

# Plantar Digital Neuritis-Neuroma

Desk Guide for non-surgeons



*The clinician must identify the earliest signs and assess the prognosis from current evidence—Bennett 1995 and Di Caprio 2018 protocols – conservative-(steroid) injection-surgery.*

Neuritis is localised inflammation without nerve damage. Neuroma is an advanced lesion of the nerve which diminishes prognosis.

- Frequency 88/100,000 females; 50/100,000 males
- Age at presentation 40-60 range 20-70
- The 3-4<sup>th</sup> intermetatarsal space neuroma is 3-10 times more frequent than 2-3rd. The 4<sup>th</sup> interspace 1-8% incidence. 1<sup>st</sup> space is unlikely to be a true neuroma.

## Cause

- Injury & compression pressure.
- Junction box theory where nerves form a junction box supplying 3/4<sup>th</sup> or 4/5<sup>th</sup> toes and have become enlarged.

## Examination

Using the following methods, identify the most sensitive test. Least sensitive to most sensitive

1. Compression dorsal/plantar
2. Mulder's Click
3. Squeeze compression across the forefoot
4. Percussion (tapping using Tinel test top and bottom)
5. Sensory test with Neurotip at toes

*Which test is most sensitive? All show a progressive neuroma*

- Sunderland's sign where two toes separate suggests enlargement.
- Bencardino (2000) found 1/3 of cases had no symptoms and yet had a large neuroma.
- Check for general secondary features: hammer toe, dislocated 2<sup>nd</sup> or 3<sup>rd</sup> toe at MTPj. Broad forefoot. *These features will compress intermetatarsal spaces.*

## Early stages of neuroma formation

- Sensations may not be recognised by the patient.
- Odd sensations occur now and again.
- Most symptoms do not last.
- The location is generally at the ends of toes can radiate back at the neuritis stage.
- Later on, symptoms shift toward the MTP joints.
- Occasionally symptoms present between the 2/3<sup>rd</sup> toe and the 4/5<sup>th</sup> toe but usually affect the 3/4<sup>th</sup> toe.

Identify patient symptoms. Do they fit this box? Seek out *frequency*, not just the *presence* of symptoms. Use a VAS scale 0-10.

Burning	Radiating
Deeper Numbness	Paraesthesiae
Cramp	Crushing
Shooting	Aching
Sickening pain	Light numbness

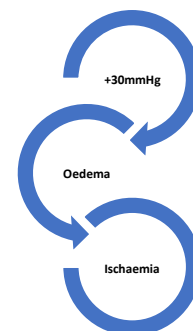
## Key questions

- Do these happen all of the time?
- Are you awoken at night?
- When does the pain arise?
- Do you stop to rub your foot?
- Do you take medication to help with discomfort?

## **What is deterioration?**

Pressure has created swelling, reducing blood flow and scar tissue has enveloped the nerves arranged in bundles. Once scar tissue has developed, then conservative care is less likely to work.

## **Kimberly Topp (2006) compression on the nerve**



- Reduction of blood supply to never may cause more interossei cramping.
- Scar tissue stops the nerve from working, causes inflammation, and can send strange signals above the foot to the ankle or even the knee in the early stages.

### Tests (provides options)

1. Ultrasound diagnostic is used for size measurement and differentiating different spaces.
2. MRI is used to determine if neuroma is not just nerve alone but another lesion
3. Do not use tests if only using conservative management
4. Do use imaging (US) if injecting or considering surgery.
5. If you are referring to US is helpful, plus sending a report.
6. Surgeons will undertake US and/or MRI before surgery

Younger patients do better. Those with short timeline symptoms do better.

### Conservative

Discuss and agree on solutions. i.e. reduce time to < 2 hours and no more than 3 hours. Chance of success 30-40% estimated from multiple sources

- Recovery is possible with lower grade symptoms
- Alter footwear design
- Introduce metatarsal pad adhesive for 24 hours trial
- Orthosis - not bespoke initially but use well made
- Bespoke orthosis
- Manipulation – massage
- Reduce inflammation and reduce scar tissue
- Reflexology

### Injection (*steroid*)

- First-line corticosteroid of choice
- The value of local anaesthetic alone will aid location.
- Ultrasound measure size +5-7mm prognosis poor beyond one year.
- Reduce inflammation, scar tissue, influence macrophage activity, aid pain
- It does not have to be ultrasound-guided but avoid injecting into nerve
- *Alternative injections of hyaluronic acid, alcohol 4% diluted with LA.*
- Review 4-6 weeks for the steroid, warn flare-up 3-10% chance.
- Avoid repeat injections benefit decreases by 50% and a third by 75%. Deposits of steroids can actively increase problems.

### Surgery

Offer the patient all options based on the current effective treatment experience. Avoid surgery for six months while conservative approach: document your advice and patient response as a rule of thumb.

- Mobilisation varies from 10 days to 6 weeks.
- Advise local v general anaesthetic options.
- Day case with discharge home is usual.

### Risks of surgery

- Numbness around toes and area
- Stump neuroma (intractable pain)
- Refractive improvement after 12 months

Additionally -

- Your patient may need to continue with orthoses.
- Avoid returning to inappropriate footwear.
- The surgeon will discuss additional surgical risks.

### Approaches

- top of foot
- bottom of foot
- through webspace

### Techniques

- To cut intermetatarsal ligament through minimal incision may work if the neuroma has not enlarged.
- US is important to measure before surgery. The accuracy of size assessment can be poor with MRI and US so false-negative information may arise.
- The dorsal incision is more cosmetic, but the risk of stump neuroma is higher
- Plantar incision gives better access, but scar and corn formation are potential risks.

**NB. Other techniques such as cryosurgery exist as radiofrequency ablation (see NICE). All require additional skills.**

**Further evidence and references can be found on [ConsultingFootPain.co.uk](http://ConsultingFootPain.co.uk) under “neuroma series”.**

