

THE IMPACT OF PATIENT BEHAVIOUR ON THE MANAGEMENT OF A DIABETIC FOOT ULCER

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This case study will explore the issues surrounding poor self-care in patients with type 2 diabetes and the impact on the management of diabetic foot ulceration.

PATIENT DETAILS AND HISTORY

The patient was a 63-year old man who was a retired school teacher. He had a 15-year history of type 2 diabetes and a 20-year history of hypertension. For the past five years he had hyperlipidaemia, a condition where the lipid levels are elevated higher than the normal range. He had suffered a foot ulceration two years. He was on combination therapy (pioglitazone, metformin and gliclazide) to control his diabetes, ramipril for hypertension and atorvastatin for lipid dysfunction.

ASSESSMENT AND ESTABLISHMENT OF TREATMENT OBJECTIVES

The patient presented with foot ulceration saying:

'I've got some big open blisters on my feet that don't seem to be healing... my doctor has given me some antibiotics and sent me to see you'.



Figure 1. The patient's foot at the initial consultation.

The patient's chief complaint was the unpleasant smell and discharge from the affected foot. He had been in some discomfort for the past four weeks. The patient was unable to determine the cause of the lesions but mentioned a period of increased physical activity when he has been gardening.

The soiled dressings that were removed from the affected foot had a noticeable yellow/green coloured discharge combined with a foul odour.

There were two ulcerated areas on the right foot. Ulcer one was

on the medial border of the heel and had irregular islands of granulation tissue in the wound base with a shallow covering of yellow exudate. The wound measured about 2cm in diameter. Ulcer two on the medial border of the metatarsophalangeal joint had a central area of thick yellow/white sloughy exudate and a peripheral ring of red granulation tissue. The wound measured 1.5cm in diameter. An outer ring of macerated tissue affected both peri-wound margins.

A visual inspection of the skin revealed dry, thin skin with clinical features of infection at the site of ulceration.

The foot was then inspected for deformities. The shape of the foot exhibited a high arch profile with callus formation over the heel and medial borders of the forefoot. Palpation of the foot pulses revealed posterior tibial pulses but there was difficulty locating the dorsalis pedis pulses, suggesting possible peripheral arterial disease.

Doppler assessment of the pedal pulses allowed further information to be collected regarding the strength of blood flow and health of the vessel wall. The results demonstrated a low-pitched biphasic sound consistent with possible mild/moderate peripheral arterial disease.

Monofilament testing was undertaken over three points on both feet to establish if protective pain sensation was intact. Normal sensation was noted on both feet.

An appraisal of the patient's footwear revealed that he was wearing slip-on shoes that were in poor condition with excessive wear on the outer sole and inner lining (*Figures 2 and 3*). The patient was advised to stop wearing these shoes as they may have contributed to his foot ulcerations.

The patient was asked about his self-monitoring of glycaemic control. He reported that he did not check this too often and acknowledged that he regularly had red wine and snacks in the evening which may contribute to high blood sugars. He was encouraged to reduce his alcohol and snack consumption as any increase in glycaemic levels may delay healing of his foot ulcers and prolong the period of infection.

TREATMENT

Consideration was given to the choice of wound dressing. The patient felt that the (non-sterile) gauze dressing he was applying daily was suitable and comfortable. The need for an antimicrobial absorbent sterile dressing was emphasised because of the signs of infection. The patient was advised to keep

the dressings on for five days to prevent further tissue trauma on daily dressing removal.

A primary contact layer of silver-impregnated dressing was chosen due to its antimicrobial properties (*Figure 4*). Silver has long been recognised as a powerful antimicrobial agent (Lansdown, 2004) but there are no randomised controlled trials that evaluate the effect of silver dressings on infection (Bergin and Wraight, 2006) hence the need for antibiotics. The silver-impregnated dressing was combined with a secondary dressing of hydrocellular foam (*Figure 5*) for its absorptive capacity and to provide some mechanical protection.

The treatment was reviewed after five days. The patient expressed a preference to change the dressings as he enjoyed outdoor walking and gardening followed by a daily bath. He was given spare dressings to use in case of soiling of the current dressing.

Consent was given to take a dated photograph of the patient's wound to enable visual comparison on subsequent visits. A swab was taken from the wound margins and from the bases of both wounds and sent to microbiology in order to identify the cause of infection.

On receiving the swab results, the patient's GP was contacted to request provision of antibiotics that could be effective against gram-negative bacteria as the clinical signs and symptoms suggested classic features of *Pseudomonas aeruginosa* infection (foul smell and green-



Figure 2. The sole of the patient's shoe.



Figure 3. The heel of the patient's shoe.



Figure 4. Application of the silver-impregnated dressing.

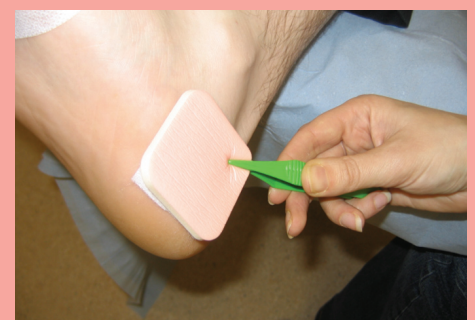


Figure 5. Application of the hydrocellular foam.



Figure 6. Inadequate footwear.



Figure 7. Good supportive footwear.



Figure 8. Provision of typical off-loading orthotic therapy.

yellow discharge in poorly nourished skin).

INTERVENTIONS

The patient was asked to stop wearing inadequate footwear with no heel support (Figure 6). He reported he was happy to throw away the current shoes and purchase new more suitable footwear. Advice and leaflets

were given indicating the most appropriate style of shoe — preferably lace-ups (Figure 7).

CLINICAL OUTCOMES TO BE REVIEWED

When reviewing the effectiveness of this patient's treatment it would be necessary to consider the following:

- ▶▶ The patient's new footwear should be assessed for suitability with a view to long-term orthotic therapy this would involve manufacture and provision of in-shoe materials to support the bony architecture of the foot and provide cushioning for vulnerable deformed and post ulcerated areas (Figure 8).
- ▶▶ The dressings should be appraised to establish their effectiveness
- ▶▶ The ulcers should be assessed for the presence/absence of foul odour which would indicate infection
- ▶▶ The initial photograph should be used to assess the progress of wound healing
- ▶▶ The patient should be asked about monitoring glycaemic control and reducing his alcohol intake.

Once the patient purchased suitable footwear and the infection regressed with provision of specific antibiotics, the wound healing accelerated greatly. Continuous monitoring of the patient's glycaemic control was reinforced as an essential element of best practise for short-term healing of the wound and long-term prevention of chronic complications. The patient successfully healed after a period of 16 weeks of silver dressing and hydrocellular foam intervention.

Regular follow up appointments at 4-weekly intervals were maintained to monitor continued communication and good health of the patient.

CONCLUSION

This case reveals the extent to which poor self-care can impact upon clinical management. A large percentage of non-traumatic lower leg amputations are performed in patients with diabetes. Successful management of risk factors can prevent adverse outcomes such as infection and amputation. **WE**

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