UNDERSTANDING & MANAGING RADIOTHERAPY INDUCED SKIN REACTIONS

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Introduction

Surgery, chemotherapy and radiotherapy are major cancer treatment modalities. It is estimated that approx 87% of patients will get a moderate to severe skin reaction (RTOG 2 and above), this is with around 10-15% of patients developing moist desquamation.[1] Concurrent chemoradiotherapy regimens can increase the risk of a skin reaction.[2] Severe skin reactions can be extremely painful, significantly decrease quality of life, and have the potential to be dose-limiting.[3,4] It is essential that appropriate management interventions are used.[5,6] There is a lack of data evaluating prophylactic skincare and treatment of radiotherapy skin reactions on which to base our practice.[3] Patient pathways involve clinicians outside of radiotherapy as severity of skin reactions may increase for 7 - 10 days after radiotherapy has finished, yet knowledge of skin reactions among non-radiotherapy health professionals is low.

Aims

- To improve awareness about radiotherapy-induced skin reactions and appropriate interventions among staff outside of Radiotherapy departments.
- To ensure treatment recommendations remain current we clinically review use of polymeric membrane dressings.

Method

- Present background information and treatment guidelines aimed at non-radiotherapy staff
- Clinical audit of polymeric membrane dressing use in our review clinic February-April 2011
- Case study presentations of 3 head and neck cancer patients

Mechanism of damage

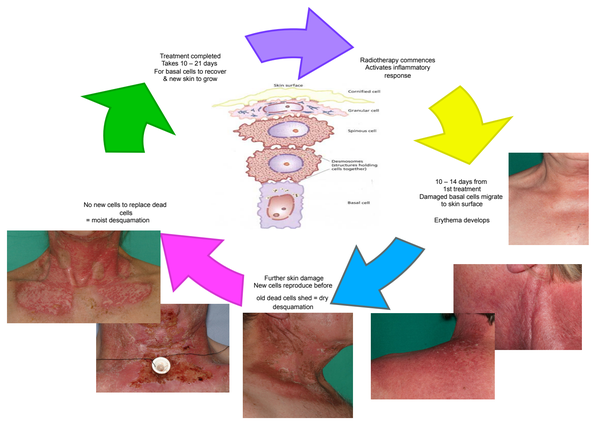


Figure 2. Radiobiological damage affects regeneration of the skin and skin damage occurs when the rate of repopulation of the basal cell layer cannot match the rate of cell destruction by treatment. Skin reactions are commonly categorised into four main areas: Erythema, Dry Desquamation, Moist Desquamation and Ulceration/Necrosis.

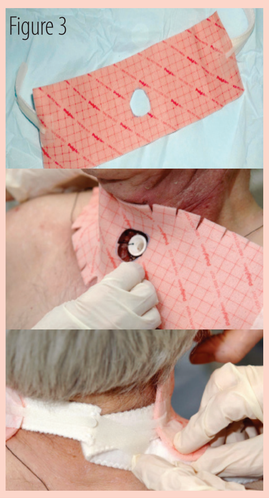
RTOG assessment tool and Intervention rationales

Assessment / Observation	*Effects of Radiotherapy on Skin Cells*	*Intervention (action)*	*Rationale*
RTOG 0 No visible change to skin		To apply aqueous cream initially twice daily	To promote hydrated skin & maintain skin integrity
RTOG 1 Faint or dull erythema. Mild tightness of skin and itching may occur		Increase application of aqueous cream as needed. 1% Hydrocortisone cream may also be prescribed for symptomatic relief. Commence analgesia as guided by WHO analgesic ladder	To promote hydrated skin, patient comfort and maintain skin integrity. To treat itchy skin. To reduce pain, soreness and discomfort.
RTOG 2 Bright erythema / dry desquamation. Sore, itchy and tight skin		Increase application of aqueous cream as needed. Continue as RTOG 1 interventions	As RTOG 1
RTOG 2.5 Patchy moist desquamation Yellow/pale green exudate. Soreness with oedema		Continue aqueous cream on unbroken skin. Stop hydrocortisone on broken skin. Apply an appropriate dressing** to exuding areas (e.g. PolyMem, Mepilex, Allevyn N.A. / Gentle are all suitable options). Analgesia as guided by WHO analgesic ladder. Wear loose fitting clothing	To promote comfort. Reduce risk of complications of further trauma and infection. To reduce pain, soreness and discomfort
RTOG 3 Confluent moist desquamation. Yellow/pale green exudate. Soreness with oedema		Stop using aqueous cream on moist/broken skin. Continue with RTOG 2.5 interventions	To promote comfort Reduce risk of complications of further trauma and infection
RTOG 4 Ulceration, bleeding, necrosis (rarely seen)		Seek specialist advice (i.e. Clinical Oncologist, Radiotherapy Clinical Nurse/Radiographer Specialist in your area).	

Figure 3. Leeds Teaching Hospitals Trust Abbreviated Guidelines, Adapted from RTOC/EORTC scoring criteria for acute radiation skin damage.[6,7]

Results

Figure 3



Clinical Audit Summary:

- Polymeric membrane dressings used in 17 patients between February and April 2011: 13 with treatment to head and neck area, 4 to the pelvic area. Roll format dressing cut to size and shape for perineal / groin areas, worn inside underwear to promote comfort and reduce skin to skin friction, or the same format dressing was made into a 'collar' dressing for use around the neck area. (Fig. 3)
- In 5 patients, polymeric membrane dressings applied from RTOG stage 2 (dry desquamation), when application of aqueous cream no longer providing sufficient relief from symptoms. In 3/5 patients, dressing applied slightly moistened with saline as no moisture produced from the area of damaged skin. In one patient, the treatment area was in anal cleft and was naturally moist, therefore no additional moistening required. Patients felt it was comfortable and provided a cooling, soothing effect and the area remained clean.
- In 11 patients, polymeric membrane dressings applied from RTOG 2.5 (patchy moist desquamation).
- In one patient polymeric membrane dressings applied from RTOG 3 (confluent moist desquamation).
- Overall observations: All 17 patients reported a soothing effect / increased comfort in area being treated, and the areas covered remained clean. Patients who managed their own dressing changes at home found it easy to do. In general, the dressings handled the moisture levels well.
  - "Dressing was easy to use and change and enabled more freedom of movement as it prevented skin to skin friction between buttocks when mobilising
  - "Patient reported an immediate cooling and soothing effect, dressing comfortable in situ."
  - "Patient reports increased comfort, finding it easy to change own dressings. To continue post discharge."

Case 1

- Mrs S, 63 yr old female. Well differentiated squamous cell carcinoma alveolar gingivae right mandible.
- Adjuvant post operative radiotherapy 60Gy with a 6 Gy boost in 33 fractions (#) over 6 ½ weeks. Twice daily aqueous cream applied to treatment field whilst reaction RTOG 0 – 2.
- At #28 skin reaction assessed as RTOG 2.5 – patchy moist desquamation. Polymeric membrane collar applied. Collar dressing continued to be applied throughout remainder of treatment to 33# and for first 8 days post treatment at which point dressing no longer required as treatment field comfortable and graded as a combination of RTOG 2 / RTOG 1– dry desquamation / faint erythema.
- Recommenced aqueous cream twice daily to promote ongoing hydration and comfort within treatment field until skin fully healed (RTOG 0).

Figure 4. Skin reaction at Fraction 28: RTOG 2.5. Polymeric membrane collar initiated and how collar dressing looked at dressing change.

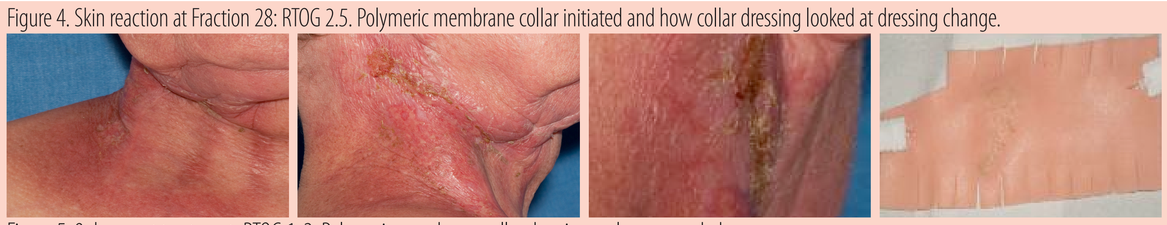
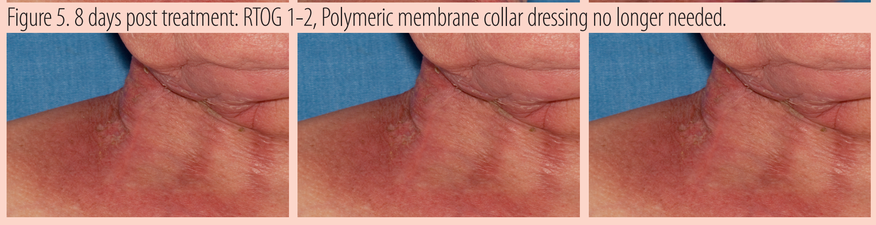


Figure 5. 8 days post treatment: RTOG 1-2, Polymeric membrane collar dressing no longer needed.



Case 2

- Mrs H, 48yr old female. Squamous cell carcinoma of right neck – unknown primary.
- Chemo-radiotherapy over 7 weeks – total of 70 Gy in 35# radiotherapy with concurrent chemotherapy (Cisplatin) in weeks 1 and 5.
- Polymeric membrane collar dressings used from week 4, RTOG 2.5 stage (patchy moist desquamation) throughout remainder of treatment and in post treatment recovery period. Soft silicone dressing used in places not covered by the polymeric membrane dressing
- 6th week of treatment- graded as RTOG 3.0 – confluent moist desquamation. Continued to use 'collar' and post treatment for comfort and protection until fully intact and comfortable without a dressing in situ (Figure 6).
- 6 weeks post treatment Medical Review- skin documented as fully healed. Photos from Nurse review at 9 weeks post (Figure 7).

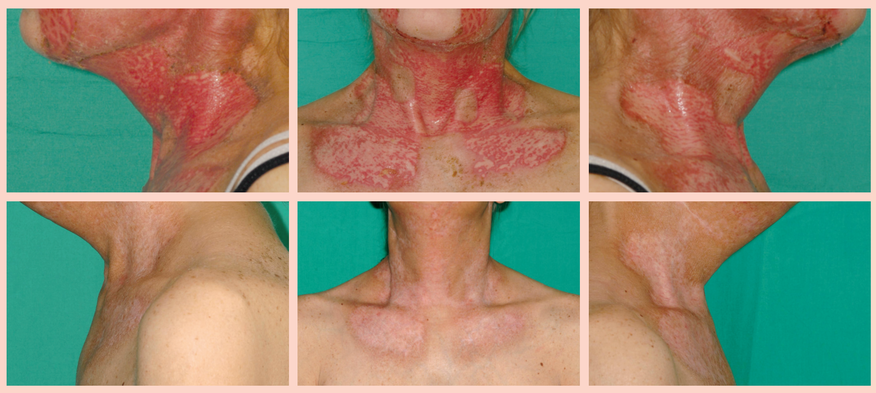


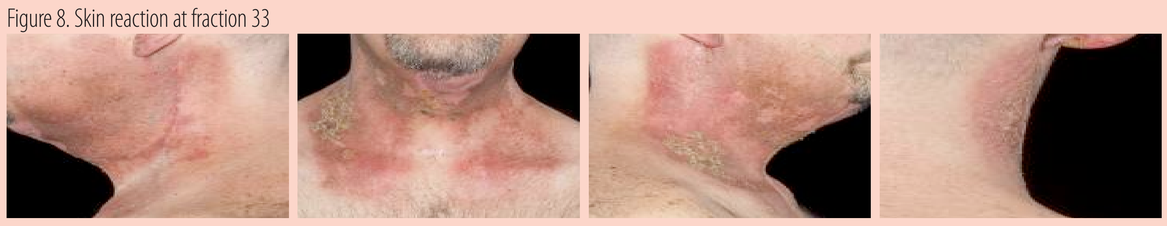
Figure 6. Week 6 of treatment

Figure 7. Week 9 after finishing treatment

Case 3

- Mr M, 45 yr old male. Squamous cell carcinoma oropharynx.
- Adjuvant post operative chemoradiotherapy of 66Gy in 33 fractions with Cisplatin 100 mg per m2 on week 1 and 4. Aqueous cream twice daily whilst reaction graded at RTOG 0 – 2 (fractions 1 – 28).
- At #29, skin reaction graded RTOG 2 – dry desquamation: patient described skin feeling uncomfortable, aqueous cream not providing sufficient relief. A moistened polymeric membrane "collar" applied instead.
- #31, skin reaction RTOG 2.5 – patchy moist desquamation: patient reported increased comfort from using polymeric membrane collar. Additional soft silicone lite dressings used on collar bone areas to ensure coverage of whole treatment field.
- #33 (last day of treatment) remains as RTOG 2.5 (Figure 8). Dressing combination continues until next review.
- 1 week post-treatment follow up (taken from written documentation – no photos available) – skin reaction predominantly RTOG 2.0 (dry desquamation), small area grade RTOG 2.5 (patchy moist desquamation) requiring only a small soft silicone dressing. Polymeric membrane collar discontinued. Aqueous cream recommenced to unbroken / dry areas.

Figure 8. Skin reaction at fraction 33



Discussion

- **Acknowledging the lack of randomised controlled trials within this field, what we do for patients is frequently based upon observation, clinical experience and most importantly from patient feedback, and is aimed at minimising further problems and improving comfort and quality of life.**
- Use of dressings on radiotherapy skin reactions is rarely cost-effective during treatment as dressings need to be removed prior to radiotherapy treatment each day and for the same reason, ensuring minimal trauma on removal as well as ease of application is essential. An ideal dressing is also conformable for difficult to dress areas e.g. pelvis and head and neck, alleviates discomfort and pain, prevents further skin damage from trauma, friction or infection and, post-treatment, promotes healing.
- Polymeric membrane dressings are thin, soft, flexible, absorbent and non-adherent. The unique provision of a surfactant within the dressings continuously cleanses the skin and means additional manual cleansing is rarely indicated, making for easy and pain free dressing changes. This allows patients to change their own dressings as needed. Also, the provision of glycerine within the dressings soothes and hydrates, further decreasing discomfort and pain and assists healing post-treatment. Polymeric membrane dressings have been used successfully for patients with skin reactions graded RTOG 2 and above, both during and after treatment, as demonstrated in the 17 patients audited. . It is hard to say if the dressings additionally prevented further exacerbation of reactions, more research into determining the preventative effects would be required. This was outside the scope of this audit.
- Training and dissemination of best practice in skin reaction management is required for appropriate clinicians.

Conclusion

- Through the data presented, we have provided background on and shared examples of our management guidelines for radiotherapy skin reactions.
- Polymeric membrane dressings demonstrated clear benefits in the patient audit and are now included in our department's recommended dressings list.
- We now plan to launch educational material and training opportunities, and to run events in our trust and the local community trusts to increase awareness among non-specialist staff.

References

1. Hornsby C, Fletcher J, Blyth CM. (2005). The production of a best practice statement in the skincare of patients receiving radiotherapy. Journal of Radiotherapy in Practice 4, 2-3, 126-130

2. McQuestion M (2006) Evidence-based skin care management in radiation therapy. Seminars in Oncology Nursing, Vol22; No.3 (August) pp163-173. Elsevier Inc. Canada.

3. Kedge E (2009) A systematic review to investigate the effectiveness and acceptability of interventions for moist desquamation in radiotherapy patients. J Radiography 15, 247-257. Elsevier Ltd. UK.

4. De Conno F. et al (1991). Skin problems in advanced and terminal cancer patients. J Pain Symptom Management. 6:247-256

5. Porrock, D Kristjanson, L (1999). Skin reactions during radiotherapy for Breast Cancer: the use and impact of topical agents and dressing. European journal of Cancer.

6. College of Radiographers, (2000). Treatment of Radiotherapy induced Acute Skin Reactions: A Clinical Guidelines for Use by the College of Radiographers

7. Cox, J. Stetz, J and Pajak, T. (1995). Toxicity criteria of the radiation therapy oncology group (RTOG) and the European Organisation for Research and Treatment of Cancer (EORTC), International Journal of Oncology, Biology and Physicis. 31, 5, 1341 - 1346.

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