Mr Laurence James BSc MBBS MRCS(Eng) FRCS(Tr&Orth)
Consultant Orthopaedic Surgeon
Foot, Ankle and Sports Injuries

WHAT IS THIS CONDITION?

The posterior tibial tendon is an important structure that is normally hard at work helping to hold the arch up and prevent over-pronation or rolling out of the foot. The posterior tibial tendon (see diagram) runs behind the inside bump on the ankle (the medial malleolus), across the instep, and attaches to the bottom of the foot. Sometimes this tendon (as well as the ligaments that support the arch of the foot) stretches or becomes inflamed – this can lead to a progressive adult acquired flatfoot which is best managed using a multi-disciplinary team approach. Common names used for this condition include: Tibialis Posterior Tendon Dysfunction, Tibialis Posterior Insuffiency and Adult Acquired Flat Foot Deformity.

COMMON CAUSES:

Flatfootedness – Most people who develop the condition already have flat feet. With overuse or continuous loading, a change occurs where the arch begins to flatten more than before, with pain and swelling developing on the inside of the ankle. Inadequate support from footwear may occasionally be a contributing factor.

Trauma or injury – Occasionally this condition may be due to fracture, sprain or direct blow to the tendon.

Age – The risk of developing posterior tibial tendon dysfunction is increased with age; research has suggested that middle age women are more commonly affected.

Other possible contributing factors – being overweight, inflammatory arthritis etc...

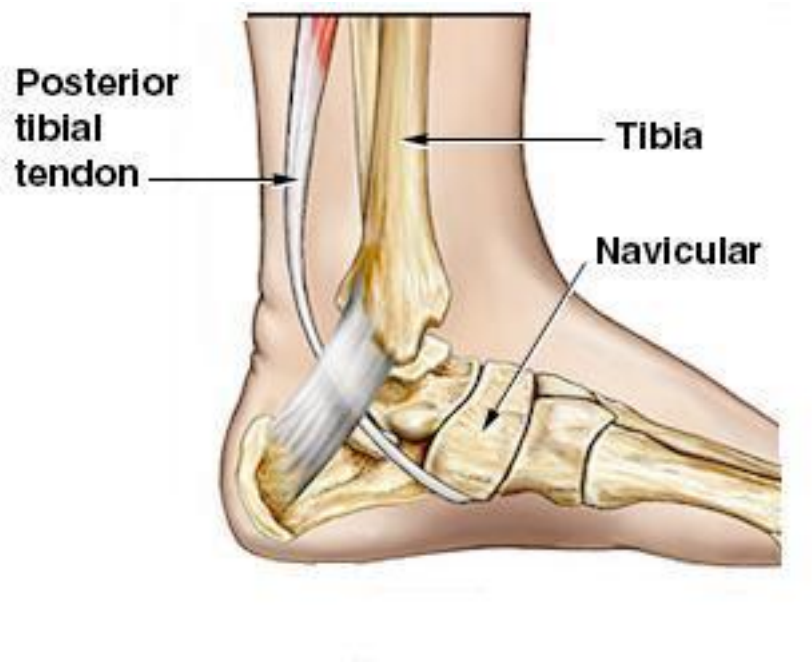
The following scheme of events is thought to cause the adult acquired flatfoot:

A person with flat feet has greater load placed on the posterior tibial tendon which is the main tendon supporting up the arch of the foot. Throughout life, ageing leads to decreased strength of muscles, tendons and ligaments. In some people, the posterior tibial tendon finally becomes overloaded, stretches,

becomes inflamed or tears. This is not a sudden event in most cases but is generally a gradual stretching over months. Once the posterior tibial tendon stretches, the ligaments of the arch stretch and tear. The bones of the arch then move out of position with body weight pressing down from above; the heel rotates outwards and the front of the foot deviates laterally and the arch appears collapsed further. The deformity can progress until the foot literally dislocates outward from under the ankle joint.

CLASSIFICATION

Tibialis Posterior Tendon Dysfunction is a condition of increasing symptoms and deformity. It is however 'loosely' classified into four stages as described below.



Stage I

Tendon stretched

Medial ankle pain (instep), especially on walking Swelling along tendon

Able to stand on tip-toe on one leg

Usually treated with insoles and physiotherapy

Stage II (a wide spectrum)

Tendon partially torn

More severe pain and swelling

Increased flattening of the foot

Unable to go on tip-toe on single leg

Treated as above, tendon reconstruction if necessary

Stage III

Heel is 'fixed'.

Treated with the use of insoles (orthoses) A fusion of the hind foot may be necessary

Stage IV

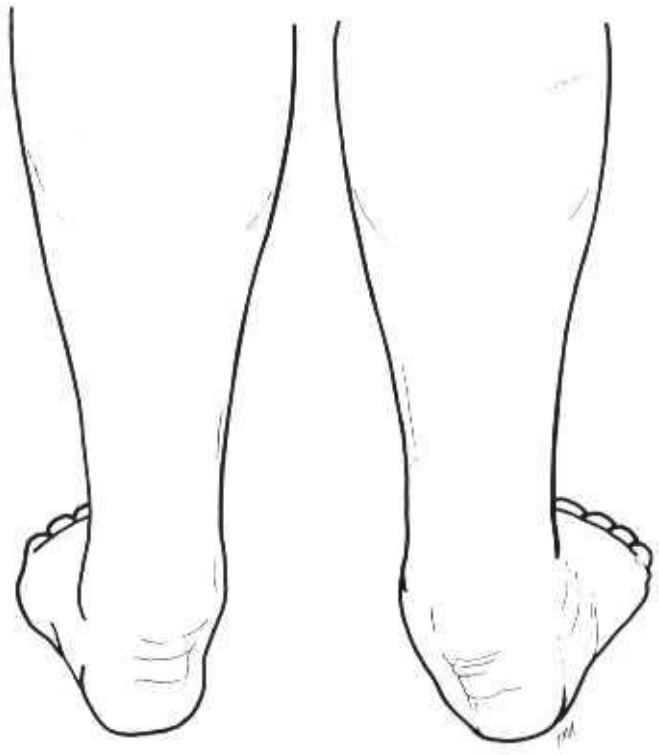
Accompanying ankle deformity

Surgery to the ankle may also be necessary

Compare the abnormal right foot with the normal left foot. There is increased flattening of the longitudinal arch (inside arch) and an outward (valgus) deviation of the hindfoot (heel). More toes are visible on the right; this is termed the 'too many toes sign' and is a result of the front of the foot turning outwards (abduction). These characteristics along with the inability or difficulty in being able to heel rise are a predominant feature of posterior tibial tendon dysfunction (see below).

COMMON SYMPTOMS

Pain – and or swelling behind the inside of your ankle and along your instep. You may also be tender behind the inner ankle where the Posterior Tibial Tendon courses. You



may also occasionally get burning, shooting, tingling or stabbing pain as a result of inflammation of the nerve inside the tarsal tunnel. You may also notice in the later stages that the pain may be felt on the outside of the ankle (as a result of the fibula abutting against the heel bone) and swelling may be present. You may experience increased levels of pain when you attempt to draw your foot inwards, outward, stretch your foot or while attempting to 'flatten' your foot.

Difficulty walking – the ability to walk long distances and a generalised ache while walking even short distances, this may probably become more pronounced at the end of each day.

Change in foot shape – sometimes your tendon stretches out, this is due to weakening of the tendon and ligaments. When this occurs the arch in your foot flattens and a flatfoot deformity occurs, presenting a change in foot shape.

Inability to go on tip-toe – a means of diagnosing posterior tibial tendon dysfunction is difficulty or inability to 'heel rise' (stand on your toes on one foot). Your tibialis posterior tendon is required for you to be able to perform this manoeuvre effectively. You may also experience pain upon attempting to perform a heel rise.

TREATMENT

The adult acquired flatfoot is best treated early. Accurate assessment by your

doctor will determine which treatment best suits you.

Non Surgical

Reduce your level of activity and follow the RICE REGIME:

R – rest as often as you are able. Refrain from activity that will exacerbate your condition, such as sports, walking etc...

I – ice, (apply to affected area) ensuring to protect area from 'frostbite' by applying a towel over the foot before applying ice pack.

C – compression, a tubigrip or elasticated support bandage may be applied to relieve symptoms and ease pain and discomfort. E – elevation of affected foot to reduce painful swelling.

Prescribed pain relief in the form of non-steroidal anti-inflammatory medications (if you do not suffer with allergies or are asthmatic).

Immobilisation of your affected foot. This will involve you having a below knee cast for a period of between four to eight weeks. In certain circumstances it is possible for you to have a removable boot instead of a cast. A member of the Foot and Ankle Team will advise as to whether this option is suitable for you.

Footwear is important. It is advisable to wear flat sturdy lace-up shoes e.g. trainers or boots. This will not only support your foot, but will also provide accommodation for orthoses (shoe inserts).

Orthoses (insoles, functional orthoses, ankle supports, braces, ankle foot orthoses - AFOs) are usually custom-made to increase the functional stability of the foot, and improve the mechanical properties of the tendon as well as reducing the actual degree of strain on the tendon. This reduces pain and inflammation.

Physiotherapy - Exercises and physiotherapy are often used to increase mobility, strengthen the tendon itself, stretch your Achilles tendon as well as reduce pain.

In Stage I, the inflammation and pain will usually respond to non-surgical treatment but you will need to continue to use insoles etc. in order to reduce the risks of recurrence or deterioration of symptoms. Compliance at this stage is crucial and may prevent your condition from progressing to a further stage.

Once the tendon has been stretched (Stage II), the heel starts rolling outwards. Total immobilization in a cast may calm down symptoms and arrest progression of the deformity in a smaller percentage of patients. Long-term use of orthoses may help stop progression of the deformity and reduce pain without surgery.

Non-surgical treatment is unlikely to arrest progression in stage III and IV but may be chosen by some patients who either are unsuitable for surgery or prefer not to have surgery.

Surgical

Surgery is usually performed when non-surgical measures have failed. The goal of surgery is to eliminate pain, stop progression of the deformity and improve mobility of the patient. Opinions vary as to the best surgical treatment for adult acquired flatfoot. Procedures commonly used to correct the condition include tendon debridement, tendon transfers, osteotomies (cutting and repositioning of bone) and joint fusions.

Surgery is very rarely required for stage I disease. Surgery for stage II diseases is more often carried out firstly on the tendon and secondly on the heel bone.

If the tendon has been markedly stretched or ruptured, surgery may be required to replace it with another tendon (tendon transfer); most tears will not simply be repairable. The tendon usually requires replacing with either the tendon that produces downward movement in the lesser toes(Flexor Digitoram Longus, FDL) or part of the tibialis anterior tendon (you may hear this procedure referred to as a Cobb Procedure) – your surgeon will explain this to you, should you require this type of surgery. This is usually carried out through one or more incisions on the inside (medial) of your ankle.

The heel bone may be shifted (reshaped) by means of a calcaneal osteotomy ('breaking the heel bone') performed through a separate lateral incision in order to bring your heel back under your leg. The bone is then usually then fixed with a screw.

Sometimes additional procedures may also be needed in order to balance your foot e.g. lengthening of the Achilles tendon, midfoot fusions etc.

In the later stages of Tibialis Posterior Tendon Dysfunction (stages III and IV), a fusion/arthrodesis may be required to correct deformity. This involves fusing three, sometimes more, of the joints in the mid and or hind foot. Your surgeon will advise you of this if it becomes an option.

If you smoke your surgeon may refuse to operate unless you can refrain from smoking prior, and during the 'healing' phase of your procedure. Research has proven that smoking delays bone healing significantly.

IMPORTANT POST OPERATIVE ADVICE FOLLOWING TENDON AND BONE PROCEDURES FOR STAGE 2

Following your operation you will remain in hospital between 2 and 4 days. Treatment is individual for each patient. However, it is usual, following a tendon transfer and calcaneal osteotomy, you will have a plaster cast in place following your operation.

Your foot may be placed in an inverted position (facing inwards); this will be done in the operating room. Your plaster cast may be changed at 2 week intervals. This allows the position of your foot to gradually be brought into a neutral position.

An appointment to attend the outpatient department two weeks following your procedure will be arranged. The sutures/clips will be removed and your wound site will be inspected. A new plaster will then be re-applied.

Until your foot is in a neutral position you will be non weight bearing (this means NO weight is to be put through the affected limb). You will be seen and assessed by a physiotherapist and instructed on the correct use of crutches. When the foot has reached a neutral position you may put your full weight through the operated limb whilst walking. REPORT SEVERE PAIN, MASSIVE SWELLING, EXCESSIVE NUMBNESS OR PINS AND NEEDLES TO YOUR GP.

Prolonged physiotherapy – is required following your operation. You may also need to have an insole for your shoe, this will be arranged with the orthotist should it be necessary.

Returning to work – this depends on the type of employment. If you have an office or sedentary type of employment and there are provisions for you to elevate the affected limb then you may resume work at approximately 4 weeks following surgery. Full recovery may take up to 12 months.

Driving – if your procedure is on the left foot and you have an automatic car you can usually drive 4 weeks following your operation. You must be able to perform an emergency stop. Notify your insurance company of the type of procedure that you have undergone to ensure that cover is valid.

Sport – a return to low impact sport may be possible. However, strenuous sporting activities are unlikely following your operation.

POSSIBLE COMPLICATIONS OF SURGERY

Infection – occurs in a small percentage of patients. Usually this is a minor infection which settles with a short course of antibiotics. Rarely a more serious infection occurs which requires removal of infected bone or screws.

Bleeding – at the surgical site is not uncommon and you may observe seepage through the plaster. The bleeding usually stops with elevation of the leg.

Numbness and tingling – at the surgical site, as a result of minor nerve damage. Often this is temporary but may occasionally be permanent.

Non union – occasionally bone fails to unite (join). If you smoke your risk of non union or major complications are greatly increased. It is therefore essential that you stop smoking before surgery and refrain from smoking until all bones have healed.

Scarring – any type of surgery will leave a scar. Occasionally this causes pain and irritation. Removal of metalwork – the screw(s) used during surgery sometimes become prominent and

can be easily removed as a day case procedure when the bone has healed.

Blood clots – deep vein thrombosis (DVT) or Pulmonary Embolus (PE) are rare. Please inform the team if you have had a DVT or PE before, or if you have a family history of clotting disorders.

Persistant pain and deformity – the operation may not be successful in about 15 % of patients and further surgery may be required.

Recurrent pain and deformity – the deformity may very rarely recur with time.