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SILASTIC FOAM ELASTOMER FOR DRESSING OPEN GRANULATING WOUNDS—A PRELIMINARY REPORT

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SUMMARY

A preliminary report on the utility of silastic foam elastomer in the management of 32 open granulating wounds in 30 patients is presented. By offering more wound comfort to the patients and by relieving the work load of surgical residents and nurses, the silicone stent serves a dual function. The ease with which the patients can dress themselves makes such a dressing ideal for domiciliary practice. The cost of silastic foam elastomer may well balance the cumulative cost of conventional dressing material i.e. cotton gauze and bandages and their sterilization.

Open granulating wounds are a problem in all surgical units, be it civil or military. These wounds heal by secondary intention. This process is long and demands repeated dressings with varied agents. The prevalent concept of management of wounds has several disadvantages. It causes lot of pain and discomfort to the patient during each dressing because the removal and the application of these dressings is difficult. A greater nursing care is required. It cannot be done as often as one would desire. It would often get soaked with offensive purulent discharge about which the patient can do nothing by himself. The cumulative cost of the dressing may be very high and these patients are unable to get the dressings done satisfactorily in their domiciliary environment.

Silastic foam Elastomer (Dow Corning Q7-9100) has been used as a dressing material to combat most of these problems. Its use has been successfully developed for the treatment of open granulating wounds in the University Hospital of Wales in Cardiff, U.K. Wood & Hughes, 1975, Wood et al., 1977). Polymerised silicone foam elastomer is supplied as a base solution along with the catalyst separately.

The mixture is mixed in a suitable container and poured into the wound. In the wound it takes the shape of the cavity and settles into a spongy foam within seconds. The stent thus formed is non-adherent non-allergic, slightly absorbent and allows air into the wounds. A preliminary study was conducted in the Department of Surgery, King George's Medical College, Lucknow, to evaluate its usefulness.

Material and Methods

Thirty-two open granulating wounds in 30 patients of surgical and orthopaedic wards were chosen for this preliminary study. The patients were between 8 yrs. and 72 yrs. of age and had a variety of problems ranging from bedsores to operated injection abscesses, gluteal abscesses, traumatic wounds and wounds following excision of large soft tissue tumours. Each patient was supplied with a questionnaire which had 3 sets of queries—first were about his present complaints, second whether he suffered from any disease viz. diabetes and tuberculosis which could be a cause of delayed wound healing and lastly his impressions about the new dressing technique were sought.

Only good surgical wounds were chosen. Suppurative wounds were freely drained before hand. Hairs around the wound edges were shaved and wound edges were freshened if they were infolded.

Technique of making a stent (Wood & Hughes, 1975)

The material used was Dow Corning silicone (Q7-9100) and a catalyst (Fig. 1). The material was stored in a cool place but before each session it was brought to the room temperature

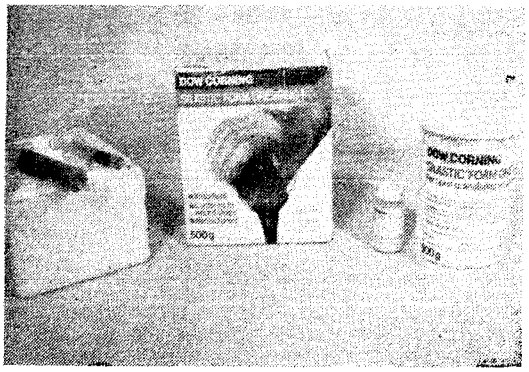

Fig. 1. The material used for making an Elastomer dressing.

otherwise the setting time of the foam got inconveniently prolonged. The session started with thorough stirring of the silicone material with a wooden spatula so that the thick caramel like sludge which collected at the bottom of the container could get evenly dispersed in the viscous elastomer. Failure to do so resulted in a stent of uneven consistency. The amount of tissue defect was measured by pouring saline in the wound and thus the amount of elastomer needed was determined. 10 ml. of viscous elastomers and 0.6 ml. of catalyst (or in similar proportion) were taken in 2 separate plastic syringes, poured into a china cup and stirred vigorously with a wodden spatula for 15 seconds. The stirring facilitated a uniform cell structure in the finished stent. The mixture was then quickly poured into the wound where it expanded to four times its volume and filled the wound and finally got set into a soft foam in 3 minutes. The stent could be taken out once it got set, washed in running water, kept soaked in Savlon solution for 15 minutes, subsequently dipped in Povidone iodine solution and reinserted into the wound. The surface of the foam stent can be marked cephalad/caudal, proximal/distal, right/left for patients reorientation. It can be trimmed as desired.

The first three dressings were done by the resident doctors and subsequently the patients were encouraged to do it themselves. (Fig. 2). No pocket of impaired drainage or wound bridging was allowed to develop during the

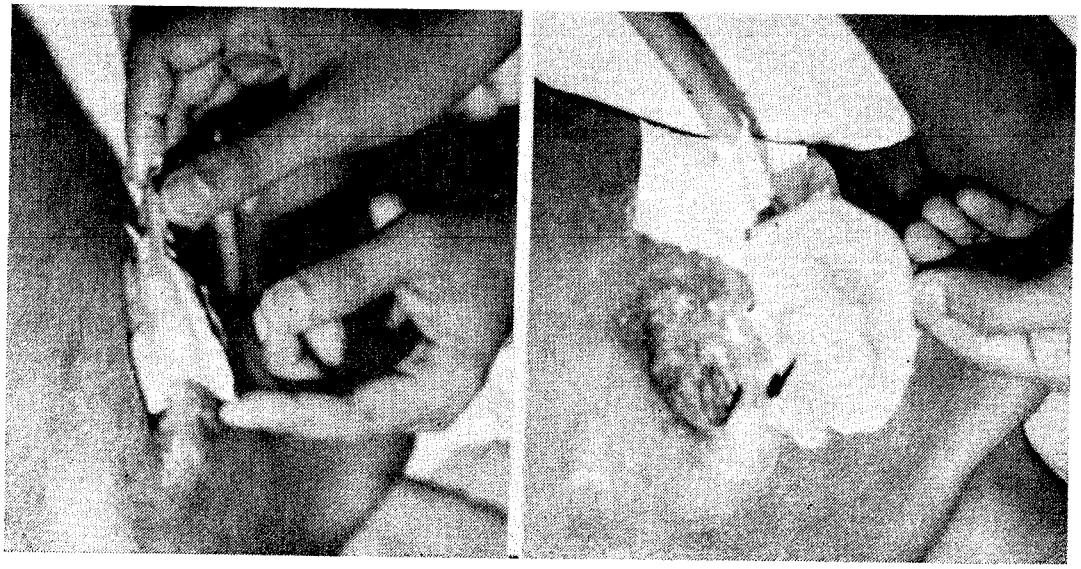

Fig. 2. The easy removal and reapplication of a silastic foam elastomer dressing in an open granulating wound.

following days. In 4 to 7 days the patients felt that the stent was not fitting properly and so new stents were made. Old ones were preserved. Thus after 4 to 5 stent changes, the wounds healed or were ready for skin grafting (Fig. 3).

Results

30 patients with 32 open granulating wounds were dressed with silastic foam elastomer.

There were mainly 2 types of wounds i.e. traumatic or operative tissue defects (including drained abscesses), and bedsores. (Table 1) These two groups behaved differently. While the tissue defect was large in the former group they responded quicker to the silastic stent dressings. More frequent stent changes were required and the wounds granulated quickly (Fig. 3). Bedsores, although not having large tissue defects, took longer time to heal and fewer stent changes were required. However, after approximately 6 weeks they all healed or could be skingrafted.

28 patients and their relatives found the

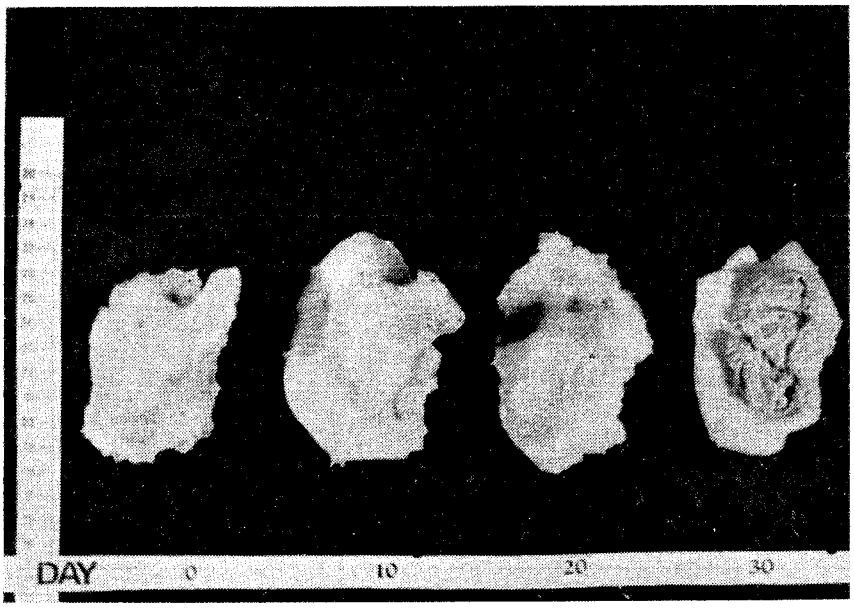

Fig. 3. Four serial stents obtained from a gradually granulating wound.

Table No. 1. Illustrating the details of various wounds dressed by Silastic foam elastomer

Nature of wound	No. of wounds	Mean volume of tissue defects*	Average No. of stents	Mean time for healing (in days)
Bed Sores—				
Greater trochanter	8	8 cc	4	40
Sacrum	4	14 cc	4	40
Traumatic Wounds	7	20 cc	5	25
Injection Abscess (Deltoid)	3	15 cc	3	12
Gluteal Abscess	6	26 cc	4	16
Operative Tissue Defects	4	30 cc	4	16

*Measured by pouring saline in the wounds.

silastic dressings very effective and convenient. They could easily pick up the dressing technique and were eager to co-operate. Two however, were not satisfied with the dressing and could not do it themselves. A 72 yrs. old patient with a bull horn injury in deltopectoral region could not bear the sight of his wound and so refused to dress himself.

The cost of a single dressing of an average size wound (40 ml) was less than Rupees ten at the U.K. price. The material is so far not yet available in India.

Discussion

An ideal dressing material for open wounds is one which can serve two main purposes—provide wound comfort to the patient and be easy to handle and should be easily applicable by the surgical residents or nursing staff or even better by the patient himself. Silastic foam elastomer goes a long way to meet this goal, and in doing so, proves to be cost effective. With its open pore surface lying adjacent to the wound it can absorb exudates from the wound and can hold some topical medicament for the wound by capillary action. All 32 wounds treated by the foam elastomer healed satisfactorily within 12 to 40 days. Because the wounds were open and drainage absolutely free, infection was no problem.

It may be too early to say however, the clinical impression and results of this and several other incompletely controlled studies by Hughes et al., (1977), Harding and Richardson, (1977) suggest that this dressing technique leads to faster healing than conventional packing (Marks et al., 1983). Shukla H. S. (1982) has tried this dressing in 65 patients of similar socio-economic status as in this study. The patients acceptability and wound comfort were of high order in this study.

The surgically created tissue defects are by far the best wounds for silastic foam elastomer dressings but wounds like bedsores which have a good amount of devitalized tissue also responded satisfactorily to this dressing technique after proper debridement.

However easy the technique may be, the approach to it should not be casual as minor errors can prove costly. The elastomer catalyst mixture should be allowed to freely flow into the wound and never be scrapped out. This will disrupt the entrapment of hydrogen gas causing hard spots in the foam stent. Such hard stents may be uncomfortable, painful, cause pressure sores and delay wound healing. An uniformly soft and spongy consistency of the stents is extremely important for proper healing. Similarly a timely change of the stent is mandatory otherwise this might delay wound healing. During all this time, other supportive measures viz. antibiotics, proteins, vitamins, etc. should not be ignored.

Conclusion

Whenever a new item is introduced to a society, the latter takes sometime to accept it. Dressing by cotton and gauze is a culture bound syndrome in our society and so a silastic stent may not be appreciated right from the first day. Patience and tolerance on the part of the treating surgeon will go a long way to make it acceptable. An occasional failure now and then should not dwarf the utility of this dressing.

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