Understanding & Managing Radiotherapy Induced Skin Reactions

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 (RTDG 2 and above), this is with around 10-15% of developing moist desquamation. Concurrent chemoradiotherapy regimens can increase the risk of a skin reaction. Severe skin reactions can be extremely painful, significantly decrease quality of life, and have the potential to be dose-limiting. It is essential that appropriate management interventions are used. There is a lack of data evaluating prophylactic skin care and treatment of radiotherapy skin reactions on which to base our practice. 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.

Results

Clinical Audit Summary:
- Polymeric membrane dressings used in 17 patients between February and April 2011. 13 treatment with head and neck area, 4 to the pelvic area. Roll format dressing cut to size and shape for general/graft areas, worn under underwear to promote comfort and reduce 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 RTDG 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 an aesthetic 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 RTDG 2.5 (patchy moist desquamation).
- In one patient polymeric membrane dressings applied from RTDG 3 (confused 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.

Case 1
- Mrs W, 63 yr old female. Well differentiated squamous cell carcioma alveolar gingiva right molar.
- Adjunctive post-operative radiotherapy 60Gy with a 4Gy boost in 31 fractions (9 weeks 5/3/10). Twice daily aqueous cream applied to treatment field.
- RTDG reaction 0-2.
- At 28th week reaction scored as RTOG 2.5 - patchy moist desquamation. Polymeric membrane collar applied. Collar dressing continued to be applied throughout remainder of treatments till 33rd and first 6-8 post treatment at which point dressing was no longer required at treatment field; comfortable and graded as a combination of RTOG 2/2.5 - dry desquamation / first erythema.
- Recommended aqueous cream to be prescrbed prior to starting hydration and comfort with the treatment field until skin fully healed (RTDG 0).

Case 2
- Mrs H, 46 yr old female. Squamous cell carcinoma of right cheek - unknown primary.
- Chemo-radiotherapy over 7 weeks – total of 70Gy in 35 fractions (8 weeks 1/11). 1/2 of the patients had a dressing applied to the whole field at the end of week 7 and continued throughout.
- Polymeric membrane collar dressing applied from RTDG 2.5 (patchy moist desquamation) throughout remainder of treatment and up to 3 weeks post treatment recovery period. Soft silicone dressing used in place not covered by the polymeric membrane dressing.
- 6 weeks of treatment, graded as RTDG 2 (confuse moist desquamation).
- Continue to use tailors and post treatment for comfort and protection until fully intact and comfortable without a dressing in situ (Fig. 6).
- 6 weeks post treatment Medical Review - skin documented as fully healed. Photos from home review at 6 weeks post (Fig. 7).

Case 3
- Mr M, 56 yr old male. Squamous cell carcinoma of anogenital area.
- Adjunctive post-operative chemoradiotherapy of 60Gy in 33 fractions with Cisplatin 100mg per 96 hour treatment every 3 weeks and fractionated RTDG 3.
- At 5th week reaction graded at RTDG 0 - 2.5 (patchy moist desquamation). Patient reported increased comfort from using polymeric membrane collar. Additional soft silicone cream dressings used as collar base area to maintain coverage of whole treatment field.
- 33rd day of treatment remained as RTDG 2.5 (Fig. 8). Dressing combination continues until next review.
- 1 week post treatment follow-up taken from written documentation - no problems observed – skin reaction predominantly RTDG 2.0 (dry desquamation), small area grade RTDG 2.5 (patchy moist desquamation) requiring only a small soft silicone dressing. Polymeric membrane collar discontinued. Aqueous cream recommended to underline / dry areas.

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. rouleaux 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-adhesive. The unique property of a surfactant within the dressings continuously cleans 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 RTDG 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.

References
- Kedge E (2009) A systematic review to investigate the clinical experience and most importantly from patient feedback, and is aimed at minimising further problems and improving comfort and quality of life.
- Porrock, D. Kristjanson, L. (1999). Skin reactions during radiotherapy for breast cancer: the use and impact of dressings and intervention rationales of Cancer (EORTC), International Journal of Oncology, Radiobiological damage affects regeneration of the skin and skin damage occurs through 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 2/2.5 - dry desquamation / first erythema.
- Increase application of aqueous cream as needed.
- Silicone lite dressings used on collar bone areas to ensure coverage of whole treatment field.

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.

Mechanism of damage

RTDG assessment tool and Intervention rationales