

# Hyiodine in action

*The journey continues*

In June 2011, a symposium was held in Edinburgh in which the first uses of a novel product – Hyiodine – in diabetic foot ulcers in the UK were presented. Keith Cutting (Buckinghamshire New University, Uxbridge and Perfectus Medical, Daresbury) opened the meeting by saying: “It is rare to come across a truly innovative wound care product that also produces exciting clinical data, but Hyiodine is one of those products.” Ongoing progress with use of Hyiodine in these hard-to-heal wounds was reported on at the 12<sup>th</sup> Annual Conference and Exhibition of The Diabetic Foot Journal in London, which took place on 18 October 2011 at the Hotel Ibis, Earls Court. The symposium and this supplement were sponsored by Contipro.

## Speakers

**Keith Cutting**, *Buckinghamshire New University, Uxbridge and Perfectus Medical, Daresbury*

**Mr Ernest Barlow Kearsley**, *Consultant Podiatric Surgeon, Charing Cross Hospital, London*

**Avni Amlani**, *Diabetes Specialist Podiatrist, Harrow Community Services, Middlesex*

## Background

Keith Cutting opened the symposium by providing the delegates with some background on the nature and properties of Hyiodine (Contipro, Czech Republic; UK distribution by H&R Healthcare). The key ingredient in Hyiodine is sodium hyaluronate, a glycosaminoglycan polysaccharide that occurs naturally in many parts of the human body (eye, joints, skin, soft tissues). The role of sodium hyaluronate in wound healing has been reported by various authors (Lees et al, 1995; Chen and Abatangelo, 1999) and includes forming an integral part of the extracellular matrix. In addition, sodium hyaluronate promotes and moderates the early stages of inflammation. The agent is also highly hygroscopic, facilitating a moist wound environment that protects cells from desiccation and assists in cell migration in the wound.

In addition to sodium hyaluronate, Hyiodine contains potassium iodide and iodine. The inclusion of iodine in the product confers antimicrobial properties, and protects the sodium hyaluronate component from bacteria-induced denaturation. An independent laboratory (Perfectus Medical, Daresbury, UK) assessed the survival of five bacterial species (*Escherichia coli*, methicillin-resistant *Staphylococcus aureus* [three strains], methicillin-sensitive *S. aureus* [three strains], *Pseudomonas aeruginosa*, *S. aureus*) brought into contact with Hyiodine. No viable isolates of the five species – whether cultured alone or in combination – were recovered after 24 hours' exposure to Hyiodine.

Experience using Hyiodine in a range of wound types has been reported by various international groups. Reports from clinicians in the Czech Republic (Sobotka et al, 2006; 2007), Italy

(Durante et al, 2010), USA (Brenes et al, 2011) and Switzerland (Ott et al, 2011) suggest good healing rates achieved using the product; in the 176 wounds treated and reported to date, 43% progressed to complete healing, 36% significantly improved (Figure 1) and this was in a series of extremely challenging wounds.

## Application

The product may be used in a range of ways:

- Applied directly to the wound
- Used to coat the contact layer of a foam dressing (this application is only suitable for clean, non-infected wounds)
- Used to impregnate a carrier dressing – gauze or an alginate – and placed in contact with the wound (Figure 2).

Gauze impregnated with Hyiodine can also be used to pack wound fistula.

Keith finished by saying that Hyiodine is simple to apply to a variety of wounds, helps stimulate wound healing, has been proven to be effective against a range of bacteria *in vitro*, and is the subject of a growing body of international evidence.

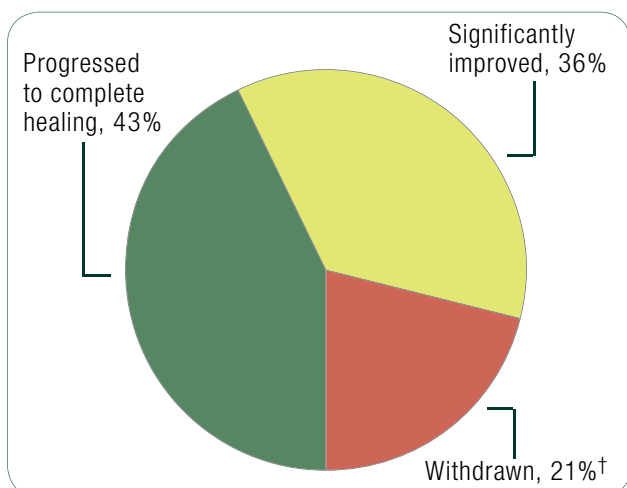


Figure 1. Wound outcomes reported in the published cases (n=176) using Hyiodine (Sobotka et al, 2006; 2007; Durante et al, 2010; Brenes et al, 2011; Ott et al, 2011). †Withdrawn due to adverse events, or lost to follow-up, or experienced no effect.

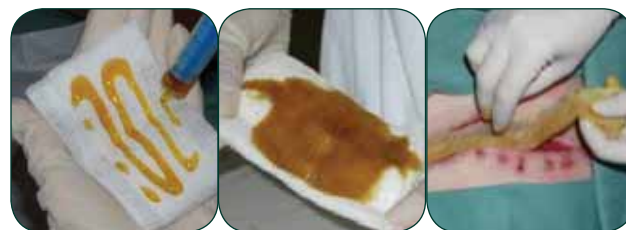


Figure 2. Hyiodine added to a carrier gauze dressing.

## Case reports

The use of Hyiodine in the UK is

expanding, with a number of clinicians using the produce in chronic diabetic foot ulcers. Two such clinicians are Mr Ernest Barlow Kearsley (Consultant Podiatric Surgeon, London) and Avni Amlani (Diabetes Specialist Podiatrist, Middlesex) who, in the second two sessions of the symposium, presented their experiences with Hyiodine in their clinical practice.

### Case 1

First, Mr Barlow Kearsley presented the case of a 63-year-old woman – Ms O – with type 2 diabetes, profound neuropathy and a BMI >30 kg/m<sup>2</sup>. Ms O presented, and was admitted, with ulcers to her left foot in 16 March 2011.

On examination, four ulcers were found on the foot, which was in the quiescent phase of Charcot neuroarthropathy. The wounds ranged from Texas grade BII (wound penetrating to tendon or capsule with infection) to BIII (wound penetrating to bone or joint with infection). Ms O had a good vascular supply to the foot, and her diabetes was well controlled.

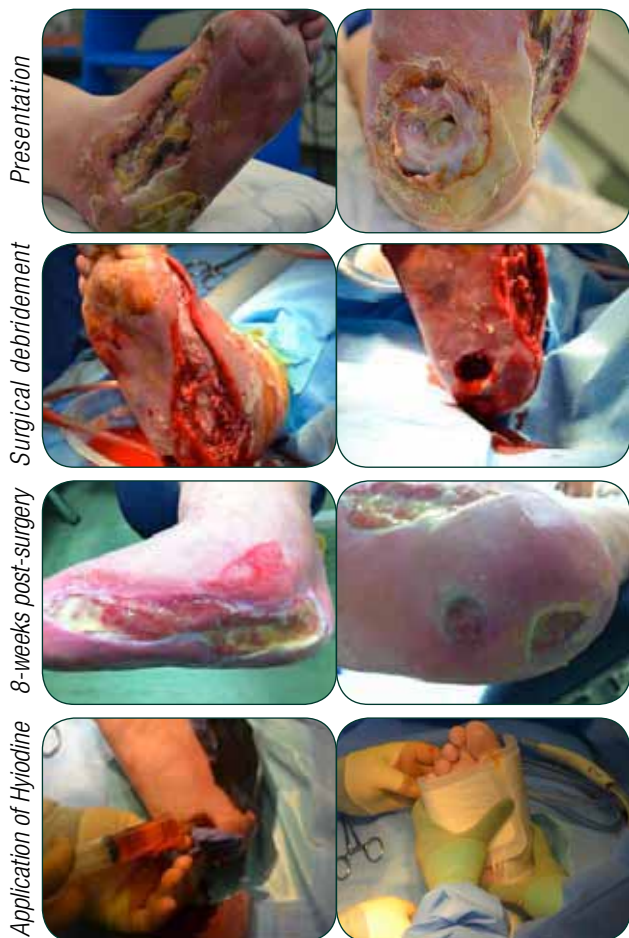
Whether to undertake an amputation of the affected foot was discussed with the multidisciplinary team (MDT), and it was considered that Ms O's obesity made remobilisation post-amputation unlikely and limb salvage should be pursued.

The foot was surgically debrided, but with the preservation of as much viable tissue as possible. Following surgery, vacuum-assisted closure therapy was undertaken for 8 weeks. At the end of this period, although the wound had progressed and granulated to some extent, the MDT was not comfortable with the rate of healing, nor the amount of slough in the wounds.

The decision was made to trial Hyiodine in Ms O's wounds. After returning the wound bed to an acute state through another episode of surgical debridement, Hyiodine was applied. Mr Barlow Kearsley reported that the application of the product was straightforward, in this case being applied directly to the wound and injected into wound cavities.

From the point of therapy initiation that included Hyiodine, wound healing progressed rapidly. Ms O was wearing a shoe and mobilised as of 14 October 2011.

Mr Barlow Kearsley stressed that the specialist, coordinated nature of MDT care is what makes the service effective. In this case, the use of a novel agent – Hyiodine – in the context of MDT care was able to move the wound from a stalled state to healing (*Figure 3*).



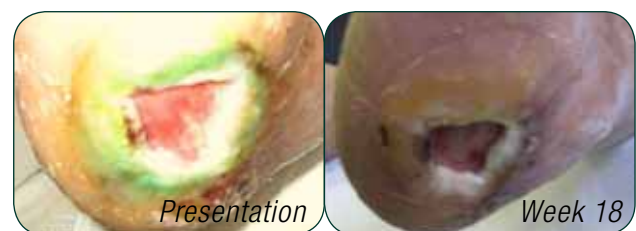
*Figure 3. Case 1: Ms O's wound at presentation, during debridement, at 8-weeks post-surgery and during the application of Hyiodine, in conjunction with sorbion sachet S.*

**Cases 2-5**

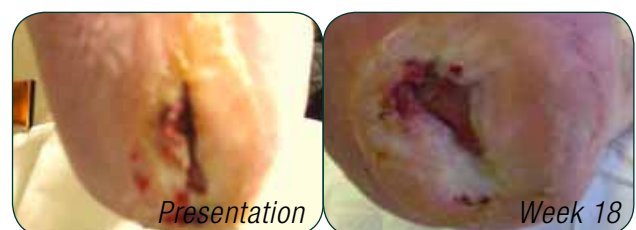
Avni presented four more extremely challenging cases of diabetic foot ulceration in which Hyiodine has been used.

Mr M, a 61-year-old man with type 2 diabetes of 24 years' duration, sustained a heel injury in 2005 that became chronic despite treatment. Mr M was referred to the Harrow Diabetic Foot Clinic in February 2011, and presented with a highly exuding and malodorous ulcer, with a greenish tinge to the periwound margin suggestive of a *Pseudomonas* infection. In addition to infection control and traditional wound care, Mr M was commenced on Hyiodine. Eight weeks later, Mr M's exudate levels were low, the wound bed was granulating and he commented that he found walking easier. *Figure 4* shows the progression of Mr M's wound from presentation to week 18.

Mr H is a 69-year-old man with type 2 diabetes of 10 years' duration who sustained a pressure ulcer to his right heel during an inpatient stay. The ulcer failed to heal and Mr H was referred to the Harrow Diabetic Foot Clinic in October 2010. On presentation, Mr H's wound could be probed to bone and was highly exuding (*Figure 5*), but X-ray did not show osteomyelitis and deep-tissue sample culture produced only light microbial growth. Mr H was fitted with a slipper cast, but in March 2011 the wound



*Figure 4. Case 2: Mr M's wound at presentation and 8 weeks after Hyiodine initiation.*



*Figure 5. Case 3: Mr H's wound at presentation and 28 weeks after Hyiodine initiation.*

remained static and Hyiodine was commenced. By week 4 of treatment the wound bed was clean and granulating. By week 12, Mr H's wound had reduced in size and exudate was well managed, and by week 28 the wound was progressing to healing (*Figure 5*).

Mr L, a 64-year-old man with type 2 diabetes of 26 years' duration, underwent a right 2nd toe amputation in 2005. In November 2010, he was referred to the Harrow Diabetic Foot Clinic with a heel ulcer to his left foot that was highly exuding and macerated (*Figure 6*). Despite good traditional wound care, including infection control, debridement and a slipper cast, the wound remained unhealed and in March 2011 Mr L was commenced on Hyiodine. During 25 weeks' treatment including Hyiodine, the depth of Mr L's wound decreased and the infection was brought under control. *Figure 6* shows the progression of Mr L's wound from Hyiodine initiation to week 25.

Mr S is a 54-year-old man with type 2 diabetes of 15 years' duration with profound peripheral neuropathy. In March 2011, his left 1st toe was amputated due to necrosis and infection. Mr S was referred to the Harrow Diabetic Foot Clinic 6 weeks after amputation with a lateral wound probing to bone, and a medial wound of 1 cm depth (*Figure 7*). The wounds were heavily exuding and malodorous. In conjunction with good traditional wound care,

Mr S was commenced on Hyiodine. Following 2 weeks' treatment, the wounds were granulating and *Figure 7* shows the progression of Mr S's wound from presentation to complete healing at week 8.

## Conclusion

Hyiodine contributes to establishing a moist environment in the wound, supplying key components for the wound healing process at a cellular level. Over the course of two symposia (one in Edinburgh, one in London), clinicians have presented the evidence for the agent's use in the diabetic foot and their own experience using Hyiodine in practice.

Keith's experience demonstrated the antibacterial properties of Hyiodine *in vitro*, and he reported the experiences of other international centres, using the product. He showed that some 43% of cases using Hyiodine reported to date progressed to complete healing, and a further 36% significantly improved, in a series of extremely challenging wounds. Mr Barlow Kearsley and Avni shared their experience of using Hyiodine in two UK diabetic foot clinics. Their cases demonstrated the ability of Hyiodine to kick-start the wound healing process in chronic diabetic foot ulcers. ■



*Figure 6. Case 4: Mr L's wound at presentation and 25 weeks after Hyiodine initiation.*



*Figure 7. Case 5: Mr S's wound at presentation and 8 weeks after Hyiodine initiation.*

Brenes RA, Ajemian MS, Macaron SH et al (2011) Initial experience using a hyaluronate-iodine complex for wound healing. *Am Surg* **77**: 355–9

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Lees VC Fan TP, West DC (1995) Angiogenesis in a delayed revascularization model is accelerated by angiogenic oligosaccharides of hyaluronan. *Lab Invest* **73**: 259–66

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Sobotka L, Smahelova A, Pastorova J, Kusalova M (2007) A case report of the treatment of diabetic foot ulcers using a sodium hyaluronate and iodine complex. *Int J Low Extrem Wounds* **6**: 143–7