

Theme: Clinical

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Analysing the impact of dose on skin toxicity for head and neck cancer patients receiving proton beam therapy alone versus concurrent chemoradiotherapyMichelle Boey Ting Fang^{1,2}, Sin Sze Yarn^{1,2}, Melvin Chua Lee Kiang¹⁻⁵ and Tan Hong Qj¹⁻⁴¹Division of Radiation Oncology, National Cancer Centre Singapore²Goh Cheng Liang Proton Therapy Centre Singapore³Duke-NUS Medical School Singapore⁴Division of Medical Sciences, National Cancer Centre Singapore⁵American Society of Clinical Oncology**Background/Aims:**

- Since June 2023, Ministry of Health (MOH) Singapore has approved Proton Beam Therapy (PBT) as an indication for the treatment of locally advanced/inoperable head and neck (HN) cancers.
- Radiation dermatitis** is one of the most common and dose-dependent adverse effects associated with HN radiotherapy (RT).
- We aim to examine the weekly and cumulative incidence of radiation-induced dermatitis in HN patients for proton RT alone versus concurrent chemoradiotherapy (CCRT).



Fig 1: Radiation Dermatitis Grade 1 (Left) & Grade 2 (Right)

Subjects and Methods:

- Jun 2023 to Dec 2024, 97 HN cancer patients treated with Sequential Intensity Modulated Proton Therapy (SEQ-IMPT) were recruited.

Prescription	Phase 1: 44Gy/22# (low-risk PTV) Phase 2: 26-29.9Gy/13# (high-risk PTV)
Planning	4-5 fields with Robust optimisation (± 3 mm, $\pm 3.5\%$)
Toxicity Assessment	Weekly (7 weeks) using CTCAE v4.0 by Physician/Advanced Practitioner Radiation Therapist (APRT)
Assessment Analysis	Toxicities graded (1-3), stratified by RT vs CCRT; Weekly and Cumulative incidence evaluated

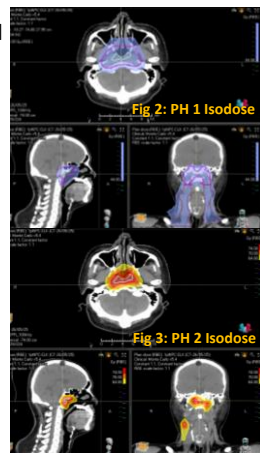
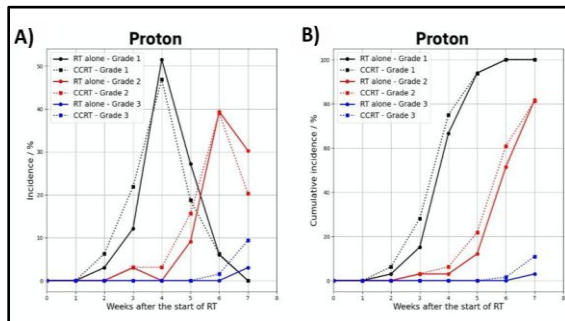
**Results:**

Figure 4: Weekly and Cumulative incidences of the different toxicity grades are shown in Diagram A and B respectively.

Toxicity Trends**Weekly Incidence (Diagram A):**

- Grade 1:** Peaked at week 4 – ~50% (RT alone) vs ~45% (CCRT)
- ➡ No significant difference in onset.
- Grade 2:** Peaked at week 6 – ~40% for both groups
- ➡ No significant difference in onset.
- Grade 3:** Infrequent, but occurred earlier and more frequently in CCRT group

Cumulative Incidence (Diagram B):

At the end of 7 weeks of RT-

Grade 1: 100% (both groups)**Grade 2:** ~80% (both groups)**Grade 3:** ~10% (CCRT), ~5% (RT alone)**Conclusion:**

In conclusion, overall skin toxicities were comparable between CCRT and RT alone, though CCRT may lead to more severe Grade 3 dermatitis. Further studies with larger cohorts and longer follow-up are needed to validate these observations and explore potential predictive factors for radiation dermatitis severity.