Carol's clawed toes

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The motor neuropathy that may occur in patients with diabetes can lead to an imbalance between extensor and flexor function and result in 'clawing' of the toes. Here are some issues to consider in managing diabetic patients with neuropathy and clawed toes.

Case history

Carol is 68 years old and has had type 2 diabetes for 16 years with moderate diabetes control (HbA_{1c} values ranging between 7 and 8.5%; ideal <7%). She has always beeen embarrassed by her flat feet and over the last few years has developed clawed toes (Figure 1), which she now finds a problem as shoes often rub her toes. She has angina but tries to walk each day on a flat path and at a gentle pace. She is worried about foot infection and knows that poor shoe fit can cause blisters or abrasions that could become infected. She doesn't feel her toes rubbing, but when she returns from her walk and takes off her court shoes, she can see that her buckled toes are quite reddened.

Carol has reduced dorsalis pedis and posterior tibial pulses in both feet and reduced sensation to her mid foot, but her skin and nails are well cared for. She regrets smoking for some 35 years when she was younger.

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Questions to consider

- Why has Carol developed clawed toes?
- What factors relevant to Carol's clawed toes do you need to assess?
- How can Carol's footwear be improved?
- What else can Carol do to reduce her risk of future problems?

Why clawed toes have developed

Carol's toes have clawed for two main reasons.

- She has flat feet so the toes will often claw more in an attempt to grip the ground and give the stability that her foot structure does not provide. The extensor and flexor balance around the metatarsophalangeal and interphalangeal joints is disrupted and the toes buckle (see Figures 2a and b). The net effect is less toe push in gait (the toes grip instead), increased load on the weight-bearing aspect of the metatarsal heads and tips of the toes, and a shortened, higher forefoot to fit into a shoe.
- Carol also has sensory neuropathy, and since the motor nerves can also be affected, the extensors and the flexors pull unevenly and further buckle the toes. She is unlikely to have pain when the metatarsals and tips of the toes bear more weight and develop thick calluses, or when the clawed toes rub on the upper of the shoes.

Figure 1. Carol's clawed toes.

Factors that should be assessed

The fit and style of Carol's shoes are issues that should be considered immediately as the wrong shoe will cause abrasions or blisters over the clawed toes and risk potential infection. Carol will not be able to feel whether or not her shoes fit comfortably.

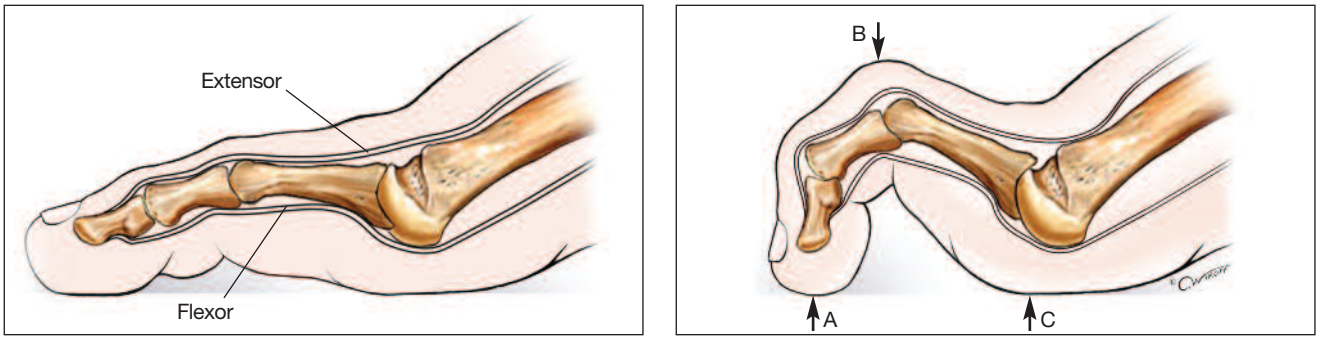
Look for pressure sites, especially over the interphalangeal joints of the clawed toes, but also the weight-bearing metatarsal heads.

As Carol has flat feet it may be helpful also to address the mechanical effects of this. A podiatrist who is well versed with

Table 1. Foot factors that predispose to foot ulcers

Vascular disease	
	Reduced healing
	Increased risk of infection
Neuropathy	
	Damage becomes painless
	Dry skin cracks
Foot structure	
	High pressure areas
Self-care*	
	Inadequate or inappropriate footwear
	Poor skin and nail care
	Lack of monitoring schedule, action plan or access to health professionals

* Note that patients may not be able to see, reach of feel their feet.



Figures 2a and b. a (left). Simplified illustration of a normal foot. There is an even and balanced function between the digital extensor and flexor that stabilises the interphalangeal and metatarsophalangeal joints. b (right). Carol's clawed toes. Motor neuropathy can reduce extensor function and result in an imbalance between extensors and flexors. The net effect is increased flexion of the interphalangeal and metatarsophalangeal joints that results in 'clawing' of the toes. This illustration also shows the three likely areas of increased pressure (A, the digit apex; B, the proximal interphalangeal joint; C, the plantar metatarsal head) that are potential sites of ulceration if the pressure is not off-loaded.

both diabetes and foot mechanics should be able to help.

Improving footwear

Carol's feet need protection. Her altered foot shape now means that shoes can damage the feet unless they are carefully selected and fitted. The neuropathy means that her toes will continue to claw and she will not be aware of any local abrasion taking place on the toes or ulceration under the metatarsal head calluses.

Pressure should be off-loaded, both weight borne and over the toes. Insoles or orthotics can assist in protecting the plantar surfaces and may reduce some of the toe clawing, but these can also fill up the shoe even more and footwear may need review. Carefully debride callused areas and thereby immediately reduce 20 to 30% of the load pressure.

Fit the feet in deeper toe box shoes. Some athletic shoes can be suitable if the sock liners are removable; such shoes will also provide good cushioning for Carol's walking program.

The socks also need special consideration as bulky styles can take up a lot of room and cause blisters. The major priority is to prevent any skin breakdown that could progress rapidly. Carol may not be able to feel the damage and the blood flow may not be enough to enable healing.

Helping reduce the risk of future problems

Carol has three of the four foot factors predisposing to foot ulcers (Table 1).[1] These factors set the priorities for Carol's self-care program (Table 2).[1] She also needs to be given an action plan so that she knows what to do if she notices a problem or has questions about her feet or self-care schedule. Address the basics first – advise her on the importance of:

- visually checking her feet (if necessary using a mirror to check the soles)
- caring for her skin, especially using moisturiser to prevent cracking
- debriding calluses – e.g. with a pumice stone after her bath or shower
- wearing well selected and fitted shoes
- using an orthotic or insole to off-load any weight-bearing areas
- possibly, wearing pressure-reducing socks (e.g. Thor-lo) for daily walks
- having a check up with her GP or podiatrist every six months to review the status of her feet and update her care needs.

Carol should also be given a 'hotline' to contact her GP or podiatrist as soon as foot problems develop. MT

Table 2. Diabetic feet: self-care priorities

Risk factor	Hygiene	Inspection	Protection
Vascular disease	++++	+	++++
Neuropathy	++	+++	++++
Foot structure	+	+	++++
Self-care	++++	+	+

Scale: ++++ = essential; +++ = very important; ++ = important; + = advisable.

Reference

1. Phillips P, Evans A. One pair must last a lifetime. Foot care in diabetes. Aust Fam Physician 2002; 31(8): 53-57.

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