Two Novel Treatments for the Prevention and Treatment of Radiation Induced Moist Desquamation

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Introduction

- A skin care working party was set up to produce evidence based practice skin care guidelines, including recommendations for the treatment and prevention of moist desquamation. An audit of 259 patients in 2008 revealed that 7% of patients developed moist desquamation.
- A literature search by members of the skin care working party found several studies looking at the prevention of skin reactions[1-6]. One of these studies looked into the use of cavilon no sting barrier film (CNSBF) in post mastectomy treatments[6]. The results from the study suggested that the use of CNSBF could reduce the incidence of moist desquamation in this group of patients. An in-house audit was devised to assess the effectiveness of CNSBF in other patient groups.
- Numerous studies have previously looked at the treatment of moist desquamation[7-11]. No one treatment intervention has been proven superior to any other[9].
- However our existing clinical practice needed updating to follow best practice moist wound healing principles.
- PolyMem dressing was chosen and assessed for its efficacy in the treatment of moist desquamation. Its appealing properties included odour reduction, non adherence, absorbency, wound cleansing as well as healing and pain relief.

Methods and Materials

- 40 patients were identified at high risk of developing friction related moist desquamation (RTOG score 2b and above) using the results gained from the previous audit (see table 1).
- These 40 patients were given CNSBF to apply during their treatment. The application started twice weekly. Once RTOG 2b was reached, the applications were increased to every other day. Their RTOG score was initially recorded weekly, then increased to twice weekly once 2b was reached. Each patient was issued with a 28mL spray bottle and given verbal instructions for use.
- 20 patients who developed RTOG 2b were given PolyMem dressings applied as per the manufacturers instructions and their RTOG score recorded twice weekly. Their pain score was recorded before and after application using the following adapted pain measurement scale by McCaffrey and Beebe (1989) as supplied by Activa Healthcare Ltd.

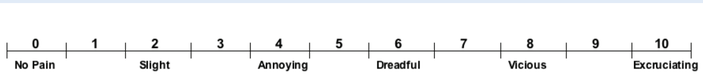

Table 1: Patient groups identified as being at high risk of developing RTOG 2b skin reactions

Treatment site is in the anal-genital area e.g. vulva, vagina, penis, scrotum, anus, groins
Radical limbs
Obese radical pelvis patients (with skin folds in treatment area)
Breast patients needing orfit immobilisation bras
Radical face and neck having concurrent chemotherapy or bolus

Results - CNSBF

- Of the 40 patients identified as being at high risk, 17 (42.5%) patients developed stage 2b or greater skin reactions, 3 of these later developed stage 3 and none of the patients in the study developed stage 4 (Graph 1).
- Stage 2b was not observed in any of the cases until week 3. Table 2 shows a summary of the weekly skin reactions over 2b observed in different patient groups including risk factors associated with these patients. 8 of these patients went from 0 to 2b in the space of a week, 3 from 1 to 2b and 2 from 2a to 3.
- The Radiographers observed a marked improvement in the skin reactions generally and in particular for patients treated for anal carcinoma that used CNSBF where the 2b area tended to be limited to the perineal region. In two anal carcinoma patients their groin and genital areas were missed in the application process, stage 2b was reached at week 3 in these areas, compared to week 5 for the perineum.
- Some skin reactions did not follow the usual gradual progression through stage 1, 2a, 2b,and instead went straight to 2a or 2b.
- Two patients reported a sensitivity to CNSBF - a mild erythematous rash developed in the application area early on in the study - therefore all patients were tested for sensitivity outside the treatment area 24 hours before CNSBF was applied, a further 2 patients subsequently showed sensitivity reactions and were excluded from the study.

Graph 1:- RTOG skin reaction scores in 40 high risk patients using CNSBF

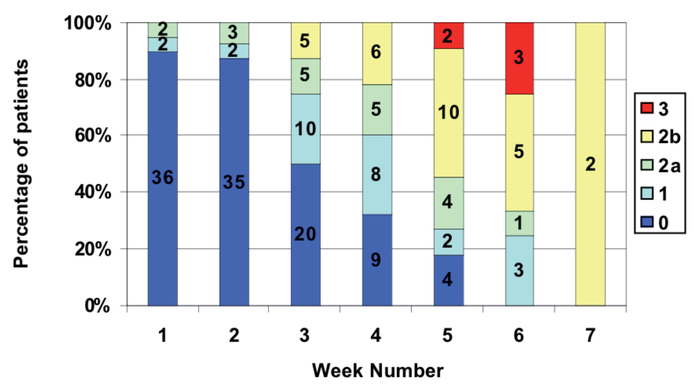

Table 2:- RTOG weekly score

Week Number	RTOG Score	Diagnosis	Risk factors
3	2b	3 x Breast 2 x Anus	Large cup size, tangential pair, Parallel Pair, bolus, concurrent chemo
4	2b	2 x Anus 1 x Rectum 1 x Vulva	As Above (same pts) Concurrent chemo, Parallel pair, bolus, concurrent chemo
5	2b	5 x Anus 3 x Rectum 1 x Penis 1 x Groin	As above Concurrent chemo, Parallel pair, concurrent chemo High total dose, bolus, vac bag
	3	1 x Vulva 1 x Groin/scrotum	Parallel pair, bolus, concurrent chemo High dose, electrons
6	2b	4 x Anus 1 x Groin	As above Same pt as wk 5
	3	1 x Vulva 1 x Groin/scrotum 1 x Anus	Same pt as wk 5 Same pt as wk 5
7	2b	1 x Groin 1 x Femur / groin	Same pt as wk 5+6 High total dose, vac bag

PolyMem

- Of the 17 patients reaching stage 2b+ in the CNSBF audit, 11 were given PolyMem to use (one patient was non compliant and a second patient did not like the dressing and therefore did not use it. The remaining patients were given gentian violet to apply by the clinician before PolyMem could be used).
- A total of 20 patients were given the dressing. Table 3 shows at which RTOG score PolyMem dressings were instigated and to which sites.
- PolyMem was generally used after the patient had received a minimum of 20Gy.
- PolyMem was found to have reduced pain scores between 1 and 4 points in 14 of the 19 patients studied. Wilcoxon Signed Ranks Test showed that this is a significant reduction ($p<0.001$).

Table 3:- RTOG score and number of patients* issued withnPolyMem dressing (*NB some patients used the dressing in multiple sites)

RTOG Score	No. of Patients	Site
0	0	
1	2	1 – Inframammary fold 1 – Genital area
2a	6	1 – Inframammary fold 5 – Anal / perineal area
2b	13	1 – Axilla 1 – Inframammary fold 1 – Scrotum 2 – Under abdominal fold 4 – Groin 4 – Anal / perineal area
3	1	1 – Anterior commisure

Discussion

- From the results of the study there appears to be a delay in the presentation of acute skin reactions. This is highlighted in two anal carcinoma patients where stage 2b was reached in areas missed by the CNSBF application 2 weeks before the areas that had CNSBF applied.
- 57.5% of high risk patients did not reach the expected 2b skin reactions negating the need for further interventions, overall this may reduce the cost in treating these patients skin reactions long term as well as improving overall cosmetic results and the patients experience of treatment.
- We are unable to offer an explanation as to why the skin reactions appeared to miss stages of reactions.
- Initially patients were asked to apply the CNSBF themselves, however Radiographers noted a better coverage and consequently a better reaction if the CNSBF was applied by Radiographers, this also encouraged Radiographers to assess the skin reaction more frequently and intervene earlier with PolyMem.
- The application process takes 30 seconds and due to the small number of patients requiring application, this has no overall impact on treatment unit throughput.
- In some patients there was a build up of CNSBF when the patient was unable to adequately wash the treatment area although this did not appear to effect the overall results. One breast patient stopped using CNSBF as her perfuse sweating caused a build up of fluid beneath the film causing discomfort.

PolyMem

- There is a significant pain reduction for many patients. This is due to an inhibition by the polymeric membrane of the dressing on the nociceptor reaction, which has also been proven to reduce inflammation, bruising and oedema[13,14] on both broken and intact skin.
- The wound cleansing properties of the dressing ensured that the risk of infection was reduced while the dressing was in place as well as ensuring ease of dressing changes and the time required was minimised.
- Wound healing commenced in some patients even whilst continuing with radiotherapy treatment.
- PolyMem also acted as an anti-inflammatory when it was instigated at stage 2a, particularly in the anal/perineal region.
- Feedback from patients was positive, from ease of use to pain and odour relieving properties. No patients showed signs of sensitivity.
- Some areas still remain difficult to dress and ensure the dressing is secure e.g. scrotal, vulval regions. Often this was effectively managed by encouraging patients to use scrotal supports and nettolast pants.

Cost implications

(as per October 2009 NHS supplies catalogue prices)

- 1 bottle of spray (£8.26) lasted for 4 weeks of application (18 patients). 22 patients required another bottle.
- Of these 40 patients, 11 received PolyMem dressings. Two sizes were ordered (10x61cm roll (£12.21 per roll) and 13x13cm dressings (£4.21 per dressing)), both dressings were cut to size as required and changed daily. Total cost per patient was dependant on when the dressing was issued the maximum cost for a single patient was for 5 rolls (£61.05). As the dressing is freely available in the community G.P.s were able to prescribe the dressing for the patients once its effectiveness was established with only 1 dressing needing to be issued by the department.

Conclusion

- Due to the effectiveness of the CNSBF it is now routinely applied by Radiographers to pre-identified high risk patients, however all patients are tested for sensitivity prior to its application.
- CNSBF is also used to preserve skin marks required for superficial x-ray and electron treatments.
- PolyMem is now issued by Radiographers to all patients presenting with 2b skin reaction.
- In patients being treated for lower rectal / anal cancers the authors would recommend the instigation of PolyMem at 2a skin reactions, particularly when the patient has a heavy mucosal discharge and therefore the skin is likely to macerate and breakdown.
- Future studies are warranted in the use of CNSBF where patients are used as their own control to fully establish CNSBF effectiveness in the prevention of acute radiotherapy induced moist desquamation.

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