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### Introduction

Advanced wound care management aims to provide high quality, evidence based care, which is cost effective and meets the needs of patients receiving the care. Complex wounds present many challenges and require innovative solutions to control wound management costs which cost billions annually. Innovative antimicrobial approaches are required to counter increasing bacterial resistance and exudate management.

Kytoceal has been developed as a gelling fibre dressing; highly absorbent dressing locks in fluid within the dressing's structure. Chitosan a versatile hydrophilic polysaccharide, made from crustaceans (Goy et al 2009). The antibacterial broad spectrum action against gram negative bacteria including ecoli, staph aureus and MRSA.

There is extensive research that demonstrates Chitosan is a natural polymer, biodegradable to normal body constituents, safe and non toxic (Dutta et al 2004) This makes it an ideal material for use in wound dressings.

### Method

The patient is a 39 year old female vet, was referred to the tissue viability service in April 2014, with bilateral ulceration and cellulitis to gaiter region of her legs. The ulceration developed post being bitten by insects in July 2013. The patient developed cellulitis and was receiving IV antibiotics in the hospitals Ambulatory care outpatients' clinic. The patient had been prescribed numerous courses of antibiotics which were ineffective. The patient was dressing the ulcer daily the ulcer was static and non-healing.

PMH IBS, fowler's syndrome. Post streptococcal nephritis, RTA affected right leg when 17, Fibromyalgia, DVT.

The wound on presentation: - The wound to right leg was full circumference 25 cm x 20 cms depth, uneven wound bed covered with thin layer of sloughy tissue and biofilm present in the wound.

Left leg ulcer to covering the lateral side only the ulcers were 12 cm x 7 cm and 8 x 5 cm, and had a similar presentation as the right leg.

Both ulcers were critically colonised and covered with 100% slough tissue, the leg wounds had cultured pseudomonas, proteus species and enterococcus faecalis suitable for topical treatment.



Fig. 1 Left Leg 17.04.14



Fig. 2 Right Leg 17.04.14



Fig. 3 Lateral Left Leg 17.04.14



Fig. 4 Lateral Right Leg 17.04.14

### Problems:

- High exudate levels and excoriation to the skin
- Odour levels
- High bacterial load
- Fibromyalgia with frequent episodes causing increased pain especially at dressing changes
- Mobility issues following RTA
- Poor nutritional status and dietary intake
- Requires morphine slow release tablets and liquid morphine for break through pain
- Takes 500mg ciprofloxacin tablets daily patient is at risk of UTI because uses intermittent self-catheterisation

### Objectives of the study:

- Reduce bacterial load and reduce odour levels in the wound
- Reduce pain at levels at dressing changes
- Effectively manage exudate levels
- Reduce dressing changes to twice a week
- Deslough wound bed and promote granulation tissue

### Results

For the first 8 weeks of treatment the ulcers required redressing 4 times weekly, twice weekly appointments at the hospital, with the patient redressing the wound twice a week at home. The exudate and odour levels where high and excoriation occurred to surrounding skin. At each assessment the pain in the ulcers has decreased and has allowed for more effective cleansing and debridement of the wound surface. The exudate is contained well within the dressing on removal of the dressing.

The ulcers by week 10 had reduced in size bilaterally, odour has reduced, exudate reduced to moderate levels and surrounding skin less excoriation. The legs are being dressed twice a week.



Fig. 5 Medial Left Leg 10.06.14



Fig. 6 Medial Right Leg 10.06.14



Fig. 7 Lateral Left Leg 10.06.14



Fig. 8 Outer Right Leg 10.06.14



Fig. 9 Medial Left Leg 14.08.14



Fig. 10 Lateral Left Leg 14.08.14



Fig. 11 Medial Right Leg 14.08.14



Fig. 12 Outer Right Leg 14.08.14

### Discussion

The patient's wounds presented multiple challenges to manage the leg ulcers effectively, and remain an on-going process. The management of the ulcers has been achieved by working in partnership with the patient. The patient has many existing health conditions which have affected the rate of wound healing. The patient has chronic pain and when her fibromyalgia flares up this makes the wound difficult to dress and her exudate levels increase. She has suffered 2 utis during the evaluation period and has received courses of IV antibiotics which have affected the slough levels in the wound.

The dressing is easy to apply, and remove, the dressing gels easily and retains its integrity and structure on removal. The dressing has been acceptable and comfortable for the patient.

### The main objectives of the study have been achieved.

1. The dressing has managed the exudate levels and has reduced the exudate levels.
2. The dressing has desloughed the wound and has controlled the bacterial load within the wound. The wounds have not required any additional anti-microbial agents.
3. Pain in the ulcers has reduced at dressing changes.

### Conclusion

To achieve effective management involves a multifaceted approach and use of new antimicrobial agents as they become available. Kytoceal has performed well and has met the objectives within a very complex case. The product will be evaluated further with other patients before being added to the wound care formulary within the Trust.

### References

1. Goy, R. C. et al. - A Review of the antimicrobial activity of chitosan Polímeros: Ciéncia e Tecnologia, vol. 19, n° 3, p. 241-247, 2009.
2. Pradeep Dutta, Joydeep Dutta & V.S. Tripathi. Chitin and Chitosan. Chemistry, properties and applications. Journal of Scientific and industrial Applications. Vol. 63 January 2004. Pp20-31.