

# Case study: wound management and calciphylaxis

## Bingham G

This case study was a winning entry in the inaugural Paul Hartmann /AWMA Advanced Wound Care Course Scholarships in 2006. Winners were chosen following a rigorous assessment process by the AWMA Executive Committee members and AWMA Education and Professional Development Subcommittee members.

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### Presentation

Patient X was a 45 year old non-smoking, non-drinking male who was a self employed business director living with his partner. On examination, he was reasonably well looking and was referred with on-going necrotic ulcerations, secondary to calciphylaxis, on his left leg; these had been progressing for several months (Figure 1).

### Medical history

Mr X suffered from cryptogenic renal failure which had been treated with haemodialysis from 1979-80. Although he had undergone a renal transplant in 1980, his residual renal function remained poor. Mr X's renal management on presentation consisted of ongoing daily peritoneal dialysis. A three-quarter parathyroidectomy was carried out in 1984. Other history included steroid induced non-insulin dependent diabetes mellitus (NIDDM), hypertension, anaemia, hypercholesterolaemia and an right above knee amputation secondary to an embolic event in 1994.

The patient reported no known drug allergies. Drug therapy included Prednisolone, Perindopril, Amlodipine, Glucoside, Atorvastatin, MS contin and Erythropoietin.

### Wound profile

The aetiology of the wound was determined to be calciphylaxis by biopsy and was consistent with bloods taken showing a calcium level of 2.86 (normal 2.1-2.6) and phosphate of 1.46

(normal 0.7-1.3). On examination, there was a large necrotic plaque and ulceration on the right medial thigh 15cm by 10cm, with livedo reticularis present on surrounding skin. Further areas of threatened skin were also visible on the shin. The status of the wound bed was difficult to determine due to the necrotic plaque, but a small area of slough could be seen in the anterior-proximal region. The wound and exudate was malodorous, with swabs confirming the presence of hetero vancomycin intermediate *Staphylococcus aureus* (HVISA).

### Aim

There were three main objectives in relation to wound management in this case: to stabilise any remaining viable tissue, to prevent further calcification occurring in the tissue, and to prepare the wound bed for skin grafting or healing by secondary intention.

### Management

The assessment and clinical decision making surrounding the aims of therapy was undertaken by medical and nursing staff at the hyperbaric unit to which the patient was referred. The literature identifies the mortality from calciphylaxis as being approximately 85%, due primarily to sepsis<sup>1,2</sup>. Therefore the immediate aim of wound management in this instance was infection control through strict aseptic technique, staged sharp removal of necrotic tissue to reduce bacterial load and dressing with Silvazine® cream (an antimicrobial agent) on a daily basis.

Mr X's medical management involved parathyroidectomy of the residual gland to control calcium levels and to prevent further calcification occurring, treatment of the HVISA infection with IV antibiotics and daily hyperbaric oxygen therapy to promote angiogenesis in the hypoxic calcified tissue.

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## Progress/follow-up

Mr X's progress over the first month of treatment was slow. While he exhibited no further signs of calcification, his wound demarcated into viable and non-viable tissue. After many months of debridement, pain and pruritus, there was a decrease in slough and buds of granulation were beginning to appear in the wound bed. During the fourth month, the wound continued to granulate and the patient was offered a skin graft which he refused. Over the course of the fifth month, the wound continued to epithelialise and contract, eventually healing by secondary intention (Figure 2).

## Discussion

Calciphylaxis is identified in the literature as presenting as multiple, painful and mottled skin lesions typically on the trunk and extremities, often progressing to indurated necrotic

Figure 1. Initial presentation.



Figure 2. Wound healing.



plaques, eschar formation and gangrene<sup>3</sup>. At present, it is a rare condition characterised by calcification of soft tissue and small and medium sized arteries, and has an incidence of 1% in patients with end stage renal failure across all age groups. It is more common in Caucasians and females<sup>4,5</sup>.

The treatment of this condition is an area which has received little attention but involves infection and pain control, debridement, control of calcium levels via parathyroidectomy, and hyperbaric oxygen<sup>6-9</sup>. The management of this patient incorporated all of these factors in a multidisciplinary approach to successfully manage a potentially difficult and life threatening wound.

## Summary

This patient presented with a wound which was potentially fatal. Best clinical practice was identified from current literature and incorporated into an appropriate wound management strategy by a collaborative multidisciplinary approach. The outcome of this was the successful closure of the wound by secondary intention and the salvage of the patient's one remaining limb.

## Recommendations

The overriding message from this experience is that the management of complex wounds such as calciphylaxis is dependent upon a team approach from healthcare professionals with the incorporation of evidence based practice.

## Declaration

No products used to treat this patient were supplied by a manufacturer.

## References

1. Mozeg D & Salsal J. Calciphylaxis: a review of pathogenesis, diagnosis and treatment. *Uni Toronto Med J* 2000; **77**:98-102.
2. Fischer AH & Morris DJ. Pathogenesis of calciphylaxis: study of three cases with literature review. *Hum Pathol* 1995; **26**:1055-1064.
3. Hahler B. Calciphylaxis in the patient with chronic renal failure. *Dermatol Nurs* 2005; **13**(6):435-436.
4. Hafner J, Keusch G, Wahl C & Burg G. Calciphylaxis: a syndrome of skin necrosis and acral gangrene in chronic renal failure. *J Vasc Dis* 1998; **27**:137-143.
5. Praker RW, Mouton CP, Young DW & Espino DV. Early recognition and treatment of calciphylaxis. *Southern Med J* 2003; **96**(1):53-55.
6. Duh Q, Lim R & Clark O. Calciphylaxis in secondary hyperparathyroidism. *Arch Surg* 1991; **126**(10):1213-1219.
7. Gilson RT & Milum E. Calciphylaxis: case reports and treatment review. *Cutis* 1999; **63**(3):149-153.
8. Scully RE, Mark EJ & McNeely WF. Case records of the Massachusetts General Hospital: weekly clinicopathological exercises. Case 31-2001: a 70 year old woman with end stage renal failure disease and cutaneous ulcers. *New Eng J Med* 2001; **345**:1119.
9. Podymow T, Wherrett C & Burns KD. Hyperbaric oxygen in the treatment of calciphylaxis: a case series. *Nephrol Dial Transplant* (official publication of the European Dialysis and Transplant Association) 2001; **16**:2176.