Comparison of Efficacy and Safety of a New Antimicrobial Packing Strip With PHMB to the Current Industry Standard Iodoform and Plain Packing Strips

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BACKGROUND

Deep and tunneling wounds are often the most difficult to manage and are commonly infected. Research indicates that up to 98% of chronic wounds are contaminated with aerobic organisms, and can include up to 4 different bacterial species per wound. It is well documented that critical colonization of bacteria adversely affects wound healing. Therefore, deep chronic wounds tend to be challenging to keep free of bioburden and are difficult to heal.

Iodoform packing strips are a commonly utilized wound dressing for deep and tunneling wounds. Recently a new antimicrobial packing strip containing Polyhexamethylene biguanide (PHMB) was launched; an assay was completed to better understand the new technology as compared to the industry standard, Iodoform dressing.

PURPOSE

To assess antimicrobial efficacy of antimicrobial packing strip impregnated with PHMB in comparison to the antimicrobial activity of Iodoform and plain packing strips.

SELECTED TEST ORGANISM

Staphylococcus aureus - ATCC # 25923

TEST MATERIALS (Size: 3/4inch diameter disks)

Curity™ AMD™ packing strips: Experimental #11/12: PHMB content – 2893 ppm

Curity™ Iodoform packing strips: P.C. 7833 Lot 42240301 exp. 2006-08

Curity™ plain packing strips: P.C. 7633 Lot 42520300 exp. 2009-09

DATA COLLECTION

Laboratory notebook: 2958B, pp. 31, 50 - 51; 54-56

EXPERIMENTS/RESULTS

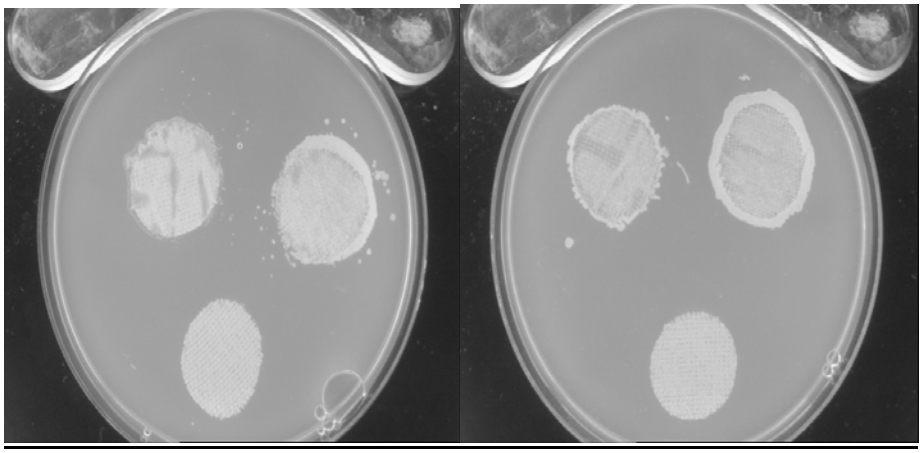
Direct inoculation model: Three packing strip test samples (Curity AMD, Curity plain and Iodoform) were placed on agar surface in a petri dish and inoculated with S. aureus (i.e. wetted with 60-70µL inoculum at 10^6 cfu/ml level = 6-7 X 10^4 cfu). The experiment was performed with three replicates of each test sample. The plates were incubated at 37^0 C for 24/48 hours and visually compared for growth/no growth of the challenge organism. The results are summarized in Table 1 below:

Table 1: Direct inoculation test results

Time	Plate #			
		AMD	**Iodoform**	**Plain**
24 hrs	**1**	0	NAE	NAE
	2	0	v.v.s.	NAE
	3	0	v.v.s.	NAE
48 hrs	**1**	0	NAE	NAE
	2	0	NAE	NAE
	3	0	NAE	NAE

0 = no signs of growth NAE = No antimicrobial activity v.v.s. = very very slight growth
slight = slight growth

The above results are illustrated in the pictures below:
Iodoform = top left Curity Plain = top right Curity AMD = bottom



24 hours 48 hours

Conclusion: The results in Table 1 indicate that Curity AMD packing strip samples were bactericidal and totally prevented growth of test organism. Iodoform packing strips only inhibited or reduced growth for 24 hours and in 48 hours the test organism growth was similar to that was observed for Curity plain packing strips.

Elution model: Each test dressing sample (Curity AMD, Curity plain and Iodoform) was immersed in 10 ml of phosphate buffer inoculated with S. aureus at 10^6 cfu/ml (6 logs) challenge level. After 24 hour of incubation, the dressing was removed and solution was assessed for difference in microbial counts compared to Curity plain packing strips. The experiment was performed with three replicates of each test sample.

The results are summarized in Table 2 below:

Curity AMD plain strip was considered to be a control sample. Bacterial counts are written as log counts.

Table 2

Sample	**N**	**Test Sample, counts**	**Control counts**	**Log count reduction**
Iodoform	3	6.19	6.31	-0.1
AMD	3	2.63	6.31	-3.7

Conclusion: The results of Table 2 indicate that only Curity AMD antimicrobial activity as tested. All other samples Plain packing strips and Iodoform packing strips exhibited no antimicrobial activity. It can be stated that Curity AMD packing strip was 3600 times (3.6 logs) more effective at reducing microbial counts compared to Iodoform packing strip.

Cytotoxicity:
The packing strips were also evaluated on a normal cytotoxicity scale using a standard profile test.

Conclusion: The results of the cytotoxicity profile analysis indicate that Iodoform is cytotoxic and that the Curity AMD samples were not.

CONCLUSION

Curity AMD samples exhibited antimicrobial activity as indicated by direct inoculation and elution models. Iodoform packing strips exhibited no antimicrobial activity in both test models. Also, Iodoform packing strips are cytotoxic and Curity AMD packing strips are not.

From a clinical perspective, it appears as if Curity AMD packing strips will be effective in preventing bacterial proliferation within and penetration through the dressing and are not cytotoxic. Conversely, Iodoform packing strips show little efficacy and are cytotoxic. Further research is merited.