

## EXPERIMENTAL EVALUATION OF A NEW STARCH GLOVE POWDER

D. Pelling, K.R. Butterworth, The British Industrial Biological Research Association, Carshalton, SM5 4DS, UK.

A problem of continuing concern to surgeons is the risk of tissue reaction and peritonitis resulting from the contamination of operative sites with glove powder (Aarons & Fitzgerald 1974). The main component of Bio-Sorb, a commonly used powder, is maize starch cross-linked by epichlorhydrin to minimise water absorption. Recent studies have shown that Bio-Sorb sterilized by steam produced less tissue response than when gamma-irradiated (Pelling & Butterworth 1980). Since gamma irradiation is more compatible with modern production methods, a new starch preparation (B60) was developed. This study sought to compare standard Bio-Sorb with B60 after different processes of cross-linking and sterilization.

The effects of sterilization by gamma irradiation and by autoclaving were compared by implanting the samples in groups of 32 rats. The abdomen was opened by midline incision under ether anaesthesia, a 50 mg measure of the sample sprinkled evenly over the exposed peritoneal surface, and the incision closed by silk suture. Post-mortem examination was made in half of each group after 7 days and the rest after 14 days, and representative lesions examined microscopically. In a second experiment, Bio-Sorb (steam-sterilized) and B60 (gamma-irradiated) were compared after cross-linking by epichlorhydrin or phosphorous oxychloride (POC), using 16 rats per group. A control sham-operated group and a group treated with talc were included in both studies.

The frequencies of the two most common peritoneal lesions were used as a basis for comparing the reactivities of the samples.

Mean incidence of peritoneal lesions in rats treated with Bio-Sorb and B60

Days implanted:	Adhesions		Granulomas	
	7	14	7	14
Sham operated	0.38	0.19	0.13	0
Bio-Sorb autoclaved	1.00	0.63	0.94	1.31
B60 autoclaved	0.56	0.19	0.44	0.31
Bio-Sorb gamma irradiated	1.44	1.19	3.13	2.00
B60 gamma irradiated	0.75	0.63	1.88	0.63
Talc	3.81	3.56	>30	>30
Sham operated	0.50	0.50	0	0
Bio-Sorb epichlorhydrin	0.75	1.00	2.63	1.75
Bio-Sorb POC	1.13	0.63	1.50	0.75
B60 epichlorhydrin	0.75	0.63	2.75	1.13
B60 POC	3.63	2.38	5.25	1.63
Talc	5.88	5.75	>30	>30

Autoclaved B60 consistently produced the fewest lesions after both implantation periods and gamma-irradiated Bio-Sorb the most. Irradiated B60 and autoclaved Bio-Sorb produced comparable numbers. B60 cross-linked by POC produced more lesions than the other samples. Analysis by a ranking test showed that talc produced significantly more lesions than all the starch powders except B60 cross-linked by POC. In general, the quantities of starch identified in the tissue sections correlated with the lesion frequency data. The results suggested that irradiated B60 when epichlorhydrin cross-linked, evoked a tissue response no greater than autoclaved standard Bio-Sorb.

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Aarons, I., Fitzgerald, N. (1974) Surg. Gynec. Obstet. 138: 385-390  
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