

# Poorer tissue healing after foot surgery in Charcot Marie Tooth Disease (Hereditary Motor Sensory Neuropathy)

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## Background

- Foot deformity in individuals with HMSN are common.
- The incidence of tissue healing problems after any type of foot surgery is <1% in our institution. However, we noted a few children with healing problems and thus prompted this study.
- A preoperative skin-cleaning and frequent dressing change protocol has been developed and is currently working well.

## Method

A retrospective analysis of our operating database was performed. All patient <16yr who had comparable foot surgery - involving plantar fascia releases, tendoAchilles lengthening, first ray osteotomies and tendon transfers were identified between 2014-2018. Any child requiring more than one dressing change after surgery was regarded as having a 'tissue healing problem'.

10 children with 18 equitable foot procedures were identified. There were 3 boys and 7 girls, ages 6-17yr.

Three children (6 foot procedures) did *not* have HMSN.

## Results

None of the children who did *not* have HMSN experienced tissue healing problems.

7 children, 14 foot procedures, had HMSN (4 had Type I, 2 had Type II and one is indeterminate). 3 children (6 feet) had poor wound healing, all three had bacterial growth identified but none had overt infected looking incisions. Tissue healing took 6-49 weeks.

Two of the children with poor wound healing had HMSN II, one had indeterminate type.

All three children had a significant sensory neuropathy (involving both sensation and proprioception) as part of their presentation.

It must be emphasised that 4 children with HMSN (7 feet) did not experience tissue healing problems. These children were younger and did not seem to have the same degree of sensory neuropathy. It was not possible to formally test this with comparable nerve conduction studies in all the younger children.



This is the foot of a 14 year old boy with HMSN Type Ia. This medial incision had broken down underneath the cast. It took 49 weeks to heal



This is a 15yr old girl of indeterminate HSMN type. Incision breakdown was noted ten days after surgery, she required 7 weeks of healing time.



## Conclusion

Experimentally capsaicin skin denervation skin using capsaicin displays impaired tissue healing. Sympathetic nerve dysfunction, for example in chemical sympathectomy, also results in poor skin healing.

It is known that some individuals with HMSN have an impaired sweating response, it is also known that HMSN Type I has both a qualitative and quantitative reduction in small nerve fibres including sympathetic fibres. A future avenue of research would be to prospectively evaluate peripheral sympathetic nervous function to predict tissue healing. The variation in sympathetic nerve involvement would explain why some children developed tissue healing problems and others did not.

We hope to alert surgeons to the higher likelihood of impaired healing in children with HMSN. As a result of our findings we have adopted a vigilant and preventative approach to foot surgery in children with HMSN. We have weekly or fortnightly reviews of the incisions. We prescribe three days of skin disinfection (Chlorhexidine) prior to surgery. So far this approach has achieved modest success - two children (four feet) have experienced slow healing but no skin breakdown.

Further work is needed, both on the incision management method we have introduced but also in identifying 'at-risk' patients.

## References

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