Case study
"So much to lose" — a holistic approach to wound management

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ABSTRACT

The effects of living with a chronic wound and the potential loss of a limb is a serious occurrence that has a significant impact on a person's quality of life and potential for healing[1]. This case study demonstrates the challenges associated with treating a person with a chronic arterial ulcer and why it is important for clinicians and patients alike to have the same goals of therapy in relation to the wound management. A combination of physical, social and environmental factors all have such a major impact on a person's potential for healing including their quality of life and daily functioning. This case study clearly demonstrates the need for a holistic assessment of a person with a wound, not just wound care[2].

Keywords: holistic, quality of life, wound assessment, wound management.

INTRODUCTION

Holistic wound management incorporates the assessment and management of a person with a wound, including the person's medical conditions, medications, wound history, social supports and, most importantly, the person's perceptions on how they view their wound[2]. All of these factors combined can have an effect on healing. Sometimes, healing is not a realistic endpoint as was the situation with the case study to be discussed within this paper. There were several challenges that arose, including not only attending to the care of an elderly man with an arterial ulcer, but also trying to prevent lower limb amputation, addressing his psychological needs following the recent loss of his wife and ongoing pain issues. These complexities required a thorough, holistic approach to wound management involving a multidisciplinary team.

This case study discusses Mr A (pseudonym), a 91-year-old gentleman with two wounds on the left limb, gaiter region, medial aspect. Mr A had been residing within a nursing home requiring high-level care for the past five months. He entered the nursing home with his wife and they shared a room together until her sudden death two months prior to the initial visit from a wound consultant. This traumatic event triggered a cascade of events that had a significant emotional and physical impact on Mr A.

Nursing staff within the facility had been attending to Mr A's wound on his left lower leg and were concerned that there was no improvement. They contacted a wound nurse consultant and requested a visit. Approximately three years prior to entering the facility, Mr A had had a right below knee amputation secondary to a thrombus in the right calf. Therefore, any problems with his left lower limb caused him a lot of anxiety.

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PATIENT ASSESSMENT

The nurse consultant began by explaining her role within the aged care facility, which arose from referrals from registered nurses and GPs. The role of the nurse consultant included visiting the resident, taking a detailed history from the resident, nursing staff and resident file. There are limitations to this role as in order for the nurse consultant to practise within her scope of practice, she cannot prescribe medications, order pathology or radiology. A physical assessment was undertaken. The findings of the assessment were discussed with Mr A, along with suggestions for the management plan. Mr A expressed that he was grateful for the consultation as he was quite concerned about his left leg. When asked what bothered him most about his wounds, his response was, "I'm so scared of losing my leg". The loss of a limb can have a profound effect on a person's quality of life and daily functioning[3].

Mr A's medical history included peripheral arterial disease (PAD), hypertension, gout, renal impairment and a right below-knee amputation. The information in the resident's history was vague and it was difficult to determine when the PAD had been diagnosed, how long hypertension had been an issue and the severity of his renal impairment. Each of these comorbidities had a significant impact on Mr A's overall health and potential for healing[4]. PAD affects the arterial blood flow to the peripheries and ulceration often results when blood supply is compromised[5]. The extent of the PAD was unknown as arterial duplex scans had not been done recently. These scans would assist in assessing the extent of the arterial compromise and whether intervention was appropriate[5]. Hypertension may also impact on wound healing as it is a known risk factor for atherosclerosis[6]. There were no documented recent attacks

of gout. The degree of renal impairment was also not known as there was no evidence of recent pathology or radiology investigations available within the resident's history. However, research has shown that patients with renal impairment have higher morbidity rates and lower rates of limb salvage[7].

In relation to Mr A's cognitive status, there were no signs of impairment evident through the conversations had. Mr A was orientated to time, person and place and did not display any signs of confusion. This is important when obtaining a history as accurate information about Mr A's health will lead to a better assessment and outcomes for him[8].

The clinicians involved in Mr A's care were nursing staff comprising a range in level of experience and training. As per protocol within the facility, only the registered nurses attended to complex wound care which Mr A required. Mr A's GP visited as requested by nursing staff and a podiatrist reviewed him every six to eight weeks. A holistic approach to wound management must incorporate a multidisciplinary approach to ensure that all aspects of care are addressed[9].

Mr A's medications included: aspirin, calcitriol, allopurinol, frusemide, atorvastatin, atenolol, Panadol Osteo®, mirtazepine and oxycodone. Interestingly, Mr A was not on any potassium supplements, which is unusual when a person is taking a loop diuretic regularly as they can cause hypokalaemia and other electrolyte imbalances[10]. Oxycodone had been prescribed for when Mr A required a stronger analgesic for his leg pain; however, he had stated that he was hesitant to take this as he was concerned about 'addiction'. Patient education was provided regarding the appropriate use of an opioid narcotic for pain relief[10]. It was also ascertained that Mr A had never smoked nicotine and had no known sensitivities or reactions to any drugs, dressings or foods.

Mr A's mobility was limited. He could transfer with the assistance of one person into his wheelchair from his bed. He was also able to ambulate with the use of a prosthetic leg and one person; however, he stated this was becoming increasingly difficult for him. When sitting in the chair or lying in bed, Mr A was able to reposition himself enough to change position. A Braden risk assessment scale was done and the result was 14, which indicated that Mr A was at a moderate risk of developing pressure ulcers and appropriate strategies should be implemented in order to prevent this from occurring[11]. Mr A had a high-density foam mattress in situ in his wheelchair and in his bed. These mattresses were examined and assessed as appropriate for him[12].

Mr A appeared quiet and withdrawn during the initial visit. He didn't smile and he stated that he missed his wife and his home. At the time, it was felt that Mr A was depressed; however, in retrospect he may have been experiencing a combination of depression and grief. No further tests were done to ascertain the exact diagnosis of his mood. As Steffens and Potter discuss, depression can be defined as a "mood disorder that produces sadness, negative self-regard, loss of interest in life, and disruptions of sleep, appetite, thinking and energy level" for more than two weeks[13]. Mr A was displaying all of these symptoms.

Mr A's nutritional intake was explored. He stated that he didn't have much of an appetite and ate about half of his meals. These meals were well balanced and provided by the facility. He did not consume any alcohol. Mr A stated he had not lost any weight over the past six months and he was not taking any nutritional supplements. Asking these questions is part of the Mini Nutritional Assessment — Short Form (MNA®–SF) which is a useful tool for assessing patients who are well nourished or at risk of malnourishment. If the latter is identified, then a full MNA is to be completed[14]. Mr A had not been seen by a dietitian since his admission to the nursing home.

A comprehensive pain assessment was done using a visual analogue scale and asking key questions as discussed in the European Wound Management Association's Position Document: Pain at wound dressing changes[15]. Mr A's pain was described as, "an ache in the left lower leg", which was intermittent and worse at night when it interrupted his sleep. Mr A commented that, "I need to hang my leg over the edge of the bed to get some relief!" Pain was described as 8/10 at worst over the past week. Wound-related pain was described as 0/10 during dressing change and the same at pre- and post-dressing change. Mr A stated he didn't usually take any analgesia for his general leg ache, although occasionally accepted Oxycodone 5 mg to help with this. This was not a regular occurrence as he was concerned about addiction, as previously mentioned. This assessment indicated that there was a degree of ischaemic rest pain as described by Mr A, which collaborated with the clinical assessment[16].

A full lower limb assessment was undertaken on the left lower leg. The skin was dry with flaky skin around the gaiter region. There was evidence of haemosiderin staining on the limb with moderate, non-pitting oedema. These clinical signs are indicative of some underlying venous disease and venous duplex studies would be able to clarify this further[17]. The limb showed that hair was present, it was warm to touch, including the foot and toes, and the colour was pink. Pedal pulses (dorsalis pedis and posterior tibial) were palpated and felt "normal". An Ankle/Brachial index using a hand-held Doppler ultrasound was not attended to due to generalised pain as described by Mr A. He stated that he wouldn't be able to cope with the procedure of having the blood pressure cuff around his calf. Following assessment, there were clinical signs of venous disease with no overt signs of arterial disease despite the description of ischaemic rest pain[18].

WOUND ASSESSMENT

A comprehensive wound assessment was undertaken and both wounds can be described as: *Wound 1:* (L) lower calf (proximal aspect) — measured 1.2 x 1.0 cm, partial-thickness depth, regular margins, 100% sloughy tissue on wound base, moderate haemopurulent exudate, nil odour, periwound erythema. No complaints of wound-related pain. *Wound 2:* (L) lower calf (distal aspect) — measured 0.8 x 1.7 cm, partial-thickness depth, regular margins, 100% sloughy tissue, moderate haemopurulent exudate, nil odour. The periwound skin was warm to touch, erythema extending 0.5 cm around wounds some venous eczema present. There was also moderate, non-pitting oedema present (Figure 1).

PROVISIONAL DIAGNOSIS

The holistic assessment of the person, lower limb and wound all indicate that the wounds are arterial ulcers with underlying venous hypertension. The wounds also appeared to be clinically infected as evidenced by the type and amount of exudate, periwound skin and odour[19].

Figure 1

RECOMMENDATIONS AND RESULTS

There were several recommendations made relating to the ongoing management of Mr A and his chronic ulcers. These included: skin care; local wound care; nutritional supplements; pressure relief; a wound swab; pathology including full blood exam (FBE), urea and electrolytes (U&Es), liver function tests (LFTs), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP); arterial duplex scan of the left limb; oral antibiotics; and an increase in analgesia and antidepressants. Rationales for these recommendations will be discussed.

The goals of therapy as discussed with Mr A were to manage the lower limb pain, treat wound infection, manage exudate, treat dry lower limb skin and prevent limb amputation.

A good skin care regime was not in place for Mr A, which was evident through the dry skin on his leg. Recommendations made by the nurse consultant included the use of a soap-free wash for the body and daily application of an emollient to treat the dryness, particularly on the lower limb[20]. In dressing the wounds, a silver hydrofibre® dressing was recommended[21]. The secondary product used was an absorbent pad to absorb excess exudate. This was held in place with a retention bandage and changed three times per week[22].

Following the nutritional assessment, Mr A was commenced on a nutritional supplement. He was prescribed to have two serves a day of an arginine supplement, which is the recommended daily intake and there is some evidence indicating a positive effect for wound healing[23]. To relieve pressure off the lower limb, a bed cradle was suggested and this was applied immediately.

Following the initial assessment, a wound swab was taken for micro culture and sensitivities to determine which organisms were causing the clinical infection[24]. The swab showed a moderate growth of *Staphylococcus aureus*. With sensitivities to a few antibiotics, Flucloxacillin was the most appropriate for Mr A. Prior to the results being available, the wound consultant suggested to Mr A's GP to commence Flucloxacillin and treat the infection promptly given the clinical signs of wound infection, rather than waiting for the results to come through[9]. This recommendation was implemented by the GP.

Pathology including haematology and biochemistry is beneficial in assessing any underlying inflammatory processes such as infection. This would be evident through raised white cell count (WCC), ESR and CRP[24]. Assessing the degree of renal impairment is necessary as causative factors of the impairment would need to be addressed, such as some medication which could be contributing such as mirtazepine[25]. Low haemoglobin levels can impact negatively on healing; therefore, causes of anaemia need to be further investigated[26]. In addition, any wound that is exuding heavily will lead to a decrease in albumin, which also impacts on wound healing[26].

Results of these tests showed the following: haemoglobin was below the normal range at 103g/L (125–175g/L), indicating anaemia. Possible causes of this anaemia could be chronicity of the wound, possible iron deficiency and renal impairment[24]. Haematocrit and red blood cells were low (0.3L & 2.9x10^12/L respectively) which coincide with the low haemoglobin and indications of anaemia[27]. Inflammatory markers were elevated indicating underlying infection. ESR was 115mm/hr (2–14mm/hr) and CRP was 85mg/L (<5mg/L). CRP is a more sensitive early indicator of infection than ESR[27]. The results of renal function tests indicated severe renal impairment as characterised by a urea of 29.7mmol/L (4.5–10mmol/L) and creatinine of 288umol/L (60–125umol/L). Combined with eGFR of 18, Mr A was monitored carefully[27].

There was concern about the degree of PAD in the left limb in view of the chronicity of the ulcers and delayed healing. An appropriate diagnostic test to determine the underlying arterial supply is an arterial duplex scan[5]. This was suggested to Mr A's GP. An arterial duplex scan assesses the peripheral arterial blood supply through to the foot and shows any occlusions which may be preventing blood flow and therefore delaying healing[5]. This was done 10 days after the initial assessment and the radiologist reported, "Moderately severe peripheral arterial disease with no flow identified in the peroneal artery. Aneurysms of the distal superficial femoral artery and distal abdominal aorta. Two vessels flow to the ankle." The wound consultant interpreted this result as indicating that there is no blood flow through the peroneal artery; however, collateral circulation at the ankle was providing some flow to the lower limb and foot. There were also two aneurysms noted, which could rupture and be a serious health threat[28].

Given the results of the above investigations, it was felt appropriate to suggest a referral to a vascular surgeon for further analysis of Mr A's arterial supply and possible surgical intervention[5]. A referral to a dietitian would be of benefit in reviewing Mr A's oral intake and prescribing the most appropriate diet and nutritional supplements for him[14].

A few phone calls were made after the initial assessment to Mr A's GP regarding the assessment and recommendations. The reply was that he would review Mr A in the next few days. It is important to ensure that communication between appropriate health care professionals is maintained to ensure consistency of care and follow-through is achieved[29]. Mr A requested that the wound consultant also contact his son to inform him of the visit and recommendations. Mr A was grateful. Involving family members within the care of a resident is beneficial for positive outcomes and to enhance concordance with care[30].

In relation to the medications Mr A was taking, the wound consultant suggested increasing the mirtazepine, given the clinical symptoms of depression. There was also concern about the type and level of

pain experienced by Mr A and, therefore, it was suggested that a regular dose of opioid be commenced for severe leg pain. Mr A was already on oxycodone, so the dosage could be increased and titrated according to pain levels. A pain chart would assist with this assessment and titration of doses[10].

INTERPRETATION/OPINION

In light of the provisional diagnosis of arterial ulcers with underlying arterial disease and his general health, including severely impaired renal function, it was felt that as a health care team and, in collaboration with Mr A, the aim was to try and manage the symptoms associated with the wounds, salvage the limb and, most importantly, continue to ask Mr A how he was feeling[31]. In addition, it was important to pursue a vascular surgeon's opinion as soon as possible in view of the clinical assessment, radiology results and Mr A's concerns regarding keeping his limb[5].

FOLLOW-UP VISIT

The wound consultant visited Mr A four weeks after the initial visit. Mr A's GP had reviewed him five days post the initial assessment and had read the assessment and recommendations (as verbalised by nursing staff). The doctor did not increase the dose of mirtazapine because, in view of the impaired renal function, an increase in dosage could have exacerbated this condition[10]. This was an important learning point as this recommendation was not appropriate given the side effects of this medication. However, tramadol 150 mg BD was commenced for the lower limb pain. This was a concern as tramadol may not be an appropriate choice due to the risk of increasing renal impairment and serotonin toxicity, especially when combined with a tetracyclic antidepressant[10]. Discussions with the nursing staff revealed that all of the other recommendations had been implemented as suggested.

Mr A's general mood had not seemed to have improved. He stated he was feeling "down". He was resting in bed on the next visit (which was late morning) and his curtains were drawn in his room. Staff stated that they had tried to encourage him to participate in activities and socialise with other residents at meal times; however, Mr A refused.

Upon reassessment of both wounds, the dimensions were unchanged. Wound bed tissue remained sloughy; however, the exudate had changed from haemopurulent to haemoserous, indicating an improvement. Also, the periwound skin erythema had reduced, indicating that clinical signs of infection had reduced[19].

Mr A stated that the leg pain remained the same, despite the commencement of tramadol 150 mg BD. Mr A also stated that he had been asking for oxycodone more regularly as he did get some relief from this medication.

Upon reviewing the progress notes from Mr A's GP, a vascular surgeon referral had not been made. As to why, this was unclear as there was no documentation in the history and Mr A stated that this was not discussed with his GP, even though this had been discussed on the initial visit. Further follow-up with the doctor was planned to discuss this option with him[32].

LESSONS TO BE LEARNED

The benefit of hindsight is an amazing thing. The wound consultant reflected that she wished she had spent more time listening to Mr A. If Mr A's grief/depression had been more thoroughly assessed, alternative strategies may have helped. For example, counselling may have been an appropriate intervention for him[31].

There were also a few other tests that may have assisted with the assessment in determining arterial blood flow and protective sensation in the foot. A Buerger's test assesses the arterial blood flow in the superficial arteries of the limb. A capillary refill test checks also assess peripheral perfusion in the limb[5]. Sensory screening using a 10g monofilament is a screening tool for assessing protective sensation in the foot. These may have assisted further and since this case study have been incorporated into the author's assessment document[5].

OUTCOME

In evaluating the original goals of therapy that were set between the health care team and Mr A, some of the goals were met. Amputation of the limb had been avoided. The lower limb pain had slightly reduced. The wounds had not decreased in size but the clinical signs of infection had reduced. Exudate levels had been contained through the use of more appropriate dressings and his skin integrity had improved.

The wound consultant received a phone call from nursing staff at the aged care facility where Mr A lived seven weeks after the initial visit to say that Mr A had passed away peacefully. Over the few days prior, he had made a decision to stop eating and drinking and he refused all medications. This was a sad outcome from the wound consultant's perspective as she felt that she had not met Mr A's goals relating to his wound management. Yet, for Mr A, this was the outcome he chose. He had verbalised how he missed his wife and the life they had prior to entering the nursing home.

CONCLUSION

In wound management today, healing is not always a realistic outcome and as illustrated in this case study, asking the person with the wound what matters most to them and how their wound is impacting on them, can assist in planning an appropriate plan of care to alleviate symptoms. Wound management is based upon a holistic assessment of the person, particularly in the elderly where there are so many variables that need to be considered. The author hopes that this case presentation has highlighted this and that Mr A has gone to a better place.

CONFLICT OF INTEREST

None.

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