallux v toe box and pressure relief. Surgical intervention is commonly o ff ered, but has a 10% ra te of dissatisfaction. For mild deformities a distal osteotomy (e.g. chevron) is usually adequate. For moderate deformities the surgeon is more likely to use a shaft, e.g. scarf (Figure 41.3) or Ludlo ff , or a basal (proximal chevron or crescentic) osteotomy . Severe deformities can be corrected by shaft and basal osteotomies but sometimes a fusion of the first TMT joint (modified Lapidus) or a first MTP joint fusion can be e ff ective and is the preferred option for hypermobile or unstable TMT1 joint deformities. Minimally invasive techniques are developing and are wide spread, especially in Europe, but there are few peer-reviewed series of outcomes from the UK and it has not become main stream. Basal osteotomies and fusions have a higher risk of abnor mal elevation or depression of the rays, resulting in ov of the rest of the forefoot. However, they do allow a massive correction. The y are best stabilised using plates. Operations such as a Keller’s excision arthroplasty , where the proximal third of the proximal phalanx is excised, serve A scarf osteotomy is named after a carpentry term; it is an elongated Z-shaped osteotomy along the metatarsal. Karl Ludlo ff , 1864–1945, German orthopaedic surgeon. Paul W Lapidus , 1893–1981, Russian-born orthopaedic surgeon, Chief of the first Orthopedic Foot Clinic and Service, Hospital for Joint Diseases, New Y ork, NY , USA. William Lordan Keller , 1874–1959, Head of the Department of Surgery , Walter Reed Hospital, Washington, DC, USA, described this operation in 1904. to defunction the toe and sesamoids and are reserved for low-demand, high-risk patients in whom there is a high risk that healing of an osteotomy might fail. The complications of bunion surgery are infection, cuta - neous nerve damage, recurrence or overcorrection of defor - mity , sti ff ness and overload of the second MTP joint (transfer - lesion); 10% of patients have significant reservations and 20% mild reservations about their outcome. Occasionally patients - develop early arthritis following sur gery and require revision to fusion. -

(b) Figure 41.3 Pre- (a) and postoperative (b) radiographs of a scarf osteotomy. (b) Figure 41.4 Clinical (a) and radiographic (b) appearance of hallux rigidus.

PATHOLOGY IN THE ADULT The forefoot

Hallux valgus Hallux valgus is deviation of the big toe away from the midline, i.e. towards the lesser toes, and is usually associated with a bunion, a swelling made up of both bone and bursa on the 41.2). It is medial aspect of the first metatarsal head (Figure a common condition that a ff ects women more than men, and that is often bilateral. It is believed that the tendency to hallux valgus is inherited and that fully enclosed shoes accelerate the development of the condition, although not all agree. With increasing deformity the first ray becomes defunc - tioned and elevated, and overload of the second metatarso - phalangeal (MTP) joint often results in pain, swelling and eventually plantar plate disruption and dislocation. This can . The present with a prominent callosity beneath the second MTP joint and eventually hammering of the second toe. algus includes a wider Non-operative treatment of hallux v toe box and pressure relief. Surgical intervention is commonly o ff ered, but has a 10% ra te of dissatisfaction. For mild deformities a distal osteotomy (e.g. chevron) is usually adequate. For moderate deformities the surgeon is more likely to use a shaft, e.g. scarf (Figure 41.3) or Ludlo ff , or a basal (proximal chevron or crescentic) osteotomy . Severe deformities can be corrected by shaft and basal osteotomies but sometimes a fusion of the first TMT joint (modified Lapidus) or a first MTP joint fusion can be e ff ective and is the preferred option for hypermobile or unstable TMT1 joint deformities. Minimally invasive techniques are developing and are wide spread, especially in Europe, but there are few peer-reviewed series of outcomes from the UK and it has not become main stream. Basal osteotomies and fusions have a higher risk of abnor mal elevation or depression of the rays, resulting in ov of the rest of the forefoot. However, they do allow a massive correction. The y are best stabilised using plates. Operations such as a Keller’s excision arthroplasty , where the proximal third of the proximal phalanx is excised, serve A scarf osteotomy is named after a carpentry term; it is an elongated Z-shaped osteotomy along the metatarsal. Karl Ludlo ff , 1864–1945, German orthopaedic surgeon. Paul W Lapidus , 1893–1981, Russian-born orthopaedic surgeon, Chief of the first Orthopedic Foot Clinic and Service, Hospital for Joint Diseases, New Y ork, NY , USA. William Lordan Keller , 1874–1959, Head of the Department of Surgery , Walter Reed Hospital, Washington, DC, USA, described this operation in 1904. to defunction the toe and sesamoids and are reserved for low-demand, high-risk patients in whom there is a high risk that healing of an osteotomy might fail. The complications of bunion surgery are infection, cuta - neous nerve damage, recurrence or overcorrection of defor - mity , sti ff ness and overload of the second MTP joint (transfer - lesion); 10% of patients have significant reservations and 20% mild reservations about their outcome. Occasionally patients - develop early arthritis following sur gery and require revision to fusion. -

(b) Figure 41.3 Pre- (a) and postoperative (b) radiographs of a scarf osteotomy. (b) Figure 41.4 Clinical (a) and radiographic (b) appearance of hallux rigidus.

PATHOLOGY IN THE ADULT The forefoot

Hallux valgus Hallux valgus is deviation of the big toe away from the midline, i.e. towards the lesser toes, and is usually associated with a bunion, a swelling made up of both bone and bursa on the 41.2). It is medial aspect of the first metatarsal head (Figure a common condition that a ff ects women more than men, and that is often bilateral. It is believed that the tendency to hallux valgus is inherited and that fully enclosed shoes accelerate the development of the condition, although not all agree. With increasing deformity the first ray becomes defunc - tioned and elevated, and

overload of the second metatarso - phalangeal (MTP) joint often results in pain, swelling and eventually plantar plate disruption and dislocation. This can . The present with a prominent callosity beneath the second MTP joint and eventually hammering of the second toe. algus includes a wider Non-operative treatment of hallux v toe box and pressure relief. Surgical intervention is commonly o ff ered, but has a 10% ra te of dissatisfaction. For mild deformities a distal osteotomy (e.g. chevron) is usually adequate. For moderate deformities the surgeon is more likely to use a shaft, e.g. scarf (Figure 41.3) or Ludlo ff , or a basal (proximal chevron or crescentic) osteotomy . Severe deformities can be corrected by shaft and basal osteotomies but sometimes a fusion of the first TMT joint (modified Lapidus) or a first MTP joint fusion can be e ff ective and is the preferred option for hypermobile or unstable TMT1 joint deformities. Minimally invasive techniques are developing and are wide spread, especially in Europe, but there are few peer-reviewed series of outcomes from the UK and it has not become main stream. Basal osteotomies and fusions have a higher risk of abnor mal elevation or depression of the rays, resulting in ov of the rest of the forefoot. However, they do allow a massive correction. The y are best stabilised using plates. Operations such as a Keller’s excision arthroplasty , where the proximal third of the proximal phalanx is excised, serve A scarf osteotomy is named after a carpentry term; it is an elongated Z-shaped osteotomy along the metatarsal. Karl Ludlo ff , 1864–1945, German orthopaedic surgeon. Paul W Lapidus , 1893–1981, Russian-born orthopaedic surgeon, Chief of the first Orthopedic Foot Clinic and Service, Hospital for Joint Diseases, New Y ork, NY , USA. William Lordan Keller , 1874–1959, Head of the Department of Surgery , Walter Reed Hospital, Washington, DC, USA, described this operation in 1904. to defunction the toe and sesamoids and are reserved for low-demand, high-risk patients in whom there is a high risk that healing of an osteotomy might fail. The complications of bunion surgery are infection, cuta - neous nerve damage, recurrence or overcorrection of defor - mity , sti ff ness and overload of the second MTP joint (transfer - lesion); 10% of patients have significant reservations and 20% mild reservations about their outcome. Occasionally patients - develop early arthritis following sur gery and require revision to fusion. -

(b) Figure 41.3 Pre- (a) and postoperative (b) radiographs of a scarf osteotomy. (b) Figure 41.4 Clinical (a) and radiographic (b) appearance of hallux rigidus.

Tendon disorders

Tendon disorders

Tenosynovitis/tendinitis is probably a misnomer as the histological data support neither pathology in many cases. It often occurs as a result of injury or overuse or is secondary to inflammatory disease. Rest, anti-inflammatory medication and physiotherapy are often helpful but, in inflammatory conditions, tenosynovectomy may be required. The tendons most commonly a ff ected by degeneration are the Achilles (Figure 41.6), tibialis posterior and the peronei (brevis more than longus). Ruptured Achilles tendon The Achilles tendon rupture is relatively frequent in the 40- to 50-year-old age group who are undertaking vigorous sport after a long period away from such activities, but can occur in any age and with little provocation. One-quarter are missed in primary care or in the accident and emergency department and the recording of the Simmonds test is mandatory . The test is non-reliable after 1 week. Management of acute rupture is more frequently non-operative nowadays, provided ultrasound has shown closure of the gap in plantarflexion (although the importance of this even is now debated), and many protocols are described for non-operative management. Surgical fixation is an alternative but large meta-analyses have shown little if any advantage of surgical fixation with an increased complication rate. Many patients do not su ff er the acute rupture classically described in all textbooks and many seem to have a series of micro-tears that g radually lead to total rupture. Studies have shown that older adult patients with Achilles rupture regained 70–90% of the normal power with no treatment whatsoever when reviewed at 1 year; for many patients, this is enough to allow some of them to return to normal function. Non-operative options for a missed rupture include a sprung ankle–foot orthotic ankle brace, while operative options involve reconstructive surgery with or without FHL tendon augmentation or synthetic ligament replacement. Achilles tendinosis Non-insertional tendinosis is frequent, often related to overuse and is usually managed non-operatively . Multiple tendon Franklin Adin Simmonds , 1911–1983, orthopaedic surgeon, The Rowley Bristow Hospital, Pyrford, Surrey , UK. Patrik Haglund , 1870–1937, Swedish orthopaedic surgeon. negative arthritides. Shockwave therapy is a recent addition to the armoury . Steroid injections may rupture the Achilles tendon and are discouraged; high-volume saline, dry-needling and scler osant injections have all been described but are used less frequently with the advent of shockwave. Surgery for non-insertional tendinosis has moderate success. Insertional tendinosis is usually associated with a Haglund’s bony deformity or the presence of intratendinous bony spurs/ shelves seen on lateral radiograph. Significant intratendinous bony spurs rarely get better without surgical input in the author’s e xperience. Minimally invasive or mini-open excision of the prominent posterolateral corner of the calcaneum in Haglund’s deformity , detachment, debridement and reattach - ment or reshaping osteotomy form the mainstay of modern surgical techniques for insertional problems, but both condi - tions have a relatively high rate of failure and complication with sur gery . Peroneal tendon problems The peroneal tendons may develop tendinosis, may subluxate or may become involved in an inflammatory process with or with - out bony overgrowth at the inferior retinaculum (Figure 41.7). An associated varus heel will amplify the problem and will need addressing with an appropriate reconstruction/osteotomy or fusion. Investigation as to w

hether the varus heel caused the peroneal problem or vice versa should be established or recurrence is guaranteed. Peroneal tendon subluxation can occur spontaneously or after injury . It may be associated with the groove at the back of the fibula being too shallow to contain the peroneal ten - dons, but ma y just be secondary to a superior retinaculum tear. The patient may be able to demonstrate a tendon subluxation over the fibula. Surgical repair is usually required and involv es deepening of the groove. Tendinosis/tendinitis can be managed non-operatively , although injections have occasionally caused rupture. Sur - gical debridement or repair of splits/tears/ruptures is well described but has only moderate success.

Figure 41.6 Insertional Achilles tendinitis (arrow). Figure 41.7 Split and degenerate peroneus brevis.

Figure 41.8 Tarsometatarsal arthritis.

Tendon disorders

Tenosynovitis/tendinitis is probably a misnomer as the histological data support neither pathology in many cases. It often occurs as a result of injury or overuse or is secondary to inflammatory disease. Rest, anti-inflammatory medication and physiotherapy are often helpful but, in inflammatory conditions, tenosynovectomy may be required. The tendons most commonly a ff ected by degeneration are the Achilles (Figure 41.6), tibialis posterior and the peronei (brevis more than longus). Ruptured Achilles tendon The Achilles tendon rupture is relatively frequent in the 40- to 50-year-old age group who are undertaking vigorous sport after a long period away from such activities, but can occur in any age and with little provocation. One-quarter are missed in primary care or in the accident and emergency department and the recording of the Simmonds test is mandatory . The test is non-reliable after 1 week. Management of acute rupture is more frequently non-operative nowadays, provided ultrasound has shown closure of the gap in plantarflexion (although the importance of this even is now debated), and many protocols are described for non-operative management. Surgical fixation is an alternative but large meta-analyses have shown little if any advantage of surgical fixation with an increased complication rate. Many patients do not su ff er the acute rupture classically described in all textbooks and many seem to have a series of micro-tears that g radually lead to total rupture. Studies have shown that older adult patients with Achilles rupture regained 70–90% of the normal power with no treatment whatsoever when reviewed at 1 year; for many patients, this is enough to allow some of them to return to normal function. Non-operative options for a missed rupture include a sprung ankle–foot orthotic ankle brace, while operative options involve reconstructive surgery with or without FHL tendon augmentation or synthetic ligament replacement. Achilles tendinosis Non-insertional tendinosis is frequent, often related to overuse and is usually managed non-operatively . Multiple tendon Franklin Adin Simmonds , 1911–1983, orthopaedic surgeon, The Rowley Bristow Hospital, Pyrford, Surrey , UK. Patrik Haglund , 1870–1937, Swedish orthopaedic surgeon. negative arthritides. Shockwave therapy is a recent addition to the armoury . Steroid injections may rupture the Achilles tendon and are discouraged; high-volume saline, dry-needling and scler osant injections have all been described but are used less frequently with the advent of shockwave. Surgery for non-insertional tendinosis has moderate success. Insertional tendinosis is usually associated with a Haglund’s bony deformity or the presence of intratendinous bony spurs/ shelves seen on lateral radiograph. Significant intratendinous bony spurs rarely get better without surgical

input in the author’s e xperience. Minimally invasive or mini-open excision of the prominent posterolateral corner of the calcaneum in Haglund’s deformity , detachment, debridement and reattach - ment or reshaping osteotomy form the mainstay of modern surgical techniques for insertional problems, but both condi - tions have a relatively high rate of failure and complication with sur gery . Peroneal tendon problems The peroneal tendons may develop tendinosis, may subluxate or may become involved in an inflammatory process with or with - out bony overgrowth at the inferior retinaculum (Figure 41.7). An associated varus heel will amplify the problem and will need addressing with an appropriate reconstruction/osteotomy or fusion. Investigation as to w hether the varus heel caused the peroneal problem or vice versa should be established or recurrence is guaranteed. Peroneal tendon subluxation can occur spontaneously or after injury . It may be associated with the groove at the back of the fibula being too shallow to contain the peroneal ten - dons, but ma y just be secondary to a superior retinaculum tear. The patient may be able to demonstrate a tendon subluxation over the fibula. Surgical repair is usually required and involv es deepening of the groove. Tendinosis/tendinitis can be managed non-operatively , although injections have occasionally caused rupture. Sur - gical debridement or repair of splits/tears/ruptures is well described but has only moderate success.

Figure 41.6 Insertional Achilles tendinitis (arrow). Figure 41.7 Split and degenerate peroneus brevis.

Figure 41.8 Tarsometatarsal arthritis.

Tendon disorders

Tenosynovitis/tendinitis is probably a misnomer as the histological data support neither pathology in many cases. It often occurs as a result of injury or overuse or is secondary to inflammatory disease. Rest, anti-inflammatory medication and physiotherapy are often helpful but, in inflammatory conditions, tenosynovectomy may be required. The tendons most commonly a ff ected by degeneration are the Achilles (Figure 41.6), tibialis posterior and the peronei (brevis more than longus). Ruptured Achilles tendon The Achilles tendon rupture is relatively frequent in the 40- to 50-year-old age group who are undertaking vigorous sport after a long period away from such activities, but can occur in any age and with little provocation. One-quarter are missed in primary care or in the accident and emergency department and the recording of the Simmonds test is mandatory . The test is non-reliable after 1 week. Management of acute rupture is more frequently non-operative nowadays, provided ultrasound has shown closure of the gap in plantarflexion (although the importance of this even is now debated), and many protocols are described for non-operative management. Surgical fixation is an alternative but large meta-analyses have shown little if any advantage of surgical fixation with an increased complication rate. Many patients do not su ff er the acute rupture classically described in all textbooks and many seem to have a series of micro-tears that g radually lead to total rupture. Studies have shown that older adult patients with Achilles rupture regained 70–90% of the normal power with no treatment whatsoever when reviewed at 1 year; for many patients, this is enough to allow some of them to return to normal function. Non-operative options for a missed rupture include a sprung ankle–foot orthotic ankle brace, while operative options involve reconstructive surgery with or without FHL tendon augmentation or synthetic ligament replacement. Achilles tendinosis Non-insertional tendinosis is frequent, often related to overuse and is usually managed non-operatively . Multiple

tendon Franklin Adin Simmonds , 1911–1983, orthopaedic surgeon, The Rowley Bristow Hospital, Pyrford, Surrey , UK. Patrik Haglund , 1870–1937, Swedish orthopaedic surgeon. negative arthritides. Shockwave therapy is a recent addition to the armoury . Steroid injections may rupture the Achilles tendon and are discouraged; high-volume saline, dry-needling and scler osant injections have all been described but are used less frequently with the advent of shockwave. Surgery for non-insertional tendinosis has moderate success. Insertional tendinosis is usually associated with a Haglund's bony deformity or the presence of intratendinous bony spurs/ shelves seen on lateral radiograph. Significant intratendinous bony spurs rarely get better without surgical input in the author's e xperience. Minimally invasive or mini-open excision of the prominent posterolateral corner of the calcaneum in Haglund's deformity , detachment, debridement and reattach - ment or reshaping osteotomy form the mainstay of modern surgical techniques for insertional problems, but both condi - tions have a relatively high rate of failure and complication with sur gery . Peroneal tendon problems The peroneal tendons may develop tendinosis, may subluxate or may become involved in an inflammatory process with or with - out bony overgrowth at the inferior retinaculum (Figure 41.7). An associated varus heel will amplify the problem and will need addressing with an appropriate reconstruction/osteotomy or fusion. Investigation as to w hether the varus heel caused the peroneal problem or vice versa should be established or recurrence is guaranteed. Peroneal tendon subluxation can occur spontaneously or after injury . It may be associated with the groove at the back of the fibula being too shallow to contain the peroneal ten - dons, but ma y just be secondary to a superior retinaculum tear. The patient may be able to demonstrate a tendon subluxation over the fibula. Surgical repair is usually required and involv es deepening of the groove. Tendinosis/tendinitis can be managed non-operatively , although injections have occasionally caused rupture. Sur - gical debridement or repair of splits/tears/ruptures is well described but has only moderate success.

Figure 41.6 Insertional Achilles tendinitis (arrow). Figure 41.7 Split and degenerate peroneus brevis.

Figure 41.8 Tarsometatarsal arthritis.

The hindfoot and ankle

The hindfoot and ankle

Ankle arthritis The definitive operative treatment for arthritis of the ankle will usually be in the form of total ankle replacement (TAR) or - more commonly arthrodesis (fusion); the latter is often carried - out via an open approach but arthroscopic techniques have better outcomes, more rapid recovery and fewer complica - tions and almost all surgical units in the UK now o ff er such techniques. Such techniques are mandatory in the presence of a poor soft-tissue envelope or in the presence of a clotting diathesis. A UK national trial is cur rently under way to evaluate the relative outcomes of TAR versus arthrodesis (the TAR V A trial), which are as yet undefined; the trial has been complicated fur - ther by the withdrawal/failure of the two leading implants. The advantage of fusion is that it has a known track record, good outcomes (over 90% of patients do well) and minimal morbidity , especially with modern arthroscopic techniques, but not all do well with fusion. Function following isolated fusion is virtually normal f or most patients and this is probably due to increased mobility at other joints. However, this may precipi - tate arthralgia elsewhere. TARs were until recently three-component devices (except in the USA) but a two-component device is now the market leader in the UK by far. It is not yet known if this is relevant - but allows an easier regula tory pathway in the USA. Outcomes instrumentation may be a key factor; custom implants based on preoperative computed tomography (CT) scans are becoming mainstream. TARs allow preservation of joint mobility but at the expense of larger incisions and possible eventual failure. Revision rates of <1% to 7% per annum are reported, with most showing an approximately 3% failure rate per year. Sur vivorship analysis does not record patients who are doing badly but who do not have further surgery and a recent paper showed revisions are under-reported. The c hanges in the regulatory pathways in the UK/European Union relating to the develop ment of new implants may limit the development of TARs in these regions to the same levels of e ffi cacy seen by total hip replacements and total knee replacements. Hindfoot (excluding ankle) arthritis The triple complex refers to the subtalar (talocalcaneal), calcaneocuboid and talonavicular joints. These joints are often a ff ected by arthritis. Treatment options are limited and, if simple measures have failed, a fusion should be performed. Smokers and patients with diabetes have a massively increased non-union rate for all foot fusion procedures and should be warned of this when they give consent. Late presentation of coalitions usually requires fusion. Ankle combined with other hindfoot arthritis If surgical input is required, one option is to treat one set of joints and then see how the patient fares. For example, o ff er the patient an ankle fusion or replacement and then assess the outcome. Secondary surgery to the other joints can then be performed if required. The alternative is to treat all joints at once. The non-union rates of the ankle following a subtalar fusion or vice versa are high (up to 75%). For this reason, some clinicians advise TAR, not ankle fusion, following a previous subtalar/triple fusion. Modern techniques now use third-generation hindfoot fusion nails that fuse both the ankle and subtalar joints. These are inserted with an open or arthroscopic fusion technique. A pantalar fusion is quite disabling but may be necessary in patients with rheumatoid arthritis or with defor mities/stress fractures and in those with a failed arthroplasty with subtalar joint involvement, pantalar arthritis or A VN with collapse of the talus. Summary box 41.6 Midfoot

and hindfoot /uni25CF /uni25CF /uni25CF /uni25CF Alan W Fowler , 1920–2013, orthopaedic surgeon, Bridgend Hospital, UK. The early presentations of rheumatological disease may include synovitis of the lesser MTP joints and widespread small joint disease, often in association with enthesopathy such as plantar fasciitis or Achilles tendinosis. However, the classic deformity is of hallux valgus with or without hallux rigidus deformity and - subluxation or even dislocation of the lesser MTP joints in the forefoot and arthritis and deformity in the mid/hindfoot. The patient may present with a bunion and prominent lesser metatarsal heads, which can often be felt to be dislo - - cated on clinical examination and are painful to palpation. Joint-sparing surgery is preferr ed, with preservation of the metatarsal heads if possible, often shortening and reloca ting the MTP joints. Destruction of the joints can be treated with proximal phalangeal partial excisions. Fusion of the first MTP joint is the usual requirement. Late recurrence can be man - aged with excision arthroplasty . Excision of the metatarsal heads produces an almost instan - taneous and gratifying relief of pain. If a plantar approach is used an ellipse of skin can be excised to move the metatarsal padding back over the end of the metatarsal. While most sur - geons avoid scar s on the plantar aspect of the foot wherever possible, this is one procedure where the results are good. How - ever, such surgery lea ves no room for revision in later years. The requirement for rheumatoid forefoot correction has fallen dramatically in the last 20 years with the advent of disease-modifying drugs; most trainee surgeons will now have never seen a Fowler’s procedure (or similar), whic h was once a mainstream and common procedure. Midfoot Rheumatological disease may also a ff ect the midfoot and here the outcome is usually just pain and sti ff ness. Options are limited to injections and fusion surgery if non-operative measures have failed. Hindfoot and ankle Rheumatological disease also a ff ects the hindfoot and ankle. Many patients require surgical hindfoot fusions and the options for the ankle are discussed in Ankle arthritis . Outcomes of TAR are favourable in patients with rheumatoid arthritis, although increased deformities may make the outcomes less predictable. The rheumatological diseases also a ff ect soft tissues. Patients are more prone to developing enthesopathy , tendinitis and tendinosis, and even tendon rupture. The Ac hilles tendon should never be injected with steroid for fear of rupture; simi - larly , the tibialis anterior and tibialis posterior tendons are risky for injection.

Joint disorders are degenerative or in /f_l ammatory The mainstay of surgical treatment remains fusion, although ankle replacements are becoming more successful Rheumatoid arthritis must be medically controlled as well as possible before surgery Knee deformities should be corrected before tackling foot problems

The hindfoot and ankle

Ankle arthritis The definitive operative treatment for arthritis of the ankle will usually be in the form of total ankle replacement (TAR) or - more commonly arthrodesis (fusion); the latter is often carried - out via an open approach but arthroscopic techniques have better outcomes, more rapid recovery and fewer complica - tions and almost all surgical units in the UK now o ff er such techniques. Such techniques are mandatory in the presence of a poor soft-tissue envelope or in the presence of a clotting diathesis. A UK national trial is cur rently under way to evaluate the relative outcomes of TAR versus arthrodesis (the TAR V A trial), which are as yet undefined; the trial has been complicated fur - ther by the withdrawal/failure of the two leading implants. The advantage of fusion is that it has a known track record, good outcomes (over 90% of patients do well) and minimal morbidity , especially with modern arthroscopic techniques, but not all do well with fusion.

Function following isolated fusion is virtually normal f or most patients and this is probably due to increased mobility at other joints. However, this may precipi - tate arthralgia elsewhere. TARs were until recently three-component devices (except in the USA) but a two-component device is now the market leader in the UK by far. It is not yet known if this is relevant - but allows an easier regula tory pathway in the USA. Outcomes instrumentation may be a key factor; custom implants based on preoperative computed tomography (CT) scans are becoming mainstream. TARs allow preservation of joint mobility but at the expense of larger incisions and possible eventual failure. Revision rates of <1% to 7% per annum are reported, with most showing an approximately 3% failure rate per year. Sur vivorship analysis does not record patients who are doing badly but who do not have further surgery and a recent paper showed revisions are under-reported. The c hanges in the regulatory pathways in the UK/European Union relating to the develop ment of new implants may limit the development of TARs in these regions to the same levels of e ffi cacy seen by total hip replacements and total knee replacements. Hindfoot (excluding ankle) arthritis The triple complex refers to the subtalar (talocalcaneal), calcaneocuboid and talonavicular joints. These joints are often a ff ected by arthritis. Treatment options are limited and, if simple measures have failed, a fusion should be performed. Smokers and patients with diabetes have a massively increased non-union rate for all foot fusion procedures and should be warned of this when they give consent. Late presentation of coalitions usually requires fusion. Ankle combined with other hindfoot arthritis If surgical input is required, one option is to treat one set of joints and then see how the patient fares. For example, o ff er the patient an ankle fusion or replacement and then assess the outcome. Secondary surgery to the other joints can then be performed if required. The alternative is to treat all joints at once. The non-union rates of the ankle following a subtalar fusion or vice versa are high (up to 75%). For this reason, some clinicians advise TAR, not ankle fusion, following a previous subtalar/triple fusion. Modern techniques now use third-generation hindfoot fusion nails that fuse both the ankle and subtalar joints. These are inserted with an open or arthroscopic fusion technique. A pantalar fusion is quite disabling but may be necessary in patients with rheumatoid arthritis or with defor mities/stress fractures and in those with a failed arthroplasty with subtalar joint involvement, pantalar arthritis or A VN with collapse of the talus. Summary box 41.6 Midfoot and hindfoot /uni25CF /uni25CF /uni25CF /uni25CF Alan W Fowler , 1920–2013, orthopaedic surgeon, Bridgend Hospital, UK. The early presentations of rheumatological disease may include synovitis of the lesser MTP joints and widespread small joint disease, often in association with enthesopathy such as plantar fasciitis or Achilles tendinosis. However, the classic deformity is of hallux valgus with or without hallux rigidus deformity and - subluxation or even dislocation of the lesser MTP joints in the forefoot and arthritis and deformity in the mid/hindfoot. The patient may present with a bunion and prominent lesser metatarsal heads, which can often be felt to be dislo - - cated on clinical examination and are painful to palpation. Joint-sparing surgery is preferr ed, with preservation of the metatarsal heads if possible, often shortening and reloca ting the MTP joints. Destruction of the joints can be treated with proximal phalangeal partial excisions. Fusion of the first MTP joint is the usual requirement. Late recurrence can be man - aged with excision arthroplasty . Excision of the metatarsal heads produces an almost instan - taneous and gratifying relief of pain. If a plantar approach is used an ellipse of skin can be excised to move the metatarsal padding back over the end of the metatarsal. While most sur - geons avoid scar s on the plantar aspect of the foot wherever possible, this is one procedure where the results are good. How - ever, such surgery lea ves no room for revision in later years. The requirement for rheumatoid forefoot correction has fallen dramatically in the last 20 years with the advent of disease-modifying drugs; most trainee surgeons will now have never seen a Fowler’s procedure (or similar), whic h was once

a mainstream and common procedure. Midfoot Rheumatological disease may also a ff ect the midfoot and here the outcome is usually just pain and sti ff ness. Options are limited to injections and fusion surgery if non-operative measures have failed. Hindfoot and ankle Rheumatological disease also a ff ects the hindfoot and ankle. Many patients require surgical hindfoot fusions and the options for the ankle are discussed in Ankle arthritis . Outcomes of TAR are favourable in patients with rheumatoid arthritis, although increased deformities may make the outcomes less predictable. The rheumatological diseases also a ff ect soft tissues. Patients are more prone to developing enthesopathy , tendinitis and tendinosis, and even tendon rupture. The Ac hilles tendon should never be injected with steroid for fear of rupture; simi - larly , the tibialis anterior and tibialis posterior tendons are risky for injection.

Joint disorders are degenerative or in /f_l ammatory The mainstay of surgical treatment remains fusion, although ankle replacements are becoming more successful Rheumatoid arthritis must be medically controlled as well as possible before surgery Knee deformities should be corrected before tackling foot problems

The hindfoot and ankle

Ankle arthritis The definitive operative treatment for arthritis of the ankle will usually be in the form of total ankle replacement (TAR) or - more commonly arthrodesis (fusion); the latter is often carried - out via an open approach but arthroscopic techniques have better outcomes, more rapid recovery and fewer complica - tions and almost all surgical units in the UK now o ff er such techniques. Such techniques are mandatory in the presence of a poor soft-tissue envelope or in the presence of a clotting diathesis. A UK national trial is cur rently under way to evaluate the relative outcomes of TAR versus arthrodesis (the TAR V A trial), which are as yet undefined; the trial has been complicated fur - ther by the withdrawal/failure of the two leading implants. The advantage of fusion is that it has a known track record, good outcomes (over 90% of patients do well) and minimal morbidity , especially with modern arthroscopic techniques, but not all do well with fusion. Function following isolated fusion is virtually normal f or most patients and this is probably due to increased mobility at other joints. However, this may precipi - tate arthralgia elsewhere. TARs were until recently three-component devices (except in the USA) but a two-component device is now the market leader in the UK by far. It is not yet known if this is relevant - but allows an easier regula tory pathway in the USA. Outcomes instrumentation may be a key factor; custom implants based on preoperative computed tomography (CT) scans are becoming mainstream. TARs allow preservation of joint mobility but at the expense of larger incisions and possible eventual failure. Revision rates of <1% to 7% per annum are reported, with most showing an approximately 3% failure rate per year. Sur vivorship analysis does not record patients who are doing badly but who do not have further surgery and a recent paper showed revisions are under-reported. The c hanges in the regulatory pathways in the UK/European Union relating to the develop ment of new implants may limit the development of TARs in these regions to the same levels of e ffi cacy seen by total hip replacements and total knee replacements. Hindfoot (excluding ankle) arthritis The triple complex refers to the subtalar (talocalcaneal), calcaneocuboid and talonavicular joints. These joints are often a ff ected by arthritis. Treatment options are limited and, if simple measures have failed, a fusion should be performed. Smokers and patients with diabetes have a massively increased non-union rate for all foot fusion procedures and should be warned of this when they give consent. Late presentation of coalitions usually requires fusion. Ankle combined with other hindfoot arthritis If

surgical input is required, one option is to treat one set of joints and then see how the patient fares. For example, o ff er the patient an ankle fusion or replacement and then assess the outcome. Secondary surgery to the other joints can then be performed if required. The alternative is to treat all joints at once. The non-union rates of the ankle following a subtalar fusion or vice versa are high (up to 75%). For this reason, some clinicians advise TAR, not ankle fusion, following a previous subtalar/triple fusion. Modern techniques now use third-generation hindfoot fusion nails that fuse both the ankle and subtalar joints. These are inserted with an open or arthroscopic fusion technique. A pantalar fusion is quite disabling but may be necessary in patients with rheumatoid arthritis or with defor mities/stress fractures and in those with a failed arthroplasty with subtalar joint involvement, pantalar arthritis or A VN with collapse of the talus. Summary box 41.6 Midfoot and hindfoot /uni25CF /uni25CF /uni25CF /uni25CF Alan W Fowler , 1920–2013, orthopaedic surgeon, Bridgend Hospital, UK. The early presentations of rheumatological disease may include synovitis of the lesser MTP joints and widespread small joint disease, often in association with enthesopathy such as plantar fasciitis or Achilles tendinosis. However, the classic deformity is of hallux valgus with or without hallux rigidus deformity and - subluxation or even dislocation of the lesser MTP joints in the forefoot and arthritis and deformity in the mid/hindfoot. The patient may present with a bunion and prominent lesser metatarsal heads, which can often be felt to be dislo - - cated on clinical examination and are painful to palpation. Joint-sparing surgery is preferr ed, with preservation of the metatarsal heads if possible, often shortening and reloca ting the MTP joints. Destruction of the joints can be treated with proximal phalangeal partial excisions. Fusion of the first MTP joint is the usual requirement. Late recurrence can be man - aged with excision arthroplasty . Excision of the metatarsal heads produces an almost instan - taneous and gratifying relief of pain. If a plantar approach is used an ellipse of skin can be excised to move the metatarsal padding back over the end of the metatarsal. While most sur - geons avoid scar s on the plantar aspect of the foot wherever possible, this is one procedure where the results are good. How - ever, such surgery lea ves no room for revision in later years. The requirement for rheumatoid forefoot correction has fallen dramatically in the last 20 years with the advent of disease-modifying drugs; most trainee surgeons will now have never seen a Fowler’s procedure (or similar), whic h was once a mainstream and common procedure. Midfoot Rheumatological disease may also a ff ect the midfoot and here the outcome is usually just pain and sti ff ness. Options are limited to injections and fusion surgery if non-operative measures have failed. Hindfoot and ankle Rheumatological disease also a ff ects the hindfoot and ankle. Many patients require surgical hindfoot fusions and the options for the ankle are discussed in Ankle arthritis . Outcomes of TAR are favourable in patients with rheumatoid arthritis, although increased deformities may make the outcomes less predictable. The rheumatological diseases also a ff ect soft tissues. Patients are more prone to developing enthesopathy , tendinitis and tendinosis, and even tendon rupture. The Ac hilles tendon should never be injected with steroid for fear of rupture; simi - larly , the tibialis anterior and tibialis posterior tendons are risky for injection.

Joint disorders are degenerative or in /f_l ammatory The mainstay of surgical treatment remains fusion, although ankle replacements are becoming more successful Rheumatoid arthritis must be medically controlled as well as possible before surgery Knee deformities should be corrected before tackling foot problems

The midfoot

The midfoot

The midfoot comprises the cuneiforms and the cuboid and related joints. Midfoot arthritis The aetiology is usually not known but the risk factors include microtrauma, rheumatological causes, flat foot, Lisfranc or similar injuries (which may have been missed), Charcot and cavus foot. Patients are best managed non-operatively with orthotics, shoes, analgesia and modifications of their lifestyle. Pain, often with palpable dorsal osteophytes, is the com monest finding. Injections and orthotics are the mainstay of Jean Martin Charcot , 1825–1893, physician, La Salpêtrière, Paris, France. comes. Fusion or interposition arthroplasty of the lateral two TMT joints has a universally poor outcome. Charcot - An acute hot, red, swollen foot (which may or may not be pain - ful) may be indicative of Charcot (often secondary to diabetes, which may as yet be undiagnosed) or other neuropathy . Immediate o ffl oading in plaster and urgent management are - indicated; National Institute for Health and Care Excellence (NICE) guidelines ar e available in the UK. The presence of any unexplained swelling, heat, ulcer or deformity in a diabetic foot mandates an emergency and referral along NICE guidelines; failure to follow such guide - lines can lead to significant sums being paid out by indemnity organsiations. Tendinopathy Rarely , dorsal pain may be due to tibialis anterior tendinosis at its insertion; management is usually non-operative. Injection carries a slight risk of rupture, which is ameliorated by a surgical boot with deep vein thrombosis (DVT) prophylaxis. Ganglions Midfoot ganglions are common and may cause neuralgia over dorsal bosses. Injection/aspiration should be attempted. Surgery may be required but recurrence is high and secondary neuralgia not infrequent. The midfoot

The midfoot comprises the cuneiforms and the cuboid and related joints. Midfoot arthritis The aetiology is usually not known but the risk factors include microtrauma, rheumatological causes, flat foot, Lisfranc or similar injuries (which may have been missed), Charcot and cavus foot. Patients are best managed non-operatively with orthotics, shoes, analgesia and modifications of their lifestyle. Pain, often with palpable dorsal osteophytes, is the com monest finding. Injections and orthotics are the mainstay of Jean Martin Charcot , 1825–1893, physician, La Salpêtrière, Paris, France. comes. Fusion or interposition arthroplasty of the lateral two TMT joints has a universally poor outcome. Charcot - An acute hot, red, swollen foot (which may or may not be pain - ful) may be indicative of Charcot (often secondary to diabetes, which may as yet be undiagnosed) or other neuropathy . Immediate o ffl oading in plaster and urgent management are - indicated; National Institute for Health and Care Excellence (NICE) guidelines ar e available in the UK. The presence of any unexplained swelling, heat, ulcer or deformity in a diabetic foot mandates an emergency and referral along NICE guidelines; failure to follow such guide - lines can lead to significant sums being paid out by indemnity organsiations. Tendinopathy Rarely , dorsal pain may be due to tibialis anterior tendinosis at its insertion; management is usually non-operative. Injection carries a slight risk of rupture, which is ameliorated by a surgical boot with deep vein thrombosis (DVT) prophylaxis. Ganglions Midfoot ganglions are common and may cause neuralgia over dorsal bosses. Injection/aspiration should be attempted. Surgery may be required but recurrence is high

and secondary neuralgia not infrequent. The midfoot

The midfoot comprises the cuneiforms and the cuboid and related joints. Midfoot arthritis The aetiology is usually not known but the risk factors include microtrauma, rheumatological causes, flat foot, Lisfranc or similar injuries (which may have been missed), Charcot and cavus foot. Patients are best managed non-operatively with orthotics, shoes, analgesia and modifications of their lifestyle. Pain, often with palpable dorsal osteophytes, is the com monest finding. Injections and orthotics are the mainstay of Jean Martin Charcot , 1825–1893, physician, La Salpêtrière, Paris, France. comes. Fusion or interposition arthroplasty of the lateral two TMT joints has a universally poor outcome. Charcot - An acute hot, red, swollen foot (which may or may not be pain - ful) may be indicative of Charcot (often secondary to diabetes, which may as yet be undiagnosed) or other neuropathy . Immediate o ffl oading in plaster and urgent management are - indicated; National Institute for Health and Care Excellence (NICE) guidelines ar e available in the UK. The presence of any unexplained swelling, heat, ulcer or deformity in a diabetic foot mandates an emergency and referral along NICE guidelines; failure to follow such guide - lines can lead to significant sums being paid out by indemnity organsiations. Tendinopathy Rarely , dorsal pain may be due to tibialis anterior tendinosis at its insertion; management is usually non-operative. Injection carries a slight risk of rupture, which is ameliorated by a surgical boot with deep vein thrombosis (DVT) prophylaxis. Ganglions Midfoot ganglions are common and may cause neuralgia over dorsal bosses. Injection/aspiration should be attempted. Surgery may be required but recurrence is high and secondary neuralgia not infrequent.

Tumours

Tumours

The most common benign tumours of the foot are ganglia, giant cell tumour and angioleiomyomas (Figure 41.10); these tumours may need surgical excision. Pigmented villonodular synovitis is a locally aggressive condition found in the ankle and is diagnosed by MRI or at - histology . Imatinib medical therapy and en bloc resection are becoming more mainstream for cure rather than repea ted arthroscopic suppression. Surveillance for recurrence is man - datory . The most common ‘tumour’ seen in the foot is the plantar fibroma or Ledderhose’s disease, which presents as a painful, often growing, lump in the sole along the plantar fascia. The condition is linked to Dupuytren’s contracture and Peyr onie’s disease. Surgery should be avoided. Ultrasound or MRI will confirm the multifocal nature of the disease and exclude other pathology . Any large or growing lump in the foot needs formal work-up along tumour guidelines, especially in the presence of night pain. Tumours

The most common benign tumours of the foot are ganglia, giant cell tumour and angioleiomyomas (Figure 41.10); these tumours may need surgical excision. Pigmented villonodular synovitis is a locally aggressive condition found in the ankle and is diagnosed by MRI or at - histology . Imatinib medical therapy and en bloc resection are becoming more mainstream for cure rather than repea ted arthroscopic suppression. Surveillance for recurrence is man - datory . The most common ‘tumour’ seen in the foot is the plantar fibroma or Ledderhose’s disease, which presents as a painful, often growing, lump in the sole along the plantar fascia. The condition is linked to Dupuytren’s contracture and Peyr onie’s disease. Surgery should be avoided. Ultrasound or MRI will confirm the multifocal nature of the disease and exclude other pathology . Any large or growing lump in the foot needs formal work-up along tumour guidelines, especially in the presence of night pain. Tumours

The most common benign tumours of the foot are ganglia, giant cell tumour and angioleiomyomas (Figure 41.10); these tumours may need surgical excision. Pigmented villonodular synovitis is a locally aggressive condition found in the ankle and is diagnosed by MRI or at - histology . Imatinib medical therapy and en bloc resection are becoming more mainstream for cure rather than repea ted arthroscopic suppression. Surveillance for recurrence is man - datory . The most common ‘tumour’ seen in the foot is the plantar fibroma or Ledderhose’s disease, which presents as a painful, often growing, lump in the sole along the plantar fascia. The condition is linked to Dupuytren’s contracture and Peyr onie’s disease. Surgery should be avoided. Ultrasound or MRI will confirm the multifocal nature of the disease and exclude other pathology . Any large or growing lump in the foot needs formal work-up along tumour guidelines, especially in the presence of night pain.

Ulceration and amputation

Ulceration and amputation

Ulceration can lead to major morbidity and amputation (Figure 41.13). Ulcers need to be treated urgently , and when ulcer healing has occurred the aim should be to keep the foot ulcer free. NICE guidelines detail optimal management pathways with urgent admission and radiological and clinical assessment in a multidisciplinary team setting, followed by debridement, antibiotics if required and formal o ffl oading. Ulceration is a surgical emergency and mandates immediate referral along NICE guidelines in the UK. Most amputations are preceded by ulceration. Ulceration and amputation

Ulceration can lead to major morbidity and amputation (Figure 41.13). Ulcers need to be treated urgently , and when ulcer healing has occurred the aim should be to keep the foot ulcer free. NICE guidelines detail optimal management pathways with urgent admission and radiological and clinical assessment in a multidisciplinary team setting, followed by debridement, antibiotics if required and formal o ffl oading. Ulceration is a surgical emergency and mandates immediate referral along NICE guidelines in the UK. Most amputations are preceded by ulceration. Ulceration and amputation

Ulceration can lead to major morbidity and amputation (Figure 41.13). Ulcers need to be treated urgently , and when ulcer healing has occurred the aim should be to keep the foot ulcer free. NICE guidelines detail optimal management pathways with urgent admission and radiological and clinical assessment in a multidisciplinary team setting, followed by debridement, antibiotics if required and formal o ffl oading. Ulceration is a surgical emergency and mandates immediate referral along NICE guidelines in the UK. Most amputations are preceded by ulceration.