SHORT ARTICLE

USE OF HYDROCOLLOID DRESSING IN THE POST-OPERATIVE ORTHOPEDIC CASES

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ABSTRACT

Objective — *To determine the frequency of superficial surgical site infection (SSSI) and blister formation in post-operative orthopaedic patients with the use of hydrocolloid dressings.*

Study design — *Descriptive case series.*

Place & Duration of study — *From October 2008 to April 2009 at Trauma & Orthopaedics department of William Harvey Hospital, Ashford, Kent, United Kingdom.*

Methodology — *In all patients undergoing lower limb orthopaedic procedures transparent hydrocolloid dressing (Duoderm) was applied to the wounds. The assessment of wound for SSSI and blister formation was made by a trained single observer on the day 1, 3 and 5 after surgery. Plasma protein level, haemog lobin and creatinine were also measured post operatively. Descriptive statistics were computed for quantitative variables. Data were analyzed in SPSS-14.*

Results — *Out of a total of 50 patients 60% were females. Thirty patients underwent elective surgery while 20 had an emergency surgery. Mean plasma protein level was 3.3 gm/dl, mean haemoglobin level was 10 gm/dl and mean post-operative creatinine was 123 mmol/l. Only 6% developed some serous discharge which resolved spontaneously and none of the patients developed post-operative SSSI or blister formation.*

Conclusions — *Hydrocolloid dressings can be safely used for post-operative orthopaedic cases.*

Key words — *Hydrocolloid dressing, Surgical wounds, Blister formation, Nosocomial infection surveillance.*

INTRODUCTION:

Hydrocolloid dressings were introduced in 1970 for moist wound care and can be categorized as advanced dressing.[1] Duoderm is a transparent hydrocolloid dressing which is impermeable to exudates and micro-organisms and creates a moist environment under it, which promotes epithelialization without causing maceration, according to the modern concept of wound healing.[2] The goal for optimum wound healing is removal of tissue contamination and maintenance of a clean moist environment.[3] This may reduce pain and decrease wound healing time.[4]

Meta analysis by Singh A et al has shown that hydrocolloid dressings are more effective in healing chronic wounds compared to the conventional gauze dressing.[5] Another systematic review by Chaby G et al concluded that though hydrofiber dressing speeds healing of acute wounds but there is a weak level of evidence on clinical efficacy of different dressing types on wounds.[4] Therefore the decision about various types of dressings for optimal healing of surgical wounds remains controversial.

We conducted this study to evaluate a hydrocolloid dressing for orthopaedic wounds according to the modern concept of wound healing**.**

METHODOLOGY:

A descriptive study was conducted on a non-probability convenient sample of 50 adult patients undergoing total hip replacement (THR), total knee replacement (TKR) and emergency surgeries like hemi-arthroplasty and dynamic hip screw, from October 2008 to April 2009 at the orthopaedic

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Table I: Details of the Orthopaedic Procedures Included in the Study.

Procedure	Number of Patients	Male	Female	SSSI	Blister
Total Hip Replacement	11	5	6	0	0
Total Knee Replacement	13	5	8	0	0
Revision TKR	2	1	1	0	0
Revision THR	4	1	3	0	0
Hemi-arthroplasty	12	4	8	0	0
Dynamic Hip Screw	6	4	2	0	0
Interlocking Nailing of Femur	2	2	0	0	0

department of William Harvey Hospital, Ashford, Kent United Kingdom, after taking informed consent from all the patients. Patients not giving consent, with renal or hepatic pathologies and those severely debilitated were excluded. Sample size was calculated taking into account the frequency of SSSI (least as 2.23% and worst as 7.6%) keeping power as 80% and confidence level as 99%.

All the patients were given three doses of prophylactic antibiotics peri-operatively. Duoderm dressing was applied to all surgical wounds, and wounds were observed for SSSI and blister formation on 1st, 3rd and 5th post-operative days by a trained surgeon uniformly in all cases. Superficial surgical site infection was assessed according to the standard criteria set by National Nosocomial Infections Surveillance (NNIS) programme,[6] and the findings noted on a performa.

Infection was defined by demonstration of at least one of the following features:

- Purulent drainage from the incision.
- Isolation of organisms from an aseptically obtained culture of fluid or tissue from the incision.
- At least one of the signs or symptoms of infection (i.e. pain or tenderness, localized swelling, redness or heat) and the incision deliberately opened by a surgeon, unless the culture was negative.

Descriptive data regarding demographic details was inquired from each patient by interview based questionnaire. Nutritional status was assessed by plasma protein level. Haemoglobin and creatinine levels were also measured. Data were then analyzed in SPSS version 14.

RESULTS:

Out of a total of 50 patients, 60% were females. Mean age of the patients was 69 years (range: 55-87 years). Thirty patients underwent elective surgeries and 20 emergency procedures for trauma (table I). Hospital stay for patients who underwent elective surgery was 5 days, while those operated for trauma was 15-29 days.

Mean plasma protein level was 3.3 gm/dl and mean haemoglobin level 10 gm/dl (range: 8.7-11.6 gm/dl). Post-operative creatinine ranged from 90-245 mmol/l. Antibiotics were administered to nine patients post-operatively for infections unrelated to the surgery. According to the criteria set by NNIS program, none of the patients developed SSSI. Though 14% (n 7) patients had serous discharge at the wound site but no bacteria was isolated in any of the wound swabs. No patient developed blisters or vesicles around the wound.

DISCUSSION:

Wound healing is affected by both local factors like oxygen tension, bacterial contamination, haematomas and systemic factors such as nutritional status of the patient as well as systemic diseases like diabetes.[7,8] Post-operative wound healing can be expedited by taking care of factors like strict asepsis during interventions, meticulous technique, appropriate antibiotics and appropriate wound dressings.[7] Many types of wound dressings are available in the market but the decision for the proper choice of the dressing should be evidence based.[9]

This study provides support for the use of hydrocolloid dressing. No SSSI was observed in our study population. Prevention of SSSI in surgical wounds leads to better wound healing and this has also been reported by Thomas S et al in their review of literature concluding that the healing time of traumatic and surgical wound is decreased by hydrocolloid dressing.[10] Wound healing is promoted by various growth factors and wound exudate is rich

in these growth factors secreted by the surrounding cells that promote growth and migration of fibroblasts and keratinocytes.[11] Wound exudates play a role in developing a moist healing environment and the choice of dressing should be such that it is able to absorb not all but only excess exudates and maintains a moist environment for wound healing. This is the characteristic of hydrocolloid dressing.

Incidence of SSSI for THR, revision THR, hemi-arthroplasty, and revision hemi-arthroplasty are reported to be 2.23%, 3.8%, 4.97% and 7.6% respectively in over 100 hospitals in England.[12] Another problem at the surgical wound site is the blister formation which occurs when epidermis is separated from the dermis due to friction at the wound site and once a blister is formed, there is a breakdown in the infection barrier provided by skin.[11] An incidence of 13-35% of blister formation in post-operative orthopaedic patients is reported.[13] In our series, use of Duoderm dressings avoided this complication. It is in comparison to the study by Milne CT et al in which taping the surgical dressing to hydrocolloid barrier prevented blister formation.[14] The limitations of this study is small sample size and no comparative arm. Further randomized trial can be planned to provide more convincing evidence.

CONCLUSION:

The use of hydrocolloid dressing avoided blister formation as well as SSSI in post-operative orthopaedic wounds.

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