

# Use of foam Dressing for Exudative Wounds and Graft Recipient area as Compared to Gauze Dressing

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## ABSTRACT

**Background:** Traditional dressing on dirty wounds was cotton and gauze pads. Due to high cotton fibers and loose threads and low absorption rates we were struggling with this dressing. Secondly preparing these dressings also need lots of labor and resources. **OBJECTIVES:** The comparative study was conducted to compare foam dressing and conventional gauze dressing with reference to healing time and chances of infection in exudative wounds and on skin graft. **MATERIALS AND METHODS:** One hundred patients were included in the study, from Plastic Surgery Ward, Bahawal Victoria Hospital (BVH) during twelve months, from 1<sup>st</sup> November 2012 to 31<sup>st</sup> October 2013. Fifty patients with exudative wounds had foam dressings while fifty had gauze dressings, which were observed over time. **RESULTS:** Results showed that granulation with foam dressing is almost 7 days as compared to gauze dressing, which on average takes 12 days to heal. Whereas chances of infection with foam dressing also reduces two times as that from gauze dressing. **CONCLUSION:** In conclusion foam dressing is recommended for dirty exudative wounds because of its high absorptive nature, a kind of low negative suction effect, easy to prepare and low cost.

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## Key Words:

## INTRODUCTION

It was noticed that foam dressings produced good results in wards, when used over infected wounds. So the study was designed to observe how foam dressing is better than conventional gauze dressing. It is believed that the foam dressing is highly absorbent and provides both weight support and pressure relief. The dressing is equally effective with varying amounts and flow rates of wound exudates. Says Chirag B. Shah, PH.D, Hansen P. BS; Brian J Dowd, MBA (Covidien, Basingstroke, UK).

One hundred patients, from Plastic Surgery Ward, Bahawal Victoria Hospital, Bahawalpur, were studied for over a year, i.e.: from 1<sup>st</sup>, November, 2012 to 31<sup>st</sup>, October, 2013. Out of 100, fifty patients had foam dressing whereas other half (fifty) were dressed with cotton gauze dressing.

The aim was to record a difference in healing time provided with foam dressing as compared to gauze for exudative wounds and areas where grafts were placed. Also to look the persistence of any infection with the use of both types of dressings.

All patients were observed during their stay at the hospital and the follow up visits. Changes in wound were recorded in text as well as captured in camera. Every wound was dressed daily. Foam being cost effective never played hindrance in a process. Wounds were washed with an antiseptic where required. Téot L, MD and Faure C,

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( Burns and Plastic Unit, Hôpital Lapeyronie, Montpellier, France) said that Antiseptics act at the wound dressing interface, with some limitations – negative side effects on the fibroblasts and keratinocytes are well described. All care givers should know that these antiseptics should not be used at each dressing change, the flora being restored very quickly after elimination of germs by local application of povidine iodine or chlorhexidine . Therefore antibiotic course was also provided to the patients. All the dirty wounds as well as tidy wounds after grafts were under observation simultaneously.

## MATERIAL AND METHOD

Wound was washed with antiseptic solutions and if required dead tissue was removed for all cases. Half inch 4×6 ft polyurethane foam autoclave able sheets were autoclaved and impregnated in pyodine solution and applied over the wound directly or over sofra tulle and was again covered by a dry polyurethane foam sheet and a compressive crepe bandage was done over it. In skin grafts we routinely changed 1<sup>st</sup> dressing after 5-6 days.

In gauze dressing, gauze pads were prepared by cutting cotton pads, and gauze sheets (fig.d). All pads were wrapped and then autoclaved. The gauze pads were also impregnated in pyodine solution and applied over wound , covered by dry gauze and then compressive crepe dressing was done. In skin grafts we routinely changed dressing after 4-5 days due to soakage.

Dressings were changed on daily basis in both cases but in foam cases, we often changed dressing on alternate days due to high absorption rates.

We did not use foam dressing on skin graft donor site due to its high adhesive nature.

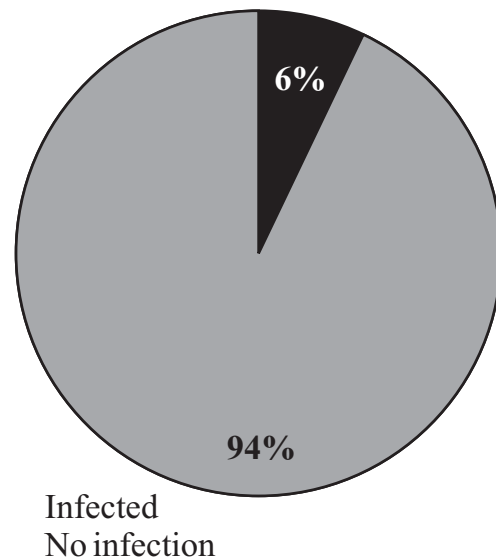
## RESULTS

Out of 50 patients who got foam dressing, 3 patients (6%) got infection in wound,

whereas 9 out of 50 patients, (18%) with gauze dressing showed infection. fig.1 and fig.2

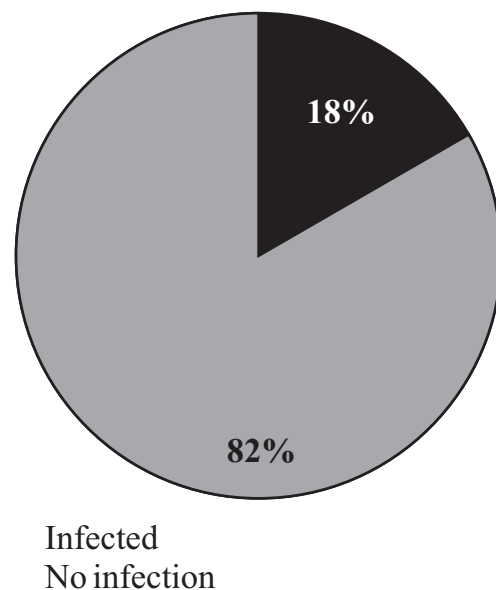
Healing time for wounds with foam dressing, on average was 7 days; however gauze dressed wounds healed in 12 days on average. Fig.3

**Percentage of patients persisted wound infection after foam dressing**



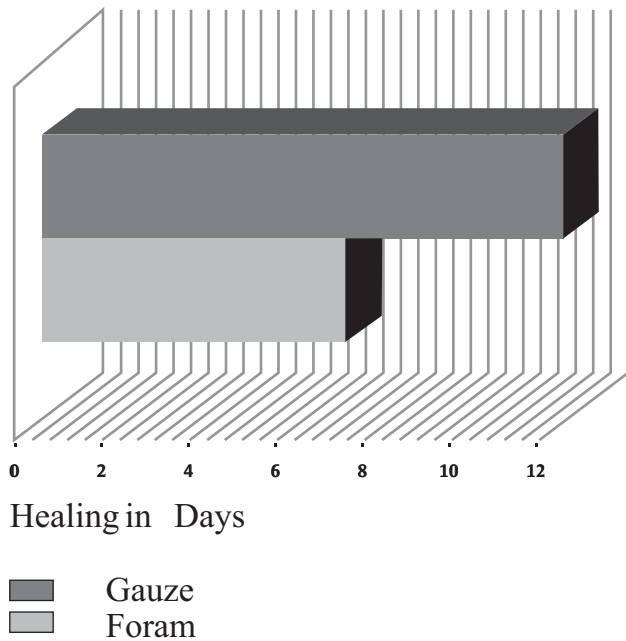
**Fig.1**

**Percentage of gauze dressing patients who showed wound infection**



**Fig.2**

**Healing time taken with foam and gauze dressings**



**Fig.3**

**CASE 1:**

A 20 year old male was shifted to plastic surgery ward from orthopedic department, he had a rod placed in his leg due to crush injury of tibia in a road traffic accident, one month before he was shifted. Wound area was infected when received and there was not a proper granulation tissue over it, We planned to prepare area before placing a graft over it.



**Figure a**

For that purpose antibiotic course was started along with proper foam dressing. Foam dressing was changed daily (fig. a) after being washed and cleaned properly. New foam was placed over wound. Primary dressing was wet foam soaked in povidine iodine whereas secondary dressing was dry autoclaved foam

(fig. b). which was finally wrapped with a crape bandage.



**Figure b**

It was continued for almost 10 days when proper granulation tissue was obtained and infection was gone from the site. Split thickness skin graft was placed over the area and again foam dressing was done over it. When foam dressing was changed after 5 days of surgery (fig. c) a well placed and healthy graft was achieved.



**Figure c**

Gauze dressing preparation requires a lot of labor, space and material (fig. d). gauze dressing are prepared when cotton sheet is packed between two layers of gauze sheet, cut into appropriate size and then autoclaved.



**Figure d**

Whenever gauze dressing is opened, it creates a lot of mess and is usually adherent to the wound. Cotton fibers, most of the time gets into wound area, acting as a foreign body . (fig.e) shows displaced graft area which was dressed with cotton gauze.



**Figure b**

## DISCUSSION

The study was designed after general observation of using foam over exudative wounds, it was expected that foam dressing would show the better results regarding healing of a wound and minimizing infection. Results came out to be not very surprising. This one year work showed that foam dressing has better results over common gauze dressing. The infection is very well controlled by foam, as it provides environment to absorb maximum exudate, Téot L, MD, PhD and Faure C, PhD said that the foam itself, with its specific porosity and the capacity to allow fluids to circulate freely from one side to the other (open pore polyurethane foam), present some changes observed immediately after application of negative pressure. The pores, initially round, become oval when submitted to negative pressure and hamper bacterial growth locally, which helps in healing wound efficiently. Also it takes off slough from the bed like a debridement of a wound whenever the dressing is changed. It gives excellent results when used with oral or i/v antibiotic therapy. Healing time was also observed to be minimized with the use of foam, as it controls

the infection and provides minimum exposure to external environment. Chirag B. Shah, PH.D, Hansen P. BS; Brian J Dowd, MBA (Covidien, Basingstroke, UK) said that the balance of moisture maintenance and prevention of infection in chronic wound management is a challenge and an ideal dressing addresses both issues may aid in healing of chronic wounds. Foam is also being more cost effective as half inch is bought in a meter sheet, whereas gauze pad needs cotton and gauze rolls which are comparatively expensive. The preparation time for gauze dressing is far more than that of foam. Cotton is layered between gauze sheets, then is cut to the size and is autoclaved after words, whereas foam is rolled as such and autoclaved and is ready to be used.

Helen Shaw and Rachael Matheson of conva tech wound therapeutics studied the role of aquacel foam dressing in stage 1 pressure ulcers prognosis. They inferred that foam dressing protects against skin breakdown caused by excess moisture, friction or shear force and also provides a waterproof, viral and bacterial barrier to protect the skin from excess moisture and incontinence episodes.

Gee TC, Xing N, Chen J, Zhou JJ, Su GL, Shi JW  
and Zheng YS from

Burn Institute of Rui'an, the Third Affiliated Hospital of Wenzhou Medical College, Rui'an 325200, China did the Comparison among several foam dressings in the properties of water-absorption, water-locking and air permeability. They concluded that among the three kinds of foam dressings, Allevyn performs best in water-absorbing rate, water-locking capacity, and air permeability, while Mepilex and Biatain perform best in water-absorbing speed. For selecting foam dressing in Clinic, the properties of foam dressings and wound characteristics should be considered at the same time.

In another study Payne JL and Ambrosio AM. Of Global R&D, Kinetic Concepts, Inc., San Antonio, Texas, USA. Said that The V.A.C. Therapy System (KCI, San Antonio, TX) is

an integrated wound management system that creates an environment that promotes wound healing which is comparable to the polyurethane foam dressing which is also reticulated. VAC therapy system is quite expensive as compared to simple foam, so it is not being used, as most of the patients cannot afford.

Rahmanian-Schwarz A, Willkomm LM, Gonser P, Hirt B and Schaller HE. From the Department of Plastic, Reconstructive, Hand and Burn Surgery, BG-Trauma Center, Eberhard Karl's University Tubingen, Germany introduced a novel option in negative pressure wound therapy (NPWT) for chronic and acute wound care. They concluded that after a long period of preserving a monopoly market position of the V.A.C.™ system, a new comparable option was successfully tested in this preliminary study. The polyurethane foam-based NPWT system (RENASYS GO™ - F/P, Smith & Nephew GmbH) is an efficient and cost-effective alternative NPWT system, which we effectively implemented in therapeutic management of different kinds of wounds.

Usman Ghani, Momin Malik, Zahid Hussain, Javed-Ur-Rehman and Irfan Shukr concluded that The vacuum-assisted closure is a relatively new technique. It is very effective in promoting healing in acute, subacute and chronic non-healing wounds. It helps by reducing wound size and promoting granulation tissue. It is also effective in promoting granulation tissue on bones devoid of any periosteum, tendons without any paratenon and even bare orthopedic implants. Many of such patients would have required a plastic surgical procedure but with application of this simple technique it was possible to close these defects with simple partial thickness grafting or delayed primary closure.

## CONCLUSION

In comparison to gauze dressing foam dressing was very easy to prepare, we just have to roll it and wrap it into clean sheet and

autoclave it as compared to gauze pads first we have to make gauze pads by gauze sheets and cotton rolls and to autoclave it. Foam is highly absorptive to absorb exudate and adhesive to wound surfaces that causes dead tissue debridement as well. This minimizes the time of healing and decreases the chances of infection to persist; it is far cheaper than gauze pads.

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